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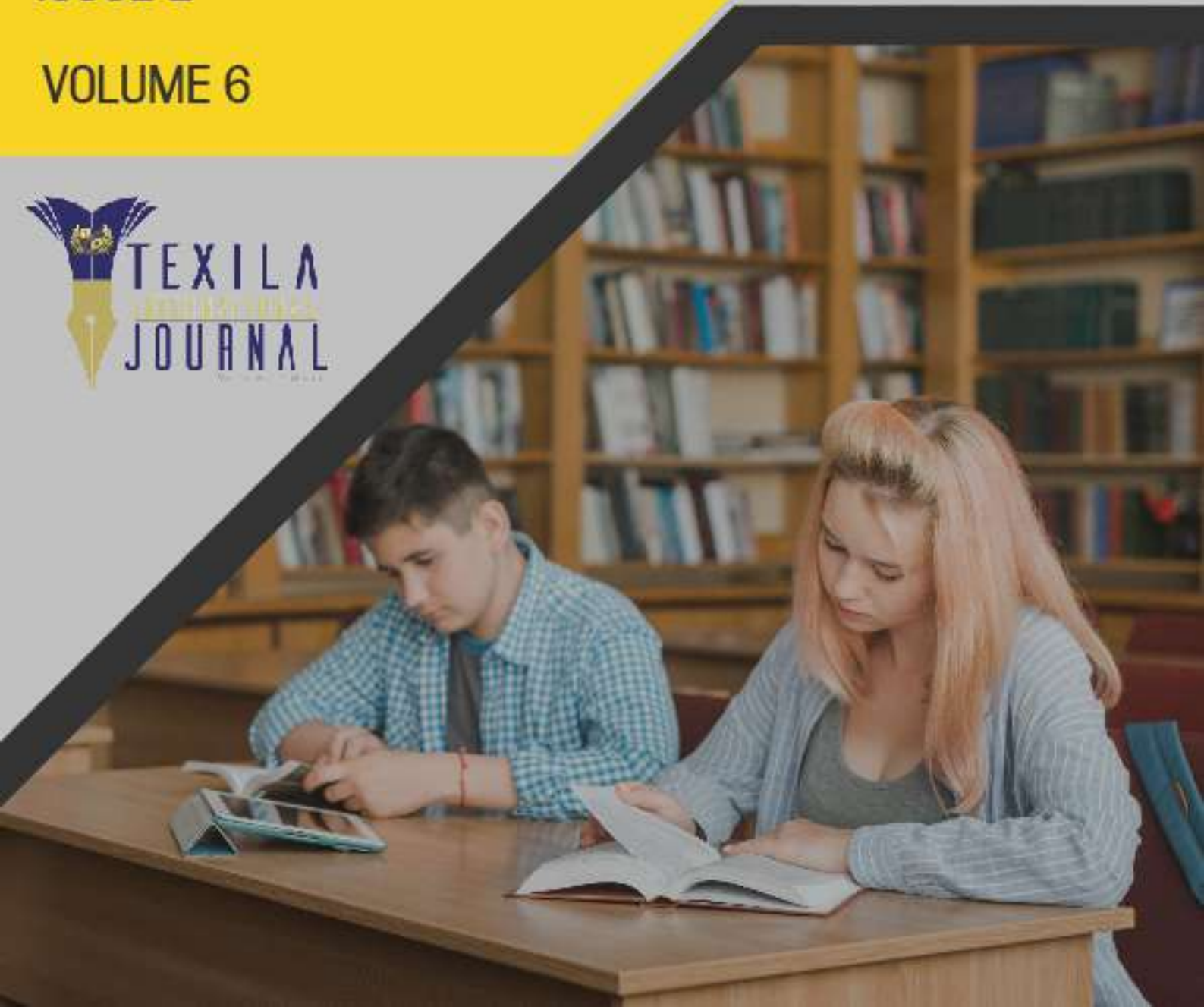

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Modern Technological Advances and the Challenges in the Kente Weaving Business of Ghana

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Abstract

The study examined the challenges of introducing modern technology to facilitate the traditional Kente weaving business of Ghana. Amongst its objectives were ascertaining the weaknesses associated with introducing the technology by identifying the threats emanating from infusing modern technology into the industry. The importance of the study lies in the fact that the findings and recommendations will not only go a very long way to enrich the body of knowledge on the subject of Kente weaving business in Ghana, but will also help make the cottage industry more attractive to the youth and uplift the living standards of the Kente weavers. Challenges associated with the initiative had to do with the fact that most of the weavers are old and illiterates so a lot of work has to be done in coaching them to come on board with the new technology. It is unlikely that the existing weavers would be able to fund the equipments needed for a smooth integration of technology into the weaving of Kente.

Keywords: *Technology management, Innovation, Kente weaving, traditional, Challenges, weaknesses.*

Introduction

Technology continues to positively influence the way various businesses are conducted. As a result, better quality products and services are not only offered to delight customers, but also cost of production is greatly reduced to register higher returns on shareholder's investment. In the banking industry for instance, owing to advancement in technology, one could sit in the comfort of his or her home to effect payments through the bank account without physically being present at the bank's premises. He or she could also approach any compatible Automated Teller Machine of even other banks to withdraw cash at any convenient time of the day. In Ghana, the sachet purified drinking water business in its earlier stages was labour intensive consequently staff cost virtually swallowed most of the profit margins. With the introduction of the Koyo dispensing machines, human touch in both the filling and packaging processes, have been hugely reduced thereby improving the profit levels in the industry. It is from this background that the researcher is of the conviction that technology can be introduced into the Kente weaving business to completely turn around prospects in the industry. Globally the Kente clothe has been known to originate and produced in Ghana.

Conceptual definition

According to Sahlman & Haapasalo (2009), technology Management can also be defined as the integrated planning, design, optimization, operation and control of technological products, processes and services, a better definition would be the management of the use of technology for human advantage. Technology management is the management of innovation, whether it be a product, a process or an organization, from its conception to its diffusion, and therefore to its implementation within the company, including the consequences, advantages and disadvantages for all of the variables and actors involved in running the company. Innovation is seen as any change produced by technology in an organization towards the satisfaction of its economic goals, i.e. providing an economic advantage. Technology management is then the management of change, i.e. the management of technology. But it also involves management by or through technology, or in other words, how technology is used to run the company. It is a set of tools that creates value by generating new markets and opportunities and or by reducing production and transactions costs.

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Review of literature

In the opinion of Levin & Bernard (2008), technology plays a vital role in business. Over the years, businesses have become dependent on technology so much so that if we were to take away that technology virtually all business operations around the globe would come to a grinding halt. Sahlman & Haapasalo (2009) argue that, almost all businesses are dependent on technology on all levels from research and development, production and all the way to delivery. Small to large scale enterprises depend on computers to help them with their business needs ranging from Point of Sales systems, information management systems capable of handling all kinds of information such as employee profile, client profile, accounting and tracking, automation systems for use in large scale production of commodities, package sorting, assembly lines, all the way to marketing and communications. It doesn't end there, all these commodities also need to be transported by sea, land, and air. Just to transport your commodities by land already requires the use of multiple systems to allow for fast, efficient and safe transportation of commodities. Luggen & Tschirky (2003) point out that without this technology the idea of globalization wouldn't have become a reality. Now all enterprises have the potential to go international through the use of the internet. If your business has a website, that marketing tool will allow your business to reach clients across thousands of miles with just a click of a button. This would not be possible without the internet. Technology allowed businesses to grow and expand in ways never thought possible. The role that technology plays for the business sector cannot be taken for granted. If we were to take away that technology trade and commerce around the world will come to a standstill and the global economy would collapse. It is nearly impossible for one to conduct business without the aid of technology in one form or another.

Almost every aspect of business is heavily influenced by technology. In the view of Metz (1996) technology has become very important that it has become a huge industry itself from computer hardware manufacturing, to software design and development, and robotics. Technology has become a billion-dollar industry for a number of individuals. Without all the technology that we are enjoying now it would be like living in the 60's again. No computers, no cellular phones, no internet. Luggen & Tschirky (2003) also explain further that, although IT has a significant impact on reducing cost, it is also a key cost component in the price of business process outsourcing services. This paper discusses the impact of software on outsourced solutions and helps buyers gain a clear understanding of how their decisions impact the cost of services. It provides a clear picture of the cost impacts from such aspects as the following:

- How customization impacts the price of services and time for implementation
- The impact of technology and sustainability of savings — why technology savings are typically not enough to justify the business case for a multi-year outsourcing agreement
- The impact of not improving retained technology and processes that are adjacent to the outsourced process

It also presents information about surprise or overlooked costs associated with governance and explains the significant impacts and ripple effects of not budgeting for these “hidden” costs. Buyers considering business process outsourcing as a strategic option should carefully consider the complete cost picture before embarking on the journey.

Kente weaving in ghana

The technique of weaving on the loom had been invented in different societies around the world thousands of years ago when human beings started wearing woven cloth garments instead of covering themselves with leaves, barks and animal skins and fur. While there is evidence of weaving of plant fibers in Africa as early as 5000 to 4000 BC, it is thought that the horizontal loom and weaving of cotton was introduced sometime in the first millennium. The Puels (Fulani) were the first to learn the trade from Syrian Semitic people from the northeast. While first working with wool, the Puels became skilled at working the loom and developed the practice of working with the new fiber, cotton--learning the techniques from the Arabs. The oldest known mention of the local production of cotton fabrics in the area is in a book written by the learned geographer, traveler and pious Arab Sunni, El Bekri, dated 1068. The techniques in weaving strips of fabric spread rapidly. Both loom and cotton industries were transmitted to the Tukulors, the Wolofs and then to the different Mande people of the Sudan, soon

reaching the Bambara, the Dogon and others. Hence, the Ewes did not invent weaving (Arthur & Rowe, 2001). When we talk specifically about "Kete/Kente Weaving" on the narrow loom, the equipment and the technique between the Ewes and Asantes are so similar that there is no doubt that they originated from the same source. Some writers also claim that Kete (Kente) was probably introduced from the western Sudan during the 16th century, when heavy, elaborate, labor-intensive versions of this fabric were designed for wealthy "tribal" chiefs and simpler designs became available for the general citizenry (Momaya & Ajitabh, 2005).

Objective of the study

The main objective of the study is to ascertain the weaknesses associated with introducing modern technology in the traditional way of weaving Kente in Ghana. Specific objectives include:

i. To understand the weaknesses inherent in the process of introducing modern technology in the Kente weaving business of Ghana.
ii. To examine the threats associates with introducing modern technology in the Kente weaving business of Ghana.

Research problem

Globally technology has contributed in no small measure towards shoring up business prospects. Various industries ranging from service, extractive, manufacturing, aviation, shipping, both print and electronic media, etc have all had the fair share in expanding their profit curves owing to the introduction of modern technology. Unfortunately, in Ghana, despite the availability of modern technology certain trades continue to hinge on the outmoded pre-colonial resource wasting methods of producing goods. Kente clothe, which is one of Ghana's cultural identities is traditionally produced by the people of Bonwire in the Ashanti region as well as most citizens of Agotime Kpetoe in the Volta Region. As a result of sticking to their old methods of production, it takes a little over one solid week to weave of 10-metre Kente cloth valued at US$200 or less. When operation cost is deducted the Kente weaver is virtually left with a pea nut for his one-week labour. If modern technology were introduced in Kente production, the 10-metre Kente could be woven or produced in one hour thereby creating enough room for the Kente weaver to produce more and improve tremendously upon his business prospects.

Thesis Statement/Hypothesis

H^1 The weakness within the introduction of modern technology in Kente weaving in Ghana can easily be resolved for the business to flourish properly.

H^2 The weakness associated with introducing modern technology in Kente weaving in Ghana will be difficult to surmount and for that matter the introduction will be a failure due to illiteracy.

Literature review

This chapter examines the concept of technology, theories underlying technology and its transfer as well as taking a close look at the challenges confronting the introduction of technology into the Kente business in Ghana in addition to role of technology in the Textile industry have all been discussed.

Concept of technology and technology management

Technology Management (TM) has become an established academic discipline for two decades ago and located within management field instead of economics or public policy and is focusing on the firm in which the analysis is at firm-level instead of industry level. However, TM is also studied at national-level. TM is multi-functional and multidisciplinary field and very diverse. Moreover, Cetindamar, Phaal and Probert (2006) have proposed TM activities from dynamic capability (DC) perspectives.

TM is to achieve competitive advantage in which have defining competitive advantage as 'the condition that enables a firm to operate more efficiently and/or effectively than the companies it competes with', in which the competitive advantage of technology and innovation-focused firms is related to the technological complexity and skills and knowledge of the firms at managing the technology (Affeldt & Silva 2013). When firms pursue for new product or new process developments, the capabilities use to develop the products/processes are basically developed through and around the

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technologies. As the capabilities are transferred through technologies to the new products/processes, it is basically the technological capabilities that are developed behind them. By referring to the definition of resource by Keller, (2002), it is obvious that technology is part of resources and as argued by Lai (2007), 'technology is the knowledge, products, processes, tools, and systems used in the creation of goods or in the provision of services.

The importance of technological resources to the firm's objectives further explained by Levin & Bernard (2008) in which the establishing and maintaining the linkages between technological resources and company objectives is of vital importance and represents a continuing challenge for many firms. The dynamic nature of technology has contributed to the existence of various definitions and concepts of technology by the previous studies which are related to technology transfer. The discussion on the concept of technology is crucial in getting a clear understanding of the nature of technology and examining what the technology consists of. Past studies have shown that defining the concept of technology is not easy (Agboola & Salawu 2010); therefore, technology has been defined from different perspectives. Existing studies on technology have attracted researchers from cross-section of disciplines including organizational management, political science, economics, sociology, anthropology, marketing and recently management of technology.

According to Chun (2007) technology consists of two primary components: 1) a physical component which comprises of items such as products, tooling, equipments, blueprints, techniques, and processes; and 2) the informational component which consists of know-how in management, marketing, production, quality control, reliability, skilled labor and functional areas. The current studies on the technology transfer have connected technology directly with knowledge and more attention is given to the process of research and development. By scrutinizing the technology definition, there are two basic components that can be identified: 1) 'knowledge' or technique; and 2) 'doing things'. Technology is always connected with obtaining certain result, resolving certain problems, completing certain tasks using particular skills, employing knowledge and exploiting assets (Chanaron, Jolly, & Soderquist (2002). The concept of technology does not only relate to the technology that embodies in the product but it is also associated with the knowledge or information of it use, application and the process in developing the product.

In defining the term technology, all the three elements must be understood as being inter-connected to each other and a change in one element will affect the other two elements. The latest definition given by Drejer (1997) has broadened the concept of technology where technology is defined as 'the information necessary to achieve a certain production outcome from a particular means of combining or processing selected inputs which include production processes, intra-firm organizational structures, management techniques, and means of finance, marketing methods or any of its combination'. Other scholars such as Goodhue & Thompson (1995) suggest that technology as a cultural system concerned with the relationships between humans and their environment. From the systems perspective, Das (1987) defines technology as encompassing: 1) the basic knowledge sub-system; 2) the technical support system (software); and 3) the capital-embodied technology (hardware). This perspective views that technology recognizes the need to identify the different elements of a particular country's technology that are complementary and mutually reinforcing.

Levin & Bernard (2008) considers technology transfer as the application of scientific principles to solve practical problems. From the social science perspective Schilling (2008) defines technology transfer as a socio-technical process implying the transfer of cultural skills accompanying the movement of machinery, equipment and tools. The technology transfer concept is not only concern about the transfer of technological knowledge or information but also the technology recipient's capability to learn and absorb technology into the production function. Das (1987) argues that technology transfer can be of two types: 1) production of new product (product or embodied technology transfer); and 2) more efficient production of existing products (process or disembodied technology transfer).

Theories on technology and its management

According to Chun, (2007) new technologies come up after series on innovations have occurred which translate into pure research and eventually developing new technologies. Innovation can therefore be said to bet the starting point of establishing new technology. Before one can examine how

a particular innovation disperses and distributes within a population, one needs to operationalize what is meant by the term innovation. At the broadest sense, an innovation can be any new idea to a population. Rogers (2003) defined an innovation as "an idea, practice or object that is perceived as new by an individual or other unit of adoption". It does not matter if the idea, practice, or object is objectively new; rather, it is the perception of novelty. In addition, innovation also does not necessarily mean better or that the new idea is more beneficial to an individual. Whereas innovation can refer to something abstract, like an idea, it can also be concrete, like a new piece of technology. This article focuses specifically on computer-based technologies as a particular type of innovation of interest (Lai, 2007).

Technology adoption models and theories

Low, Chen, & Wu, (2011) noted that the rate at which payment systems develop depends largely on a struggle between rapid technological change and natural barriers to new product or service acceptance. A number of theories have proposed to explain consumers' acceptance of new technologies and their intention to use. These included, but were not restricted to, the Theory of Diffusion of Innovations (DIT) that started in 1960, the Theory of Task-technology fit (TTF), the Theory of Reasonable Action (TRA), Theory of Planned Behavior (TPB), Decomposed Theory of Planned Behaviour, the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), (Venkatesh and Bala 2008).

Rogers (1995) proposed that the theory of 'diffusion of innovation' was to establish the foundation for conducting research on innovation acceptance and adoption. Rogers synthesized research from over 508 diffusion studies and came out with the 'diffusion of innovation' theory for the adoption of innovations among individuals and organization. The theory explicates "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Luo et al, 2006). Basically, it's the process of the members of a social system communicated an innovation through certain channels over time known as diffusion. The Rogers' (2003) diffusion of innovation theory explained that the innovation and adoption happened after going through several stages including understanding, persuasion, decision, implementation, and confirmation that led to the development of Rogers (2003) S-shaped adoption curve of innovators, early adopters, early majority, late majority and laggards as shown in figure 1:

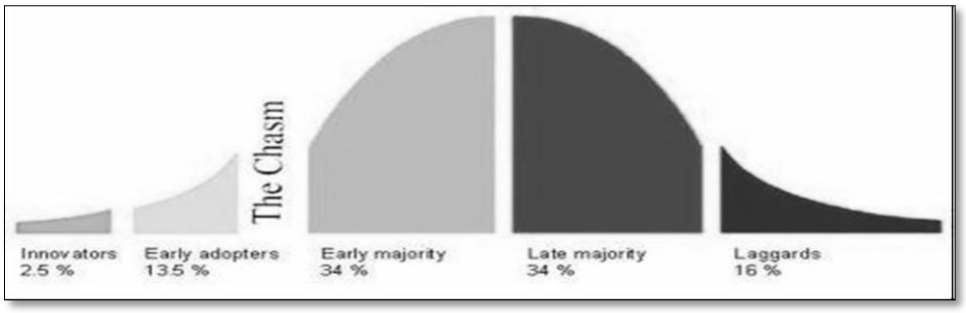

Figure 1. Adoption curve of innovation

Technology readiness (TR) refers to people's propensity to embrace and use of new technologies for accomplishing goals in home life and at work. Based on individual's technology readiness score and the technology readiness, Burgelman, Christensen, & Wheelwright (2004) further classified technology consumers into five technology readiness segments of explorers, pioneers, skeptics, paranoids, and laggards. This is similar to Rogers (2003) S-shaped adoption curve of innovators, early adopters, early majority, late majority and laggards. The Diffusion of innovation or Technology readiness is vital for organization implementation success because it is market focus.

According to Dodgson et al (2008), Task-technology Fit (TTF) emphasizes individual impact. Individual impact refers to improved efficiency, effectiveness, and/or higher quality. Drejer (1997) assumed that the good fit between task and technology is to increase the likelihood of utilization and also to increase the performance impact since the technology meets the task needs and wants of users

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more closely. The task-technology fit is good for measuring the technology applications already release in the marketplace like in the google play store or apple store app (iTunes) etc.

Challenges of introducing technology in business

To remain competitive in a global economy, Buchanan (2012) explains that businesses need to adapt to an ever-changing environment to meet their customer's needs. Staying competitive means continuing to evolve as an organization and making changes to both process and technology to gain a competitive edge over their competition. Organizations must become adept in bringing in new technology and managing the challenges that go along with implementing the change. Changes of this nature can provide significant benefits to an organization but can also present many challenges that need to be managed to yield a positive outcome. Problems arise when organizations attempt to bring in a new technology without proper management and training for their employees (Barnes 2005).

Constant technological change simultaneously creates threats to established business models, while also offering opportunities for novel service offerings. Leading firms often seek to shape the evolution of technological applications to their own advantage (Lai, 2007). With the advanced and dynamic growth of technologies, how fast the consumers are accepting these technologies depends on a number of factors such as availability of technology, convenience, consumers' need, security etc. There have been a number of researchers addressing the consumers' adoption of new technologies. Since technology is such a vital force, the field of technology management has emerged to address the particular ways in which companies should approach the use of technology in business strategies and operations. Technology is inherently difficult to manage because it is constantly changing, often in ways that cannot be predicted (Chun, 2007). Managing employees' acceptance of technology change can be a challenge for any organization (Lynch et al 2011). To successfully implement a technology change, several areas need to be affectively addressed. Challenges with internal conflict, or resistance by staff to the change must be managed. Employee training, communication and a multi-generational work force should all be considered and planned for when selecting a new technology. These items can be addressed with a well-defined implementation plan, an effective training plan and open communication between employees and management.

Resistance to change

Change is an unavoidable phenomenon within the business world. It arises from the dynamics of the environment organizations operate in and is required for an organization that wants to flourish. To remain competitive, Liao (2005) indicates that, it is essential for organizations to be able to upgrade their tool set on a regular basis and have these changes accepted by staff. There are many items to consider when bringing new technology into an organization. It is important to note that altering staff behavior is a long-term objective and change cannot be forced on employees overnight, it is a key to provide them with the context for the change so they are able to understand the need for it (Pilkington & Teichart, 2006).

Gaining acceptance at the staff level can be a challenge as getting buy-in by the employees' who are going to use the new technology can be difficult to manage. Introducing changes within an organization can cause disruptions in patterns or behaviors that can cause loss of continuity, replace customary social structures and familiar relationships (Agboola & Salawu, 2010). Bringing on new technology can be intimidating for employees' who are content in doing things as they have always done them. Adopting new technology can mean changes to job responsibilities, added work load, additional training and personnel. Technology changes of this nature can also impact the politics of an organization. Those who possess certain skills and abilities may see change as a threat to their positions and undermining their job competence. Changes of this nature also have the potential to impact relationships and change behavior patterns of employees. Resistance to change can also come from an unexpected source, management (Anderson, 1997). In some situations, managers who should be champions of change, may see it as a threat to their position within an organization. When changes are directed by senior level management, middle managers can find themselves in a similar position as their employees and begin to resist the changes that are being pushed down to them. Managers in this position are uniquely

positioned to either have a negative or positive effect on the change being made by encouraging employees to either resist or accept the change being implemented (Brady et al 1997).

Chun (2007 further argue that, Technology changes can also impact the nature and culture of an organization. Changes have the possibility of impacting an employee's job responsibilities, which can create feelings of uncertainty. The uncertainty of what new technology means for employees' can trigger more resistance to their acceptance of it. Resistance can also come in the form of attachment to old processes and legacy tools that employees are comfortable with. Employees can become accustomed to a situation that are not the most beneficial and will strongly resist any suggestions to change it. Technology change is more than just brining in a new tool or piece of software, it is also changing the behavior of employees' that can be content with a given way of doing things and resistant to changing what they are used to (Benamati et al, 1998).

Human discomfort with change is really based on the fear of loss. The fear of the unknown sometimes is worse than the actual change itself and employees can let these fears cloud their judgment about the benefits that a change may bring for them and an organization. Causes of these fears can come from feelings of uncertainty, lack of tolerance, differences in opinion and threatened self-importance. According to Carr (1999) "resistance to change is mainly an effort to maintain the status quo and resistance is a behavior put up to protect an individual from the perceived effects of a real or imagined threat". To help manage change effectively and reduce the resistance of employees to change, organizations should have a mechanism in place to introduce and control the changes so they are able to avoid production or morale issues.

Research done by Benamati, et al (1998) showed that the fear of new technology kept employees from using it to the fullest extent. Instead of embracing the new technology only the minimum functionality required to use it was learned to apply it to their work. Additional research also suggests that promotion-focused employees would maximize their ability to master the new technology on their own, because it would provide them with a sense of achievement and accomplishment where as a prevention-focused employee would be reluctant to separate from their normal routine to learn new technology own and procrastinate in adopting it for fear of not having enough time to get their assigned work completed (Keller, 2002).

Cetindamar et al (2006) described resistance to change as "barriers arising from organizational politics, inappropriate use of power, challenges to cultural norms and institutional practices, lack of understanding, inappropriate timing, inadequate resources, incorrect information or employee suspicion of honorable management intentions". In most cases resistance to change is a negative force and does not always surface in standard ways and can appear in various forms such as being overt, implicit, and immediate or deferred in nature. Resistance to change is part of human culture which can be rather inflexible at times. This inflexibility influences people's behavior and efforts to make changes creates natural resistance in people (Boateng, 2011).

Research methods

This segment gives a summary of the research methodology used in the research. In order to help address the issues raised under the research questions section in chapter one, explanatory research design was chosen. The explanatory research presents data relevant for cause-effect relationships. It is therefore the best approach to adopt in explaining how events occur (Booth et al (2008).

Population of the study

The target group is the Kente weavers in Bonwire as well as Agotime Kpetoe in addition to picking up information from stakeholder pertinent public institutions. Yin (2009) describes a research population as a group that the researcher wants to generalize from which a sample is drawn and interviewed for picking up needed information to meet the objectives of the study. This was supported by Creswell (2013) when he defined a sample as a subset of the population in determination of sample. Random selection captures and inspects data using descriptive statistics question and comprises a selection of members from that particular population. The definition of the sample is of vital importance as the results of an investigation are not trustworthy more than the quality of the population or representativeness of the sample.

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Source of data

Both primary and secondary data was employed in conducting the study. Whereas primary data emanated from responses collated from interview guide and questionnaire administered to the respondents, secondary data were obtained from books, pertinent academic journals and other unpublished materials. In obtaining the primary data, purposive sampling technique was used to directly pick up officials who have the requisite knowledge in Kente weaving and distribution to assist the study in meeting its objectives.

Data analysis and discussion

This chapter presents the analysis of data gathered from the field together with their interpretation. It begins with the demographic of both groups of respondents prior to displaying the finding in respect of the specific objectives of the study aimed at introducing modern technology in the Kente weaving business of Ghana.

Educational background of kente weaver

Findings on the academic background of respondents have been shown in figure 4.1

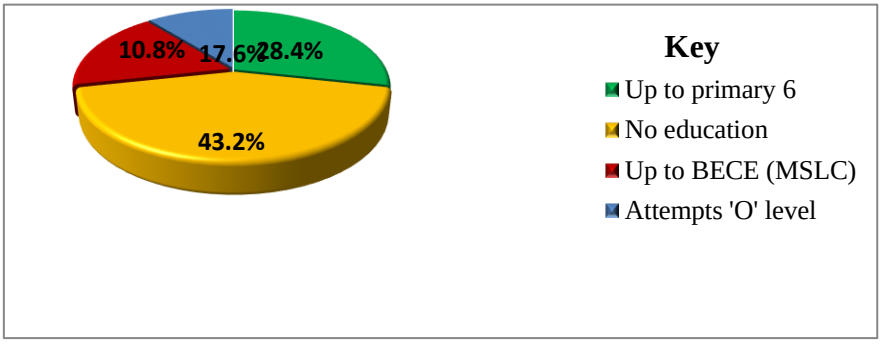

Figure 4.1. Distribution of academic background of respondents

Sources: Field Data (2018)

Figure 4.1 shows that, 32 (i.e. 43.2%) out of the 74 kente weaving respondents had no formal education. Twenty-one (i.e. 28.4%) respondents schooled up to the primary 6 level while 13 (i.e. 17.6%) respondents ended their academic work at the basic school level i.e. either Middle School Leaving Certificate (MSLC) or he recently introduced basic education certificate examination. Eight (i.e. 10.8%) respondent attempted the general certificate of education (GCE) ordinary level. It is obvious from the above that the kente weaver wild very low academic qualification.

Number of years in kente weaving

Findings on respondents' number of years in kente weaving has been shown on figure 4.2

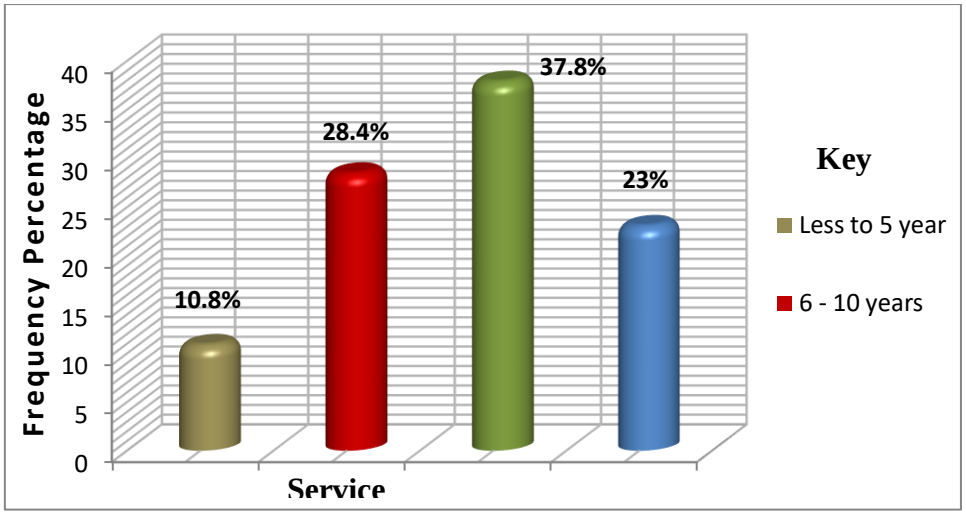

Figure 4.2. Distribution of service duration in kente weaving

Source: Field Data (2018)

It can be gathered in Figure 2 that 28 (i.e. 37.8%) respondents out of 74 have been working in Kente weaving business in periods between 11 and 15 years. Twenty-one (i.e. 28.4%) have been in the employ of the Kente business for periods between 6 and 10 years. Seventeen (i.e. 23%) respondents have also been on the Kente weaving for over 15 years while 8 (i.e. 10.8%) respondents have been with the business for not more than 5 years.

Analysis of Issues relating to Research Objective Two of Understanding the Weaknesses Associated with introducing Modern Technology in Kente weaving business of Ghana.

This segment examines the weaknesses inherent in the process of introducing modern technology in the kente weaving business of Ghana. First it looks at the views of the weaver respondents prior to discussing the responses from the stakeholder institutions.

Table 4.10. Frequency table from Kente Weavers on Weakness Associated with introducing Technology into Kente Weaving Business

Response Type	Frequency (Out of 74)	Percentage %
We are not educated how can we understand the use of the new technology in the shortest possible time to continue or trade.	55	74.3
Non-traditional weavers will invade the business and throw us out in the process.	59	79.7
During the learning process where do we get money to fend for ourselves and families.	64	86.5
The machines or new weaving equipments will be too expensive to meet our pockets.	69	93.2
We don't have strong trade association to eight for over business rights.	48	64.9

Source: Field Data (2018)

Table 4.10, contains weaknesses within the process of introducing technology into the Kente business as seen by the weavers. According to 69 (i.e. 93.2%) Kente weaving respondents, one main weakness in the introduction lies with the fact that the machines or the new weaving equipments will be too expensive for the traditional weaver to purchase. Sixty-four (i.e. 86.5%) respondents pointed out that it will be difficult for them to come by that amount of money needed to procure the new equipments or machines for their businesses. In the opinion of 59 (i.e. 79.7%) respondents another weakness is that non-traditional weavers will invade the business and as it were, throw them out of business.

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It can also be gathered from table 4.8, that 55 (i.e. 74.3%) respondents noted that they are not educated people and for this fact it will be difficult for them to easily understand how the new technology works. According to 48 (i.e. 64.9%) respondents the Kente weaver are virtually on their own without any strong trade association to properly position their business. Forty-three (i.e. 58.1%) respondents observed that the advent of the new waving technology is likely to introduce a glut into the market leading to price war and fall in revenue and by extension profits.

The findings that the new equipments needed to conduct the Kente waving might be too expensive for the traditional weavers to purchases initially have been corroborated by Stam & Stanton (2010) who noted in a similar study that more often than not, new equipments introduced to facilitate cottage industries are often priced beyond the pocket of the industry participants. In the opinion of Kadolph (2007) funds should be made available to support industry players like the traditional Kente weavers to help them acquire the new equipments to complete the integration exercise. Scott (2000) is also of the view that some national funds could be established to enhance the process of transformation. The findings that other investors could invade the kente weaving market to 'pirate' the industry profits away have also been supported by Frings (2008) who submitted that when an industry is made attracted, together investors locally come on board thereby introducing intense competition in the industry.

The source disagreed that the 'invasion' will 'pirate' profits away, and noted however that such competition will rather result in new designs within the product profile leading to more patronage and therefore better quantum of revenue for all. The absence of a reputable trade association to organize kente weavers was seen by Asare (2012) as a serious setback to the introduction of the new technology. The source explains further that a strong trade association helps in fostering healthy industry bonds amongst members necessary to ensure judicious use of resources by members. Generally, it was noted that these weaknesses in new equipment introduction can all be resolved through proper analysis and appropriated solutions prescribed (Benamati et al, 1998).

Findings from stakeholder officials

Discussed below are research findings from stakeholders on weaknesses associated with introducing modern technology in the Kente weaving business of Ghana.

Table 4.11. Frequency table on weakness in introducing modern technology in kente weaving business

Statements on weakness	**N**	**Mean**	**Std. Deviation**	**Variance**	**Rank**
Illiteracy amongst weavers will delay the technology integration process.	84	4.07	.597	.356	1
Entrenched traditions will dissuade the elderly weavers from embracing the modern tradition.	84	3.71	.886	.785	2
Sian Tigers, especially Chinese industrialists, will capitalise on the introduction of technology to over produce Kente leading to a glut in the seemingly restricted business area.	84	3.43	1.122	1.260	3
Banks and other financial institutions may be unlikely to finance individual weavers in acquiring the new equipment to propagate the business.	84	3.29	1.036	1.074	4
Individual weavers might be unwilling to form groups to enhance their chances of winning external financial support.	84				

Source: Field Data (2018)

Table 4.11 - mentions illiteracy and entrenched traditions as the key weaknesses associated with the introduction of technology in the kente weaving business of Ghana. Furthermore, the weavers might have adequate financial resources to purchase the equipments for the weaving process. Another

weakness mention by the officials related to the fact that Banks and other financial institutions may be unlikely to finance individual weavers in acquiring the new equipment to propagate the business. Moreover, the stakeholders were of the conviction that individual weavers might be unwilling to form groups to enhance their chances of winning external financial support.

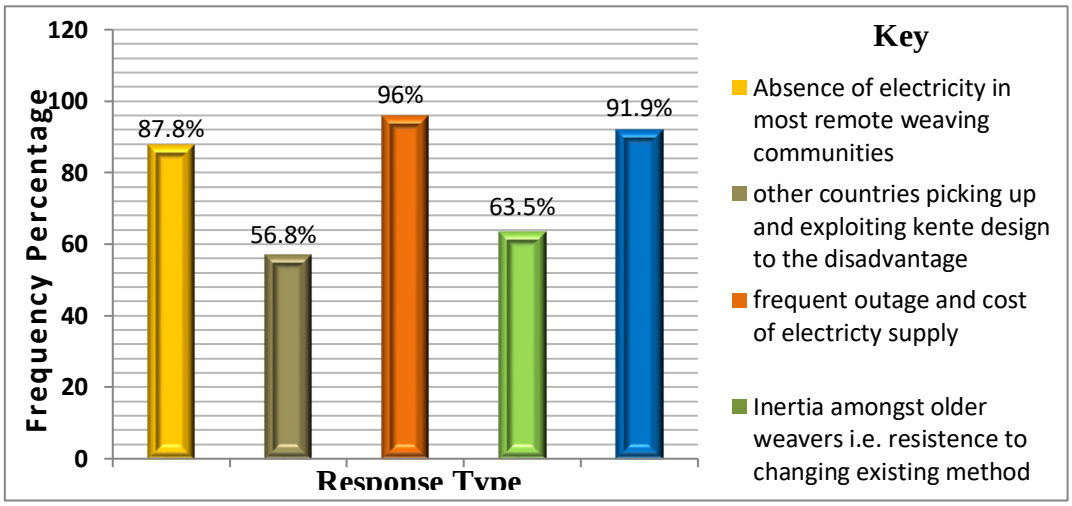
Generally, weakness can be address if the weavers will allow stakeholders to help them with such difficulties. According to Stam & Stanton (2010) where technology is being introduce to non-educated people, a lot of efforts must be made to ensure that the rudiment of the processes is clearly understood in a language that the learner speaks.

Analysis of Issues relating to the Objective of Examining Threats Associated with introducing Modern Technology in Kente Weaving in Ghana

As it has been done, above the views of the kente weavers will precede those of the small-scale industry stakeholders.

Views of Kente Weavers on threats Associated with introducing Technology in Kente Business

Presented in figure 4.4 are the views of kente weavers on the likely threats concerning introducing technology to support the kente business.



Source: Field Data, 2018

Figure 4.4 indicates that 71 (i.e. 96%) kente weaver respondents are of the view that frequent outage of electricity supply and its increasing cost constitute a huge threat to the envisaged strategy for introducing modern technology in the kente weaving business. According to 68 (i.e. 91.9%) weaver respondents another threat will be the initial funds required by traditional weavers to convert their outdoor weaving business to an indoor enclosed business. Sixty-five (i.e. 87.8%) respondents saw the unavailability of electricity supply in some remote rural communities as a further threat to modernizing the traditional kente weaving business. Forty-seven (i.e. 63.5%) respondents saw inertia amongst older weaver as another potential threat to the new technology integration process in the kente weaving business. In the opinion of 42 (i.e.56.8%) respondents' other countries are likely to pick up the kente design for piracy purposes thereby over producing to create glut in the business.

View from officials of stakeholder institutions

Views from stakeholder institutions have been presented here-under in table 4.13

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Table 4.13. Frequency table on threat posed to Kente Business by Technology Introduction

Statements on Threats	N	Mean	Std. Deviation	Variance	Rank
Large production volumes could drive price of commodity down.	84	4.07	.597	.356	1
Foreign investors could disrupt and divert industry profit.	84	3.86	.643	.413	2
Other countries might hijack the Kente business thereby losing its African in Ghanaians accent.	84	3.64	.977	.955	3
The Kente designs could be corrupted and 'diluted' leading to loss of original accent and taste.	84	3.36	1.453	1.112	4
When exposed too much other designs from industrialised economies could crowd out the Kente product in price leading to drop in revenue.	84	3.26	.838	.702	5

Source: Field Data (2018)

Table 4.13 shows that in the opinion of stakeholders the greatest threat to the technology integration process lies in the fact that other investors could invade the industry to produce more thereby creating a price war and as it were drive down prices considerably. This ranked first with mean score of 4.05 out of a maximum of 5 on the likert scale graduation. Coming second with a mean score of 3.86 is the threat of foreign investors joining the industry to compete away profit. There is a threat of sub regional countries also pirating the kente designs and using the new technology, they could over produce to reduce industry profit.

Kente being a global dressing material, there is also the threat of industralised countries using more sophisticated technology to produce the commodity at much cheaper cost thereby being in the position to serve at highly competitive prices with its negative impact on the fortunes of the traditional Ghanaian kente weaver.

Kente Weavers on Weakness Associated with introducing Technology into Kente Weaving Business

The study indicated further that; weaknesses associated with introducing technology in the kente weaving business are that:

- Non-traditional weavers will invade the business and throw us out in the process
- During the learning process where do we get money to fend for ourselves and families
- The machines or new weaving equipments will be too expensive to meet our pockets.
- We don't have strong trade association to eight for over business rights.
- We are not educated how can we understand the use of the new technology in the shortest possible time to continue or trade

Weakness in introducing Modern Technology in Kente Weaving Business

The study disclosed further that, some of the weakness in introducing modern technology in Kente weaving business includes:

- Banks and other financial institutions may be unlikely to finance individual weavers in acquiring the new equipment to propagate the business.
- Individual weavers might be unwilling to form groups to enhance their chances of winning external financial support.
- Illiteracy amongst weavers will delay the technology integration process.
- Entrenched traditions will dissuade the elderly weavers from embracing the modern tradition.

- Asian Tigers, especially Chinese industrialists, will capitalize on the introduction of technology to over produce Kente leading to a glut in the seemingly restricted business area.

Threat posed by the introduction of Modern Technology to shore up Prospects in the Kente Weaving Business

It came out from the study that, threat posed to Kente business by introduction modern technology may include:

- Large production volumes could drive price of commodity down.
- Foreign investors could disrupt and divert industry profit.
- The Kente designs could be corrupted and 'diluted' leading to loss of original accent and taste.
- When exposed too much other designs from industrialized economies could crowd out the Kente product in price leading to drop in revenue.
- Other countries might hijack the Kente business thereby losing its African in Ghanaians accent.
- The absence of electricity supply and frequent interruption in most hinterlands, where Kente weaving goes on, could disrupt the technology integration process.

Summary, conclusion and recommendation

This final chapter summarizes the study, draws useful conclusions and makes appropriate recommendations.

Summary of the study

The overall objective of the study was to ascertain the challenges associated with introducing modern technology into the traditional way of weaving Kente in Ghana. Specific objectives include understanding the weaknesses inherent in the process of introducing modern technology in the Kente weaving business of Ghana, as well as examining the threats associated with it.

Technology plays a vital role in business. Over the years, businesses have become dependent on technology so much so that if we were to take away that technology virtually all business operations around the globe would come to a grinding halt. Staying competitive means continuing to evolve as an organization and making changes to both process and technology to gain a competitive edge over their competition. Changes of this nature can provide significant benefits to an organization but can also present many challenges that need to be managed to yield a positive outcome.

Conclusions

The study explored the possibility of introducing new technology in the traditional kente weaving business in Ghana by analyzing the challenges to be anticipated. The study concludes that the weaknesses associated with the introduction concern the fact that majority of the weavers are illiterates and for that matter handing down technological knowledge will be difficult to undertake. It was further noted that absence of electricity supply in most hinterlands or rural areas will be a big threat to the new technology integration process. Attention is now turned towards testing the hypothesis of the research.

Test of hypothesis

The hypothesis that most of the weaknesses in introducing technology in the kente weaving business can be resolved is accepted and its null hypothesis i.e. H_2 rejected because the weakness like illiteracy of traditional weavers can be overcome through adult education to enable them appreciate the rudiments of the new technology being introduced.

Recommendation

In the light of some weaknesses and threats uncovered in the study, the following recommendations can be made:

Ensuring fair distribution of electric power to rural and deprived communities

The study uncovered the fact that a good number of rural areas do not have electric lights and that this is likely to disrupt the introduction modern technology in the kente weaving business of Ghana. It is therefore recommended that stakeholder institutions especially national board for small scale

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industries (NBSSI) liaises with the appropriate department of electricity generating institutions like Volta River Authority (VRA) and Electricity Company of Ghana (ECG) to ensure that the commodity is evenly distributed across the country. Where possible, government could subsidize the cost of electricity to the rural dwellers so as to encourage patronage for various poverty reduction projects.

Financing cost of new technology for weaving kente

The kente weavers complained of the likelihood of their inability to finance the acquisition of the new weaving equipments under the new dispensation. It is hereby recommended that a soft funding arrangement should be put in place to facilitate easy acquisition of the new weaving equipments. A strong trade association should be established to help the financial institution or government agency to monitor placed in the domain of the traditional weaver.

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An Assessment of the Knowledge and Practices of Mothers on Home Management of Diarrhoea in the under Five Children at the Medicalised Health Center Nkwen, North West-Cameroon

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Citation: Christina Asoh (2019). Factors influencing the practice of exclusive breastfeeding among lactating mothers attending IWC at the Mbengwi District Hospital in the North West Region of Cameroon.

Abstract

Diarrhoea has been and is still one of the highest threats to the lives of children below five years. According to millennium development goal, the fourth goal aims at reducing child mortality and morbidity to 2/3 from 1990 to 2015. Diarrhea remains the second leading cause of death among children under five years globally [Adimoraet al (2011)]. Nearly one in five child deaths, about 1.5 million each year, are due to diarrhea [Ansari et al (2011)]. Northern Cameroon estimated approximately 18500 diarrhoea episodes and 3696 RVA-associated child mortality occurred in Cameroon annually (Parasharet al, 2003). Many children under five who come to that hospital suffer from diarrhea they have been a steady rise ain the prevalence of diarrhoea among children under five in Cameroon and word (WHO 2004). Therefore, this study aims at assessing the knowledge and practices of mothers on home management of diarrhea in under five.

The descriptive cross-sectional study design was used to assess the knowledge, and practices of the mother in the home management of diarrhea. Targets were mothers in home management of diarrhea in children (0-5 years) who came in IWC, ANC units at the Nkwen Medicalised Health Center within the period of study. The instrument of data collection was a structured questionnaire, Microsoft Excel 2010 was used for analysis and data presented on tables, pie charts, histograms and Bar charts.

The current study revealed that mothers have inadequate knowledge on home management of diarrhoea 90(60%). They had negative practices towards the home management of diarrhoea and the use of ORS/zinc tablets as recommended by WHO was very low (29%) as compared to the use of drugs and traditional medicine. According to USAID and Experts worldwide (2002), success in the reduction of deaths and illnesses due to diarrhoea in childhood depends on the acceptance of the scientific basis and benefits of ORT by governments and medical communities.

There is need to educate mothers on home management of diarrhea using scientific bases to reduce infant mortality from diarrhea.

Keywords: *knowledge and practices, diarrhea, under five children.*

Introduction

Diarrhea remains the second leading cause of death among children under five years globally [Adimora *et al (*2011)]. Nearly one in five child deaths, about 1.5 million each year, are due to diarrhea [Ansari *et al* (2011)]. It kills more young children than Acquired Immunodeficiency Syndrome (AIDS), malaria and measles combined [Bacho, *et al* (2001)]. Each year, an estimated 2.5 billion cases of diarrhea occur among children under five years of age, and estimates suggest that overall incidence has remained relatively stable over the past two decades [Barbbie, (1989).]. It is estimated that, on average, each child under 5 years of age in developing countries suffers from three episodes of diarrhea per year [Bhutta, Z.A.2010)].

In Africa, a child experiences five episodes of diarrhea per year and 800,000 children die each year from diarrhea and dehydration which account for 25 to 75% of all childhood diseases [Biritwum, et *al* (2004) and Black*et al* (2002)]. The number of childhood deaths only decreased by 4% in Africa from

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2000 to 2008, due to inadequate interventions and high poverty rate [Boschi-Pinto *et al* (2008) and Enu-Kusi, (2010)].

The timely administration of oral rehydration salt (ORS), zinc tablets, vitamin A supplementation, safe water, good sanitation, and the use of antibiotics have proven to be both cost effective and efficacious as primary interventions for preventing diarrhea morbidity [Forsberg *et al* (2007), GSS/MOH/UNICEF (2006)]. Notwithstanding, diarrhea prevalence has remained relatively stable over two decades as the interventions are not effectively implemented by many children [Forsberg *et al* (2007) and GAVI (2005)]. For instance, only 39% of infants less than 6 months are exclusively breastfed and only 35% of children with diarrhea receive oral rehydration therapy

Diarrhoea is a condition in which someone passes 3 or more loose stool per day or more frequently than is normal for an individual which can be cause by Rota virus and verities of bacteria's such as Shigella and enterobacterias. WHO (2009).

It represents a significant burden on the health system, the house hold and the nutritional status of children,2195 children die every day due to diarrhoea more than deaths caused by AIDS, Malaria and measles combined, (Lieu *et al*, 2000).

Diarrhoea also accounts for one in nine child deaths worldwide making it the second leading cause of deaths among the under-fives. For children with HIV, it is even more deathly, with the death rate eleven times higher than the rate for children without HIV (Hutton. *et al*, 2007).

Globally, it is estimated that 1.7 billion cases of diarrhoea occur each year and is the leading cause of dehydration, malnutrition and retarded growth in children between 0-5 years of age. Diarrhoea can be acute or chronic and has a high incidence and mortality rate in low- and middle-income homes, (Haroun, *et al*, 2004).

According to WHO (2013), diarrhoea has become less common in developed world and recent statistics estimate that it is common with high incidence in Africa, Asia, and Latin America.

Children less than five years of age in the Sub-Saharan Africa experience a median of five episodes of diarrhoea per year with the highest incidence occurring in children aged 6-23 months (Boshi-pinto *et al*, 2009).

In Africa a group of expertise estimated that 90% of acute diarrhoeaare cause by infectious disease mostly through the faeco oral route of transmission 10% acute causes often blame on the diet. Escherichia coli and Rota virus in Africa causing 72% of diarrhoea cases and others cause by adenao virus, Shigella and antibiotics use WHO (2013).

According to United Nations Children's Fund (UNICEF) annual report, 93,000 children less than five die every year in Cameroon [Keratanas*e et al* (2006)]. Diarrheal disease is one of the major public health problems that cause excess morbidity and mortality in children in Cameroon [Kendell, *et a*l (2009)]. Although diarrhea is recognized as a serious public health problem in Cameroon, very little comprehensive studies relating diarrhea-causing pathogens responsible for endemic diarrhea among Cameroon's children have been reported in the medical literature. World Health Organization (WHO) has accordingly underlined the need for epidemiological surveys of infantile diarrhea in all geographical areas. The main research objectives were to assess the knowledge, and practices of mothers on the home management of diarrhoea in the under five children at Nkwen Medicalised Health Center.

Statement of the problem

Diarrhoea has been and is still one of the highest threats to the lives of children below five years. According to millennium development goal, the fourth goal aims at reducing child mortality and morbidity to 2/3 from 1990 to 2015. Though childhood mortality related to diarrhoea diseases have reduced, its incidence and prevalence is still sky-rocketing. 1.87 million (94%) children below five years died of diarrhoea yearly with 1.46 million (76%) coming from South East Asia and Africa combined (WHO, 2002). Diarrhoea proportionate mortality accounted for 19% of child deaths in the year 2000 and when applied to the total in 2004, it was responsible for approximately 1.8 million deaths in children under five years in low and middle income countries, (Boshi-Pinto *et al* 2006).Monthly (seasonal) prevalence of Group A rota-virus in Northern Cameroon estimated approximately 18500 diarrhoea episodes and 3696 RVA-associated child mortality occurred in Cameroon annually (Parashar*et al*, 2003). Based on my observation at the bamenda III sub-divisional medicalised health

center Nkwen. Many children under five who come to that hospital suffer from diarrhea they have been a steady rise in the prevalence of diarrhoea among children under five in Cameroon and word (WHO 2004).

This might be due to lack of knowledge and practice of home management of diarrhoea in children under five. So, the study of home management of diarrhoea in children under five years would provide baseline data that can be exploited to prevent diarrhoea among children under five years.

Study objectives

General objectives

To assess the knowledge, and practices of mothers on home management of diarrhoea in under five children at the Nkwen Medicalized Health Center.

Specific objectives

- To determine the demographic characteristics of mothers/caregivers.
- To assess the knowledge of mothers in home management of diarrhoea in children under five.
- To assess the practice of mothers in the home management of diarrhoea in children under five and their difficulties in the home management of diarrhoea.

Research question

What is the knowledge and practices of mothers on home management of diarrhea in under five children at the Nkwen Medicalized Health Center?

Hypothesis

Mothers have little knowledge in the management of diarrhea in under five children at the Nkwen Medicalize Health Center.

Methodology

Description of study setting

The Nkwen Medicalised health center is a public health institution located 5km form the Bamenda Health District Service and the North West Regional Delegation for Public Health. It is found inside the Nkwen Urban Health Area which is one of the 18 health areas of the Bamenda Health District.

This Health Facility is found in the heart of the Nkwen urban health area in the Baelle Zone alon the Bambui/Bambili highway, opposite the Amour Mezam Transport Agency.

The health facility has a catchment population of 86.681 inhabitants spread over 4main zones. This health facility operates with both the minimum and complementary package of activities as per the Cameroon health system.

Eligibility criteria

Inclusion criteria

- Mothers dealing with home management of diarrhea.

Exclusion criteria

- Mothers who did not deal with home management of diarrhoea
- Mothers who refuse to participate to our study
- Mothers who are not present during the data collection process.

Study design

The descriptive cross-sectional study design was used to assess the knowledge, and practices of the mother in the home management of diarrhea at the Nkewn medicalised health center.

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Sample size determination

To determine the number of mothers to be included in the study, the single population proportion formula was used.

$$\boldsymbol{N = \frac{Z^2 P(1-P)}{C2}}$$

Where: N= sample size
P= Prevalence diarrhoea in children
C= error marging (0.05)
Z= 1.96 at 95% confidence interval

$$N = \frac{1.96^2 \; x \; 0.11(1-0.11)}{0.05 \; x \; 0.05}$$

N= 150 mothers (sample size)

Sampling technique

A simple random sampling technique was used to obtain a sample from mothers who had managed diarrhoea at home but who attained ANC and IWC at the Nkwen Medicalised Health center to ascertain their knowledge and practices on the home management of diarrhoea in children age under five years.

Data collection tool and data collection method

The instrument of data collection was a structured questionnaire, structured as follows:
Section one: demographic of mothers in the home management of diarrhea.
Section two: knowledge of mothers on diarrhea.
Section three: practices in the home management of diarrhea in children 0 to 5 years by mothers and care givers and their difficulties in the home management of diarrhoea.

The questionnaires were self-administered by the researcher face to face on all ANC and IWC days within the study period. The convenient sampling method was implored here where only those mothers who attended IWC and ANC and consented were administered questionnaires.

Data management

Responses from questionnaires were analyzed using Microsoft Excel 2010. Graphs, tables and pie chats were then generated from the same software for better interpretation.

Strength and limitations

Limitations included recall bias for mothers who manage diarrhea in the children long time ago. Some responses were somehow irrational since some mothers who managed diarrhea in their under-fives at home ended up losing their babies. However, randomization minimized the effect of these limitations on the study outcome.

Results

Section 1. Socio-demographic data

Table 1. Distribution of respondents according to age group

Age group	15-20 years	21-30 years	31-40 years	41-50years	Total
Number of respondents	26	66	39	19	150
Percentage (%)	17.33	44	26	12.66	100

From table 1, out of 150 respondents recruited for the study, 66(44%) were between 21-30 years of age, 39(26%) between 31-40 years, 26(17.33%) between 15 -20 years and19 (12.66%) between 41-50 years.

Table 2. Distribution of respondents according to educational level

Educational level	**Frequency**	**Percentage (%)**
Primary	31	20.66
Secondary	42	28
High school	38	25.33
University	39	26
Total	**150**	**100**

It can be observed on table 2 above that 42(28%) of the respondents were from the secondary level of education, 39(26%) from the university level, 38(25%) from the high school level and 31(21%) from the primary level of education.

Table 3. Distribution of respondents according to occupation

Occupation	**Frequency**	**Percentage (%)**
Teacher	24	16
Business	33	22
Farmer	08	05.33
Student	33	22
Civil servant	21	14
House wife	21	14
Others	10	06.66
Total	**150**	**100**

From table 3, 33(22%) of the respondents recruited for the study were students, 33(22%) business ladies, 24(16%) teachers,21(14%) civil servant 21(14%) house wives, 10(06.66%) other occupations and 08(5.33%) farmers

Section 2: Respondents' Knowledge on Diarrhea

Table 4. Distribution of respondents on the definition of diarrhoea

Definition	**Frequency**	**Percentage (%)**
Passage of loose or watery stool at least 3 times in 24hours or more frequent than usual	60	40
Bloody stool	30	20
Stool which looks like catarrh	45	30
Protruding anus with pain during stooping	15	10
Total	150	100

It can be observed in table 4 above that 60(40%) of the respondents defined diarrhoea as the passage of loose or watery stool at least 3 times in 24 hours or more frequent than usual, 45(30%) of them defined it as stool which looks like catarrh, 30(20%) as bloody stool and 15(10%) defined diarrhoea as protruding anus with pain during stoolling.

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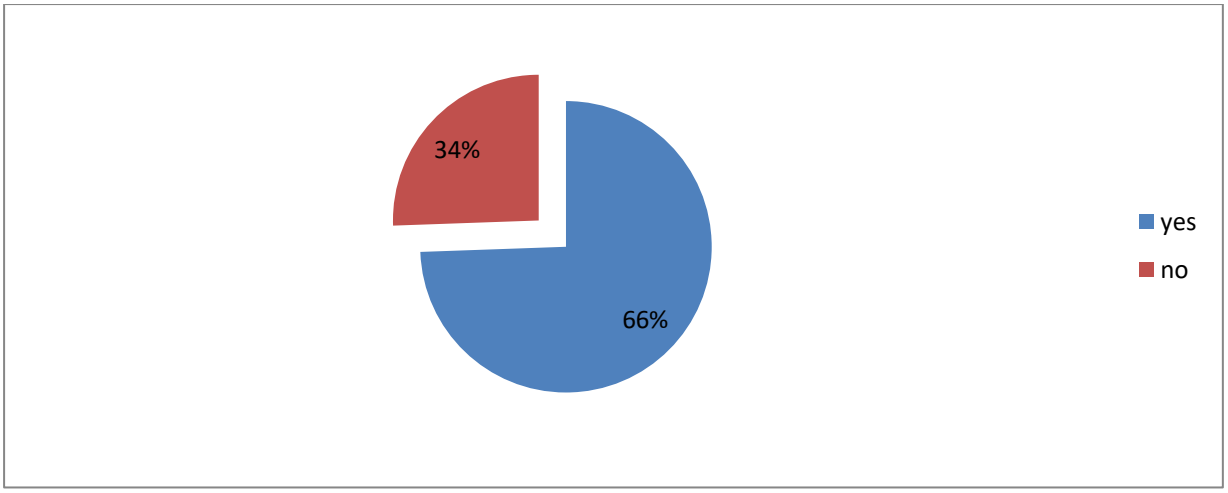

Figure 1. Distribution of respondents according to wherther their child ever has diarrhoea

From figure 1 above, 99(66%) of the respondents reported that their children had diarrhoea, and 51(34%) had not suffered from diarrhoea

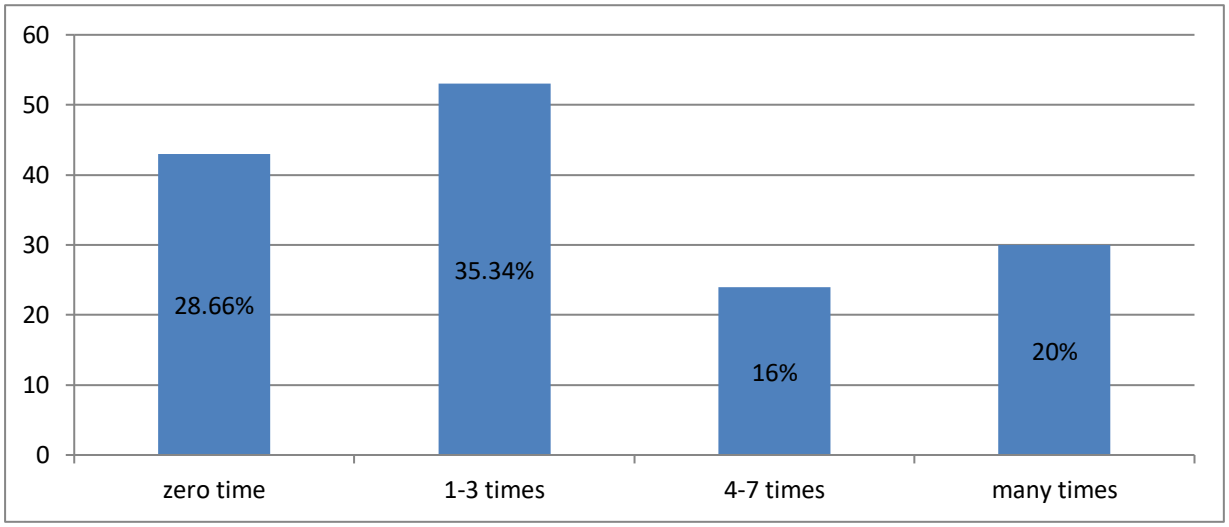

Figure 2. Distribution of respondents according to the number of times their children have had diarrhoea

From figure 2 above, 53(35.34%) of the respondents reported that their children had had diarrhoea 1-3 times before the study, 43(28.66%) had not suffered from diarrhoea, 30(20%) suffered from diarrhoea many times and 24(16%) had suffered from diarrhoea 4-7 times.

Table 5. Distribution of responses on the causes of diarrhoea

Causes	**Frequency**	**Percentage (%)**
Consumption of dirtaround	30	20
Contaminated water	33	22
Contaminated food	33	22
Dry food	3	2
Teething(milk teeth)	12	08
Do not know	09	06
Beans	04	02.66
Unripe fruits	21	14
Malnutrition	5	03.33
Total	**150**	**100**

From table 5 above, 33(22%) of the respondents indicated that diarrhoea could be caused by contaminated food and water, 30(20%) indicated that the consumption of dirt around is one of the causes, 21(14%) said diarrhoea is caused by unripe fruits, 12(08%) said teething, 09(6%) did not know the causes, 05(3.33%) said malnutrition and 4(2%) said dry food can be the cause.

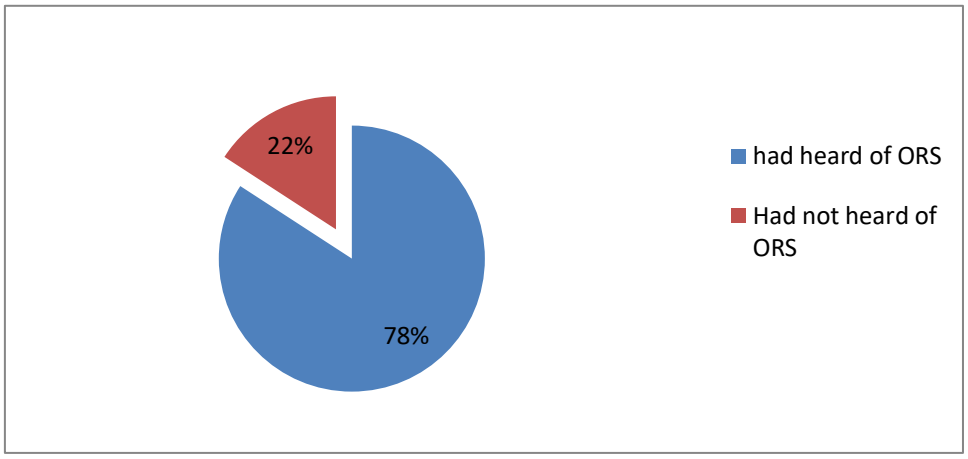

Figure 3. Distribution of respondents on the knowledge about ORS

As presented on figure 4, 117(78%) of the respondents had heard of ORS and 33(22%) had not. The sources of the knowledge about ORS are presented on table 9 bellow.

Table 6. Distribution of respondents on the sources of knowledge about ORS

Sources	**Frequency**	**Percentage (%)**
Radio and TV	40	26.66
Hospital	60	40
Friend	30	20
Neighbour	15	10
Personal reading	05	03.34
Total	**150**	**100**

It can be observed on table 6 above that 60(40%) of the respondents heard about ORS in the hospital, 30(20%) heard about it from their friends, 15(10%) from neighbours40(26.66%) from the radio and TV, and 05(3.34%) had the knowledge through personal reading.

Table 7. Distribution of respondents on the effects of diarrhoea on a child who is not taking enough fluids during diarrhoea

Effects	Frequency	Percentage
dehydration	60	40
nothing	15	10
Child willlose weight	52	34.66
Can led to child death	23	15.34
total	**150**	**100**

It can be observed in table 7 above that 60(40%) of the respondents said that the child can be dehydrated if enough fluid is not given during diarrhoea, 52(34.66%) said the child would lose weight, and 23(15.34%) said it can lead the child to death 15(10%) said nothing will happen

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Table 8. Distribution of respondents on the signs of dehydration during diarrhoea

Signs of dehydration	Frequency	Percentage (%)
Vomiting	36	24
Sunkeneyes	60	40
Dry mouth and tongue	48	32
Skin does not flatten when pinched and released	6	4
Total	150	100

From table 8, 60(40%) of the respondents said that sunken eyes are a sign of dehydration during diarrhoea, 48(32%) said dry mouth and tongue, 36(24%) said vomiting and 6(4%) said that the skin does not flatten when pinched and released.

Table 9. Distribution of responses on the signs of danger that a child should be taken to a health facility

Signs	Frequency	Percentage (%)
Waterystool and vomiting	27	18
Mucoidstool	11	7.34
High fever	21	14
No improvement within 24 hours after home management	22	14.66
Signs of dehydration are noticed	30	20
Stool mixed withblood	39	26
Total	**150**	**100**

It can be observed from table 9 above that 30(20%) of the respondents indicated that they would take their children to a health facility if the signs of dehydration are noticed, 27(18%) said they would do so if the child presents with watery stool and vomiting, 39(26%) said stool mixed with blood, 22(15%) said the health facility would be the only option if there is no improvement within 24 hours after home management, 21(14%) said high fever and 11(7.34%) said mucoid stool.

Section 3: Practices of mothers and care giversin the home management of diarrhea in the under-fives and their difficulties in the home management of diarrhoea

Table 10. Distribution of respondents according to what they do immediately their children start diarrhoea at home

Management	Frequency	Percentage
Buy medicine from a drug store and administer	30	20
Buy, prepared and administer ORS	48	32
Wait for some time and take child to the heath facility when diarrhoea persists	37	24.66
Stop feeding until diarrhoea stops	9	06
Search for traditional medicine and administer	26	17.34

From table 10, immediately a child starts diarrhoea at home, 30(32%) of the respondent said they buy drugs from a drug store and administer, 37(25%) said they prefer to wait and take their children to a health facility if diarrhoea persists, 48(32%) said they give ORS to their children, 26(17.34%) said they administer traditional medicine and 9(6%) said they stop feeding until diarrhoea stops.

Table 11. Distribution of respondents according to the fluid of choice for the child in case of diarrhoea at home

Fluid	Frequency	Percentage (%)
ORS	60	40
Water	45	30
Breastmilk	18	12

Corn water	5	3.33
Saltedrice water	7	4.66
Carrotsoup	15	10
Total	150	100

From table 11, 60(40%) of the participants said ORS is the fluid of choice for children in case of diarrhoea at home, 45(30%) said water, 18(12%) said breast milk, 15(10%) said carrot soup, 7(4.66%) said salted rice water and 5(3.33%) said corn water.

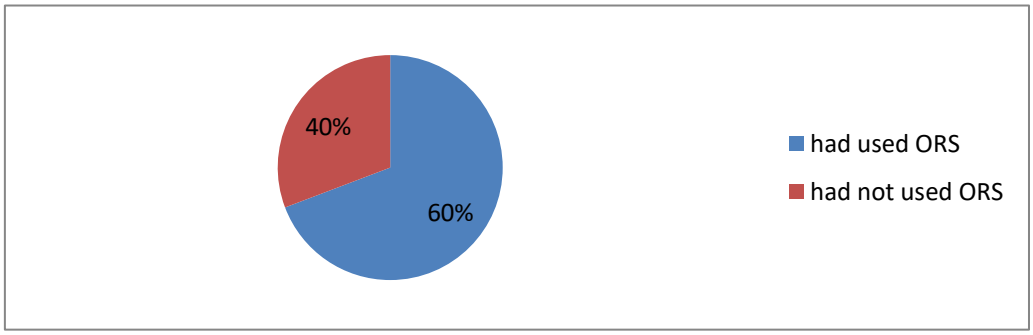

Figure 4. the use of ORS

From figure4: 90(60%) of the respondents had used ORS before the study and 60(40%) had not. Out of the 40% of respondents who had not used ORS, 27(18%) said they did not know how to prepare it and 33(22%) said they had had no case that needed the use of ORS.

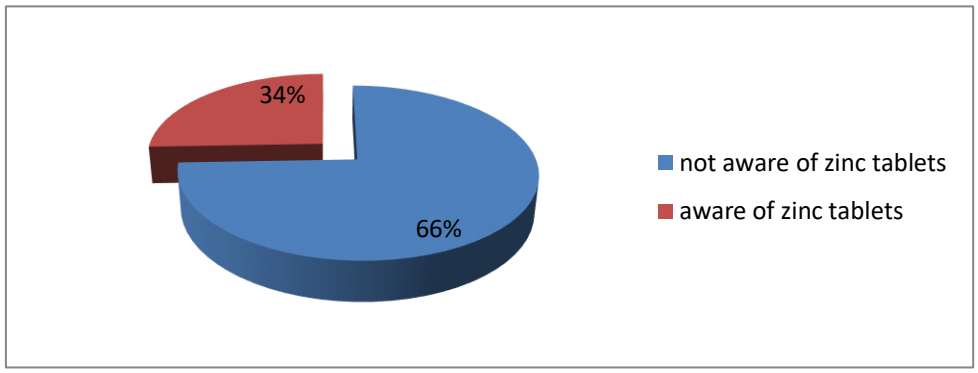

Figure 5. Respondents awareness of the inclusion of zinc for the home management of diarrhoea

Figure 5 indicates that 99(66%) of the respondents were not aware that zinc tablets have been included in the home management of diarrhoea while 51(34%) of them were aware.

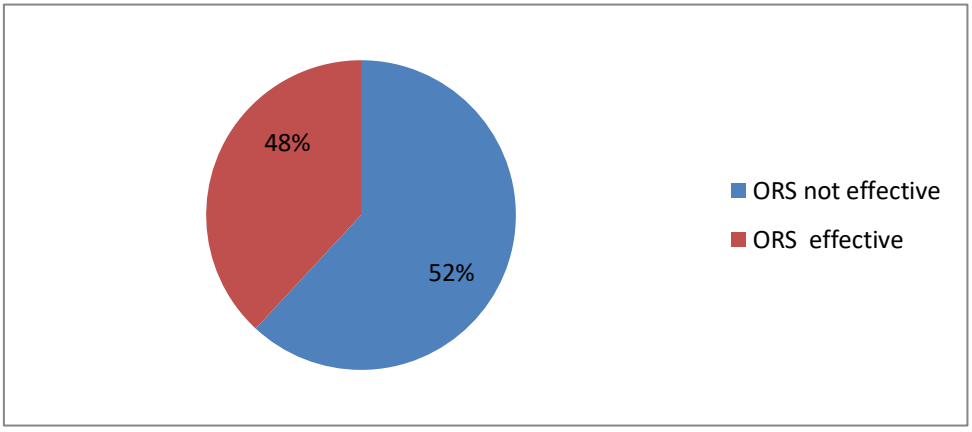

Figure 6. Respondents appreciation of ORS in the home management of diarrhoea

From figure6. 78(52%) of the respondents believed that ORS is not effective in the home management of diarrhoea while 72(48%) believed and said it is effective.

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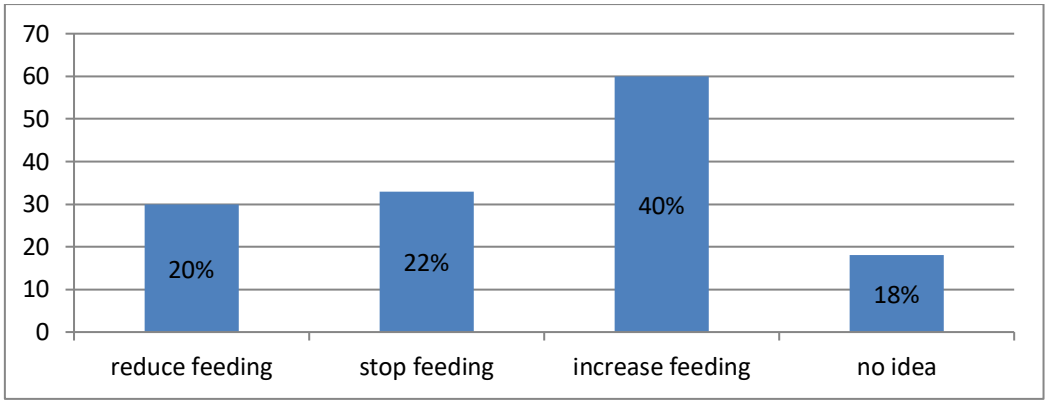

Figure 7. Distribution of respondent on the rate of feeding during diarrhoea

From figure7above, 60(40%) of those who took part in the study increased feedings for their children during diarrhoea episode, 30(20%) reduced feeding, 33(22%) stop feeding and 27(18%) did not know what to do.

Table 12. Distribution of respondents according to the reasons for their continual feeding during diarrhoe

Reasons	**YES**	
	Frequency	**Percentage (%)**
For recovery	12	8
To provide energy	11	7.34
To replenished lost nutrients	16	10.66
To prevent weight loss	12	8
To prevent death	10	6.66
No reason	14	9.34
To rehydrate the child	14	9.34
NO		
Wastage of blood	30	20
Can cause more harm	16	10.66
Loss of appetite	15	10

From table 12, out of the (66%) respondents who accepted continual feeding during diarrhoea, 11(7.34%) said it is necessary to provide energy, 12(8%) said it prevents weight loss, 12(8%) said it is necessary for recovery and 10(6.66%) said it prevents death. Out of the (34%) who said continued feeding is not necessary, 30(20%) said it is wastage of food, 31(20.66%) said it can cause more harm and loss of appetite.

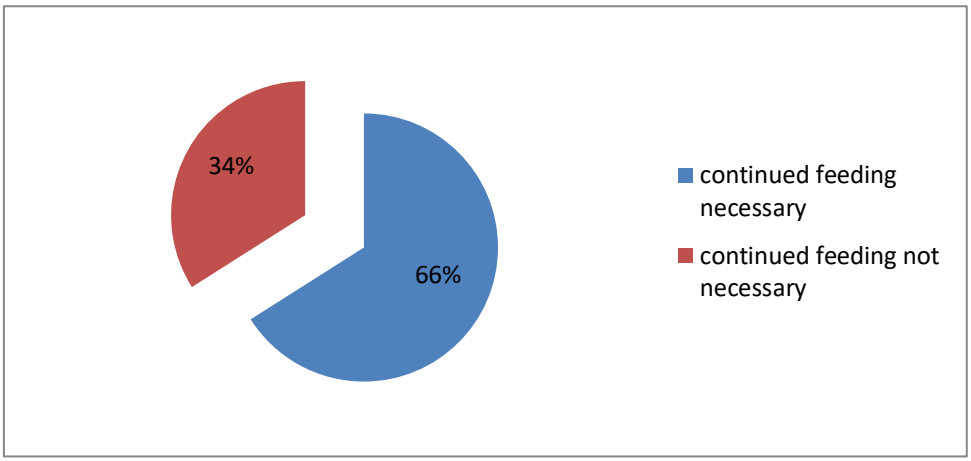

Figure 8. Despondences on continual feeding during diarrhoea episode.

As presented on figure 8, 99(66%) of the respondents accepted that continued feeding during diarrhoea is necessary while 51(34%) said it not necessary.

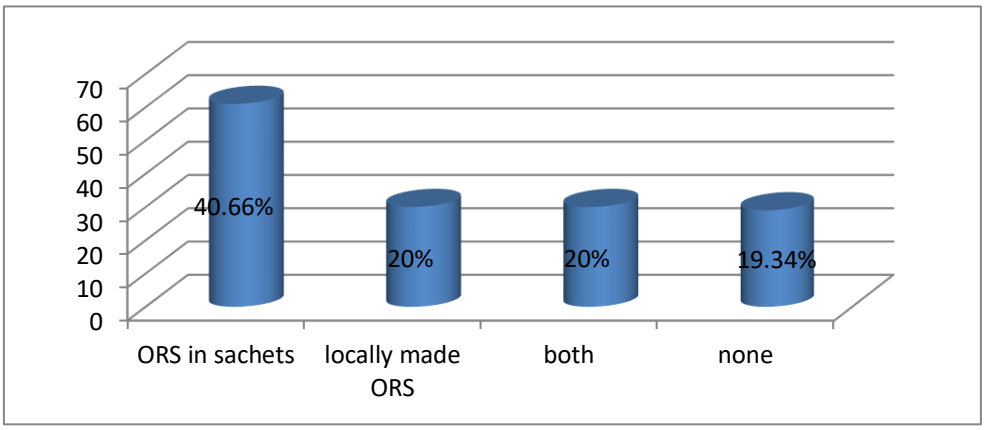

Figure 9. Distribution of respondents according to their familiarity with ORS.

Figure 9 shows that 61(40.66%) of the respondent where use to ORS in sachet provided at the health facility, 30(20%) locally made ORS, 30(20%) where use to both and 29(19.34%) where not familiar with either.

Table 13. Distribution of respondents on their methods in the local preparation of ORS

Methods of preparation of ORS	**Frequency**	**Percentage (%)**
5 cubs of sugar + 1 tea spoon of salt + half a lemon fruit juice in 1 litter of clean water	19	12.66
8 cubs of sugar +1 tea spoon of salt in 1.5 litter of water	18	12
Sugar + salt in 1 litter of water	27	18
8 cubs of sugar +1 tea spoon of salt in 1 litter of warm water	20	13.33
Do not know	66	44
Total	150	100

From table 13, it can be observed that 66(44%) of the respondent said they did not know how to prepare local ORS at home, 27(18%) used sugar +salt in 1 litter of water, 19(12.66%) used 5 cubes of sugar + 1 tea spoon of salt +half a lemon fruit juice in 1 litter of water, 18(12%) used 8 cubs of sugar + 1 tea spoon of salt in 1 litter of water and 20(13.33%) used 8 cubes of sugar +1 tea spoon of salt in 1.5 litter of water.

Table 14. Distribution of the respondents on the administration of ORS solution

Intervals for ORS administration	**Frequency**	**Percentage**
2 times daily using a spoon or cup	4	2.66
3 time daily using a spoon or cup	35	23.34
After every stool using a cup or spoon	24	16
Any time the child wants to drink	57	38
Do not know	30	20
T0TAL	100	100

From table 14, 57(38%) of the respondents gave ORS to their children any time they wanted to drink during diarrhoea, 35(23.34%) gave it 3 times daily, 30(20%) said they did not know how to administer it, 24(16%) gave it 2 time daily and 24(16%) gave it after every stool.

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Table 15. Distribution of respondents on the choice of tablets for children in case of diarrhoea at home

Tablets	Frequency	Percentage
Flagyl	94	62.66
Zinc	15	10
Paracetamol	26	17.34
Tetracycline	15	10
TOTAL	150	100

It can be observed from table 15 above that 94(62.66%) of the respondents used Flagyl as a drug of choice in case of diarrhoea at home, 15(10%) used zinc tablets, 26(17.34%) used paracetamol and 15(10%) used tetracycline.

Table 16. Distribution of respondents according to the difficulties face in managing diarrhoea at home

Reasons	Frequency	Percentage (%)
Fear of death	13	08.66
No knowledge about management	38	25.34
Forgetfulness	27	18
No time to do it	22	14.66
Fillbored	20	13.34
None	30	20
Total	100	100

From table 16 above, 38(25.34%) of the respondents had no knowledge about the management, 27(18%) said the always forget, 22(15%) said the lack time to do it, 20(13.34%) said it boring, 13(8.66%) they fear death and 30(20%) said no difficulty.

Table 17. Distribution of respondents according to what they think can be done to better management of diarrhoea at home

Reasons	Frequency	Percentage (%)
Keep environment clean	30	20
Wash your hand with clean water and savon before breast feeding the baby	33	22
Make sure your nipple is clean before breast feeding the baby	45	30
Have a single pot for your child	30	20
No idea	12	8
Total	150	100

From table 17 above, 30(20%) of the respondents think that the environment should be clean to the better management of diarrhoae at home, 33(22%) said they should wash hand with clean water and Savon before breast feeding the baby , 45(30%) said they should make sure the nipple is clean before the breast feeding the baby, 30(20%) said they should have a single pot for the child , 12(8%) said they have no idea.

Discussions of findings

Socio-demographic data

The age group 21-30 years made the highest number of respondents (44%). Respondents of this age group are younger, highly reproductive, and socially active. They are inexperienced in the home management of diarrhoea especially secondary school students of lower ages and so will likely shift the

responsibility to someone very competent. 42(28%) of the respondents were educated and had attended at least the secondary school while 31(21%) had attended the primary school. The findings of this study are congruent with the previous study findings of Matziou*et al.* (2008) in Greece and by Oshikoya and Senbanjo (2008) in Nigeria who found that the educational level of the mother had positive out comes on mothers' knowledge and practice in the home management of diarrhoea. The highest percentage 33(22%) were students and business ladies with the rest engaged in one job or the other to earn their living. Though the respondents were educated, their ages and occupations negatively affected their knowledge and practices in the home management of diarrhoea because they probably had been pre occupied with one thing or the other during health education on diarrhoea management in the under-fives during ANC and IWC. This made them faced difficulties in managing diarrhoea at home as recommended by WHO/UNICEF.

Knowledge on Diarrhoea

The respondents gave many definitions for diarrhoea but only 60(40%) gave a good definition as defined by WHO. Similar finding was reported by Shah *et al* (2010) in their study conducted in Aligarh where they found that 83% of mothers and care givers were having correct knowledge. This definition indicated that they would treat a child who presented with bloody stool or mucoid stool with ORS. ORS may fail to stop these conditions and the respondents have a negative feedback for the use of ORS in the home management of diarrhoea. According to WHO/UNICEF, ORS is used to manage diarrhoea with the threat of dehydration to the child. The respondents were knowledgeable on the causes of diarrhoea amongst which the highest number 33(22%) said contaminated food and water are the causes. However, they failed to recognize some of the major causes of diarrhoea in the under-fives like malnutrition and the non-practice of exclusive breast feeding for the first six months of life for infants. These results are in line with those reported by Othero Dm*et al* (2008) in Kenya where 35% of mothers said diarrhoea is caused by unclean water and contaminated food. 117(78%) of the respondents had not heard about ORS. This result is similar with those reported by rabby*et al* (2013) in Bangladesh showed that more than 50% of mothers and care givers had not heard about ORS. This indicates that they used other like drugs to treat diarrhoea at home. There were variable sources of knowledge about ORS to those who had heard about it. The hospital 60(40%) was the main source though 90(60%) heard about it from sources out of the hospital. The quality of the knowledge depends on the sources of the knowledge and this greatly affect their methods of preparation of ORS since a good number of them heard about it from sources out of the hospital.

Closely looking at the respondents' identification of the signs of dehydration during diarrhoea, only 114(76%) of them were knowledgeable on all the signs while 36(24%) could identify just few. This result is consistent with other study that was carried out by Agha *et al* (2007) in Gambat, Pakistan showed that 100% of mothers and care givers were knowledgeable on all the signs of dehydration during diarrhoea. Only 30(20%) were aware of the signs of danger during diarrhoea that a child should be taken to a health facility while 120(80%) could identify at least one of the signs. It can be feared that these respondents can leave their children severely dehydrated during diarrhoea and would not report to a health facility until the signs they know are noticed. This also indicates that they would try to manage all case of diarrhoea at home and will only seek for medical attention when the condition is already out of hand.

Knowledge and practices of mothers and care givers in the home management of childhood diarrhoeaand their difficulties in the home management of diarrhoea

In the home managements of diarrhoea, only 48(32%) of the respondents reported that they administered ORS to their children, 30(20%) administered drugs and 26(17.34%) administered traditional medicine. Flagyl, 94(62.66%) was the drug mostly used. This indicates that 94(62.66%) of the respondents preferred drugs and other means to ORS as recommended by WHO/UNICEF. Shelby .*et al* (2012) reported similar results in Burkinafasso where only 21.4% of mother administered ORS to their children during diarrhoea. According to Dryden Ms et al (2002), antibiotics may be beneficial in certain situations during diarrhoea but there are concerns that they may increase the risk of haemolytic uremic syndrome.

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A great majority, 66(66%) were not aware that zinc tablets have been included for the home management of diarrhoea despite health education on diarrhoea during IWC. Ogunrinde *et al* (2012) had a similar resulting Nigeria where only 36% of mothers were aware of the zinc tablets. Though WHO/UNICEF recommend and emphasize that ORS is very effective in the home management of diarrhoea with dehydration, 78(52%) of the respondents still said it is not effective. 89(59.33%) of the respondents accepted that continued feeding is necessary for the child during diarrhoea with a number of good reasons while 61(40.66%) said it is not necessary with reasons that it can cause more harm and that it is wastage of food since the child's system can't tolerate food. This result is similar with those reported by Mishra.*et al* (2009) in India were found that 66.25% of mothers and care givers were continued feed their children during diarrhoea episode. Another study carried out by Sood et al (2003) in India reported that 88% of mothers and care givers restricted their children's diet during diarrhoea episode. WHO/UNICEF recommend that continued feeding during diarrhoea is necessary because it replaces lose nutrients and facilitates recovery.

The respondents were knowledgeable on the fluid of choice for children during diarrhoea at home in which ORS was chosen by 40(40%). Despite this, the used of ORS in the home management of diarrhoea still remain very low. 60(40%) of the respondents reported that they increased the feeding rate for their children during diarrhoea while 30(20%) reduced feeding. This result is on line with those carried out by Kolahi et al (2008) found that during diarrhoea 30% of mothers and care givers increased amount of breast milk or food in their children's diet. Increased feeding rate during diarrhoea is necessary to replace lost nutrients and provide energy to the child. Only 61(40.66%) of the respondents were familiar with ORS in sachets provided at health facilities while 30(20%) were used to locally made ORS.66(44%) of the respondent said they did not know how to prepare local ORS at home while others 84(56%) could prepare local ORS at home. This study is similar with the study carried out by Kaushit (2008) in west Bengal showed that 66.7% of mothers and care givers could prepare local ORS solution at home correctly. Most of the respondents (64%) had no knowledge 15(15%) said they face no difficulty while others were due to negligence which can led to the death of many children at home.90(90%) of the respondents were knowledgeable of the requirements to prepare ORS but were confused on what quantity to use. The knowledge and method of preparation of ORS had a significant relationship with the age, educational level, occupation and the source of the knowledge. According to Nisha and Nicholas N. (2010), households with mothers belonging to the youngest age group, lowest educational attainment and poorest health index are the least likely group to properly treat their children suffering from diarrhoea. This is proven true because most of the respondents were of the younger age group though were educated.

Conclusion

Proper home management can reduce morbidity and mortality due to diarrhoea. Factors of particular importance include caregiver's knowledge about causes of diarrhoea and the associated dangers signs, prevention of dehydration during diarrhoea episodes through the use of RHFs and ORS, support of nutritional status through the continuation of an adequate diet, avoidance of harmful practices and early referrals for treatment. The current study revealed that mothers have inadequate knowledge on home management of diarrhoea 90(60%). They had negative practices towards the home management of diarrhoea and the use of ORS/zinc tablets as recommended by WHO was very low (29%) as compared to the use of drugs and traditional medicine. According to USAID and Experts worldwide (2002), success in the reduction of deaths and illnesses due to diarrhoea in childhood depends on the acceptance of the scientific basis and benefits of ORT by governments and medical communities. There is need to implement interactive communication strategies for mothers and health workers at community level in order to facilitate sustainable positive change in the practices of home management of diarrhoea. The communication strategies should recognised the role played by culture in influencing perception of mothers. There is need for reinforcement of family knowledge on home management of diarrhoea, providing information and support to underserved families. Therefore, the recommended home management of child hood diarrhoea needs to be emphasized to mothers by health workers.

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Bottom Up and Top-Down approaches to school management: Lessons from Primary Schools in Chadiza District, Eastern Province, Zambia

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Abstract

This paper shares detailed insights into primary school management in Chadiza District in Eastern Province of Zambia. It provides a critical review of both top down and bottom up approaches to management, specifically focusing on primary school practices. Much of what is discussed herein is anchored on phenomenological data gathered over years of teaching, interacting and supervising teachers and student teachers at primary school level of education. The paper recommends that managers of schools must not get glued to one form (top down or bottom up) but engage junior officers to promote and yield progressive academic performance on the part of learners and maintain standards of teaching and professionalism on the part of teaching staff. This, however, should not be achieved at the expense of losing grip of job and focus of the overall goal of the school.

Keywords: *Primary School, School, Management, bottom-up approach, top down.*

Introduction

This paper discusses bottom up and top down management styles in primary schools. It covers the following topical areas: objective; purpose; methodology; defines bottom up and top down management styles with examples given where appropriate; discusses the philosophical underpinning of the approaches and with examples, in some cases, and review literature thereof; argues if the two approaches are being applied in schools or not; states advantages and disadvantages of the two approaches; draws some lessons; and makes conclusions.

Objective

The main objective of the study was to investigate management styles schools use in Chadiza District in Eastern Province of Zambia.

Purpose

This paper details management styles that schools use in Chadiza District in Eastern Province of Zambia. Chadiza has teachers that trained in the olden days as well as teachers that have trained in the new era. The combination suggests, consequently, that top down and bottom up approaches of managing schools take place in the schools.

Methodology

This study used the qualitative research design, following the phenomenological research method. It covered lived experiences of head teachers in more than 10 schools where the researchers taught

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before. Since uncovering lived experiences of practitioners was the sole aim of the study, phenomenology was a fitting approach to employ. Moreover, it is widely observed that a phenomenological study can generate thick descriptions of great value for understanding a problem that has not been well studied. Oftentimes, results from such studies can be very useful for scoping dimensions of an unstructured problem, gaining sufficient knowledge to then structure theory and an understanding of variables pertaining to a problem at hand (Smith, Flowers, Larkin, 2009)

Purposive sampling was used because it allowed selecting or handpicking supposedly typical or interesting cases (Blaxter et al, 2006).

Predominantly, data was collected using interviews, document review and observations. Data was collected over the 10 years of teaching, interacting and supervising teachers and student teachers at primary school level of education. The researches thereafter employed the thematic data analysis method to present and discuss the findings.

Findings and discussions

The part of the article presents and discusses findings. They are further triangulated. After categorizing emerging findings collected into, the thematic approach of analysis was employed.

Definitions

Bottom up approach

The bottom-up approach, like the word suggests, is a process by which management information flows from grassroots to top management. A bottom-up approach is the piecing together of systems to give rise to more complex systems, thus making the original systems sub-systems of the emergent system. Bottom-up processing is a type of information processing based on incoming data from the environment (grassroots) to form a perception at top management. In a bottom-up approach the individual base element (members of staff in this case) of the system are first specified in great detail. These elements are then linked together to form larger subsystems, which then in turn are linked, sometimes in many levels, until a complete top-level system is formed. In essence, therefore, what is received as singular is broadened by top management and spread down or horizontally in order to achieve the goal of an organization. In this system, a concept is conceived at grassroots, digested and submission is made to top management. If top management sees it appropriate, it is sent down for action.

Top down

In the top down approach, the flow of information is from the top management down to the grass root. This is a situation where top management may conceive an idea, and then it is taken down to the grass root teams to ponder it. The top management then receives a feedback from the bottom or grass roots to help them make a decision that will be integral in nature.

Suffice to say that top-down and bottom-up are both strategies of leadership styles and knowledge ordering, used in a variety of fields including software, humanistic and scientific theories and in management and organization. In practice, they can be seen as a style of thinking, teaching, or leadership. In real meaning as a result, schools use these approaches in a day to day management of their institutions. The debate of who uses what and who does not use what comes in with the individual's training that he/she obtained. It is correct to state that some managers use both approaches in the management styles and they succeed.

Philosophical underpinning and review of literature

The bottom up or top down system of management is the flow of information from top management down to the subordinates while the bottom-up approach is a system which entails flow of information from bottom to the top management. This suggests that in this system of management, the departments are either not made use of or are made use of, as information flows directly from top to bottom or from bottom to top management. The olden management liked using the top down, mechanical way, of handling issues as it gives management absolute power to making decisions. This is what also Gravett (2004) observed as he says that real conceptual change or perspective

transformation is, however, very difficult and takes a long time, which is why managerial, top-down approaches to improving quality of teaching are hard to implement. At best, there is a grudging compliance with whatever is being offered as the latest teaching innovation, but no real ongoing long-term changes will be made.

Gravett observes that this top-down management system is opposed heavily and described as hard way of improving quality of teaching. If anything, compliance is hard to do and if there is any compliance, then it is a grudging one. Otherwise people oppose it and look at it not as a good way of running the education system and that there must be some changes. While that is true Gravett's perspective, some institutions just need this type of management in order for things to run. Some people are generally full of inertia and take long to act on things. In such situations, consequently, the top down arrangement is an appropriate form of leadership style.

While this type of management gives absolute power to managers, there is a possibility that this top management is lacking real information to as what is obtaining within the teaching community. This is because of lack of consultative approach to governance. There is no deliberate policy where members of the organization at different levels can be engaged in the dialogue. For obvious reasons of wanting to protect power, maintaining the size of people in power, dominating the subordinates and issue commands at will.

Freire (1970:173) argues that the difficulty is that this category of dialogical action (like the others) cannot occur apart from the praxis. The praxis of oppression is easy (or at least not difficult) for the dominant elite; but it is not easy for the revolutionary leaders to carry out a liberating praxis. The former group can rely on using the instruments of power; the latter group has this power directed against it. The former group can organize itself freely, and though it may undergo fortuitous and momentary divisions, it unites rapidly in the face of any threat to its fundamental interests. The latter group cannot exist without the people, and this very condition constitutes the first obstacle to its efforts at organization.

While from the above discourse we see Freire discussing the elite leaders in an organization, there is a relationship that is seen between what Freire is saying and what is going on in schools whose leaders are practicing the top down type of management. The relationship is that in organization where there is freedom in coming up with decisions, it is easy for the goals to be achieved. This is because the goals are owned by people at every level and as such would want to accomplish whatever activity is entrusted with them. In other words, the general work force is motivated to push in their best energies in trying to realize the organization set goals.

On the contrary, the top down approach does not allow such maneuvers and as such it is rigid. It does not permit the input of the general working staff and it is in that sense retrogressive and unproductive. It does not encourage tapping from the vast experiences and reservoir of knowledge that lay at the grassroots with people that are thought of as not being knowledgeable.

Readers of this article should be made to appreciate the fact that in the top down and bottom up management models; top leadership is not the sole preserve of decision making. They consult the other stakeholders before decisions are arrived at. It is, however, the level of consultation and amount of openness to people being consulted that is of great influence on whether a particular approach be favored or not. Those managers that would like to have absolute power prefer the top down management style as opposed to bottom up approach.

Can top down and bottom up approaches be applied in schools?

The top-down and bottom up models of management are practiced in schools. One of the reasons for this is that we still have differently trained managers of the education system. The newly trained managers may not apply themselves in the same manner as the trained in the olden days. By this argument, you may appreciate that even the philosophies obtained are different.

Dubois (2002) argues both approaches can be found in the organization or an institution as these are involving decision making.

In bottom-up organized organizations, for example ministries and their subordinate entities, decisions are prepared by experts in their fields, which define, out of their expertise, the policy they deem necessary. If they cannot agree, even on a compromise, they *escalate* the problem to the next

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higher hierarchy level, where a decision would be sought. Finally, the highest common principal might have to take the decision. Information is in the debt of the inferior to the superior, which means that the inferior owes information to the superior. In the effect, as soon as inferiors agree, the head of the organization only provides his or her "face″ for the decision which their inferiors have agreed upon, (Dubois, 2002).

In Eastern Province, particularly in Chadiza District, the schools that are in remote areas, headed by old head teachers have that approach of leadership style. Often times, the head teachers are fixed and glued to guidelines and never bend. The use of threats, rush in charging erring teachers and calls for transfer for anyone who questions his or her supremacy is the order of the day. Such schools are less productive and allow less fresh ideas. If, for example, you check on the performance of the school, the highest score does not exceed 50%. Sadly, such schools remain with few staff and standards are often times compromised. What makes the situation even worse is that standards officers hardly reach out such schools.

In the opposite, the township schools' administration is based on a top-down approach, where general teaching staff enjoys no other task than simply to execute decisions made by their superiors. As those superiors also require consultation, this consultation is provided by members of staff or heads of department. The deputy head teachers or senior teachers sit together to formulate the guidelines which everybody follows. This approach is not only preferred and good but also productive.

In schools where there is little consultation from the departments, primary or secondary, the aspect of domination is there. Such leaders, in addition, are protecting their positions and power, and they would rather make threats in issuing out instructions. They make sure that there are no groupings among the departments and or from within members of departments that emerge to question their authority. It would indeed be inconsistent of the dominant elite (top management) to allow the leaders in departments to organize. The internal unity of the dominant elite, which reinforces and organizes its power, requires that the people be divided; the unity of the leaders only exists in the unity of the people among themselves and in turn with them. The unity of the elite derives from its *antagonism* with the people; the unity of the revolutionary leadership group grows out of communion with the (united) people. This concept is well understood by the top down model of leadership and it is well harnessed.

According to Huber (2004), when schools are regarded as learning organizations, it implies that the stakeholders should be given the necessary power and they should operate in cooperation. In brief Huber (2004) said that "Leadership is about empowering others as viable partners in leadership". In a school set up, there are a lot of structures that need to be paid attention to. Freedom given to such people in these lower but viable ranks, if well utilized can produces a lot of good results.

From what Huber says, for example, it is clear that the top down leadership is not a good leadership style and hence such managers need to transform. They indeed need to adopt a modern leadership style, which is ruling through departments. Spillane (2005) also mentions the different terminologies used to describe distributed leadership and these are cooperative leadership, democratic leadership and emergent concepts known as organizational-educational management.

In the top down management style, skills cannot be shared between management and subordinates and amongst subordinates themselves. It does not promote team work and problem solving is at individual capacity. Further challenge is that this style has its employees' morale low and this in turn affects production. The way employees are handled has a great impact on the performance of workers and this is the core engine for high production.

In situations where top down management is promoted, work suffers a great deal. This is because when people that are entrusted to do a particular work are committed elsewhere, work stalls up until their commitment is over. This is all because they have not shared the work with the other colleagues and as such, they (colleagues) do not know what to do in their absence. Although many reforms are being made by governments and changes are imposed from above and outside, there is also a wish for change within schools so as to improve teaching and learning. The managers, generally, have the task of driving changes and teachers have the responsibility for implementing those changes. This structure brings about the necessity for middle managers to bring about the link between Rectors

(Principals) and classroom teachers. In secondary schools these middle managers are presented as Head of Departments (HODs) and other such post so that leadership responsibilities are distributed and thus bringing not only cooperation but also helping the Rectors in their duties (Dinham, 2007).

Application of top down or bottom-up approaches by school administrators (HoDs Head, Deputy Head & Senior Teachers)

The HoDs have some formal duties and responsibilities assigned to them. They are accountable for their departments and they exert their influences both horizontally and vertically. This is further extended within and beyond the department and school (Dinham, 2007). In larger secondary schools, the teaching and learning of hundreds of students depend on his competences. The role of the HoDs, can be divided into two namely; the internal and external roles. The internal role includes the allocation of classes to staff; the allocation of resources; coordinator; monitor of standards; delegator of responsibilities to others in the department. The external role includes developing and maintaining good working relationships with other HoDs, other educators, the inspectorate, school panels, Senior management Teams and the governors or managers (Turner, 2005).

In a similar vein, the head teachers, deputy head teachers and senior teachers have such a mammoth task too. They have to attend to internal daily duties; class allocations, supervision, control of pupil movement, cleanliness of environment to state but a few examples. At the same time, they have a big task of coordinating the outside teams that visit the school for one reason or the other. While the HoD's work may be narrow, the Head teacher's job with colleagues is heavier and more demanding. It requires a lot of courtesy as well as tact. This is because these are dealing with different publics.

Advantages of using top down or bottom-up approaches

In particular, the advantage of the bottom-up approach is the level of expertise provided, combined with the motivating experience of any member of the administration to be responsible and finally the independent "engine" of progress in that field of personal responsibility.

The advantage of the top-down principle on the other hand is that political and administrative responsibilities are clearly distinguished from each other, and that responsibility for political failures can be clearly identified with the relevant office holder.

Disadvantages of using top down or bottom-up approaches

A serious disadvantage that top down model has is the lack of democratic control and transparency, this leading, from a democratic viewpoint, to the deferment of actual power of policy-making to faceless, if even known, public servants. Even the fact that certain managers might "provide their face" to the actual decisions of their inferiors might not mitigate this effect, but rather strong legislative rights of control and influence in procedures thereof.

Another problem that is possible with the top down management approach in this era is that it bleeds suspicion in the minds of some employees and this brings about nagging and bragging attitude within an institution. This slows down work and, in the end, produces low pass rates. This situation can be noticed even by the external people and this may hinder people's participation in developing the school. The danger in letting the external people start suspecting the school management does not only affect the people present in that particular school, it is generalized to a larger constituent of school managers or rather head teachers. To clean this mess, it would take considerably long time and it would also require patience and persistence on the people that would want to induce positivity in the minds of the people from the immediate community.

Further disadvantages of this top down are that the system triggers dehumanization of subordinates, who know that their ideas to improve school might not be welcome just because of their position, and that the decision-makers cannot make use of the full range of expertise which their juniors will have collected during their long trainings.

Administrations in *dictatorships* traditionally work according to a strict top-down approach. As civil servants below the level of the political leadership are discouraged from making suggestions, they to suffer from the lack of expertise which could be provided by the inferiors, which regularly

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leads to a breakdown of the system after a few decades. Modern forms therefore prefer to define a framework of permissible, or even encourage, criticism and self-determination by junior staff, which would not affect the major state doctrine, but allows the use of professional and expertise-driven knowledge and the use of it for the decision-making persons in office.

As we wrap up the bottom up, top down or indeed vertical approach to management, it is, to a larger extent, detrimental to the school system. It is requiring that such approaches be changed and bring in a new way of managing school called the horizontal management style. Some of the effects include communication break-down, work stalling, none sharing of skills and bleeding suspicions. Others are promoting isolated manner of doing work, conservativeness, exploitative and lack of transparency and accountability. Mintzberg (2004) asserts that terms such as bosses and subordinates are becoming outdated. He mentioned that instead, the relation should be shifted to colleagues and partners, sideways and not hierarchical. Nominated leaders are needed in the web to unite and be part of the cause rather than to give orders and supervise. Successful leadership is more about inspiring than empowering; more about connecting than controlling; more about demonstrating than decision-making. And all this is done by full engagement, a great deal more than anyone else.

Horizontal school engagement: merits and demerits

This entails flow of information from top management to all middle management members or the other way around. This is not a favored manner of leadership by people that would like to enjoy massive control over teachers or indeed employees in a big organization. The approach has a great deal of benefits in that it is inclusive and allows for changes in tactics in accomplishing tasks. The skills are shared and people are free to take decisions. This helps in the school to run smoothly and fast.

Distributed leadership: merits and demerits

Variations occur according to the degree of involvement of informal leaders in the practice of distributed leadership. It may come from a 'top down' initiative who acknowledge such type of leadership relationships within the community or from a 'bottom up' initiative through individuals or groups inside the organization who are perceived by others as having a leadership role (Bennet et al., 2003).

Indeed (Bennet et al., 2003) scored a very powerful point in the discourse. He said that the changes to distributive leadership style can be initiated by the top managers or indeed from the bottom. It is however stating the fact that the people have been perceived as having the leadership tenets. It should however, be noted that not all top leaders may see such changes as necessary. They would rather see it as changes that may demean them in their roles.

Another benefit of this horizontal leadership style is that it is dynamic and it promotes team work. Team work emphasizes on collaboration, multiple and complementary strengths and expertise, and it is also necessary for all members to have the same view of the purposes of the team and its ways of working. All these characteristics have correspondence to a great extent of the opinions about distributed leadership (Karkkainen, 2000). Moreover, researchers often differentiate between two types of teams namely the formally structured teams and those which are formed for a particular purpose to carry out specific projects. Both styles mutually function best in an open environment, where the relationships are founded on trust, mutual protection and support (Bennet et al., 2003).

From the team work perspective, a lot of issues have been discussed. One of the issues discussed is the fact that all members are required to dip into the philosophy of the team and work as such. There is sharing or complementing of skills and strengths, a thing that not only promotes unit but also produces quality results. The atmospheres within which work is done is friendly and people under such conditions work even outside the stipulated times set for them to work. The results of the horizontal or distributive leadership style are excellent.

Another positive element about horizontal leadership style is that it may be practiced through a long-term institutional form with team structures and committees. On the other hand, the literature also revealed the existence of a strong theme of fluid leadership, based on know-how rather than the stance and which function according to varying ad hoc groups formed on the account of immediate

and appropriate expertise. Such leadership will only be possible within an atmosphere of trust and mutual support which in turn becomes an integral part of the internal organizational, social and cultural context (Bennet et al., 2003).

Indeed, successful teams and the practice of distributed leadership should provide for means to face and to resolve conflicts. Such an approach may have to function in a much larger sphere than would be required by smaller teams. The conflict resolution approach can be hierarchical, headed by a sole leader, or more mutually respectful, through united or collective leadership, depending on the motives and on the degree of hierarchy.

Distributed leadership is beneficial in many ways. It gives recognition to individuals in both formal and informal positions to be responsible for leadership activities via a network of interactions.

Based on that point above, horizontal leadership plays a part in the stable improvement of schools in domains like high levels of both student skills and achievements. Accordingly, horizontal leadership is recognized as a collective leadership where teachers became experts by working in collaboration since connecting people in the leadership activity is the essence of horizontal leadership practice. Such a practice greatly encourages teacher participation and dedication, and Gamage et al. (2009) asserts that the transparency and efficiency of team management show the way to development of the processes, content, and outcomes of both teaching and learning.

Accordingly, in participative leadership settings, decision-making processes of the group have to be the fundamental focus of the group. This 'normative model' is supported by three criteria namely: school effectiveness is improved by participation; Participation comprises of democratic ideologies and any lawful stakeholder is eligible to the Leadership position. Participative approach of leadership thrives in bonding personnel together and in attenuating the pressures on school principals.

The burdens of leadership will decrease only when leadership functions and roles are shared and the concept of leadership density emerged as a feasible replacement for principal leadership (Bush, 2003).

As elaborated above, distributed leadership has been very popular and largely adopted in the professional world during the past decade. However, a large amount of the discussion is 'prescriptive', that is it is based on ideals rather than data. Both theory and empirical study propose to be cautious with such an approach as "there is a time and a place for sharing leadership". Guidance should be sought to better understand when and how to share leadership for learning. Yet when being in the right hands, shared leadership is a powerful tool for expanding the school's capacity to achieve its vision and create its own desired future. It is worth noting that research does recommends that even if policy measures supports shared leadership, the principal's own leadership is crucial in developing the leadership of others (Hallinger, 2011).

It should observed that no matter what the future might consider for the idea of distributed leadership, yet, the prospect to ponder on its history and scholarly uptake has consolidated the argument that distributed leadership has contributed to an improved understanding and appraising of the work of schools and it has been both perceptive good and productive.

Critical reflection

There is a need to redefine the nature of leadership, management and governance in schools. From the above discourses on effective leadership in schools, we can tell that the authority to lead may not inevitably be situated in the person of the leader but may be scattered inside the school among different people. Therefore, Leadership is not centered in a person or an office but in the people within the organization.

The school leaders must bear in mind, too, that schools are places where leadership actions are distributed and diffused across the whole school system. Every member of staff must be responsible for leading his or her practice. Moreover, the school leaders must be attentive to the fact that individual schools are now working in collaboration with other schools in their locality or with other agencies and professionals. Networks are being formed. Consequently, traditional beliefs that learning is developed only in the classroom or only in the hands of the school principal should be replaced with the concept of extended and multi-professional practice.

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Considering and undertaking this distributed or horizontal leadership in its totality will help schools in being highly productive. This will help in mapping such schools national wide.

Lessons learnt and way forward

There are a lot of lessons that can be drawn from the discourses above. One of them is that there forms of management undertaken in schools are varied. While some prefer a top down management system, others on the other hand use the bottom up form. There are merits and demerits in the use of either style of leadership. A clever manager will prefer to use both styles in order for work to move. The situations at hand should dictate what form of management style has to be used.

Another lesson that was learnt is that greater productivity is associated with distributed leadership or the bottom up approach of the leadership. The top down approach on the contrary produces among other things the teacher resentment, low production, suspicion and slow rate of doing things. There is however a positive aspect of it where originality of policy is concerned. No distortions can be experienced as the recipient is the same person that transfers the information.

Conclusion

In the vertical engagement or rather top down management style, flow of information is from the top leadership to the bottom or subordinates. It entails that much of the thinking is done at top management and decisions are made right at the top.

This gives absolute power to top management and issues of dialogue are almost none existent. It is noted that such approaches deny top management skills and no strengths were pooled apart from the fact that the preservation of originality of shape of the organization is maintained. Often times, work suffers a great deal if the persons delegated to do the job is committed elsewhere. This form of management is practiced in most of the schools in Chadiza District and more so in the rural areas.

The horizontal engagement or bottom up is seen as a fabulous manner of leadership which should be promoted in schools. This ensures skills are being shared, strengths pooled together, and a great understanding of the set goals rife. Workers do the work with high morale and the productivity levels are high. The approach promotes networks within and outside the school system and this entails continued learning taking place even outside learning time. It builds team work and this reduces burden or pressure on top leadership.

All in all, the essay was highly educative and cognizance should be taken on the fact that, if leaders in schools would engage themselves in studying such topics in detail, their schools' performance would greatly improve. There is no sure way of understanding leadership styles better than studying such and engaging in books containing such themes.

It is the head teacher who organizes the time-table and distribute work load. However, the head teacher alone cannot change everything; teachers and external partners are important stakeholders. Head teachers lead instruction at school, help teachers develop instructional strategies and techniques and encourages teamwork, ensure in - service training and plan for seminars for his staff, assemble resources and distribute them to benefit the students, maintain a well - balanced staff with multiple techniques and competencies, establish goals for the school and articulate those goals with clarity, conviction and understanding (Hopkins, 2005). A teacher is a key resizing actor. A school is a reflection of the quality of the teachers it has and transformation can only occur with good teachers. Every teacher is different and every teacher matter. Moreover, Schools cannot work in isolation. Besides the headmaster, the teacher and the students, there are also the school community comprising of parents and people at large who are engaged in providing support to the school.

All these matters raised above should not be ignored if any school has to function successfully.

Recommendations

1. Both top down and bottom up styles of leadership should be used in schools in Chadiza District depending on the situation at play.
2. The managers of schools must not get glued to one form (top down or bottom up) but that a great deal in using the junior officers promote huge results. It should however not be at the expense of losing grip of job and focus of the overall goal of the school.

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Knowledge, Behaviour and Perceptions Affecting Control of HPV / HIV Co-Infection and Cervical Neoplasma Screening Among Patients with Cervical Cancer in Kenya

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Abstract

The main objective of this study was to assess how Knowledge, behavior and perceptions affect Cervical Cancer screening and the control of HIV/ HPV Co-infection among patients with cervical cancer in Kenya. The following specific objectives guided the study; to weigh the knowledge, behavior, and perceptions on the understanding of the absorption of Cervical Cancer Screening and prevention strategies among women in Kenya. This was a cross-sectional, descriptive and quantitative comparative study of cervical neoplasia screening and control strategies among women attending Kenyatta National Hospital and Coast Provincial General Hospitals in Kenya. The study was conducted at the Coastal region of Kenya particularly Mombasa County and all parts of Nairobi County over a twelve-month period at the Coast Provincial General Hospital (CPGH) and Kenyatta National Hospital respectively. The target population for this work involved all female respondents who had tested positive for HIV and Cervical Cancer and have the results or they need further screening. Convenience sampling technique was used because of time constraints. Random sampling was used to identify participants. The study concludes that knowledge, behavior, and perceptions on absorption of Cervical Cancer Screening and prevention by women depend on initiatives that have been put in place to motivate and educate women on issues related to cancer screening. The study recommends that the need for community understanding of cervical cancer and the causal relationship between HPV and cervical cancer is usually poor, giving priority to continuing education on the significance of HPV prevention and periodic cervical Cancer screening.

Acronyms and Abbreviations

ACC	Adenocarcinoma
ANC	Antenatal Clinic
AOR	Adjusted Odds Ratio
ARR	Adjusted Related Risk
ASCUS	Atypical Squamous Cells of Uncertain Significance
CDC	Centre for Disease Control
CI	Confidence Interval
CIN	Cervical Intraepithelial Neoplasia
CxCa	Cervical Cancer
DALY	Disability Adjusted Life Year
DVI	Direct Visual Inspection
EBRT	Extend Beam Radiotherapy
ELISA	Enzyme Linked Immunosorbent Assay
FIGO	International Federation of Gynecology and Obstetrics

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GIT	Gastrointestinal system
GUT	Genitourinary Tract system
HAART	Highly Active Antiretroviral Therapy
HBM	Health Belief Model
HGSIC	High Grade Squamous Intraepithelial Lesions
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
HR	Hazard Ratio
HRT	Hormone Replacement Therapy
IARC	International Agency for Research on Cancer
ICC	Invasive cervical cancer
IDU	Intravenous Drug Users
KNH	Kenyatta National Hospital
KCR	Kenya Cancer Registry
LEEP	Laser Electrosurgical Exicision procedure
LGSIL	Low Grade Squamous Intraepithelial Lesions
LOH	Loss of Heterozygosity
MMR	Mismatch Repair Region
NGO	Non-Governmental Organization
NCSP	National Cervical Screening Program
O&G	Obstetrics & Gynaecology
OCP	Oral Contraception Pills
OR	Odds Ratio
Papsmear	Papanicolou Smear
PVE	Per Vaginal Examination Examination (pelvic examination)
RCT	Randomized Control Trial
SCC	Squamous Cell Carcinoma
SES	Socio Economic Status
SIR	Standardized Incidence Ratio
SPC	Statistical Process Control
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
TQM	Total quality management
UNAIDS	United Nations Joint Program of HIV/AIDS
VIA	Visual Inspection after application of Acetic acid
WBC	White Blood Count
WHO	World Health Organization

Introduction

Background information

One of the leading causes of morbidity and mortality in Kenya and the world at large is Human Papillomavirus (HPV). High-risk, oncogenic HPV types (featuring HPV 16 and HPV 18) are connected to 99.7% of all cervical cancers. Low-risk HPV types (HPV 6 and HPV 11) are accountable for incremental abnormal Pap test results, and almost all cases of genital warts. HPV is so prevelant that more than fifty percent of all sexually active people will be

tainted by the disease in their lifetime, however, it is the young sexually active women who bear the chief impact of both infection and clinical complications. Presently, there does not exist an effective HPV prevention strategies or efficient treatments for individuals with genital warts or cervical lesions in Kenya; the available treatments only focus on extracting the affected area consequently, recurrence is common. The government of Kenya is planning to avail to the health sector prophylactic vaccines in the near future. It is hoped that the vaccines will unquestionably reduce the morbidity and mortality associated with these infections.

A study conducted by CDC, (2004) revealed that roughly 20 million people living in America are infected with HPV and roughly 6.2 million new HPV infections develop each year. HPV is rampant among the sexually active populations since the infection is spread by skin-to-skin sexual contact. The study further reveals that Centers for Disease Control projects that at least half of the sexually active population will contract HPV at a given point in their lives, and at least 80% of women will contract the infection by the age of 50. In the United States, about 10% of the population have an active HPV infection, whereas 4% have an infection that results in cytological abnormalities, and an additional 1% have infection causing genital warts (Koutsky, 1997). Despite the small percentage of Americans revealed to have clinically visible genital warts, as many as 13% of americans attending STD clinics are reported to have genital warts (Koutsky, 1997). The greatest risk factors attributed to the infection include; gender, youth, and sexual activity, with the maximal rates being routinely found amongst the sexually active women aged 25 years and below. In a study conducted by Winer *et al*, 2003 that sampled 148 female university students who were sexually active and within 24 months 38.9% were infected by HPV. The most common HPV type detected was HPV 16 which had a cumulative infection rate of 10.4%, HPV 18 had a cumulative infection rate of 4.1% by the end of the 24 months. In a smiliar study conducted by Brown et al, (2005) examined a smaller sample of mid-adolescent women for a period of two years. At the end of the period, the results revealed that, 82%of the women were infected with HPV). DNA from both low-risk and high-risk HPV types has even been detected amongst women who engage in sexual activities with their fellow women counterparts, which is a population that was expected to have a low incidence of HPV infection (Marrazo et al; 2001). It should be observed that prevalence estimates vary due to the technique enaged in assessing the viral load; polymerase chain reaction analysis is a more sensitive detection method and yields higher rates of prevalence.

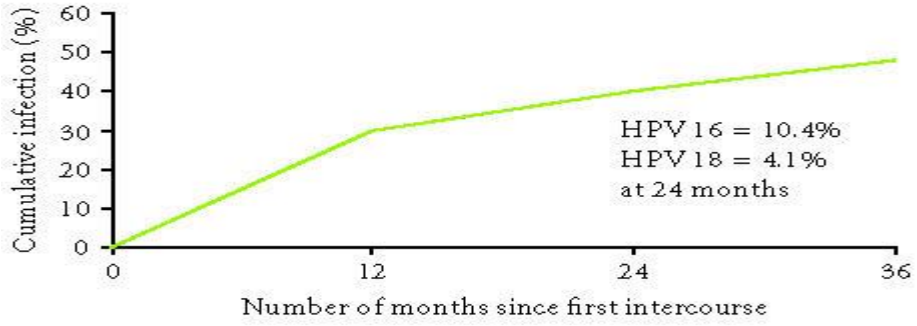

Figure 1. Reveals the cumulative rate of HPV infection amidst college-aged women who were virgins at baseline. Adapted from (Winer et al 2003)

Limitations

The most important limitation of this study is the exclusion of genotyping tests to establish the common genotypes circulating within the population responsible for Cervical Cancer acquisition and progression due to financial constraints. It is important to recognize possible limitation of this study in terms of identification of specific genotypes responsible for acquisition of cervical cancer.

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Thirdly, the other limitation to the study is the lack of viral load considering the fact viral load detection in blood is a good indicator of viral suppression as well as monitoring of drug effectiveness for HIV patients diagnosed with cervical cancer.

Materials and Method

Study site

The study was conducted at the Coastal region of Kenya particularly Mombasa County and all parts of Nairobi County over a twelve-month period at the Coast Provincial General Hospital (CPGH) and Kenyatta National Referral Hospital. The County of Mombasa and Nairobi have approximately 939,370 people and 3,138,369 respectively (KNBS, 2009). They are Cosmopolitan Centers with people of different races. The study sites a fair presentation of both the youth and the older generation. The Centers are chosen due to accessibility of VCT and free cervical malignant growth screening services being offered by the Ministry of Health (MOH) and also due to the fact that that they form the bulk of the population of both Mombasa county and Nairobi County.

Study design

A cross-sectional, descriptive and quantitative comparative study of cervical neoplasia screening, and control strategies among women attending Kenyatta National Hospital and Coast Provincial General Hospitals in Kenya

Data collection techniques

Data was obtained from a total of 300 patients via face to face, patient interviews, patient records both outpatient and inpatient. The data collection was carried out by the researcher according to the schedule shown in the table. Only patients who consent will be scheduled in the study. Data was captured and cleaned then analyzed using the SPSS software.

Data management and analysis

Data quality was checked by pre testing questionnaires before use and data entered in the computers using double entry system. Queries were raised and resolved as soon as they were identified. Quality control was done to ensure reliability and validity of data. Data collected from patients at the Gynecological clinic, Oncology clinic, Radiotherapy clinic, Comprehensive Care Centre (CCC) and Pathology Laboratory was captured in the electronic data base and exported to excel work book 2010. Data analysis was done using SPSS Version 23.0 statistical software. Basic characteristics of the study samples were summarised using simple proportions and means, median and inter quartile ranges.

Further analysis was done to perform one way ANOVA comparing more than two means followed by Post hoc Student Newman Keul for multiple comparisons. Independent t-test was used to calculate if there was any significant difference between different groups. Data was presented by use of frequency distribution tables. In both statistics, 95% confidence level was used and all statistical tests were considered significant at $P < 0.05$. The data was presented qualitatively and quantitatively by way of narrative, description, tabulation and discussion.

Results

Mean comparison of the respondents

ANOVA

The study sought to determine the significance level between the groups in each of the objectives. From the findings, the f-calculated of Attitudes towards Cervical Cancer Screening was 2.792.

Table 1: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Attitudes Towards Cervical Cancer Screening	Between Groups	536.503	30	17.883	2.792	.000
	Within Groups	1069.658	167	6.405		
	Total	1606.162	197			

T-test

To test this, we concentrate on the 2-tailed value and compare it with 0.05. Values that are below 0.05 we reject the null hypothesis. From the results, the attitudes towards cervical cancer screening before education, the p-value was 0.001 for both equal variances assumed and equal variances not assumed. Therefore, we reject the null hypothesis.

Table 2. T- Test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Attitudes Towards Cervical Cancer Screening	Equal variances assumed	2.905	.090	3.384	196	.001	1.35008	.39894	.56331	2.13685
	Equal variances not assumed			3.398	185.623	.001	1.35008	.39736	.56615	2.13401

Student-newman-keuls

Attitudes towards cervical cancer screening

Attitude toward second scanning

From the ANOVA table, the p-value indicates that there was significant different between the groups on attitude towards Screening with a p-value of 0.041 which is less than 0.05. However, Student-Newman-Keuls indicates that there is no significant different between the groups. Therefore, Type I error levels are not guaranteed.

Table 3. ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.301	3	3.100	2.813	0.041
Within Groups	213.790	194	1.102		
Total	**223.091**	**197**			

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Table 4. Student-newman-keuls

Student-Newman-Keuls[a,b]		
If you were offered a free cervical cancer screen, would you be willing to be screened?	N	Subset for alpha = 0.05
		1
Unsure, many be willing	34	2.5882
No, would not be	93	2.6452
Don't know what cervical cancer is	37	3.0000
Yes would be willing	34	3.1471
Sig.		.076

Means for groups in homogeneous subsets are displayed

a. Uses Harmonic Mean Sample Size = 41.406.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed

Reason for not willing to take second screening

From the ANOVA table, the p-value indicates that there was significant difference between the groups on willingness to be screened with a p-value of 0.000 which was less than 0.05. From Student-Newman-Keuls, it was inconvenient to get to a clinic and some didn't know what was cervical cancer. Other reasons include; The test is human wanting are all not significantly differences while I don't have time to attend for a test, The test will be painful and other groups are all significantly different because they are in different column which is column 1, 2, 3 and 4. Therefore Type I error levels are not guaranteed.

Table 5. ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	153.330	5	30.666	51.356	.000
Within Groups	114.649	192	.597		
Total	**267.980**	**197**			

Table 6. Student-Newman-Keuls

Student-Newman-Keuls[a,b]						
What will make you not to be willing or interested in taking cervical cancer screening?	N	Subset for alpha = 0.05				
		1	2	3	4	5
It's inconvenient to get to a clinic	34	1.1765				
I don't know what it's for	24	1.3750	1.3750			
Other reasons	81		1.7284	1.7284		
The test is human wanting	19			2.0526		
The test will be painful	18				3.2222	
I don't have time to attend for a test	22					4.0000
Sig.		.362	.105	.137	1.000	1.000

Means for groups in homogeneous subsets are displayed

a. Uses Harmonic Mean Sample Size = 25.309.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed

Individual cervical cancer

From the ANOVA table, the p-value indicates that there was significant difference between the groups on how the patient think are risks for cervical cancer with a p-value of

0.024 which is less than 0.05. However, Student-Newman-Keuls indicates that there is no significant different between the groups. Therefore, Type I error levels are not guaranteed.

Table 7. ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	40.329	2	20.165	3.799	.024
Within Groups	1034.923	195	5.307		
Total	**1075.253**	**197**			

Table 8. Student-Newman-Keuls

Student-Newman-Keuls[a,b]		
Do you think you are at risk for cervical cancer	N	Subset for alpha = 0.05
		1
Yes	152	7.2171
Don't know	27	8.2222
No	19	8.3684
Sig.		.122

Means for groups in homogeneous subsets are displayed

a. Uses Harmonic Mean Sample Size = 31.170.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed

Attitude towards Healthy Woman and Screening for Cervical Cancer

From the ANOVA table, the p-value indicates that there was no significant different between the groups on whether the patient think healthy woman, who feed well, need to be screened for cervical cancer with a p-value of 0.064 which is less than 0.05. Similarly, Student-Newman-Keuls indicates that there is no significant difference between the groups. Therefore, Type I error levels are not guaranteed.

Table 9. ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	1.002	2	.501	2.789	.064
Within Groups	35.038	195	.180		
Total	**36.040**	**197**			

Table 10. Student-Newman-Keuls

Student-Newman-Keuls[a,b]		
Do you think a healthy woman, who feeds well, need to be screened for cervical cancer	N	Subset for alpha = 0.05
		1
No	19	1.0000
Don't know	21	1.0000
Yes	158	1.1772
Sig.		.262

Means for groups in homogeneous subsets are displayed

a. Uses Harmonic Mean Sample Size = 28.148.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed

Individual Cervical Cancer Information Sharing

From the ANOVA table, the p-value indicates that there was significant different between the groups on whether the patient have ever talked with their mother, daughter or friends about cervical cancer with a p-value of 0.043 which is less than 0.05. However, Student-

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Newman-Keuls indicates that there is no significant different between the groups. Therefore Type I error levels are not guaranteed

Table 11. ANOVA

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	2.489	2	1.244	3.189	.043
Within Groups	76.097	195	.390		
Total	**78.586**	**197**			

Table 12. Student-Newman-Keuls

Student-Newman-Keuls[a,b]		
Have you ever talked with your mother, daughter or friends about cervical cancer	N	Subset for alpha = 0.05
		1
No	23	1.0435
Don't know	21	1.1905
Yes	154	1.3701
Sig.		.103

Means for groups in homogeneous subsets are displayed

a. Uses Harmonic Mean Sample Size = 30.741.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed

Discussion

The study discussed the respondents' response and findings according to the questionnaires given to them.

Attitudes towards cervical cancer screening before educational intervention

Knowledge and Awareness Levels after Educational Intervention with 3.347 and Attitudes towards Cervical Cancer Screening Educational was 3.897 and the f- tabulated is 1.527 hence there was significant different between the groups. For knowledge and awareness levels after educational intervention the p-value for both equal variances assumed and 0.033 and 0.029 respectively, therefore we reject the null hypothesis. The p-value for attitudes towards cervical cancer screening educational is 0.282 and 0.287 which is greater than 0.05. We therefore accept the null hypothesis. Lastly the p-value for general health was 0.057 and 0.053 for both equal variances assume and equal variances not assumed respectively therefore we accept the null hypothesis. In all of the outcomes there was not much significance difference in the mean. According to a study conducted in Western Kenya that discovered the following, first, self-reported HIV was linked with increased CC screening attendance and secondly not all women who admitted living with HIV undertook screening services, this finding highlights the significance of education among the high-risk group of women (Orango'o et al; 2016). In order to ensure proper conveyance of information and retention of patients in health care is through laying a strong foundational relationship between the provider and patient, particularly those who have many medical and social needs (Fletcher et al; 2014).

Conclusion

The study concludes that knowledge, behavior, and perceptions on absorption of Cervical Cancer Screening and prevention by women depend on initiatives that have been put in place to motivate and educate women on issues related to cancer screening. When there are good strategies of education the awareness level and knowledge increase therefore reduces the risk associated with Cervical Cancer.

Recommendations

The recommendations of this study can be summed up based on Kenya health Care reforms. Outreach, community mobilization, health education (including extensive sexuality education) and counseling are vital elements of an efficient program for the prevention and control of cervical cancer that guarantees elevated coverage of vaccination and screening and elevated therapy adherence (75). Also, vital elements of the HIV reaction are community outreach, mobilization and commitment. Using HIV infrastructure can provide both programs with resource optimization and extra efficiencies. Reducing morbidity and mortality from cervical cancer needs better schooling and interaction. Community understanding of cervical cancer and the causal relationship between HPV and cervical cancer is usually poor, giving priority to continuing education on the significance of HPV prevention and periodic cervical screening.

Disclaimer

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the Kenyatta University nor Clinical and Laboratory Standards Institute. Use of trade names is for identification purposes only and does not constitute endorsement by Kenyatta University nor Clinical and Laboratory Standards Institute.

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Factors Influencing the Practice of Exclusive Breastfeeding among Lactating Mothers Attending the IWC in District Hospital Mbengwi in the North West Region of Cameroon

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Abstract

Breastfeeding is an unequalled way of providing ideal nutrition for the healthy growth and development of infants. The global public health recommendation is that infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health (WHO, 2003). Exclusive breastfeeding in the first six months of life stimulates babies' immune systems and protects them from diarrhea and acute respiratory infections, two of the major causes of infant mortality in the developing world and improves their responses to vaccination (UNICEF, 2006). Approximately 1.5 million young infants die each year as a result of lack of knowledge about exclusive breastfeeding benefits and improper infant and young child feeding practices (Nguyen, 2009). The World Health Organization (WHO), United Nations Children's Fund (UNICEF) and other organizations promote exclusive breastfeeding as one of the key effective low-cost interventions to enhance child survival. It is therefore for these reasons that we sort to find out the factors influencing the practice of exclusive breastfeeding among lactating mothers attending infant welfare clinic (IWC) at the Mbengwi District Hospital.

A cross-sectional survey was used where the convenient sampling technique was used. Data collection tool was a structured questionnaire with open and closed ended questions to give a snapshot of the factors influencing the practice of breast feeding among lactating mothers attending IWC. Data analysis was done using Microsoft Excel tables and figures.

The rate of exclusive breastfeeding among lactating mothers attending IWC in district hospital Mbengwi was found to be 26.6% which is relatively higher compared to those reported in other studies 13.3%, 16%, in Tanzania, Kenya, respectively (Maru et al, 2009). This observed difference may be due to the strengthened MCH services. Despite the improvement in the percentage as compared to other African countries, there is still a need for strengthened MCH services to improve the percentage of mothers adhering to exclusive breastfeeding.

Keywords: *exclusive breast feeding, lactating mother, infant welfare clinic, Mbengwi District hospital*

Introduction

Statement of the problem

Approximately 1.5 million young infants die each year as a result of lack of knowledge about exclusive breastfeeding benefits and improper infant and young child feeding practices (Nguyen, 2009). The World Health Organization (WHO), United Nations Children's Fund (UNICEF) and other organizations promote exclusive breastfeeding as one of the key effective low-cost interventions to enhance child survival. Numerous awareness campaigns have been launched by national governments, multilateral organizations, and non-governmental and private sector organizations across the globe to educate mothers and families about the benefits of exclusive breastfeeding and with aim to encourage the practice (Nguyen, 2009).Such initiatives include Baby Friendly Hospital Initiatives (BFHI) and establishment of work place breast feeding facilities. These efforts have achieved different levels of

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success. The BFHI for example, does promote exclusive breastfeeding in the health facility but does not sustain it at community level. In reality many mothers are unable to practice exclusive breastfeeding as advocated (Dhandapany *et al*, 2008) and there is Paucity of scientific data on reasons why exclusive breastfeeding is not practiced optimally.

In many Sub-Saharan Africa societies, exclusive breastfeeding is considered by far the best feeding option for women of unknown HIV status and for most HIV positive mothers, although it is challenged by low acceptability and feasibility (Cames *et al*, 2009).The rates of exclusive breastfeeding have improved over the recent past, with the global rate at 37% (UNICEF, 2009c and UNICEF, 2011a). However, in all regions the percentage of infants under six months receiving the benefits of exclusive breastfeeding is less than 50% (UNICEF, 2011b). In the developing world, less than 40 % of infants under 6 months old receive the benefits of exclusive breastfeeding. The rate is particularly low in Africa, where less than one third of infants under 6 months old are exclusively breastfed (UNICEF, 2009a). There has been a major increase in exclusive breastfeeding in 19 African countries including Rwanda (88%), Tanzania (41%) and Malawi (57%) among others (UNICEF, 2011c and UNICEF, 2009b). In Kenya however, rates of exclusive breastfeeding remain low with only 32% of infants below six months being exclusively breastfed (KNBS and ICF Macro, 2010).Studies have identified various factors that influence breastfeeding practices such as inadequate knowledge of the health benefits of breastfeeding (Ochola, 2008; LINKAGES, 2004); inadequate antenatal counseling on breastfeeding (Dhandapany *et al*, 2008) and belief that breast milk is insufficient (Savage et al, 2004). A range of maternal and child health attributes such as marital status, economic status and child age also influence the practice of exclusive breastfeeding (Alemayehu *et al*, 2009). To make better feeding choices, mothers need specific, culturally appropriate, information that responds to their constraints and concerns (LINKAGES, 2004).

In Cameroon breastfeeding remains a culturally accepted practice with 99% of women practicing breastfeeding initially breastfeeding rates remain low in the country. According to the Uganda demographic and health survey 2000-2001, 62% of children under six of age exclusively breastfeed as compared to 74% of those aged less than four months. Similar values in Cameroon are yet to be documented. The challenge is how to scale up exclusive breastfeeding to universal levels. Breastfeeding in Cameroon is normative but exclusive breastfeeding is not customary. National statistics from WBTI Cameroon shows that 45% of newborns initiate breastfeeding within 30minutes to 2hour as stipulated in the 10 steps to increase full breastfeeding but only 21% breastfeed till 6months without giving water, other fluids and food. Breastfeeding practices, including initiation and duration, are influenced by multiple interwoven factors which include health, psychosocial, cultural, political, and economic factors (Cripe *et al*, 2008.; Schmied V, Barclay L, 1999). Among these factors, decisions regarding initiation and duration of breastfeeding in low-income countries are influenced by education, employment, place of delivery, family pressure, and cultural values (WHO, 2010; Gartner LM *et al*, 2005.; Otoo *et al*, 2009). While there is a large body of published material on the factors affecting Breastfeeding, there are few studies documenting factors influencing exclusive Breastfeeding. To improve exclusive breastfeeding, factors influencing its practice have to be identified in order to target these in programmed implementation. In the Northwest Region of Cameroon, determinants of exclusive breastfeeding practices have not been documented. This study therefore shall obtain information which would lead to a 4better understanding of factors influencing exclusive breastfeeding practice among LM attending IWC in the Mbengwi DH.

Study objectives

To assess factors influencing EBF practices among lactating mothers attending the IWC in the district hospital Mbengwi Cameroon.

Specific objectives

1) To find out how the practice of exclusive breastfeeding was been carried out among LM attending IWC in the Mbengwi DH.
2) To find out or explore whether or not lactating mothers have the knowledge and understanding about the concept of EBF.

3) To find out the factors associated with the practice of EBF among lactating mothers attending IWC in the Mbengwi district hospital.

Research question

What are the factors influencing exclusive breast-feeding practices among lactating mothers attending IWC at the Mbengwi District Hospital?

Hypothesis

Exclusive breast feeding can positively influence if mothers are well educated about its benefits at IWC.

Methodology

Description of the study setting

Mbegwi is a rural community located some 22km away from Bamenda. It is the headquarter of Momo Division and comprises of the following Villages; Mengen, Mbo, Mbengwi, Gonoku, Fonam, nyen, Djimbi, Acha Tugui, bome, bome, Kopi Yang and Ngembo. Its indigenous people are the Meta people. The Health District has one district hospital, one integrated health center and many health unites including private hospitals, clinics, there is also the availability of schools ranging from pre-nursery to higher institutes, markets, banks, Hotels, Motels and site of interest include the Abbi Water fall located in the heart of the town and the Catholic monastery.

The study population were lactating mothers attending the IWC with infants of age 0-6months during the period of data collection.

Eligibility criteria.

Inclusion criteria

- All lactating mothers attending the IWC
- All lactating mothers with infants of age 0-6months
- All lactating mothers who gave in their consent

Exclusion criteria

- Non-lactating mothers
- Lactating mothers with infants above the age of 6months
- Lactating mothers who refused giving their consent

Study design

The study was a descriptive cross-sectional study.

Sample size

The sample size for this study was 30 lactating mothers randomly chosen from all lactating mothers attending the IWC with infants aged from 0-6 months.

Sampling technique

A convenient random sampling was used for this research. All women attending IWC during the study period were randomly sampled using the convenient sampling technique.

Data collection tool and method

The instruments for data collection was a self-administered structured questionnaire which were used to achieve the objectives of the study. The questionnaires were developed following the flow of information for this study.

The questionnaires were self-administered to respondents and those who could neither read nor write were assisted by the researcher who read and explain the contents of the questionnaire for better understanding. Information from respondents was collected using the questionnaire. Mothers were first asked for their consent to participate in the study. Upon agreeing to participate in the study, a research

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self-administered a questionnaire on current infant feeding practices and responses were recorded. Questionnaires were being administered to 30 LM; where each took about 15 to 25minutes depending on mother's speed of replying and calmness of the infant to answer the questions.

Data analysis

Data was analyzed with the use of Microsoft Excel where pie charts, bar charts, percentages and frequency tables were generated.

Study limitations

This study had a number of limitations. The study subjects were those attending IWC in DH Mbengwi, which may not be a representative of the general population of lactating mothers with infants aged 0-6 months. Moreover, there is possibility that the responses of the study subjects were biased. This was overcome by explaining the purpose of the study clearly to the study participants and by assuring them that no matter the type of feeding a mother practiced, no negative consequences will befall her as a result of her practice.

Results

Socio- demographic characteristics of study participants (n=30)

Table 1. Age distribution of respondents

AGE (GROUPED IN YEARS)	RESPONDENTS(n)	PERCENTAGE
15- 20	13	43.3
21-25	8	26.7
26-30	7	23.3
31 +	2	6.7

Among the 30 participants 13(43.3%) were of aged group 15-20years, 8(26.7%) were of age group 21-25years, 7(23.3%) were of range 26-30years and 2(6.7%) were of age above 30years. Infants were of 0-6 months; their mean infant age at the time of interview was Out of these 10 (33.3%) were boys and 20 (66.7%) girls and they had an average weight of 3.2kg.

Table 2. Distribution according to marital status

MARITAL STATUS	RESPONDENTS(n)	PERCENTAGE OF RESPONDENTS
Married	13	43.3
Single	17	56.7
Co-habiting	0	0
Divorced	0	0
Widow	0	0

Among these 13 (43.3%) were married, 17(56.7%) were single mothers, 0 (0%) were cohabiting 0 (0%) divorced and 0(0%) widows.

Table 3. Parity of respondents

PARITY	RESPONDENTS	PERCENTAGE OF RESPONDENT
Primiparous	17	56.7
Multiparous	13	43.3

The parity of the respondents: 56.7% were primiparous while 43.3% were multiparous as summarized in table above.

Table 4. Educational level of respondents

LEVEL OF EDUCATION	RESPONDENTS	PERCENTAGE OF RESPONDENTS
Primary	7	23.3
Secondary	19	63.3
College and above	4	13.4
No formal education	0	0

Most of the LM 7(23.3%) had finished primary school, 19(63.3%) were Secondary school students, 4 (13.3%) had finished college while 0(0%) had no formal education.

Table 5. Occupation of respondents

Occupation	Respondents(n)	Percentage of respondents
Student	10	33.3
Seamstress	6	20
Hair stylist	3	10
Business	2	6.7
Farmer	2	6.7
Teacher	4	13.3
House wife	3	10
House wife	3	10

Majority 10 (33.3%) were students,4(13.3%) teachers, 6(20%) seamstress, 3(10%) hair stylist, 3(10%) house wives, 2(6.7%), businesswomen, and 2 (6.7%) farmers. In all 28(93.3%) were Christians while only 2(6.7%)

Exclusive breastfeeding

Mothers were categorized in two groups: first, as practicing exclusive breastfeeding if the infant was fed on breast milk only for the first six months of life, and second not practicing exclusive breastfeeding if the mother gave infant breast milk and other foods/liquids, or did not breastfeed exclusively for the first six months of life. Data shows that exclusive breastfeeding (EBF) was practiced by 8(26.7%) of the mothers, the remaining mothers 22(73.3%) did not breastfeed exclusively

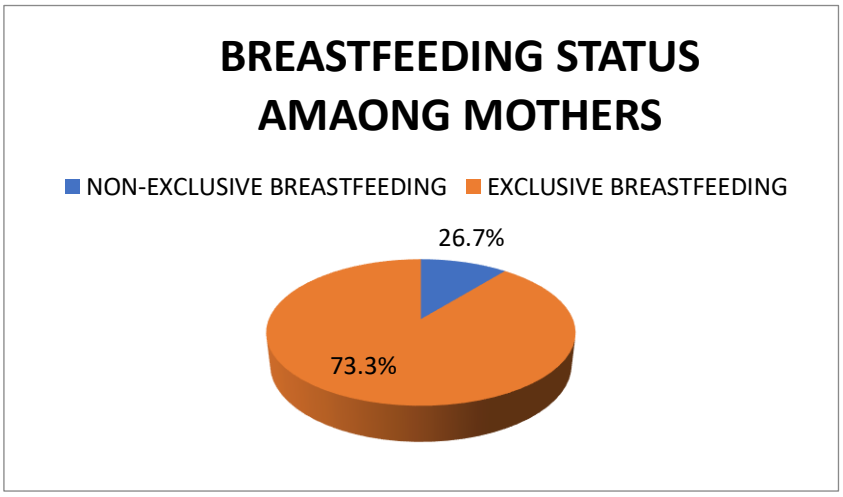

Figure 1. Breastfeeding status among lactating mothers

The rates of exclusive breastfeeding were high at the beginning of the baby's life after birth, data shows that most of infants (100%) were exclusively breastfed during first month, however; these rates started to decline as the age of infant increases

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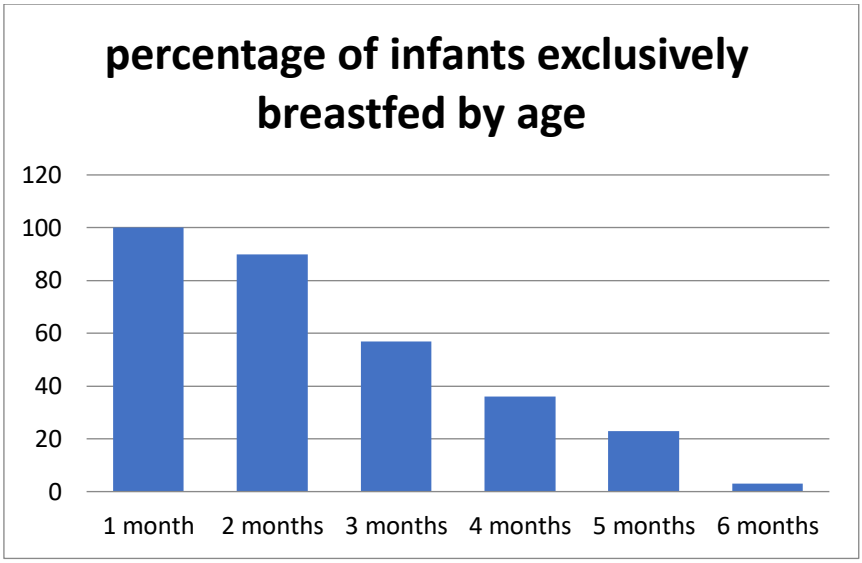

Figure 2. Percentage of infants exclusively breastfed by age

Other feeding practices

Table 6. Distribution of feeding practices among lactating mothers (n=30)

Feeding practice	Number	Percent
Exclusive breastfeeding	08	26.7%
Exclusive replacement feeding	0	0
Mixed feeding	16	53.3%
Other feeding	6	20%
Total	30	100

As seen on the table above 53.3% of respondents revealed that they practiced mixed feeding while 26.7% practiced exclusive breast feeding and another 20% practiced other types of feeding.

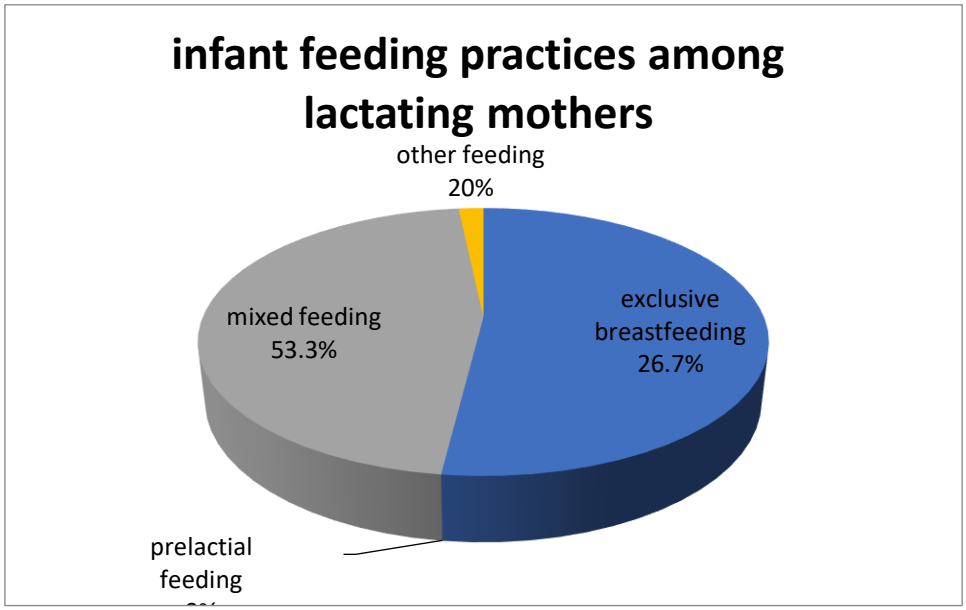

Figure 4. showing infant feeding practices

Rate of exclusive breastfeeding and non-exclusive breastfeeding practice by socio-demographic characteristics

It was discovered that age and occupation had an influence to extend to which LM practiced exclusive breastfeeding.

Table 7. Distribution by maternal age

Age	Exclusive breastfeeding (%)	Nonexclusive breastfeeding (%)
15-20years	4(50%)	9(40.9%)
21-25years	3(37.5%)	5(22.7%)
26-30years	1(12.5%)	6(27.3%)
30 and above	0	2(9.1%)

The socio-demographic data were analyzed, where findings showed that exclusive breastfeeding was practiced more by mothers who were at age group of 19-29 by 23.3%, as compared to other age groups.

Table 8. Distribution by occupation

Occupation	Exclusive breastfeeding (%)	Nonexclusive breastfeeding (%)
Student	2(25%)	6(27.3%)
Seamstress	1(12.5%)	5(22.7%)
Hair stylist	1(12.5%)	2(9.1%)
Business	0	2(9.1%)
Farmer	1(12.5%)	2(9.1%)
Teacher	1(12.5%)	5(22.7%)
House wife	3(37.5%)	0

Out of the number of respondents who practiced EBF that is 8(26.7%), Majority were house wives 3(37.5%), followed by students 2(25%), seamstress 1(12.5%), hair stylist 1(12.5%), farmers 1(12.5%), teachers 1(12.5%) and business 0(0%) as shown in table 9 above. As regards to those who didn't practice EBF, a great number of them were students with 27.3%, seamstress 22.7%, teachers 22.7%, hair stylist 9.1%, business 9.1%, farmers 9.1% as shown on table 9 above.

1 Finding out Knowledge and understanding of LM on the concept of EBF

Table 9. what do you understand by exclusive breastfeeding?

Response	Number	Percentage
Breastfeeding infant from birth up till 6monts at any time the baby is in need of breast milk without giving any food/ Fluid.	30	100

All mothers had a good knowledge of exclusive breastfeeding and its duration but not all had the awareness on the importance of colostrum

Table 10. what is the importance of the yellow colored milk that comes out the breast within the first week after birth?

RESPONSE	NUMBER	PERCENTAGE
Nutritious	16	53.4
Protection against diseases	4	13.3
Nutritious and protection against diseases	4	13.3
I don't know	6	20

In this regard, majority of them had a knowledge of colostrum as being nutritive that is 16(53.3%), others knew it as giving protection against diseases 4(13.3%), 6(20%) didn't know the function of colostrum and 4(13.3%) knew its functions is for the protection against diseases and nutrition. The results of this are represented on table 11 above.

However, from the results it indicates that all of these mothers had a good knowledge on exclusive breastfeeding but most of them fail to put it into practice as presented on the table below.

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Table 11. Knowledge of mothers who ever breastfed their children on EBF

Response	Number	Percentage
Breastfeeding infant from birth up till 6monts at any time the baby is in need of breast milk without giving any food/ Fluid.	08	100
Breastfeeding the child without food and or fluid for 3 months	0	0
I don't know	0	0
Others	0	0

Table 12. Knowledge of mothers who do not practice exclusive breastfeeding

Response	Number	Percentage
Breastfeeding infant from birth up till 6monts at any time the baby is in need of breast milk without giving any food/ Fluid.	22	100
Breastfeeding the child without food and or fluid for 3 months	0	0
I don't know	0	0
Others	0	0

Barriers to the practice of exclusive breastfeeding

Most mothers faced difficulties in exclusively breastfeeding their children such as; work related issues, studies and inadequate flow of breast milk.

Table 13. percentage of LM practicing non-exclusive breastfeeding who are workers.

Work	Respondents(n)	percentage
Teachers	5	22.7
Business	2	9.1
Total	7	31.8

Out of the 22 (73.3%) respondents who didn't feed their infants exclusively on breast milk 7(31.8%) were workers that is, teachers 22.7% and business 9.1% and this was because they work away from home and are not allowed to carry their infants to their place of work.

Table 14. percentage of LM practicing non-exclusive breastfeeding who are students

Students	Respondents(n)	percentage
Secondary school	5	22.7
College and above	1	4.5

Others were not able to breastfeed their children exclusively because they were students, that is 6(27.3%), 5(22.7%) and 1(4.5%) for secondary school students and higher education respectively.

Other reasons

Table 15. Percentage of LM practicing non EBF due to other reasons

Variables	Respondents(n)	Percentage
Insufficient flow of breast milk	1	4.5%
Friends	2	9.1%
Parents and grand parents	4	18.2%

Some did not exclusively breastfeed their children because of other reasons such as insufficient flow of breast milk 1(4.5%), influence from friends 2(9.1%) and influence from parents and grandparents 6(8.2%) as indicated on table above.

Mothers decision

Table 16. Percentage of LM practicing non EBF as result of mother's decision

Who advised you to give your child such foods or fluids?

My own decision	**2**	**9.1**
Parents/ grand parents	4	18.2
Friends	2	9.1
Others	0	0

Among respondents who didn't exclusively breastfeed their infants it was discovered that some of them did it just out of self will either because they felt breast milk alone didn't adequately satisfy the baby and or because the baby ought to drink water after feeding to ease digestion just like every other human being 2(9.1%).

Discussion on findings

The findings of this study highlighted the proportion of EBF among lactating mothers, identified factors that are associated with EBF and explored barriers and motivators to EBF simultaneously. The findings suggest a need of more support and strengthened counseling for mothers to be able to breastfeed exclusively for the recommended 6 months. It has been shown that EBF is more influenced by health workers, mothers of lactating mothers' own decision to practice EBF, and proper knowledge about EBF than informed choice of individual mothers.

The results of this study are similar to other previous studies in African countries and elsewhere that have showed that breastfeeding is the culture and well accepted practice where most of the infants are breastfed at one point in time (Leshabari *et al,* 2007) .In this study it was found that most mothers (100%) breastfed their babies, the finding which is consistent with that of study by de Paoli et al and the demographic health survey where it was noted that, almost all (98%) babies in Tanzania are breastfed for some period of time regardless of mothers HIV status (Paoli *et al,* 2001). It was found in this study that most mothers (71%) initiated breastfeeding within one hour after birth, which is the recommended time. The rate of exclusive breastfeeding among lactating mothers attending IWC in district hospital Mbengwi was found to be 26.6% which is relatively higher compared to those reported in other studies 13.3%, 16%, in Tanzania, Kenya, respectively (Maru *et al*, 2009). This observed difference may be due to the strengthened MCH services. However, the duration of exclusive breastfeeding decreased as the age of the infant increase, being higher in the first months of life and going down as the child grow. This could be a result of mothers being unsure whether their breast milk is sufficient to meet infant's body requirement for the first six months as well as other factors.

Moreover, it was discovered that all of the mothers in this study 100% had a good understanding of the concept of exclusive breastfeeding but failed to practice exclusively breastfeed their children because they didn't believe EBF was enough for their infants. It was also discovered that though they had a good mastery as to what EBF is some did not know the importance of colostrum.

Furthermore, the place of delivery, specifically health facilities was a strong predictor of early initiation of breastfeeding, though it did not influence exclusive breastfeeding. This differs from other studies that reported place of delivery (health facility) to be a predictor of exclusive breastfeeding (Shirima *et al*, 2001). The difference could be attributed to the fact that though all of the mothers (100%) delivered in health facilities most of them did not put to practice what they were been taught in the ANC and IWC because of certain factors such as work 7(31.8%), studies 23.3%, insufficient breast milk flow 4.5%. others included influence from family and friends as well as mother's self-will. While some of the mothers were being encouraged on their EBF practice through support from family and significant others, that is 25% by their mothers, 62.5% by nurses and 12.5% by their husbands.

The study findings have limitation that they cannot be generalized due to the small sample size and also due to the fact that it was health facility based. The study participants may have answered questions easily and accurately because they received infant feeding counseling. This bias may have

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overestimated the rates of exclusive breastfeeding practices while at the same time underestimate the rates of mixed and other feeding. Regardless of these limitations, study findings provide vital input on infant feeding decision.

Conclusion

This study highlights the factors that contributed to adherence to EBF among lactating mothers as: mother's age, support from family and health workers facilitate immediate initiation of breastfeeding. However, barriers were found to be, friends and family pressure to mix feed as it is a norm, insufficient breast milk flow, work, studies and mothers' decision. These findings suggest a need for a more extensive and comprehensive approach of breastfeeding education and especially of exclusive breastfeeding. These important issues that are related to factors influencing the practice of EBF that are brought up by this study, needs to be taken into account by implementers and policy makers for the purpose of accelerating exclusive breastfeeding practice among lactating mothers. However, since health workers are the sole supporters of infant feeding practices, in particular exclusive breastfeeding, capacity building should be done to ensure that they have current information and positive attitude towards EBF.

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The Effect of Traditional Marital Counseling Therapy (TMCM) on Marital Distresses among Married Couples in Ghana

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Abstract

The study aims at determining the impact of the Traditional Marital Counseling Model (TMCM) on marital distresses among married couples in Ghana. The study adapted versions of the Session Process and Outcome Measures-Client version (SPOM-C) and the Revised Dyadic Adjustment Scale (RDAS) questionnaires to measure therapy outcome for 50 married couples who were selected through stratified proportionate random sampling technique to participate in a descriptive-correlational-experimental research design. Disparity analyses were done using the Predictive Analytics Software (PASW) 18 guide to Data Analysis. Descriptive frequencies were used to analyze the data on the levels of marital distress. Disparity mean values within the sample were measured by paired t-test technique. Correlation between outcome of therapy for TMCM and level of marital distress were measured by Pearson correlation coefficient. The study found that TMCM has a significant effect on the marital distresses of the married couples. Though TMCM is better for counseling clients with various types of marital distresses, it is most effective in situations where clients present severe marital distress. Therapists should use TMCM especially for clients showing sever marital distress.

Keywords: *Traditional Marital Counseling Model (TMCM), Marital Distress, Married Couples, Marriage and Family Counseling, Marital Therapy.*

Introduction

Generally, there is a need for effective marriage and family counseling in Ghana. Other approaches exist for offering marriage and family counseling. These include behavioral strategies, communication skills training, systematic interventions, integrated couples' therapy, emotionally focused couple therapy, imago therapy, Gottman's sound marital house theory, and the cognitive-behavioral marital therapy (CBMT). Despite the existence of all these models of marital therapy, family and marriage counseling is yet to have a documented impact in helping clients with marital distresses deal with the problems. In light of this need, the researcher proposes and measures the impact of the Traditional Marital Counseling Model (TMCM) on marital distresses among married couples in Ghana.

Literature review

The Traditional Marital Counseling Model (CBMT).

Traditional Marital Counseling Model (TMCM) is a self-determined term that the researcher uses to describe the dominant model of therapeutic intervention at the instance of marital distress in African marriages. As indicated by Bakadzi Moeti and Hildah L. Mokgolodi in Botswana, the origin of marital counseling in Africa cannot be separated from the beginning of the culture itself (Moeti & Mokgolodi, 2017: 65-66). Marital therapy begins right from the performance of the customary marriage. In most African societies, the experiential tales of older folks concerning marriage is key. Both elderly men and women counsel the couple on the ingredients of a successful home. In Ghana, it is a common practice for each of the contracting families to present two individuals as a bulwark of the marriage. These individuals are expected to be the first point of contact for the couple in all matters concerning the marriage for which they need counsel. For this reason, the individuals selected are supposed to be of good behavior and personal piety.

Though the counseling model, referred to as Traditional Marital Counseling Model (TMCM), has generally been considered effective in helping African couples deal with their marital distress, no

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empirical data has been provided to support this general assertion. The current research accesses the efficacy of TMCM in assisting marital couples to deal with their marital distress. The Traditional Marriage Counseling Model (TMCM) operates within the framework of the African philosophy of healthy marriage and the role theory.

Across most African communities, marriage is considered a basic union that enables society to promote "life" through "procreation" (Kyalo, 2012: 211). For this reason, dissatisfaction in marriage was never encouraged. All individuals of the community were expected to maintain marriage stability at all cost. The marital relationship, also, laid some "dignity" on the couples (Kyalo, 2012: 214). Both husbands and wives drew their marital roles from this dignity. Non-performance of these roles led to marital dissatisfaction. Thus the general cause of dissatisfaction in African marriages was the non-performance of spousal roles in the marital relationship (Nwoye, 2000: 348; Kyalo, 2012: 216).

The main assumption of TMCM is that individual, marital distress negatively affects members of the household as well as the larger society leading to problems in the marriage, family, and corporate relationships. This implies that by helping couples with marriage and family-related problems to solve, adjust, or cope with their marriage and family-related distress, marriage and family counseling can subsequently aid them to make necessary changes in their behaviors that will cause them to enjoy their marital, family, and corporate relations. Thus, TMCM forms the basis of this study. Consequently, data collection, data management, and data analysis and interpretation are done from the perspective of this theory. From this perspective, the study probes ways to enhance marriage and family counseling in Ghana through TMCM.

A study by E. M. Gichinga (2005) identified "communication, physical/emotional abuse, parenting challenges, trauma (chronic and terminal illness), infidelity, alcohol/substance abuse, finances, infertility/childlessness, in-laws, and sexual dysfunctions" as the cause of marital distress in African marital relationships (cited in Sodi, Esere, Gichinga, & Hove, 2010: 335). T. Sodi and E. Sodi added "lack of trust (suspicions and extramarital affairs)" to the list of factors that cause marital distress (Sodi et al., 2010: 335). At the onset of marital distress, the complaining couple is expected to follow a three-stage mediation (Sodi, Esere, Gichinga, & Hove, 2010: 336). First, couples must try self-mediation. This is a personal attempt to resolve the underlining causes of marital distress without involving a third party. In the second stage, couples are expected to inform the individuals given to them by their respective families during the marriage contract. In the third stage, the matter is brought to a wider audience for hearing and arbitration. Normally, the audience consists of close family members of the couples.

Earlier research on indigenous African counseling has indicated "group counseling," song therapy, proverb/metaphor therapy as dominant approaches used in marital therapy (cf. Moeti & Mokgolodi, 2017: 68-70). In the current study, the Traditional Marital Counseling Model (TMCM) employs these traditional counseling approaches in addition to varied approaches from the Western context. These Westernized approaches include Experiential Family Therapy (EFT), Structural Family Therapy (SFT), Cognitive-Behavioral Marital Therapy (CBMT), Integrative Behavioral Couple Therapy (IBCT), Multi-Systemic Therapy (MST), Solution-Focused Brief Therapy (SFBT), and Narrative Therapy (NT). The option to use any of these approaches or a combination of them depends on the training of the therapist and the nature of the client's marital distress.

In Experiential Family Therapy (EFT), the therapist assists clients of marital distress in probing personal perception and emotions that underline the feelings of dissatisfaction in the marital relationship. The therapist helps clients focus on the positive aspects of the other spouse as well as on the positive aspects of the marital relationship. TMCM also uses Structural Family Therapy (SFT). In this type of therapy, the therapist assists clients in identifying general areas in the structure of the family that needs modification. Once these changes are made, the structural family therapist assumes couples can easily work out their marital challenges or attachment difficulties.

TMCM sometimes employ Cognitive-Behavioral Marital Therapy (CBMT). In using this approach, the TMCM therapist focuses on aiding the client to modify his/her pattern of thought concerning the other spouse and the entire marital relationship. The TMCM therapist believes that modifying clients thought patterns about the other spouse and the entire relationship would help restore marital stability. In seeking to understand the background of clients, TMCM therapist may employ the Integrative

Behavioral Couple Therapy (IBCT). This approach enables the therapist to gain insight into presenting marital distress so the therapist can assist clients in accepting each other.

The TMCM therapist may also employ the Multi-Systemic Therapy (MST). In this therapeutic approach, the therapist holds the therapeutic session within the environment of the client. While the move makes counseling accessible to clients, MST also enables the therapist and clients to address comprehensive factors that subtly contribute to marital and family distress. The TMCM therapist has the option of using the Solution-Focused Brief Therapy (SFBT). Focused on resolving the presenting marital distress, TMCM uses the SFBT to design short-term intervention plans that aim at investing clients with the ability to determine their solution to presenting marital distress.

In following the procedure of TMCM, one realizes that it partially uses Narrative Therapy (NT). By listening and re-listening to the client, the TMCM therapist affords clients the opportunity to examine the narratives that drive their thoughts, behavior, and feelings. Once clients become aware of this, TMCM therapist assists them in enhancing specific positive narratives that ensure marital stability. Sometimes, the therapist encourages the client with real-life stories of an anonymous individual who had similar situations but was able to work through it.

Nwoye has attempted formalizing the counseling stages of the Traditional Marital Counseling Model (TMCM). Terming his procedures as "mediatorial session," Nwoye describes counseling in African societies as a system of "claim, and counter-claim" in the presence of "mediating elders" who function as "jury" (Nwoye, 2000: 348-349). Nwoye's 'mediatorial session' is divided into three major stages. These are the social stage, the initial hearing, and the reconciliation stage. In the first stage, the couple interacts with the counselor. The goal of this stage is to gain first-hand insight into the marital distress and also to establish the beginning of a hearing.

This stage overlaps into the second stage of the hearing. In the initial stage is divided into two- the first and second hearings. In the first hearing, the therapist listens to the individual version of marital distress. Usually, the counselor meets individuals couples on alternate days. After both couples has narrated their version of the marital distress, the counseling enters the second phase of the second stage. During this phase, the counselor engages individual clients separately. The purpose is to enable them to clarify and modify maladaptive thoughts, feelings, and behaviors that sustain marital distress.

Also, the counselor helps clients to identify personal areas of negative thoughts, feelings, and behaviors through indigenous modeling. These models involve the use of "proverbial observations, metaphors, short wisdom story genres, and some fictional ideologies" (Nwoye, 2000: 355). Generally, this stage ends with client conscious of negative actions as well as personally-designed solutions to the presenting marital distress.

The third stage is divided into two phases. In this stage, the therapist meets both couples together and directly point out the fault of each other in the session. This is followed by specific admonition on marital roles and societal values to the concerned couple. The first phase of this stage ends with an exchange of apologies or acceptance of the apology. The second phase of the third stage is the apex of the TMCM. In this phase, the couple actively expressed their forgiveness and acceptance of one another. Activities include warm embrace between couples, the presentation of money or "appeasement gift," and the preparation of the delicacies for the other spouse (Nwoye, 2000: 357).

The current study uses Nwoye's "mediatorial session" as procedures for the Traditional Marital Counseling Therapy (TMCM). Some participants in this research will be assigned to this therapy to access its efficacy in helping clients deal with their marital distress. Two factors limit the efficacy of the Traditional Marital Counseling Model (TMCM). First, it is semi-structured. Though it appears to have identifiable stages, sessions within each stage and the duration each session takes are not readily observable. It appears these hidden sessions vary, both in terms of number and in-session duration. Second, the seemingly fluid nature of this therapy does not easily enable the use of the psychological instrument in the therapeutic process. In the current study, the researcher ensured that these factors did not disrupt the use of the model.

Marital Distress

Marital distress describes general feelings of dissatisfaction that occur in the marital relationship (Reis & Sprecher, 2009: 344; Halford, 2003: 3). DSM-V has placed marital distress among the category of "other conditions" that need clinical attention (cited in Barlow, 2014: 703). Even in this

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category, marital distress is marked with the '"V code' of relationship distress with spouse or intimate other" (cited in Barlow, 2014: 703). Scholars have observed that marital distress causes physical, mental, and emotional suffering than most "DSM" recognized "disorders" (Barlow, 2014: 703). Additionally, marital distress contributes to some disorders such as depression that impacts "mental health, physical health," and "family health" of partners in the marital relationship (Fincham & Beach, 1999: 48, 49; Greene & Burleson, 2008: 149; Carlson & Dermer, 2017: 1008). Lebow et al. indicated that marital distress has a close association with "bipolar disorder, alcohol use disorders, and generalized anxiety disorder" (Lebow, Chambers, Christensen, & Johnson, 2012: 146).

Inadequate or lack of "communication" between couples have been generally ascribed as the cause of marital distress (Cox & Brooks-Gunn, 2014: 52; Jacob, 2013: 147). Michael J. Salamon thinks "specific communication styles" are the real cause of marital distress (Salamon, 2008: 113). Elizabeth van Acker noted that lack of "time" for each other and "financial" challenges were some causes of marital distress (van Acker, 2017: 21). In addition to poor communication skills between couples, Chris Segrin and Jeanne Flora observed that other "dyadic skills" including "problem-solving and coping between spouses" as well as poor "relational skills" between couples cause marital distress (Segrin & Flora, 2011: 252). Contrary to the opinion of some researchers, D. Eugene Mead has found that "gender" only deepens marital distress but does not cause it (Mead, 2002: 299). In line with cognitive-Behavior Marital Therapy (CBMT), Donald H. Baucom and Norman Epstein argue that the interplay of some cognitive factors underlines marital distress. These factors are an individual couple's "perceptions" about actual events, "attributions" (that is an individual couple's explanation of life events), "expectancies" (individual couple's projection of consequent events), "assumptions" concerning reality and interactions between life activities, and "beliefs or standards" (that is an individual couple's notion of how things are supposed to be) (Baucom & Epstein, 2013: 47).

Some researchers have attempted to categorize marital distress. Irving E. Sigel and Gene H. Brody, for example, classified marital distress into "physically aggressive, verbally aggressive, withdrawn, and nonaggressive"(Sigel & Brody, 1990: 197). The current study categorizes marital distress into mild (from 47 to 42, RDAS), moderate (from 41 to 32, RDAS), and severe marital distress (below 31, RDAS). This classification is based on couples score on the Revised Dyadic Adjustment Scale (RDAS).

Methodology

The descriptive-correlational-experimental design was used in this study. A descriptive survey involving the sample enabled the study to present a detailed state of the interaction between marital distress and marital counseling in Ghana. The correlational aspect of the study made it possible for the researcher to measure the relationship between socio-demographic variables and the outcome of therapy for TMCM. Using experiment, the causal relationship between marital distress and TMCM for marital counseling was assessed.

The proportionate stratified random sampling technique was used (Henry, 1990: 29; Babbie, 1990; 85; Cochran, 1953: 65; Kish, 1965: 21; Fowler, 1993: 15; MacNealy, 1999: 156). The rationale for using this technique was to ensure the equal representation of all characteristics of married couples in Ghana relevant for the study. Hundred (50) heterosexually married couples (one hundred (100) heterosexually married individuals) participated in the study.

A six-session TMCM therapy was designed for the research group. The total duration of the treatment plan was ten (10) days. In-session duration ranged from three hours to six hours of therapy. The first session focused on inaugurating the therapy. Activities in this session corresponded with Nwoye's social stage. The counselor established rapport with the couples set the counseling goal and established the ground rules for therapy. In the second session, beginning Nwoye's initial hearing stage, the counselor met the wife alone in her home. The reason was to understand the wife's version of the underlining causes, the present state of affairs, and the consequences of marital distress.

In the third session, ending Nwoye's initial "hearing stage," counselor met the husband at a venue determined by the husband. Following Nwoye's procedure, this therapeutic session occurred two days after the therapist had met the wife. The choice of the venue engendered trust between the therapist

and the client. The main concern of the counselor was to understand the husband's version of the underlining causes, the present state of affairs, and the consequences of marital distress.

In the fourth session, beginning Nwoye's second hearing stage, the counselor met again with the wife at the same venue as in the first meeting. The focus of this meeting was to assist the wife in examining her narrative of marital distress. Accordingly, the counselor sought to clarify, rephrase, and reflect on the thoughts, feelings, and behavior of the wife. The role of the wife in the marital relationship was the center-stage of the discussion. At the end of this session, the wife had an objective assessment of the underlining causes of marital distress. Further, the wife gained insight into how she could focus on her duty to save her marriage from general dissatisfaction. In situations where wives were found to be the guilty party, the counselor encouraged her to express reconciliatory gestures at the last session of therapy.

The fifth session, ending Nwoye's second hearing stage, occurred two days after the counselor had met the wife. The venue was the same as it was in the first hearing with the husband. The goal of this session was to help the husband clarify and evaluate the personal contribution to marital distress. From the perspective of the husband's role in the marital relationship, the counselor assisted the husband in arriving at personal ways of resolving marital distress. As in the fourth session with the wife, the counselor encouraged the husband to express reconciliatory gestures at the last session of therapy. This encouragement only happens where husbands were the guilty parties.

The last session of TMCM corresponds with Nwoye's final stage of reconciliation. It took place a day after the fifth session. In this session, the counselor meets both couples. The session aims to provide couples with insight regarding the cause(s) of marital distress. Through metaphors, proverbs, and narration of vicarious experiences concerning societal expectations for each couple as well as about the entire marital relationship, the counselor helped couples to focus on the significance of forming a functional alliance to make the marriage work. The counselor ensured that discussions were equitable to each of the couple. The expression of reconciliatory gesture from one of the couples was appropriately responded to by the other couple. This was followed by an affirmation of unity. During the therapy, couples either engaged in a warm embrace or compensated the offended spouse using cash or kind.

Two weeks after TMCM ended, counselor followed up on the couple. In this follow-up, couples individually filled out the RDAS for the second time. Average scores for the couple were stored for later usage. Also, couples filled out a questionnaire measuring their perception of the outcome of counseling. Average scores for the couple were stored for later usage.

Two research instruments were used in gathering data for the study- the SPOM-C and the RDAS. The study adapted the Session Process and Outcome Measures-Client version (SPOM-C) to gather information about married couples' perception of the outcome of the marriage and family counseling from both the research group and the comparison group. The adapted version of the SPOM-C comprised of four sub-scales. These were the socio-demography section, the Helping Skills Measure (HSM-C), Session Evaluation Scale-Client Version (SES-C), and the Relationship Scale-Client Version (RS-C). The demography section gathered socio-demographic information about the research sample. It included the level of marital distress among the study sample.

The HSM-C uses a 13-item scale to measure couples' evaluation of the performance of counselors during the exploration, insight, and action stages of marriage and family counseling. All items in this sub-scale begin with the stem "in this session, my helper..." RS-C subscale consisted of four items all beginning with the stem "in this session, I..." The SES-C subscale included four items each built on the stem "I..."Thus HSM-C instrument consisted of 21 items. It uses a five-point Likert scoring scale that ranges from strongly disagree (1) to strongly agree (5). Scoring is accumulated. The higher the score, the more effective the married couple (client) perceives of the marriage and family counseling.

Test-retest analysis by Hill and Kellems (2002) on the threefold structure of the SPOM-C produced a reliability alpha co-efficient 0.73, 0.71, and 0.82 for the exploration, insight, and action stages of the counseling process. Also, their study found a validity alpha co-efficient of $r=0.43$, p, <0.001, $r=0.44$, $p<0.001$, and $r= 0.60$, $p<0.001$ for the exploration, insight, and action stages of counseling.

The second instrument was a slightly modified version of the Revised Dyadic Adjustment Scale (RDAS). It was used to screen initial respondents and also to measure the level of marital distress

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among the research sample. The RDAS is an updated version of the Dyadic Adjustment Scale (Spanier, 1976: 15; Busby, Christensen, Crane, & Larson, 1985: 289-290). Apart from the modified socio-demographic measurement, the RDAS uses a 14-item on a 5- or 6-point scale to measure marital adjustment in three key areas. These are consensus, satisfaction, and cohesion. The total score of the RDAS is 69. Scores of 48 and above indicate greater marital stability and scores of 47 or below indicates the existence of marital instability.

In this study, average scores of couples are used to determine the presence or otherwise of marital distress. While average couple scores of 48 and above were considered as non-distress/distress free, average couple scores of 47 or below were considered to be distressed. Among the distressed couples, average couple scores between 47 and 42 were regarded as mild distress; 41-32 was regarded as moderate distress, and 31 and below were regarded as severe distress. The RDAS has a reliability of ".90" and a "construct validity of .68 ($p<.01$)" (Busby, Christensen, Crane, & Larson, 1985: 290; Crane, Middleton, & Bean, 2000: 53). The efficacy of the RDAS in determining the presence of marital distress has been attested to by many studies (Anderson et al., 2014: 530; Turliuc & Muraru, 2013: 49). The RDAS has been replicated in another socio-cultural context (Hollist et al., 2012: 348).

Comparative and disparity analysis were done on research data using the Predictive Analytics Software (PASW) 18 Guide to Data Analysis. Descriptive frequencies were used to analyze data on participants' levels of marital distress. Disparity mean values within the sample were analyzed by a paired t-test technique. Correlation between the outcome of therapy for TMCM and type of marital distress was measured by Pearson correlation coefficient.

The researcher followed the code of ethics of the American Association for Marriage and Family Therapy (AAMFT) in involving human beings as participants for this study. By Principle V ("Responsibility to research participants"), the researcher ensured that participants volunteered their participation in the study. Also, interested participants were informed of their right to withdraw from the study at their volition. Again, the researcher assured participants that personal information shared was strictly limited to this study.

Discussions

Table 1.1. Distribution of marital distress before and after therapy for TMCM

Type of Marital Distress	Before		After	
	Frequency	Percent	Frequency	Percent
Severe	29	58.0	-	-
Moderate	8	16.0	5	10.0
Mild	13	26.0	45	90.0
Total	50	100.0	50	100.0

Table 1.1 presents distribution scores and frequencies for the three types of marital distress for both the before and after therapy for the sample. Frequencies and scores for before therapy were: severe was 29 (58%); moderate was 8 (16%), and mild was 13 (26%). Frequencies and scores for after therapy were: severe was 0 (0%); moderate was 5 (10%), and mild was 45 (90%). Table 1.1 indicates a significant impact of therapy on the status of marital distress for the sample.

Table 1.2. Type of marital distress and therapy outcome for TMCM

Marital Distress = Severe to moderate

Variable	Obs	Mean	Std. Err	Std. Dev.	[95% Conf. Interval]	
After therapy	4	40	0.408	0.816	38.700	41.299
Before therapy	4	25.5	1.5	3	20.72	30.27
Difference	4	14.5	1.658	3.316	9.22	19.77

Mean (diff) = mean (Marital distress after therapy - Marital distress before therapy) t = 8.74

Ho: mean (diff) = 0 degrees of freedom = 3

Ha: mean (diff) < 0 Ha: mean (diff) ≠ 0 Ha: mean (diff) > 0
Pr (T < t) = 0.9984 Pr (|T| > |t|) = 0.0031 Pr (T > t) = 0.0016

The analysis indicates the marital distress for four (4) participants moved from the severe state to the moderate state with a mean difference of 14.5 from before and after therapy provision.

Marital Distress = Severe to Mild

Variable	Obs	Mean	Std. Err	Std. Dev.	[95% Conf. Interval]	
After therapy	14	44.5	0.429	1.605	43.57	45.43
Before therapy	14	27	0.907	3.396	25.039	28.96
Difference	14	17.5	0.982	3.674	25.038	28.961

Mean (diff) = mean (Marital distress after therapy - Marital distress before therapy) t = 17.82

Ho: mean (diff) = 0 degrees of freedom = 13
Ha: mean (diff) < 0 Ha: mean (diff) ≠ 0 Ha: mean (diff) > 0
Pr (T < t) = 0.9984 Pr (|T| > |t|) = 0.0031 Pr (T > t) = 0.0016

The analysis indicates the marital distress for fourteen (14) participants moved from the severe state to the mild state with a mean difference of 17.5 from before and after therapy provision.

Marital Distress = Severe to Distress free

Variable	Obs	Mean	Std. Err	Std. Dev.	[95% Conf. Interval]	
After therapy	11	51	0.894	2.966	49.007	52.992
Before therapy	11	27.818	0.970	3.219	25.655	29.980
Difference	11	23.181	1.060	3.516	20.819	25.544

Mean (diff) = mean (Marital distress after therapy - Marital distress before therapy) t = 21.866

Ho: mean (diff) = 0 degrees of freedom = 10
Ha: mean (diff) < 0 Ha: mean (diff) ≠ 0 Ha: mean (diff) > 0
Pr (T < t) = 1.0000 Pr (|T| > |t|) = 0.0000 Pr (T > t) = 0.0000

The analysis indicates the marital distress for eleven (11) participants moved from the severe state to distress free state with a mean difference of 23.18 from before and after therapy provision.

Marital Distress = Moderate to Mild

Variable	Obs	Mean	Std. Err	Std. Dev.	[95% Conf. Interval]	
After therapy	3	45.666	0.333	0.577	44.232	47.100
Before therapy	3	35	1.527	2.645	28.427	41.572

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Difference	3	10.666	1.666	2.886	3.495	17.837

Mean (diff) = mean (Marital distress after therapy - Marital distress before therapy) t = 6.40

Ho: mean (diff) = 0 degrees of freedom = 2

Ha: mean (diff) < 0 Ha: mean (diff) ≠ 0 Ha: mean (diff) > 0

Pr (T < t) = 0.9882 Pr (|T| > |t|) = 0.0236 Pr (T > t) = 0.0118

The analysis indicates the marital distress for three (3) participants moved from the moderate state to the mild state with a mean difference of 10.66 from before and after therapy provision.

Marital Distress = Moderate to distress free

Variable	Obs	Mean	Std. Err	Std. Dev.	[95% Conf. Interval]	
After therapy	4	50.25	0.854	1.707	47.53	52.96
Before therapy	4	35.5	0.5	1	33.908	37.09
Difference	4	14.75	1.315	2.629	10.565	18.935

Mean (diff) = mean (Marital distress after therapy - Marital distress before therapy) t = 11.22

Ho: mean (diff) = 0 degrees of freedom = 3

Ha: mean (diff) < 0 Ha: mean (diff) ≠ 0 Ha: mean (diff) > 0

Pr (T < t) = 0.9992 Pr (|T| > |t|) = 0.0015 Pr (T > t) = 0.0008

The analysis indicates the marital distress for four (4) participants moved from the moderate state to distress free state with a mean difference of 14.75 from before and after therapy provision.

Marital Distress = Mild to Distress free

Variable	Obs	Mean	Std. Err	Std. Dev.	[95% Conf. Interval]	
After therapy	9	50.666	0.5	1.5	49.51	51.81
Before therapy	9	44.555	0.603	1.810	43.16	45.97
Difference	9	6.111	0.388	1.166	5.21	7.00

Mean (diff) = mean (Marital distress after therapy - Marital distress before therapy) t = 15.71

Ho: mean (diff) = 0 degrees of freedom = 9

Ha: mean (diff) < 0 Ha: mean (diff) ≠ 0 Ha: mean (diff) > 0

Pr (T < t) = 1.0000 Pr (|T| > |t|) = 0.0000 Pr (T > t) = 0.0000

The analysis indicates the marital distress for nine (9) participants moved from the mild state to distress free state with a mean difference of 6.11 from before and after therapy provision.

Comparing the means, it is evident that the TMCM therapy was significant among the participants with moderate marital distress to distress free of 14.75, then to those in the moderate to mild state of 10.66 mean difference for before and after therapy and from the mild state to the distress free state record a mean difference of 6.11. The study found out that under the TMCM, the therapy effect was great among the participant with severe marital distress moving to distress free after the therapy application with a mean difference of 23.18. The efficacy of TMCM lays in its flexibility to vary various approaches to tackle the complexities of tension the clients are likely to face in the study setting.

Conclusion

In order to identify ways of improving family and marriage counseling in Ghana, current study tested the impact of traditional marital counseling model (TMCM) on marital distresses among married couples in Ghana. The research design was descriptive-correlational-experimental. It revealed that TMCM had significant impact on the various types of marital distresses among married couples in Ghana. It significantly caused marital distress to move from moderate to mild, moderate to distress free, and mild to distress free. The flexibility of TMCM will enable both therapists and clients in Ghana to explore their total marital experience to resolve, adjust, or cope with marital tensions. Though TMCM is better for counseling clients with various types of marital distresses, it is most effective in situations where clients present severe marital distress. Therapists should use TMCM especially for clients showing sever marital distress.

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Comparative Study of Haematological Parameters in Male-Female Diabetics and Non-Diabetics in Abuja, Nigeria

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Abstract

Diabetes mellitus (DM) is a disease caused by a deficiency or diminished effectiveness of endogenous insulin. The complicationsof diabetes mellitus are known to be very severe, unbearable, incapacitating, fatal, and has high health and economic burdens. This study was conducted to compare hematological parameters in diabetic males and females compared with non-diabetic individuals. This study was done at the Defense Reference Laboratory, Asokoro, Abuja, Nigeria. Venipuncture was performed on all participants; Complete Blood Count was carried out with 2ML-EDTA blood tubes using the Sysmex platform while Fasting blood sugar was done using 2ML-Fluoride Oxalate blood tube. This assay was done using an automated Chemistry analyzer (Selectra Pro-S). The data were analyzed using SPSS for Windows version 25.0. A total of 200 participants including 40 diabetic males, 60 diabetic females, 48 non-diabetic males, and 52 non-diabetic females were recruited for the study. The values of FBS and MCHC were significantly higher in the diabetic male and female group. The mean values of PCV and MCV were significantly higher in both male and female non-diabetic group. The values of HB, RBC, and PLT-CT were also significantly lower in diabetic male but not significantly in females. There were 48% cases of anaemia among diabetic females 27% among non-diabetic females whereas only 13% anaemia was seen for diabetic males. Hematological parameters should be evaluated and treated periodically in both male and female diabetic patients to reduce the burden of DM and ocular morbidity due to retinopathy.

Introduction

Diabetes mellitus (DM) represents one of the most challenging public health problems of the 21st century and is reaching epidemic levels globally(Whiting *et al.*, 2011).DM still remains seriously under-reported, partly because many people with diabetes do not realize they have it and do not seek help until they have developed serious complications that may even result in death. About 3.1 million people in Nigeria live with Diabetes mellitus(Chinenye, 2012).

A complication of Diabetes mellitus (acute and chronic) can be severe, debilitating and fatal. Diabetes is the leading cause of non-traumatic lower limb amputation and end-stage kidney disease, and it is also associated with eye disease, particularly diabetic retinopathy. DM has cardiovascular disease as one of its serious and common complications and is the most common cause of death among diabetic patients. Similar to the other parts of the world, Sub-Saharan Africa is experiencing an increasing prevalence of diabetes as it is to other non-communicable diseases(Kimando *et al.*, 2017). With this increasing awareness of the disease, studies conducted on the issue are limited, especially in Nigeria.

Several studies have reported the prevalence of DM among males and females in Nigeria since 1989. Erasmus*et al.*(1988) reported no significant difference between male and female in Ilorin while the ratio of male to the female diabetic patient was reported to be 1.4:1 in Port Harcourt(Rasaki *et al.*, 2017)reported a higher prevalence of DM in females than in males in Oke-Ogun, Nigeria. Although

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some data are available on the comparison of the prevalence of DM among males and females in Nigeria, the comparative study of hematological parameters of male and female DM patients is rather scanty; hence this study is timely and important in providing information that will help to better the management of diabetes in Nigeria.

Methods

This case-control study was carried out in Abuja, Federal Capital of Nigeria at the Defense Reference Laboratory, Asokoro. The participants were divided into two groups; 100 diabetic patients and 100non-diabetic participants. The data obtained included socio-demographic data. Both the diabetics and non-diabetics who agreed and gave their informed consent were recruited for this study. Patients with a cute illness including hematologic diseases, atherosclerotic diseases, hepatic failure, renal failure, heart failure, chronic infections, alcohol abuse, and those were on medication that would alter the platelet function were not included in the study. Ethical clearance was obtained from the Federal Capital Territory Health Research Ethics Committee, (FCT HREC), Abuja and participants were made to sign an informed consent before being recruited into the study.

All participants were venipuncture and a total of 4ml of blood was collected from each participant; 2ml in EDTA for complete blood count and another 2ml in fluoride oxalate blood tube for fasting blood sugar using the vacutainer system. A unique number was given to each participant and was used throughout the study in order to concede their identities. Fasting blood glucose (FBS) using plasma was assayed with Selectra pro S automated chemistry analyser with glucose oxidase technique and was performed using the 2ML Fluoride Oxalate blood tube. Complete Blood Count was performed with 2ML EDTA blood tubes using the Sysmex platform.

The data obtained were inputted and analysed using IBM-SPSS (Statistical Package for the Social Sciences) for Windows version 25. Comparison of mean between two groups was done using one-way ANOVA Analysis of variance setting the significant level at $p<0.05$.

Result

This study comprised 200 (100 diabetics and 100 nondiabetic) participants, including40 diabetic males, 60 diabetic females, 48 non-diabetic males, and 52 non-diabetic females. There was no statistical difference between diabetic and non-diabetic gender ($p= 0.319$).

Comparison of gender heamatological parameters between diabetic and non-diabetic groups

This section examines the influence of gender in the significant differences observed in hematological parameters between diabetic and non-diabetic groups. Figures 1 to 9 shows the variation of hematological parameters among gender.

The values of FBS and MCHC were significantly higher in the diabetic male and female group than the non-diabetic male and female group (Figures1 and 2).

On the other hand, the mean values of PCV and MCV were significantly reduced in both male and female diabetic group than the non-diabetic group as shown in both Figures 3 and 4 ($p<0.05$).

The values of HB, RBC, and PLT CT were also significantly lower in male diabetics than in non-diabetic males ($p<0.05$) whereas they were not significantly different in both diabetic and non-diabetic females (Figures 5, 6, and 7).

WBC value was significantly higher in diabetic males than non-diabetic males ($p<0.05$) but not significantly different in diabetic and non-diabetic females (Figure 8). Only MCH was not significantly different between the groups ($p>0.05$; Figure 9).

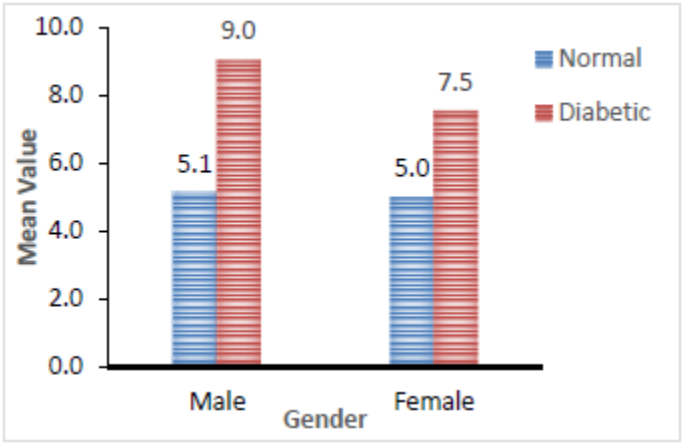

Figure 1. Comparison of gender FBS between diabetic and non-diabetic groups
FBS (P<0.001* for male and female)

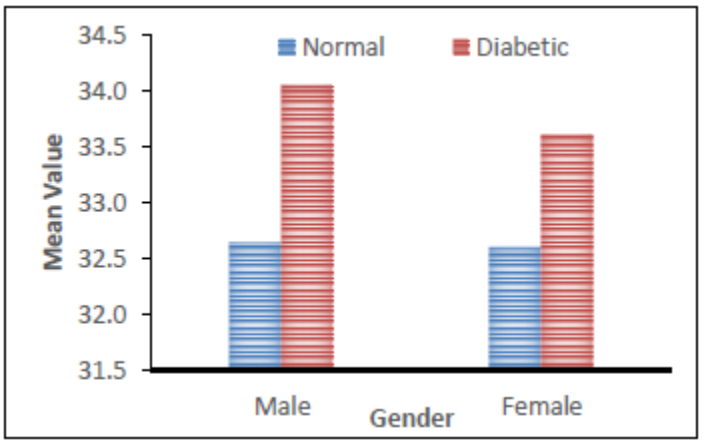

Figure 2. Comparison of gender MCHC between diabetic and non-diabetic groups
MCHC (g/dl) (p<0.001* for both male and female).

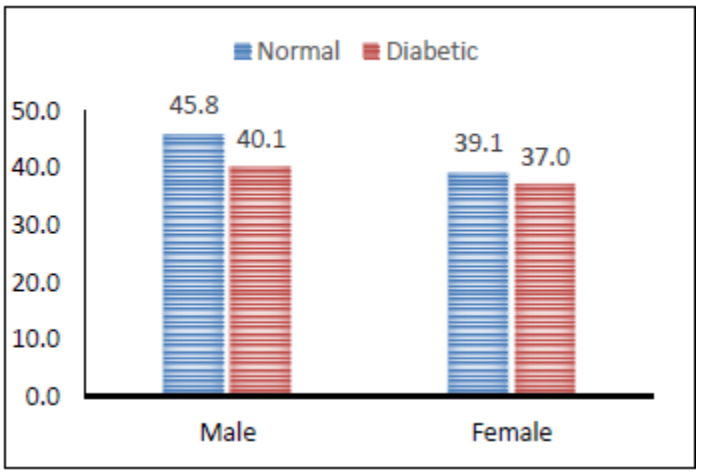

Figure 3. Comparison of gender PCV between diabetic and non-diabetic groups
PCV (%) (Male: p<0.001*; Female: p = 0.021*)

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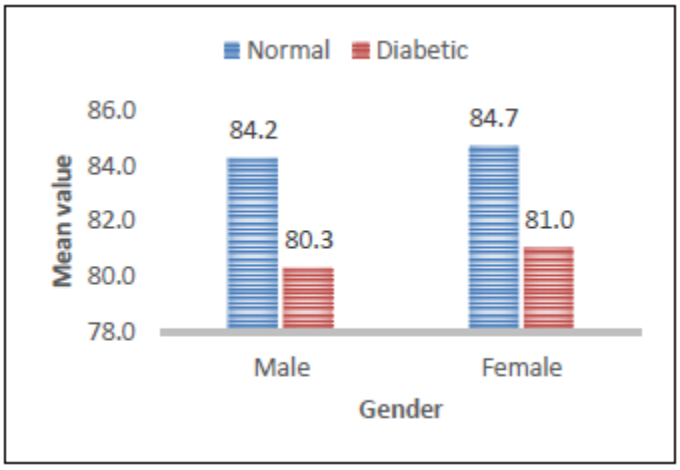

Figure 4. Comparison of gender MCV between diabetic and non-diabetic groups
MCV (fL) p (Male =0.004*; Female = 0.007*)

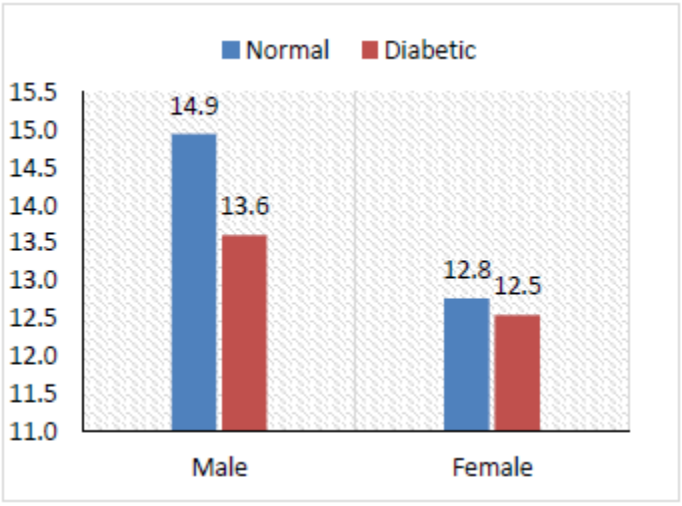

Figure 5. Comparison of gender HB between diabetic and non-diabetic groups
HB (g/dL) (Male; P<0.001*; Female, P =0.434)

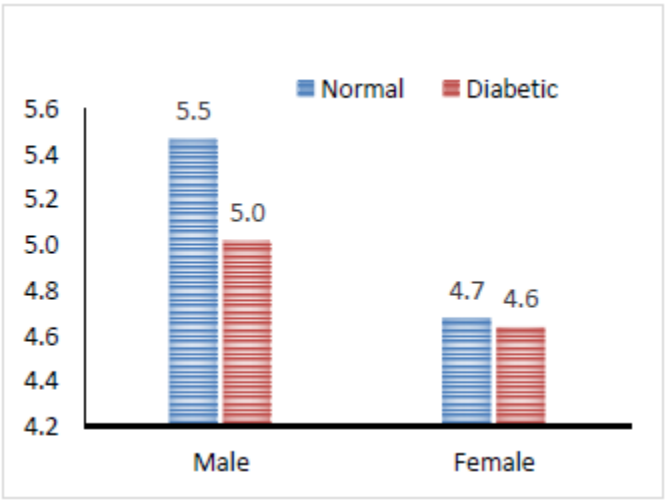

Figure 6. Comparison of gender RBC between diabetic and non-diabetic groups
RBC p (male =0.002*; Female = 0.751)

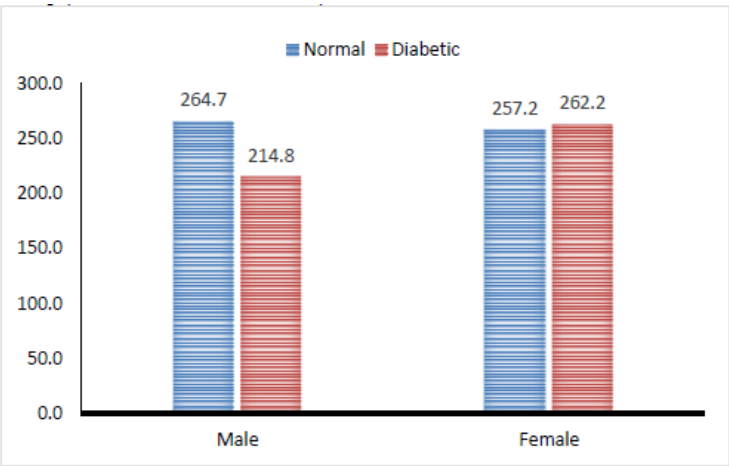

Figure 7. Comparison of gender PLT CT between diabetic and non-diabetic groups
PLT CT. (X109/L) p (male <0.001*; female = 0.769)

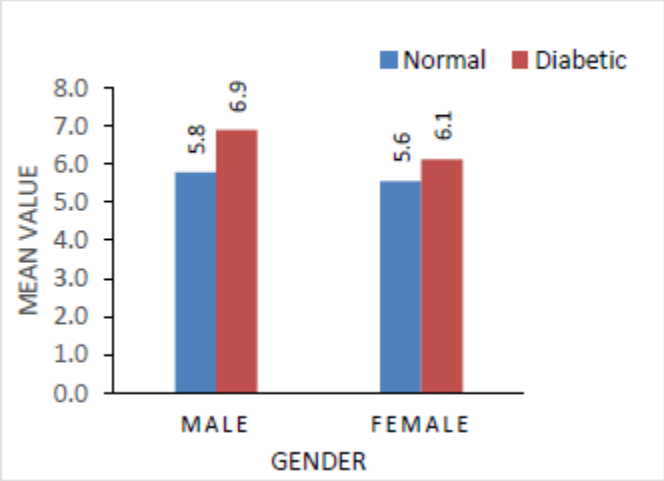

Figure 8. Comparison of gender WBC between diabetic and non-diabetic groups
WBC (X109/L) (p; male = 0.033*; female = 0.073)

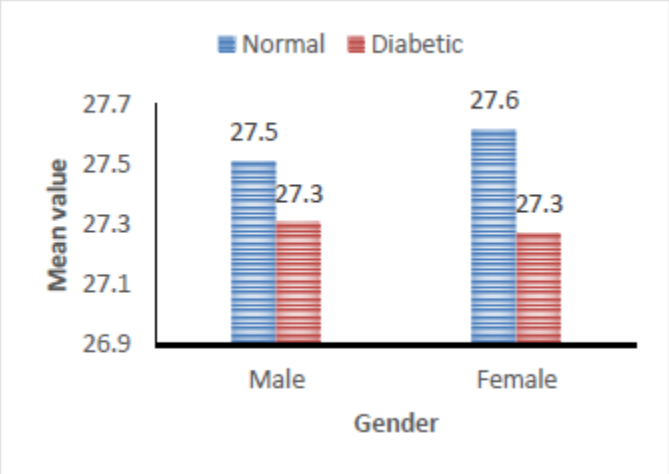

Figure 9. Comparison of gender MCH between diabetic and non-diabetic groups
MCH (pg) (p; male =0.695, female = 0.499

Table 1 shows the comparison of gender differential cell count between the groups. All lymphocytes were significantly different between the groups while Neutrophils were significantly

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different in males but not in females. There were significant differences in the values of EOS and BAS between female diabetic and non-diabetic groups but not significantly different in males.

Table 1. Comparison of gender differential cell counts between diabetic and control groups

	Diabetic Male	**Normal Male**	**p value**	**Diabetic Female**	**Normal Female**	**p value**
Neu ($x10^9$/L)	3.97 ± 0.45	2.43 ±0.13	0.001*	3.05 ± 0.16	2.60 ± 0.17	0.053
Neu (%)	53.69 ± 2.23	41.52 ±1.39	<0.001*	48.89 ± 1.17	46.14 ± 1.58	0.158
LYM ($x10^9$/L)	2.36 ± 0.12	2.61 ± 0.11	0.136	2.55 ± 0.96	2.24 ± 0.96	0.025*
LYM (%)	36.91 ± 1.77	45.52 ± 1.30	<0.001*	42.45 ±1.18	40.90 ± 1.18	0.355
MONO ($x10^9$/L)	0.49 ± 0.07	0.49 ±0.02	0.980	0.44 ± 0.05	0.43 ± 0.02	0.843
MONO (%)	7.17 ±0.85	8.67 ± 0.28	0.074	7.01 ± 0.73	7.05 ± 0.31	0.264
EOS ($x10^9$/L)	0.09 ±0.02	0.21 ± 0.02	<0.001*	0.08 ±0.01	0.32 ± 0.10	0.010*
EOS (%)	1.38 ± 0.20	3.60 ±0.41	<0.001*	1.35 ± 0.16	4.41 ± 1.22	0.009*
BAS ($X10^9$/L)	0.01 ±0.00	0.04 ±0.00	<0.001*	0.01 ± 0.00	0.03 ± 0.00	<0.001*
BAS (%)	0.18 ± 0.06	0.71 ±0.05	<0.001*	0.13 ±0.04	0.60 ± 0.05	<0.001*

World health organisation (WHO) anaemia classification of diabetic cases

Table 2 shows the WHO grade of anaemia seen in the present study. Both diabetic and non-diabetic groups recorded one severe anaemia case each. More females had anaemia in both groups than males. There were 48% cases of anaemia among the female diabetic group and 27% among non-diabetic females whereas only 13% of the male diabetic group had anaemia while none of the male non-diabetic group had anaemia.

Table 7. WHO Anemia grading in subjects and control

WHO grade	Range	Diabetic			Control		
		Male	Female	Total	Male	Female	Total
Normal	≥13.0	27	27	54	48	25	73
Mild	(11.0-12.9 d/dl)	8	24	32	0	24	24
Moderate	(8.0-10.9g/dl)	5	8	15	0	2	2
Severe	(<8.0g/dl)	0	1	1	0	1	1
	Total	40	60	100	48	52	100

Discussion

Comparison of gender heamatological parameters between diabetic and non-diabetic groups

Gender was found significantly different in mean FBS of the diabetic group, the mean FBS was significantly higher in males than females, this may be probably due to the fact the males are more involved in activities that predispose them to high FBS accumulation like poor diet and alcohol consumption, etc. more than the females.

There was a significant increase in the mean corpuscular heamoglobin concentration (MCHC) mean value in diabetic patients in this study when compared with the control groups in both males and

females subject, this may be due to the onset of renal insufficiency and also probably due to changes in shape of red blood cells (spherocytosis) ((Demirtas*et al.*, 2015; Harish Kumar, Srinivasa, & Prabhakar, 2017; Kothari & Bokariya, 2012).

It is of interest to note that gender difference and packed cell volume (PCV) of participants correlated significantly with FBS in control subjects. These findings suggest that PCV and heamoglobin levels as an index of aneamia were significantly lower among female diabetics group compared the males as well as the non-diabetic controls. This complements the finding that aneamia is prevalent among female diabetic patients than in their male counterparts. This could be the main reason for heart failure and hypoxia-induced organ damage in diabetic patients, mostly in those with overt nephropathy or renal impairment. So many factors may have increased the prevalence of aneamia in female diabetic patients, the inability or the failure of the kidney to increase the production of erythropoietin in response to the depleting haemoglobin appears to be the dominant factor for aneamia in the diabetics. This study is in line with the previous report of Bharathi in which anaemia was reportedly higher in female diabetic patients than in males (Bharathi, 2016). There has not been any proof that anemia directly contributes to accelerated complications of diabetes or to the progression of diabetic nephropathy; however patients with diabetes are more vulnerable to the effects of anemia due to significant relationship with cardiovascular disease and hypoxia-induced organ damage; the use of ACE inhibitors may also result in anemia in diabetics due to direct blockade of pro-erythropoietic effects (Bharathi, 2016).

There was a significant rise in the WBC of both the male and female diabetic patients as compared with the control groups. The reason for this significant variation might be due to the fact that the high WBC count in the diabetic group is in keeping with the increased oxidative stress triggered by the high levels of hyperglycaemia (Waggiallah & Alzohairy, 2011; Donath *et al.,* 2011).WBC count is a known marker of systemic inflammation and may be involved in the pathophysiology of prediabetes states and subsequently in the manifestation of diabetes.

This study also found that the PLT count was significantly higher among the male diabetics compared to male non-diabetics, but slightly and non-significantly increased in the female diabetic patients when compared with the female non-diabetics. Increase in platelet count with increasing blood glucose level in patients with diabetes could be as a result of the stress response, most especially in males. This finding is in agreement with some similar previous studies ((Demirtas*et al.*, 2015; Kumar *et al.*, 2017).

The significant reduction in HB concentration values in male diabetic patients and very low HB in females when compared with the control group in the study might be as a result of chronic hyperglycaemia, which causes nonenzymatic glycosylation of red blood cell membrane proteins leading to accelerated aging of the RBCs (also reduced in both male and female), which also contribute to the occurrence of aneamia in diabetic patients. This is in agreement with the findings of previous reports have suggested that recombinant human erythropoietin treatment is effective in correcting erythropoietin-deficiency anaemia in patients with diabetes (Waggiallah & Alzohairy, 2011; Bharathi, 2016; Kumar *et al*., 2017).

This research also revealed that the mean value of the Mean corpuscular volume (MCV) in both male and female diabetic patients was highly significantly lower as compared with the mean value of the apparently healthy individuals who participated in this study, this is probably due to the presence of microcytic (small average RBC size) anaemia in diabetic patients (Bharathi, 2016; Kumar *et al*., 2017; Waggiallah & Alzohairy, 2011).

Elevated levels of neutrophil count in type 2 diabetes in both male and female genders, noted in our findings in this study may be as a result of inflammation in the vessel wall. This is consistent with previous studies who also reported neutrophil elevation in type 2 Diabetic Patients (Bharathi, 2016; Biadgo, Melku, Abebe, & Abebe, 2016; Demirtas *et al*., 2015) but contradicts the report of Kumar *et al*. who reported insignificantly higher neutrophils in non-diabetic group (Kumar *et al*., 2017).

Elevated neutrophil level in diabetic patients with glucose intolerance is an indication of systemic inflammation (Gurav & Jadhav, 2011), and has been linked to a diabetic foot ulcer(Kahramane*t al.*, 2016).

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The increased Basophil and Eosinophil levels found in normoglycemic controls as against Hyperglycemic subjects could be due to immune disturbance associated with hyperglycemia.

This study suggests that the hematological parameters should be evaluated and treated periodically in both male and female diabetic patients to reduce the burden of DM and ocular morbidity due to retinopathy.

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Big Data Phenomenon in Banking

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Abstract

The banking industry has significantly thrived with the rapid advancement of human civilization and the associated growth in information technology. Earlier to this digital era, all the transactions and the business intelligence thereof had excessive human involvement. The digital world, while making the transactions clear and transparent, generated large amount of digital data. Digital data has snowballed, with the proliferation of network services, mobile devices, and online users on the Internet the banking sector has witnessed a rise of interest in big data. A recent study showed that the global population produces a total of 2.5 quintillion bytes of data daily and this continue to rise. The global financial service sector continues to rapidly embrace digitization aided by the advent of new technologies and greater government push. This trend has been further stimulated by the emergence of Financial Technology (FinTech) players, who are playing a significant role in the banking value chain. The availability of Big Data in this domain has opened up new avenues for innovation and has offered huge opportunities for growth and sustainability. Simultaneously, it has presented a number of new challenges that must be surmounted in order to maximize its value. Since today's customers expect more personalized banking services and to remain competitive while complying with bigger regulatory surveillance, the banking services sector is hugely pressurized to utilize the depth and breadth of the available data in the best possible way. This study will examine big data and its analytics while looking at the impact and applications of Big Data in the banking domain. It will also consider the important Big Data challenges that remain to be addressed in the banking sector.

Keywords: *Big Data, Big Data Analytics, Financial institution, Banking.*

Introduction

As banking is becoming branchless, contemporary and digital at a very fast pace, the need to manage big data and analytics becomes more relevant as banks compete to gain competitive advantage. In recent years, as huge as 90 percent of the world's data has been developed due to the creation of 2.5 quintillion bytes of daily data. This speedy enlargement and storage of big data produce opportunities for structured and unstructured data collection, processing and analysis (Trevir, 2018).

Big Data Phenomenon, which is characterised by rapid growth of volume, variety, velocity, veracity and value of data - information assets, thrives the paradigm shift in analytical data processing. However, the extremely large financial data volumes, high generation speeds, and heterogeneity associated with the relevant financial domain data, along with its susceptibility to errors, make the ingestion, processing, and timely analysis of such vast volumes of often heterogeneous data very challenging (Taruna and Vipin, 2016).

Big data analytics has recently become the core driver of innovation in the banking sector. Various studies have shown areas like econometrics, investment analysis, risk assessment, fraud detection, customer interactions analysis, trading and behaviour modelling where big data is helping the banks to optimize their performance. According to Vladimir (2018), having witnessed a total investment in 2016 of about $21 billion in big data analytics, the banking sector domain has become one of the leading consumers of big data services, and an ever-hungry market for Big data architects, solution and customized tools. The continuous acceptance of big data will certainly transform the landscape of banking services. The data collected in banks are so complex that it is outside the ability of any traditional data software tool to manage. Hence big data analytical tools are employed to solve this issue of managing, storing and analyzing large and complex data. Analytics transform data into

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helpful insights thereby helping to improve the way banks budget, market products and plan for the future.

Despite the banking sector increasing acceptance of big data, there tends to be some significant but surmountable challenges in the field.

The big data phenomenon

Many authors have tried to define big data in many ways (first by Garnter in 2001, later updated in 2012). Big Data was originally defined by Gartner as "a high-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight discovery, decision making and process optimisation". Also Navint (2012) viewed it as ''a term that refers to data sets or combinations of data sets whose size (volume), complexity (variability), and rate of growth (velocity) make them difficult to be captured, processed, managed or analysed by conventional technologies and tools, such as relational databases and desktop statistics or visualization packages, within the time necessary to make them useful".

From these definitions, we can successfully view big data as being mainly characterised by "3V" words. The first "V" is volume, which is a pointer of the sheer amount of data produced and analysed compared to other traditional sources. The second ''V'' denotes Velocity which implies that data is generated at great speeds and Variety, the third "V" suggests that there are different forms of this emerging data which are different from traditional systems. However, there is the Veracity and Value are recently added as the fourth and fifth characteristics worthy of consideration.

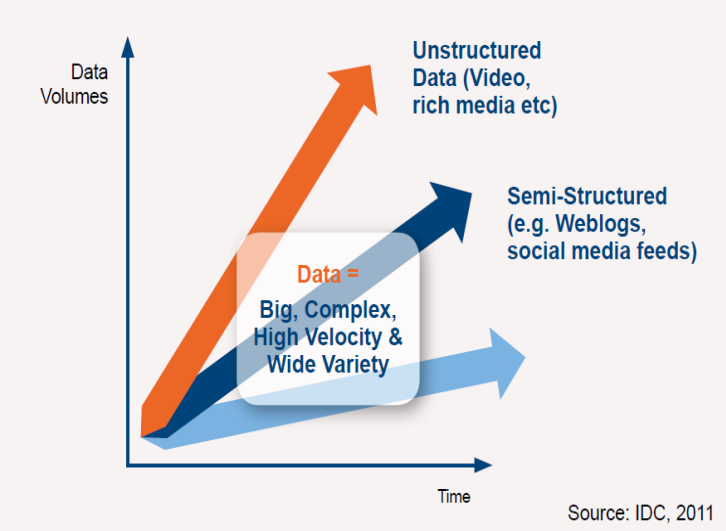

Figure 1. Definition of big data

Characteristic of big data

I. **Volume**: The quantity of analyzed data exceeds the capability of conventional analytics and statistical modelling tools. Big data itself relates to voluminous size hence size is germane to determining value out of data. Pence (2014) saw that the sheer volume of stored data is exploding, and IBM predicts that by 2020 there will be 35 zettabytes stored. The Centre for Economics and Business Research (2013) is of the view that as data volumes increase, there is a need for greater sophistication of technologies to harness the benefits that can be derived from it.

II. **Velocity**: This refers to the speed of accessing data. While conventional Business Intelligence (BI) applications use historical data dating back weeks, months or quarters, big-data relies on real time information in order to deliver rapid insights. According to Harvard Business Review (2012), the rate or speed by which data is produced is as important as the other characteristics as this provides rapid vision that can in turn provide competitive advantage and confirmed to be beneficial to organisations.

III. **Variety**: This represents information expansion resulting into heterogeneous data types (textual, numeric, etc.), encoding, formats, semantics, structures (structured, semi-structured,

unstructured), syntax etc. Usually, data can be separated into structured, semi-structured and unstructured data. According to Gartner (2013), unstructured data represents 85% of data while structured data is described as data grouped into rows and columns, making it easy to query and obtain information for an organisation's operational requirements. Semi-structured data, on the other hand, is a mixture of both structured and unstructured data.

IV. **Veracity**: This is tantamount to the quality of data. It involves the Origin, authenticity, availability, accountability and trustworthiness of data.

V. **Value**: This refers to the ability to convert a tsunami of data into business. Data about customers and requests has different value than data generated by GPS devices. Data can be transactional, descriptive, statistical, hypothetical or historical. Each of them has different value, hides different information (Andrej, 2013)

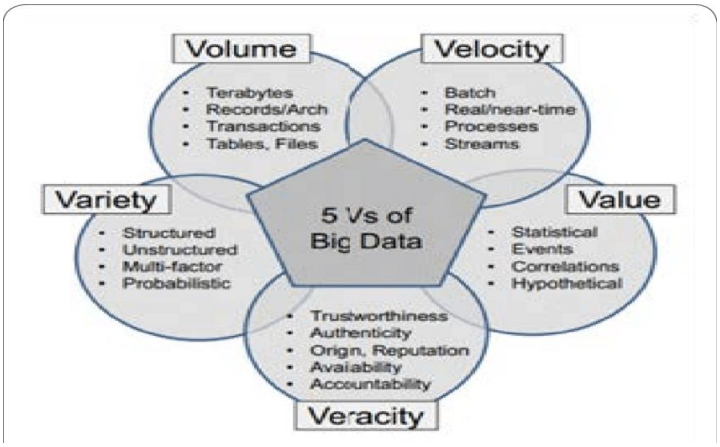

Figure 2. 5V's of Big Data

Big data analytics

The ultimate goal of a Big Data pipeline is to facilitate analytics on the available data. Big Data analytics provides the ability to infer actionable insights from massive amounts of data and can assist with information discovery during the process. It has become a core component that is being deployed and used by entities operating at various spheres of the financial field. For example, predictive analytics tools are increasingly being deployed by the banks to predict and prevent fraud in real time.

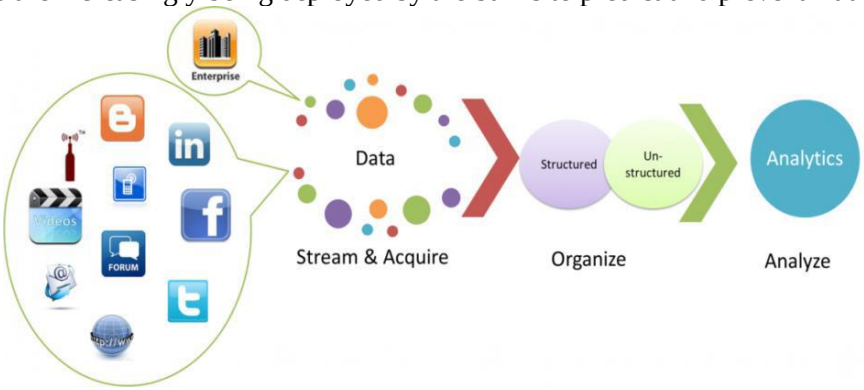

Figure 3. Data generation to analytics

To analyze a large volume of data, Big Data analytics is typically performed using specialized software tools and applications for predictive analytics, data mining, text mining, forecasting and data optimization (Vangie, 2018). Revealing the hidden information in big data via Data Mining (DM) techniques has become an emerging trend and ultimate objective for a wide range of studies (Hassani et al, 2018) Banking analytics can help improve how banks acquire, segment, target and retain customers. In addition, predictive analytics can help customers manage their accounts and easily complete financial transactions. Banks also benefit by minimizing risk and reducing costs.

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Big data and analytics in banking

The mining of Big Data provides a massive opportunity to stand out from the competition as banks are now digitized. All banking transaction is a lump of data, so the industry sits on huge stores of information. By using data science to collect and analyze Big Data, banks can advance, or reinvent, practically every aspect of banking. Hence big data analytics has become a key driver of innovation in the financial sector. According to Ayesha and Riyazuddin (2017), data science can allow hyper-targeted marketing, personalized wealth management advice, optimized transaction processing and more - the prospect is endless. The application of big data analytics can also help support risk management in areas like credit scoring, cards fraud detection, financial crime compliance, stress-testing and cyber analytics. The recent desire by various governments' policy to digitize the entire banking sector and its subsidiaries greatly propels Big Data generation opening up huge opportunity globally. This available data shows that more than 1.7 billion mobile phone users are currently excluded from the formal financial system thus making them invisible to credit bureaus, but they are increasingly becoming discoverable through their mobile presence. This is boosting the global demonetisation to ensure cashless society.

While banks have traditionally been good at running analytics at a product level, such as credit cards, or personal loans, very few have done so holistically, looking across inter-connected customer relationships that could offer a business opportunity – for instance, when an individual customer works for, supplies or purchases from a company that is also a client of the bank. The dynamic data science field aids this seamless view.

Richa (2015) posited that less than half of the banks analyse customers' external data, such as social media activities and online behaviour. At the same time the use of the following is increasing:

i. **Online Banking**- As the global usage of internet has increased to 56.1 percent as at April 2019, Internet banking facilities and mobile apps have consequently increased on a daily basis. Major attraction for the customers is the ease of paying utility bills online, money transfer, managing fixed deposit, buying insurance policies are attractive to the customers.

ii. **Automated Teller Machine (ATM)** - The conveniences with which ATMs dispense money and accept deposits have become the biggest source of attraction to bank's customers. Also, increasing competition amongst banks is resulting into boost in ATMs installation trying to expand geographical areas. Government's cashless drive is playing crucial role in widening the sphere of ATM network focusing on rural India.

iii. **Debit Card** - Banks are now issuing Debit Cards to their customers with saving or current accounts. These cards can be used by customers to buy goods and services at different channels like online, ATMs, Point of Sale (POS) etc instead of using cash. The amount paid through debit card is automatically debited (deducted) from the customers' account.

iv. **Mobile Banking**- As the number of phone users increases, the use of mobile banking is becoming popular among both the educated and illiterate populace. Through the mobile phone, a customer can receive and send messages (SMS) from and to the bank in addition to all the functions possible like mobile top-ups, transaction viewing, sending and receiving cash in and out of their mobile wallets etc through phone banking.

v. **Credit Card** -This is one of the products aggressively sold by banks to enhance the buying power of customers. It serves as a source of soft credit line on cards to help meet urgent needs of the customers.

Benefits of big data analytics to the banks

According to the study by IDC, the worldwide revenue for big data and business analytics solutions is expected to reach $274.3 billion by 2022. Going by a recent Strategy Analytics survey of about 450 companies worldwide, banking tops most sectors when it comes to Big Data analytics. Big data that is either obtained from various sources or internally generated data is expected to be used in the manner that it is in harmony with the vision and mission of the organisation. Banks ensure they use this information to meet their predetermined objectives of either reducing cost, boost profit, minimizing the processing time, launch a new product to name but a few. These and others factors and variable should eventually result to better decision making in the organization. In as much as importance of big

data analytics to the banks is huge, the greatest prospect of big data in banking is still yet to be harnessed. The following are quite a few of the many examples of how big data is used in banking:

i. **Marketing and sales automation**- According to Peppard (2013), marketing analytics involves the practice of measuring, managing and analyzing market performance to maximize the effectiveness of and return on investment (ROI) from the marketing activities. Nowadays, with the huge volumes of available data, banks can gather previously unimaginable information about each of their customers. This provides a better understanding of customers' needs and helps to proactively address these needs. It also allows different departments within a bank, such as marketing, sales and IT, to collaborate for optimal performance. For instance, rather than pushing out products to all customers, banks can now merge Business Intelligence (BI) and sales force automation tools to market products tailored to customers' existing situations, whether they're constructing new homes, starting small businesses or beginning families. Indeed, banks using BI reported a 7 percent expansion in cross-sell and up-sell revenues

ii. **Product innovation, performance analytics and budgeting**- Banks employ BI to appraise business and employee performance and then create branch budgets and employee goals based on past achievements. Big data solutions allow banks to collect, analyse and share branch (as well as individual employee) performance metrics across departments in real time. This implies better visibility into the daily operations and a superior ability to proactively resolve any issues. Also, they can plan the education and training of their employees for off-peak times and monitor progress toward goals in real time. Banks can also use performance data on product features and services can be used by banks to produce new offerings designed around modern customer demand.

iii. **Risk Management** and **Fraud Prevention**–David and Desheng (2017) were of the opinion that there exist two instances of pioneering use of data analytics, machine learning and big data in banking institutions namely risk management and fraud prevention. In the area of risk management, big data analytics tools support bankers with deeper insights into their customer's behaviours by analyzing information like credit reports, spending habits and repayment rates of credit applicants. Big data software determines the chances that an individual would default on a loan or fail to constantly meet payment obligations as at when due (Hortonworks Inc, 2013). In preventing financial fraud, Urban (2014) established that big data analytics have become an essential part of any strategy to help detect and prevent financial crime, as a result of the ever-changing attack methods used by criminals exploiting multichannel vulnerabilities to compromise technology systems. Hence risk management and fraud prevention are two of the most important issues for banks at the moment and, for this reason, they are the first projects to have been addressed with these technologies. For instance, CitiBank strategically invested in Feedzai, a data science corporation that apply real-time machine learning and predictive modeling to explore big data to identify fraudulent behaviour and minimize financial risk for online banking providers.

iv. **Enhanced need assessments**-After getting access to huge amount of data, containing needs of different customers, banks can offer those needs in a meaningful way. By using this data, banking industry will provide exactly the information required by the customer instead of any other information.

v. **Personalized financial products**- Banks aspire to offer their customers a new account concept and tailor-made products by replacing the generic services with value-added ones. Since every customer has their own economic activity, the use of data analytics helps detect patterns and behaviours. This will enable banks to offer their customers personalized, bespoke financial products and services for an enhanced customer experience and better satisfaction.

vi. **Optimization of the bank's processes and resources** - Data gathering and analysis of bank's processes and resources helps them discover the pattern and behaviours that were, until now, unknown to maximize benefits while minimizing expenses. Consequently, the processes are significantly improved.

Challenges of big data and analytics

With the huge potential in big data management, it however comes with many challenges. It presents a number of challenges relating to its complexity. How big data can be understood and used

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by banks when it comes in an unstructured format, such as text or video or how they can capture the most significant data as it occurs and deliver that to the right people in real-time or how they can store and analyze it given its size and our computational capacity. And there are numerous other challenges, from privacy and security to data quality and the likes which are considered thus:

i. **Privacy and Security** - Big Data offers immense possibilities of providing major steps forward for Banks, but it is not without the challenge of privacy and intrusion. While the potential for abuse of this data is important, but Banks need to get it right. Thus, Big Data techniques and analytical tools can help customers get better service and assist Banks to effectively manage resources. It's a thin line between being helpful and intrusive (Mousumi, 2014).

ii. **Data Quality** –It is essential that banks create Data Quality metadata that includes Data Quality attributes, measures, business rules, mappings, cleansing routines, data element profiles, and controls for Big Data Quality and Data Management. Since the greatest impact of big data is on its quality, data Quality is thus vital in this Big Data era. To guarantee highest Data Quality and Integrity, Data Quality attributes like validity, reasonableness, accuracy, completeness, timeliness and the likes must be clearly measured, defined, recorded, and provided to end users. Proper care must be taken not to lose the original values when data is mapped or cleansed. Data element profiles which ensure the completeness of every record must be created. Considering that data could migrate across systems, controls and reconciliation criteria have to be created and recorded to ensure that data sets accurately reflect the data at the point of development and that no duplicate or loss of data occur in the process. There is need to give special care to unstructured and semi-structured data as Data Quality attributes may not be easily or readily defined. If structured data is created from unstructured and semi-structured data, the creation process too must be documented and any of the previously noted Data Quality processes applied.

iii. **Legal and Regulatory Challenges** - Big Data often come with great legal and regulatory concerns that have complexities and limitations due to sheer size. Many organisations already have control and data management procedures in place for small data, and a comfort level that those controls are appropriate. Considering the growing impacts of regulation and oversight, banks are avoiding Big Data, or at least proceeding judiciously, simply because of the risks.

iv. **Talent Challenge**- In as much as good talent is scarce, getting that magic combination of hard science and business acumen is scarcer still. Blending a staff of data scientist skill and visualization teams is a new workforce management concept. Big Data Specialist need to have solid business understanding of SAS/R/SQL/Python programming and statistical knowledge along with Visualization skill. Also, Banks need to pay a lot more to a Data Scientist or a Big Data Specialist compared to a traditional ETL or Business Intelligence hire

v. **Organizational Mindset** - Several Banks are still driven majorly by past experience, Intuition, SME knowledge and Customer Experience. There is need to have additional Data Curiosity, Data Driven thinking and to invest more in acquiring, storing and analyzing data. Banks that tap into Big Data and analytics will be more competitive, especially in this strict regulatory environment. Hence the need for banks to give data investment the top priority.

vi. **Inefficient data management**.

vii. **Regulatory Reporting**.

viii. **Offer management and relationship pricing**.

Conclusion

The present information Technology age is characterised by generation of huge data. However, advanced analytics are making it possible for banks to manage the increasing cost of compliance and the risk of non-compliance. At present, big data analytics is mandated across numerous spheres of banking sector thereby helping them deliver higher services to both their internal and external customers, in addition to improving their security systems. Banks has realized that each of its customers generates massive amounts of data each and is fully reforming itself to extract as much hidden facts from this information as possible. Before now, this data did not add value but now the goal is to have the customer and their data at the nucleus of the business. This study focused mainly on big data and analytics as it relates to modern day banking. Besides showcasing the impact or

benefit of Big Data analytics in the banking, the challenges of the concept were critically reviewed. To remain competitively relevant, banks need to reconsider their modus operandi and adopt data-driven approaches. Moreso, the application of big data and analytics in the banking sector can help improve efficiency leading to customers' satisfaction and increased profitability.

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Examining the Use of Digital Media and Technologies in teachers' teaching: A Case of Selected Schools in Luampa District, Zambia

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Abstract

The purpose of this study was to investigate and examine teachers' use of technology and digital media in their lesson delivery. This study also explored how teachers equip their learners with 21st century skills that are taking place in the education sectors. Respondents under this study were primary and secondary school teachers. The primary school runs from early childhood to grade 9, while the secondary sector covers grades 8 to 12. A questionnaire was formulated and used to collect data from two institutions used as study areas.

Results revealed that the most worrying concern is lack of knowledge of many teachers on the use of digital media and emerging technologies on teaching. The other challenge observed was on the lack of the required technological tools to use at the secondary sector and lack of technological skills. There was need to train teachers on technology skills so that they can provide our learners with solid foundation of ICT and Computer Studies.

Keywords: *digital media; emerging technologies; creativity; ICT; primary and secondary school.*

Introduction

The use of digital media and technologies in teaching and learning under education has been on an increase. It was observed that teachers are aware of the pressure technology has put on education, learning and pedagogies to be used (Musawi, 2011). The purpose of this study was to explore and examine the use of media and technology in teachers' teaching in both primary and secondary sections in order to equip learners with necessary skills so that they integrate technology in their learning at higher levels. It also looked at how teachers involve technology in their lessons in order to enhance learners' proper understanding. This made the researcher examine the use of digital media and technologies in the only two chosen schools in our district. The first institution is a government primary school that has a well-furnished Computer Laboratory and the second one being a day secondary school under the care of a church.

On the other hand, we realise the governments emphasise on the teaching examining of Information and Communication Technology (ICT) to all school going age. With this great emphasis put on by the Ministry of General Education in Zambia, the study aimed to establish the root cause of why teachers fail, if that will be the case, to obey the ministry's directives.

The reasons established on whether teachers are or not using technologies in their teaching will lead to an area of study to be proposed that can be undertaken in future researches either by the researcher or other different researchers interested in the topic in order to find solutions to the identified challenges. The data was collected through the use of questionnaires and observations made as the researcher interacted with respondents. The respondents in this case were teachers from early grades up to grade 12. The study established the level at which the use of technology was practiced or not practiced in teachers' classroom situation.

Literature

It is evident that there have been pressures mounting on the change in the way teachers teach (Walsh & Apperley, 2011) due to experienced constant changes in knowledge base. It is emphasised that instructional strategies should accommodate the emerging twenty-first century skills that involve technology (Uzun, Yildirim & Ozden, 2013) if creativity is to be enhanced. Technology innovation has influenced so many changes in human life (Hatlevik & Guðmundsdóttir, 2015) starting from fun, work to education (Torres, Esteves dos Santos, Kowalski & Behrens, 2016). If learners are to be

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adequately prepared to encounter future challenges in their life time, there is need to change the manner teachers teach and nature of education to be acquired (Hall, 2012) in order to provide rich learning environment. Technology also encourages new contexts and changes in the way the curriculum (Hall, 2012) is organized in order to integrate and develop digital competency in young people. Technology is associated to a way of using knowledge with a view to provide solutions to problems experienced by mankind (Siyanbola, Egbetokun, Oluseyi, Olumiyiwa, Aderemi & Sanni, 2012). Musawi (2011) categorised emerging digital technologies in education into three roles: medium or resources, the management and delivery roles.

The level to which technologies have been accepted by students and instructors is of great importance and concern of many educators (Uzun, Yildirim & Ozden, 2013). This is what has influenced this study, to inquire on how teachers have accepted and adopted the use of technologies and media in their teaching. Use of media in a classroom situation can be satisfied through employing visuals, sounds, smells and tastes as it is believed learning can be satisfied through the use of senses. Commonly used media under the information and communication technology includes blogs, wikis, YouTube Videos, mobile devices (Phones and tablets), digital tools (like the chat, discussion group, forums, Video and Video Conference and electronic mail) satellites of TV broadcast, electronic books, CD-ROMS and Laser disks. These are used in teaching in order to enrich and improve the students learning process (Bates, 2015) by providing an equal opportunity for everyone to learn easily.

Bates (2015) addressed a question on what influences teachers' use and selection of media and technologies in his or her teaching. He talked of the nature of students, the type of technology, the cost of the media and the time available to be the major determinant when it comes to what is considered in the type of media and technology to use in one's teaching. The other necessary factor to consider is that teachers should be equipped with required skills in the use and appropriate selection of technologies. This means teachers should have the right digital competence if they are to support students learning process (Ala-Mutka, Punie and Redecker, 2008). The digital competence can be built in our learners only if ICT skills are integrated in their learning as early as during their early grades or in primary education (Al-Mutka et al, 2008). Examining our syllabi, it was observed that technologies are introduced in lower grades (1 to 4) as a component of Creative and Technology Studies (Curriculum Development Centre, 2013) and from grades 5 to 7 is categorised as Technology Studies (Curriculum Development Studies, 2013). At Junior Secondary School level the subject is offered as Computer Studies, it is compulsory and it is examined. When it gets to Senior Secondary grades it becomes optional.

The importance of technology in teaching was stressed (Pitler, Hubbell, Kuhn & Malenoski, (2007) and Omariba, Gitau & Ayot, 2016) in that it provides immediate feedback and is a scaffold offered that help students understand the content learned. It also develops skills like critical thinking and self-reliance is enhanced in individual learner. The implementation of technologies in teaching has its own hindrances as noted by Omariba and his friends. Some of the cited challenges are lack of technologically skilled teachers, and equipment failure or software behaviour to respond to commands.

Methodology

For the purpose of this study, a structured questionnaire was developed following the information gathered under literature consulted. The questionnaire consisted of 10 questions. The respondents under this study were teachers from two different institutions which were Mwandasengo Primary and Luampa Secondary schools. Teacher were used in order to examine their level of acceptance to adapt technology in their teaching to offer support in students' learning in order to satisfy their various diversity learners come with to their classroom. From each school a total number of 15 teachers were targeted.

This study aimed at analysing and describing teachers' perspective of how they often promote the usage of technologies and digital media in their teaching. Data gathered was analysed to provide insights into challenges teachers face in promotion and usage of technologies in their lesson delivery.

This led the author of this article to suggest what can be done and further recommend areas to be looked at in the future studies under the same topic.

The study followed a non- probability sampling strategy. A small non-random sample was adopted and critically examined in order to provide information on what was the situation on the use of technologies in the schools in the district and to assist in attaining a trustworthy conclusion.

Data analysis and results

Frequency of usage of technology

Inquiring on how often teachers involve technology in their lesson delivery, responses are tabulated as shown below:

S/N	CHOICE	SCHOOL TYPE	RESPONSES
1.	ALWAYS	A (Primary)	3
		B (Secondary)	-
2.	SOMETIMES	A (Primary)	5
		B (Secondary)	9
3.	DON'T USE IT	A (Primary)	-
		B (Secondary)	-

Table 1: Showing results on how often technology is used.

It is clear that from School A we had 3 teachers indicating they always use technology in their lesson delivery while 5 teachers sometimes use technologies in their teaching and learning exercise. Coming to the other section (secondary), all responses indicated that they sometimes use digital media in their teaching. No teacher, either from primary or secondary, chose option 3 (Don't use it).

Training attained in the use of technologies and media

Table 2. Results on training attained in use of technology

S/N	CHOICE	SCHOOL TYPE	RESPONSE
1.	NO	A	2
		B	5
2.	YES	A	6
		B	3

From the secondary level 5 teachers were not trained in the use of technology or went to college the time the component of technology was not yet included in the courses covered, while 3 of them accepted having undergone training in either ICT or Computer Studies. One teacher from secondary did not indicate any choice. At primary sector, 6 teachers attained training in the use of technologies in their teaching and 2 teachers lacked the knowledge on how and when they can use technologies. This influences the researcher to embark on a study that will look at how teachers already serving are equipped with changes that take place when they are in the field.

Media and technologies used

The commonly used and stated technologies and media by most teachers in the two schools are as: Computers and Laptops, internets, radios, cell phones, books newspapers, and televisions.

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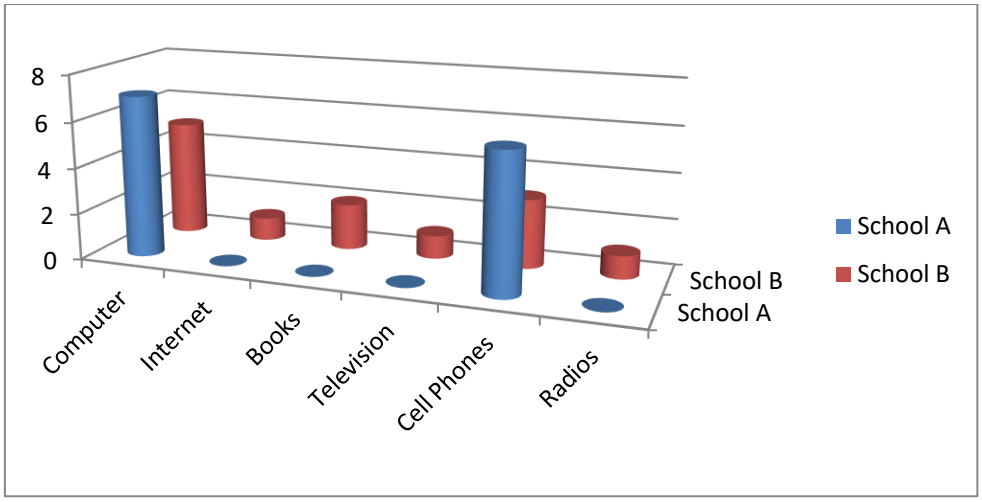

Table 3. Types of media and technology

It is evident that most teachers don't understand what is meant by media and technologies that can be used in teaching and learning process. From School B: 5 teachers choose computers; 1 choose internet; 2 indicated books; 1 choose television; 3 choose cell phones and 1 teacher choose radio. While on the primary sector (School A) choices of media they use in their lesson delivery in order to facilitate and promote learners' understanding are: 7 teachers chose computers; and 6 chose phones. No one considered, from School B, indicated the internet, books, television and radio.

Advantages of technology in education

A number of reasons that are considered as advantageous to teachers for using technologies gathered are as shown below.

Table 4. Advantages of Technologies

S/N	ADVANTAGES OF TECHNOLOGY	RESPONSE ACCORDING TO SCHOOL TYPE	
		School A	School B
1.	Improves teacher's delivery strategies	4	4
2.	Saves time	0	4
3.	Enhances learners' understanding	5	6
4.	Promote hand on activities	2	3
5.	Interaction between learners is encouraged	1	1
6.	Equip learners with modern skills	5	0
7.	Self-dependence is intensified in learners	1	0

Challenges faced in the use technology

Teachers indicated that it is important that they use media and technologies in their teaching though they are hindered by a number of factors. They also understand that using instructional technologies allow learners grasp easily the concepts presented to them (Omariba, Gitau & Ayst, 2016). The responses gathered from teachers are as shown below and these are responsible for their usage of media and technologies in their lessons

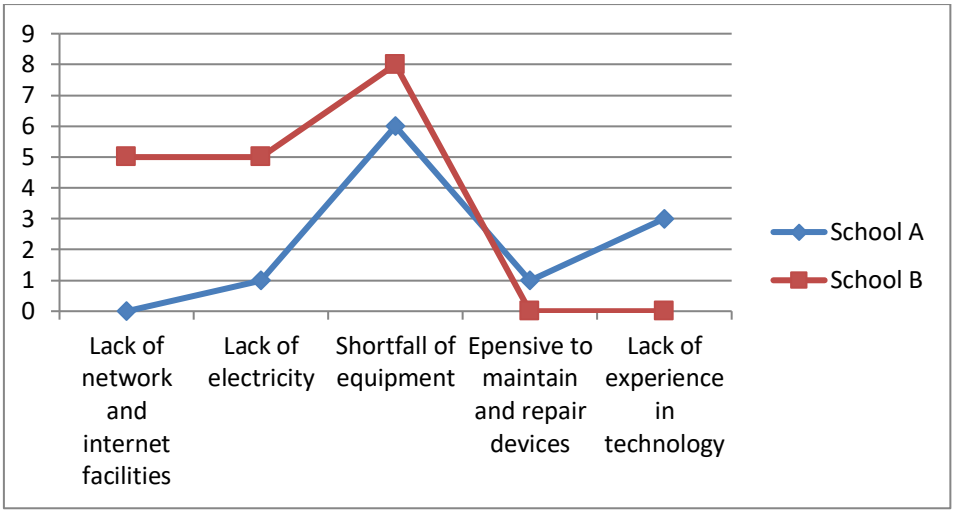

Table 5. Challenges faced by teachers in using technology

From the line graph above, it is evident for School A that shortfall of equipment is leading followed by teachers' lack of technological skill, while on school B; shortfall of equipment is on a lead followed by lack of electricity, and lack of network and internet facilities. The identified challenges influence the extent to which teachers involve technologies in their teaching.

School management support in promotion of usage of technologies

School administrators have recognised the need of not just depending on books as the only method of instruction when teaching. For this reason, managers from the two institutions have attached great interest to the promotion of teaching of technology through provision of the services listed as below. Majority of the respondents did not fill or respond to this part.

Table 6. Role played by school management in supporting technologies

S/N	RESPONSES	SCHOOL TYPE AND CHOICES	
		SCHOOL A	SCHOOL B
1.	Securing of devices/equipment	5	4
2.	Sensitisation on embracing technology	2	4
3.	Provision of alternative power sources (Solar).	1	2

Conclusion

Use of technology and digital media has influenced changes in the way teachers teach, learners learn and the strategies involved in acquiring and transmission of new knowledge.

It is evident from resources consulted that the roles of technology in education can no longer be neglected but has to be embraced by all teachers and students if they are to acquire the most 21st century skills (Omariba et al, 2016). From the small portion of teachers integrated with from two schools in our district, there is still much work to be done if all are to acquire more technology skills needed and to be able to incorporate the technological changes experienced.

The study had its own challenges; firstly, the intention was to target 15 teachers from School A and School B, and 30 questionnaires were prepared and distributed. The head teachers were asked to distribute them to their teachers. Respondents' attitude was discouraging as not all questionnaires were filled up and returned. From School A, only 8 questionnaires and School B returned 9 questionnaires. Secondly, the researcher's lack of knowledge on SPSS packages in analysing collected data was a blow. Lastly, a small number of respondents will not give us a true picture of what is the actual situation in the entire district.

Lack of training in technology skills by many serving teachers (Constantino, 2014) has great impact on their usage of technologies in their teaching and this leads them to failure to categorise

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digital media and technology devices. The future study to be undertaken will address the issue of how already serving teachers are assisted to acquire changes that exist in the system.

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Influence of integrated Services on Routine family planning use: a cross-sectional survey in South Sudan

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Abstract

South Sudan's modern contraceptive prevalence rate stands at just 2.7 percent, with an unmet need for modern family planning (FP) at 30.8 percent (FP 2020, 2018). Multiple barriers contribute to low FP uptake in South Sudan: inadequate data collection tools and insufficient analysis, interpretation, and communication of data. Research from the Democratic Republic of the Congo (DRC) shows that improved management of FP data enables stronger ownership of program results at the health facility and community levels, empowering community members and providers to increase FP uptake (Ho & Wheeler, 2018). The study methodology used a cross-sectional observational design with quantitative and qualitative approaches to data collection and analysis. Data were collected from 178 health facilities across 17 counties in two states in South Sudan: Central Equatoria and Western Equatoria. The purpose of the study was to explore how effectively FP data in the routine health information system (RHIS) are analyzed, interpreted, and communicated, and it discusses barriers to RHIS data use and ownership in two states in South Sudan, to inform policy and programmatic decision making. The study result was over half (55.8%) of the 172 health facilities assessed that should be collecting FP data do collect FP data. Only 16 percent of the county health departments (CHDs) assessed, and fewer than six percent of the health facilities assessed, carry out FP data analysis. Two hospitals, two primary healthcare centers (PHCCs), and one primary healthcare unit (PHCU) had the capacity to interpret analyzed FP data.

Keywords: *Family planning, South Sudan, Democratic Republic of the Congo, routine health information system and empowering community members.*

Introduction

An African Union policy brief on FP reported that an estimated US$1.40 is saved on maternal and newborn healthcare for every dollar invested in FP (2013). A study conducted in the DRC found that good FP data management is linked to increased stakeholder ownership and subsequent increases in FP uptake (Ho & Wheeler, 2018). Unfortunately, South Sudan's health financing is heavily dependent on external donors with the government spending less than one percent of its budget on health. Funding gaps have slowed progress towards increased demand for FP and improved FP services. Consequently, the government is struggling to achieve its FP commitments to increase the modern contraceptive prevalence rate (mCPR) to 10 percent in 2020. The current conflict in the country has substantially added to the existing health systems challenges, further limiting service provision, contraceptive supply chains, supervision visits, and timely reporting as a number of health facilities have become inaccessible or nonfunctional. As a result, FP service uptake has remained low with FP 2020 estimates showing a mCPR of 2.7 percent and an unmet need for modern contraception at 30.8 percent (FP 2020, 2018).

South Sudan's RHIS captures the following client data: age, sex, marital status, education, occupation, current FP method, and whether the client is a new user or a revisit. Information is also collected on the origin of the client (location), contraceptives dispensed at the health facility recorded by contraceptive method, days of stockouts of three tracer FP commodities (condoms, oral contraceptive pills, and Depo-Provera) in the past three months, and people reached with FP information or education (South Sudan Ministry of Health [MOH], 2018).

The departments of family planning at static health facilities provide FP services; however, communication for demand creation takes place during immunization and antenatal visits. Intra

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Health, an international nongovernmental organization (NGO) with a focus on HIV/AIDS, works with key populations and provides FP services during HIV outreach visits, but the client information is not shared because of sensitivity. In the past, some NGOs introduced community-based distribution of FP, but these efforts faced resistance from some communities leading to attacks on community health workers. Currently, there is no community health worker program for FP services in South Sudan. In a recent reproductive health (RH) forum, the director general for RH acknowledged the gaps in demand for and access to FP services, emphasizing the need for advocacy to change attitudes about FP at all levels, including parliament.

FP data are collected from the health facilities using a paper-based tool like an FP register. The MOH is developing an FP register with revised indicators including capturing data on Sayana Press, a new self-injectable method recently introduced in South Sudan. Paper-based monthly summaries of facility data are submitted to the CHD. Counties then enter the data electronically into the district health information system (which is based on DHIS 2), run analyses to calculate coverage indicators, and send the reports to the state Ministry of Health (SMOH). The SMOH aggregates the counties' results and sends the state-level indicators to the MOH. NGOs and private clinics operating at the county level report to the counties. Those that operate at the state level send their reports to the SMOH. Feedback should follow an inverse path: from the national MOH to the SMOH, to the CHDs, and lastly to the health facilities (Laku, Camino, Stoops & Ali, 2012).

Although the data management flow described above is consistent with international minimum standards, the RHIS has limited functionality. Data from health facilities are not always complete or reliable; data collection is delayed; and feedback to collecting facilities from the MOH, SMOH, and CHDs is practically nonexistent. Many NGOs and private agencies implementing FP projects do not provide the required data or information to the MOH. As a result of these challenges, FP data are incomplete, not analyzed, disorganized, or not presented in a user-friendly way, making interpretation difficult and limiting the use of data for health planning (MOH, 2011).

Methods

The study used a cross-sectional observational design with quantitative and qualitative approaches to data collection and analysis. Data were collected from 178 health facilities across 17 counties in two states in South Sudan: Central Equatoria and Western Equatoria. Data collection entailed individual questionnaires administered to health facility staff, key informant interviews (KIIs), and direct observation at points of service delivery. Data were analyzed using the statistical package for social sciences (SPSS) and a qualitative pattern-matching approach. The process involved reviewing the data collection forms, coding, data entry, and analysis. The data were triangulated by comparing responses from the questionnaires to the KIIs.

Results

Just over half (55.8%) of the 172 health facilities assessed that should be collecting FP data do collect FP data. Only 16 percent of the county health departments (CHDs) assessed, and fewer than six percent of the health facilities assessed, carry out FP data analysis. Two hospitals, two primary healthcare centers (PHCCs), and one primary healthcare unit (PHCU) had the capacity to interpret analyzed FP data. Only four health facilities (2.3%) out of a total of 172 displayed information on new FP users (disaggregated by all methods, natural methods, oral pills, condoms, Depo-Provera shots, implants, intrauterine contraceptive devices, tubal ligation, and vasectomy). Five health facilities (2.8%) displayed information on the quantity of contraceptives dispensed (condoms, oral contraceptive pills, and Depo-Provera) in the past three months, and four health facilities displayed data on the number of days of stockouts of three tracer FP commodities (condoms, oral contraceptive pills, and Depo-Provera) in the past three months. The major reasons given for lack of data analysis were data not being collected owing to a lack of FP services being offered, poor data analysis skills, and the absence of directive/leadership/guideline(s) for FP data analysis, among others. The major reason given for lack of interpretation of analyzed findings was the lack of skills and technical guidance.

Conclusion

The study found that FP data are not effectively collected, analyzed, interpreted, and communicated in Central Equatoria and Western Equatoria States of South Sudan. This is because of such factors as lack of skills for FP data analysis; lack of guidelines for data collection, analysis, and interpretation; lack of personnel dedicated and trained in FP service provision; and lack of leadership for FP data management and communication. These challenges have limited the information available on FP services and performance for decision making from the health facility to the national level, specifically for policymaking and strategy setting. Recommendations to address these issues are training health facility management and data-specific personnel; providing guidelines on data collection, analysis, and use; improving data infrastructure; holding monthly or quarterly review meetings; and conducting regular supportive supervision visits to health facilities.

Study rationale

Although DHIS 2 was introduced in South Sudan in 2010, no government-led evaluation has been conducted of the country's RHIS, and there is no publicly available information on evaluations of FP data in South Sudan's RHIS conducted by implementing organizations. Other than the FP indicators included in DHIS 2, there is no information system in South Sudan specific to FP data, and no study has been done to determine the extent to which DHIS 2 adequately and appropriately produces satisfactory FP reports. Similarly, no research has explored behavioral and organizational factors influencing the effectiveness of FP data analysis, interpretation, and communication, such as data knowledge and skills, culture of information sharing, and motivation to use data.

Study objective

The purpose of the study was to explore how effectively FP data in the RHIS are analyzed, interpreted, and communicated in two states in South Sudan to inform policy and programmatic decision making. The research was guided by three research questions:

- How and at what level are FP data in the RHIS analyzed?
- At what level of the information chain are FP data in the RHIS interpreted and who is involved in the interpretation of these data?
- What and how are FP data in the RHIS communicated?

The researchers believe that the new knowledge generated through this study will provide baseline data to support program design and intervention planning; support the MOH to develop a more effective FP data management system as part of the RHIS; alert trainers at the national and state level to plan and implement a refresher training program for health facility staff to improve data analysis, interpretation, and communication; and provide information to other researchers to conduct follow-up studies on the use of FP data for informed decision making.

Methods

Study setting

South Sudan is the youngest nation in the world, having gained independence from Sudan only in 2011. With an area of 619,758 square kilometers, South Sudan has a total population of 14 million and an annual population growth rate of 3 percent (South Sudan National Bureau of Statistics [SSNBSS], 2008). The country borders Ethiopia, Kenya, Uganda, the DRC, the Central African Republic, and Sudan. According to the World Bank, South Sudan has a young population with 72 percent below the age of 30 years (2017). South Sudan has been politically split into 28 states, but the United Nations Office for the Coordination of Humanitarian Affairs and humanitarian organizations use the original 10 states for planning purposes.

The study was conducted in two states based on the former structure of 10 states: Central Equatoria and Western Equatoria. South Sudan has 64 tribes: 60 percent of them are pastoralists. The dominant religion is Christianity. The majority (83%) of the population is rural, and adult literacy stands at 27 percent (SSNBSS, 2018).

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Central equatoria state

Situated in the south and bordering Uganda and the DRC, Central Equatoria is composed of six counties (Juba, Yei, Kajo Keji, Morobo, Lainya, and Terekeka) with a population of over one million people. More than half (65%) of the population lives in rural areas and most (55%) of the population of 15–24-year-olds is literate (SSNBSS, 2018). Christianity is the dominant religion. There are 70 health facilities: 28 PHCCs, 36 PHCUs, and 6 hospitals.

Western equatoria state

Located in the southwest part of the country bordering the DRC and the Central African Republic, Western Equatoria is composed of 10 counties (Yambio, Tambura, Nagero, Nzara, Ezo, Ibba, Maridi, Mvolo, Mundri West, and Mundri East) with over half a million people. A high proportion of the population (84%) live in rural areas. Less than half (43%) of the population of 15–24-year-olds is literate, and Christianity is the most common religion. The state has 46 PHCCs, 165 PHCUs, and 4 hospitals.

Study design and data collection

The study used a cross-sectional observational technique to explore how effectively FP data in the RHIS are being analyzed, interpreted, and communicated to relevant stakeholders. Data on the three research themes were collected using quantitative and qualitative techniques. Qualitative information was collected through KIIs (Appendix 1) and quantitative data were gathered using printed questionnaires (Appendixes 2 and 3). The interview schedule had open and closed-ended questions and explored the effectiveness of data analysis, interpretation, and communication, including knowledge, skills, the culture of information sharing and motivation to use data. The KII guide contained a list of questions related to the three thematic areas of data analysis, interpretation, and communication of data analysis findings.

Data were collected from health facility in-charges (FP providers and medical directors and medical superintendents), data clerks and monitoring and evaluation (M&E) officers, CHD directors, state RH director (M&E staff), and the national MOH RH director (M&E personnel).

Sampling strategy

The study used a combination of simple random sampling technique, convenience sampling, and cluster sampling. The convenience sampling technique was used because of security issues that constrained access to certain health facilities and geographical areas within the study population. Although conflict in South Sudan has spread to all parts of the country, the researchers identified the Central and Western Equatoria states because they have fairly stable security and are accessible, in large part, for field data collection and desk reviews. The lot quality assurance Sampling technique that defines a state as a supervision unit and a county as a supervision area was used for sample size estimation. In each county, 19 health facilities were chosen for administration of questionnaires. According to this technique, a sample size of 19 provided an acceptable level of error for making management decisions. Although the minimum sample size is 19 Samples larger than 19 are considered to have the same statistical precision as 19 (Uganda Program for Human and Holistic Development, 2006).

Although the original target was 304 health facilities, only 180 were reached because many health facilities were inaccessible or nonfunctional. The facilities were inaccessible because of political insecurity (fighting between rebel forces and government soldiers) that limited or inhibited our safe travel to specific sites. The fact that some of the health facilities we visited were nonfunctioning was attributed to people abandoning their communities because of political insecurity and fighting between armed forces. The medical facilities in these communities were closed because they lacked personnel, medicine and commodities, and basic infrastructure. Therefore, most counties were under-sampled.

Table1. Study sites and facilities

State	Couties	PHCC	PHCU	Hospital	Privet Clinic	CHD	Total
Centeral Equatoria	Juba	7	3	1	3	1	15
	Yei	4	1	1	1	0	7
	Morobo (inaccessible)	0	0	0	0	0	0
	Kajo Keji (inaccessible)	0	0	0	0	0	0
	Lainya (inaccessible)	0	0	0	0	0	0
	Terkeka	7	10	0	0	0	17
West Equatoria	Yambio	8	9	1	0	1	19
	Nzara	7	13	1	0	1	22
	Mundri East	3	2	1	0	1	7
	Mundri West	2	6	0	0	1	9
	Mvolo	2	3	0	0	1	6
	Ibba	4	14	0	0	0	18
	Mardi	6	12	1	0	0	19
	Ezo	2	18	1	0	0	21
	Nagero (inaccessible)	0	0	0	0	0	0
Total		55	106	7	4	6	178

One staff member was interviewed at each health facility using the KII guide. This included 55 PHCC in-charges, 106 PHCU in-charges, seven hospital in-charges, and four private clinic in-charges. Additionally, six CHD personnel were interviewed. A total of 178 facility-based and county-based personnel participated in the study, as well as one RH director from the SMOH and MOH, respectively (Table 2).

Table2. Study participants

Job title	Number reached
Health facility incharge	172
CHD data clerks and M&E officers	3
CHD rirector CMO	3
SMOH RH director	1
MOH RH director	1
Total	180

Data analysis

Quantitative data were analyzed using SPSS, Version 25.0, and qualitative data were analyzed thematically. Raw quantitative data (data from the field) were reviewed, cleaned, coded, and entered into the system. Data were then analyzed using the "Analyse" field in the SPSS window to generate tables and graphs for the answers from the questionnaire. Data cleaning included inspecting the data for completeness and looking for missing responses in the questionnaires. Questionnaires with greater than 10 percent of the responses missing were eliminated. Cross tabulation analyses were run at a confidence interval of 95 percent, giving a margin of error of 5 percent.

The KII responses were recorded, transcribed, and coded. All codes generated were then entered in a code book. Coded themes were sorted to generate thematic frameworks. The coded themes were refined to align with the research questions and summarized.

Ethics review

The research proposal was presented for ethics approval to the Directorate of Policy Planning, Budgeting, and Research under the MOH, Republic of South Sudan. Approval was granted May 18, 2018. Data collection in the field commenced after ethics approval was granted. Study participants were informed that participation in the study was entirely voluntary. After the researchers thoroughly explained the purpose and procedures of the research, study participants were asked to sign written

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informed consent forms before beginning any study activities. The data collection tools were pretested for three days and amendments were made before actual field data collection.

Results

FP data collection at health facilities

Although FP data collection was not one of the research objectives, the research team found it useful to gather information on FP data collection because it provided a basis to proceed with the subsequent questions of FP data analysis, interpretation and communication and, administratively, it helped the research team understand why certain health facilities had no FP data.

Among the 172 sites that should be collecting FP data (client data are not collected at CHDs), only 96 (55.8%) health facilities are. Among these 96 facilities, PHCCs and PHCUs represent the biggest sources of FP data at 47.9 and 46.8 percent, respectively, and hospitals account for 5.2 percent of the FP data collection sites. Although five out of seven hospitals and 46 out of 55 PHCCs collect FP data, the majority of PHCUs do not. Among 106 PHCUs 61 (57.5%) do not collect FP data. Furthermore, none of the private clinics reached by the research team collect FP data.

Although the data show that the majority of health facilities are collecting FP data, during the in-depth interview session respondents indicated that they do not possess procedure manuals for FP data collection. According to a RH focal point at the MOH, "One of the challenges facing data issues at the health facility is the lack of procedure manuals in some health facilities."

FP data analysis

Family planning data analysis is done using DHIS 2 or by making simple calculations on paper and presenting the data in hand-drawn tables or graphs that are often displayed at health facilities, CHD offices, SMOH, the MOH or NGO offices. Fewer than 6 percent of the health facilities assessed carry out FP data analysis. Among the eight (4.6%) health facilities conducting data analysis, five are PHCCs, two are hospitals, and one is a PHCU. Because none of the private clinics collect FP data, none of them undertake data analysis. Some of the issues reported as challenges to FP data analysis at the health facility include lack of guidelines for indicators (i.e., no indicator reference sheets), missing monthly and annual targets, and lack of skills required for FP data analysis, as explained by one PHCC in-charge: "We do not have guidelines for data collection, analysis and interpretation at this health facility."

Six CHDs, one SMOH, and the national MOH were reached and interviewed about whether they analyze FP data collected from the health facilities and if so, how they do it. Only one of the CHDs analyzes FP data collected from the health facilities using DHIS 2. The SMOH reported using DHIS 2 to conduct FP data analysis; however, a breakdown of the system at the time of data collection rendered it nonfunctional. At the national MOH, data analysis is conducted using DHIS 2. The M&E officer at the MOH conducts FP data analysis on a monthly basis and on demand.

FP data interpretation

Two hospitals had the capacity to interpret analyzed FP data because they had an up-to-date copy of written guidelines on FP indicator definitions and were oriented on how to use them. Likewise, only two PHCCs and one PHCU had the capacity to interpret analyzed FP data because an up-to-date copy of written guidelines was available.

The CHDs had a similar challenge interpreting analyzed FP data with only one (16%) having the capacity to interpret FP data based on available guidelines. The results for the SMOH and the MOH showed capacity to interpret analyzed FP data with up-to-date guidelines on FP indicator definitions. At the health facilities, data clerks interpret analyzed FP data while M&E officers interpret FP data for NGOs, CHDs, SMOH, and the MOH.

Table3. FP data interpretation

Facility or department	Interprets analyzed FP data
Hospital (n=7)	2 (28%)
PHCC (n=55)	2 (3.6%)
PHCU (n=106)	1 (1%)
Privet clinic (n=4)	0 (0%)
CHD (n=6)	1 (16.7%)
SMOH department (n=1)	1 (100%)
MOH department (n=1)	1 (100%)

FP data communication and use

As presented in Table 4, only four health facilities (2.3%) out of a total of 172 displayed information on FP new users (for all available methods, i.e., natural methods, oral pills, condoms, Depo-Provera, implants, intrauterine contraceptive devices, tubal ligation, and vasectomy). Five health facilities (2.8%) displayed information on the quantity of contraceptives dispensed (condoms, oral contraceptive pills, and Depo-Provera injections) in the past three months and four health facilities displayed data on the number of days of stockouts of three tracer FP commodities (condoms, oral contraceptive pills, and Depo-Provera) in the past three months.

Eight health facilities (none of which were private clinics) possessed a map of their catchment area. Less than one percent of all health facilities displayed a summary of client demographic information, such as population by target group(s). Only one health facility (a PHCC) received feedback from the CHD on the FP-RHIS report submitted with further guidance and recommendations for actions. Likewise, only one PHCC reviewed their FP/RH strategy by examining service performance targets and actual performance, by month. None of the 178 health facilities sampled reviewed facility personnel performance on a monthly basis.

Table 4. FP data communication and use at the health facility level

Indicator	Hospital n=7	PHCC n=55	PHCU n=106	Privet clinic n=4
Displays information on FP new user	2 (28.5%)	1 (1.8%)	1 (1%)	0 (0%)
Displays information on number of contraceptives dispense	2 (28.5%)	2 (3.6%)	1 (1%)	0 (0%)
Displays data on the number of days of stock out of FP tracer commodities	2 (28.5%)	1 (1.8%)	1 (1%)	0 (0%)
Displays summery of demographic information, such as client population	1 (14.3%)	1 (1.8%)	0 (0%)	0 (0%)
Has a map of catchment area	2 (28.5%)	5 (9.1%)	1 (1%)	0 (0%)
Has quarterly or yearly feedback meetings on FP – RHIS data with guidelines & recommendation for action	0 (0%)	1(1.8%)	0 (0%)	0 (0%)
Review FP/RH strategy by examining service performance target & actual performance, by month	0 (0%)	1 (1.8%)	0 (0%)	0 (0%)
Review personnel responsibility by comparing service targets with actual performance, by month	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Only one CHD displayed a summary of information on FP new users, provided feedback to lower levels (health facilities) on the indicators that the health facilities are reporting on, and conducted routine meetings on a quarterly basis for reviewing managerial or administrative matters. None of the CHDs had annual action plans showing decisions based on FP data. Similarly, none of the CHDs

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published a newsletter as a way of disseminating information. The SMOH displayed summary information on new FP users and provided feedback to lower levels (health facilities and CHDs) on the indicators that they report on. SMOH also conducted a meeting to review managerial or administrative matters in the past three months and had an annual action plan showing decision made based on FP data. The MOH displayed summary information on new FP users, provided feedback to the subnational directors, and had annual action plans showing decisions based on FP data. The Ministry reported that it had published a newsletter in the past three months but does not publish a newsletter or report on a regular basis.

Table 5. FP data communication and use at the CHD, SMOH, and MOH levels

Indicator	CHD n=6	SMOH n=1	MOH n=1
Displays information on FP news user	1 (16%)	1 (100%)	1 (100%)
Provides feedback to lower levels on the FP indicators the report on	1 (16%)	1 (100%)	1 (100%)
Conduct routine meetings to review managerial or administrative matters	1 (16%)	1 (100%)	1 (100%)
Has annual action plan showing decision based on FP- RHIS information	0 (0%)	1 (100%)	1 (100%)
Has publication in the past three months with examples of FP data being used	0 (0%)	0 (0%)	1 (100%)

Discussion

Effectiveness of FP data collection at health facilities

The findings reveal a high level of unresponsiveness to FP data collection by health facilities. Although facility reporting forms include specific fields for FP data, the data entry form is simple, and the form requires minimal training, about 44 percent of health facilities do not record FP information. This could be because the need for FP data is not well-communicated or understood by health facility staff; there is lack of motivation for FP data collection; over-stretched staff do not have the time to prioritize FP data collection; and/or more resources are needed in terms of staff training on data collection, record keeping tools and equipment, and personnel for FP data collection.

The degree of data collection varies by facility type; 84 percent of PHCCs and 71 percent of hospitals collect FP data, but only 43 percent of PHCUs do. None of the private clinics in our study collected FP data. The majority (57%) of PHCUs do not collect FP data, and none of the private health clinics collect this data, so is difficult to obtain a clear understanding of the FP situation in the two study states because a significant percentage of FP data are missing.

The responses varied when researchers asked where subjects sent FP reports, or where they sent compiled FP data. Some facilities indicated that the compiled data or FP reports are sent to the CHD and NGO (in circumstances where an NGO is supporting a health facility), whereas other facilities indicated the SMOH and NGO. Under normal circumstances, data collection reports compiled at the health facility are forwarded to the CHD, which then forwards them to the SMOH. This finding implies that facility personnel have not been properly oriented on the reporting procedures.

Most of the health facilities assessed keep copies of the outpatient register and monthly FP-RHIS reports (after sharing with the CHD). This indicates that facility personnel understand the importance of record keeping and having FP information available for future use.

The majority of facilities indicated that they do not possess procedure manuals for FP data collection. This could imply that standard procedures for data collection—including adherence to ethical considerations while collecting FP data, use of specific FP data formats, and observing standard definitions and calculations for FP indicators—may not be followed during data collection. It also points to key aspects of data quality that may be absent from the data collected, including consistency, completeness, accuracy, relevance, and reliability. This partly explains the challenges

experienced by M&E personnel at the CHD while dealing with data obtained from the health facilities.

Effectiveness of FP data analysis

Although over half of the health facilities assessed carried out FP data collection, there is a wide gap between FP data collection and data analysis, with fewer than five percent of all facilities that collect FP data analyzing them. This gap suggests that facility performance information, such as indicator-target performance, is not readily available to inform decision making on a regular basis. This is presumably the case in other health facilities not reached by the study. The lack of FP data analysis may stem from lack of skills required for FP data analysis or other factors, such as lack of indicator guidance, monthly or annual targets not being communicated or understood by health facility staff, or a culture of recording data solely for the purpose of fulfilling reporting requirements and not appreciating the potential for data use. Data collection and reporting guidelines provided by the MOH have not been shared with many health facilities, CHDs, or SMOH.

Effectiveness of FP data interpretation

The study indicates that most health facilities do not interpret data analysis findings. This follows from the fact that most facilities lack data analysis guidelines and therefore do not analyze the data collected. Consequently, little information is available for discussion and action-taking during health facility meetings. Further, the findings reveal that facility meetings are ad hoc—respondents indicated that meetings were held weekly, monthly, biweekly, etc., as needed—which could imply that no standard guidelines have been provided by the CHD, SMOH, or MOH for holding facility-based meetings.

Effectiveness of FP data communication and use

Most health facilities assessed do not display data on FP new users and revisits, for traditional or modern methods, nor do facilities display data on the amount of contraceptives dispensed for both new users and revisit clients; days of stockouts of three tracer FP commodities (condoms, oral contraceptive pills, and Depo-Provera), which are key FP supply chain indicators; or summarized demographic information of health facility clients such as population by target group(s). This implies that little, if any, FP information is being communicated to stakeholders, including clients at the health facilities.

Only one health facility made action-oriented decisions based on FP data analysis and interpretation. This facility reviewed its FP/RH strategy by comparing service performance targets with actual performance, by month. None of the facilities made action-oriented decisions about facility personnel responsibilities by comparing service targets with actual performance, from month to month. Only one health facility made action-oriented decisions to mobilize or shift resources (e.g., FP commodities) based on a comparison of services, and only one health facility made action-oriented decisions to advocate for more resources by showing the gaps in its ability to meet its monthly or annual targets. This suggests that health facilities are not taking actions based on evidence of sound analysis of data or informed discussion of FP issues. It could also imply that decisions, such as clients' most preferred FP method(s), by cohort (e.g., adolescent clients or postpartum women), are not made based on evidence and therefore are not likely to address the real needs of FP, as identified in the health facilities.

Again, very few facilities (2.2%) discussed issues such as data quality or timeliness of reporting in the FP-RHIS, service quality, FP use by clients, FP service coverage, or FP commodity stockouts. This implies that most decisions made pertaining to FP services provision are not based on evidence (or meeting resolutions taken after a data review). This is evidenced by the fact that only five of the 178 health facility respondents answered "yes" to the question, "have you made any decisions based on above discussions?" in relation to the questions of whether the topics of "management of FP-RHIS (data quality, reporting, or timeliness of reporting)" and "FP-RHIS findings (client use, service coverage, or FP commodity stockouts)" were discussed during the past three months.

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The study indicates that few health facilities conducted routine meetings in the previous three months to discuss facility-related issues. This infers that facility-related issues that require the attention of all staff may be ignored and that decision making may not be inclusive. As such, decisions taken on FP issues may not reflect the experiences and position of every staff member at the health facility. This also partly explains why no follow-up actions took place regarding decisions made during previous meetings; facility staff are not seen as stakeholders that own the decisions made by management.

Very few facilities kept records of management meetings. This could suggest that health facilities lack reference points, such as meeting minutes to use for future verification of information. Such documents and information may be needed for audit purposes or to check whether or not decision-making is evidence-based. This is an information management gap(s) at the health facility-level.

The findings reveal that few health facilities received directives from senior management or CHDs concerning data use at the health facility. This is a data management and communication gap at the CHD and health facility levels that must be addressed if the quality of service and decision making is to improve. Likewise, only one health facility received feedback on its performance and the quality of its services. Effective feedback offers important guidance and provides attainable recommendations for course of action. Effective feedback also validates data collection and reporting, demonstrates that someone is tracking progress, and conveys that data use matters. Yet health facilities are not regularly updated on the performance or quality of their services (in relation to targets and indicators) because this information is only obtainable from the CHD. This explains why only three health facilities made action-oriented decisions regarding FP issues discussed and reported.

No health facility received annual or monthly targets (based on the FP-RHIS information) to guide implementation, M&E, or community outreach activities at the health facility level. This makes it difficult for facilities to make comparisons of actual performance with targets set at the beginning of the month or year. It also makes it hard to establish accountability and determine whether health facilities are meeting clients' needs or using resources efficiently.

Only two facilities received a CHD or MOH FP-RHIS office newsletter during the past three months. This shows the limited availability of FP-related information including county, state, or country-wide FP targets and performance.

Very few health facilities (12) have documentation showing use of information for advocacy purposes. In addition, only one facility conducted advocacy for more resources by showing gaps in the ability to meet targets. This indicates that FP data/information has played a limited role in the country regarding advocacy on FP matters.

Very few health facility in-charges participated in meetings at the CHD to discuss FP-RHIS issues and performance in the past three months. This lack of involvement may be because the CHD did not hold a meeting in the past three months; many facility in-chargers were not able to attend the meeting; or, more likely, meeting organizers at the CHD did not feel the need to invite facility in-charges to participate in the meetings. There is a danger in making decisions on FP issues that affect service delivery at the health facility level without providing the space and venue for facility representatives to express their concerns and help craft solutions. Perhaps, owing to issues of hierarchy and authority, the experiences and perspectives of health facility in-charges, who are based at the health facilities and interact directly with clients, are ignored even though they are at the core of FP services delivery. Such decisions may include the amount of resources (e.g., FP commodities and staffing) needed to achieve monthly health facility targets.

The fact that very few health facilities possess an up-to-date copy of written guidance on FP indicator definitions and calculations provided by the National FP Program's M&E Unit suggests that few facilities may be providing services that meet internationally recognized FP practices and standards. This lack of FP indicator guidance also implies that health facilities, in general, lack other FP guidelines and standards of practice, such as provision of youth-friendly FP and RH services or provision of FP services to HIV-positive or postpartum clients. This has negative implications for the country's FP program.

When asked why health facilities do not analyze FP data, respondents gave several reasons: no data analysis focal persons, a lack of skills relevant for data analysis, data not being collected owing to a

lack of FP services provided, a lack of guidelines for FP services in the form of indicators, and a lack of leadership for FP data analysis.

Recommendations

Based on the study findings, we developed the following recommendations to improve data collection, analysis, interpretation, and use:

1. Strengthen data analysis capacity at the health facility level by training data-specific personnel. This will also improve the staff's ability to interpret and communicate findings from the data analysis.
2. Provide guidelines on data collection, analysis, interpretation, and use. This will ensure facility-specific performance data are available for decision making.
3. Improve the quality and usability of data infrastructure to strengthen the capacity of data management systems at health facilities. This may include procuring and installing cloud-based data collection and reporting equipment/software.
4. Address the lack of human resources to provide FP services at health facilities by recruiting facility-specific FP and RH personnel. This will help respond to the "lack of FP personnel to provide the service," which study participants gave as a reason for lack of data collection and analysis at certain health facilities, because no FP services were being provided.
5. Train health facility management on the importance of FP information and how data can be used to track performance. This is in response to study participants indicating "lack of directive/guidance by management" as one of the reasons for a lack of data analysis at health facilities.
6. Improve the information flow and feedback of information to health facilities by higher authorities (CHD, SMOH, and MOH). This will help health facilities understand their performance status and provide the opportunity for dialogue on how FP service delivery can be improved.
7. Invite facility in-charges to CHD meetings where FP data and service delivery will be discussed. Engaging the in-charges in these meetings and giving them a voice will empower them and help achieve a common goal of improved FP outcomes.
8. Hold regular meetings (monthly or quarterly) to review FP targets and performance. Share meeting minutes with health facilities and disseminate strategies and action points to the health facilities.
9. Engage with NGOs, community-based organizations, and faith-based organizations that are operating private clinics and/or implementing FP activities in public facilities, to leverage their resources and support provider trainings for public and private service providers on data collection and analysis.
10. Create a regular schedule for staff from CHDs, SMOHs, or the MOH to conduct supportive supervision visits at health facilities. The visits will allow troubleshooting of any data collection or analysis challenges at the health facility, foster a relationship of collaboration between the different levels of the health system, and provide a clearer understanding of what some of the data challenges are on the ground.
11. Expand the field of research in FP data collection and use to other counties and states in South Sudan to establish whether facilities in other locations are experiencing the same trends regarding FP data collection, analysis, communication, and use and what their data challenges—and solutions—are.

Conclusion

The study found that FP data are not collected, analyzed, interpreted, and communicated in the Central Equatoria and Western Equatoria states effectively. This is because of such factors as lack of skills for FP data analysis at the facilities; lack of guidelines for data collection, analysis, and interpretation; lack of personnel dedicated and trained in FP service provision; and lack of leadership regarding FP data management and communication. These challenges have limited the information available on FP services and performance for decision making from the health facility to the national level, specifically for policy making and strategy setting. There is a need to expand the study to cover other counties in South Sudan to determine whether health facilities in those locations have similar patterns of FP data collection, analysis, interpretation, and communication. The recommendations and

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future course of action will help uncover existing gaps in FP data management and communication and improve decision making for better FP outcomes.

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Challenges faced by Biology Secondary teachers when using instructional methods that promote Science Technology, Engineering and Mathematic (STEM) Education in Zimbabwe.

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Abstract

The study sought to determine the challenges faced by Biology Secondary teachers in Zimbabwe when using instructional methods that promote Science Technology, Engineering and Mathematic (STEM) Education and the possible solutions to the challenges. The sample was composed of fifty secondary schools in Harare that offer Biology at Ordinary and Advanced level. Two Biology teachers per school were involved and the total number of Biology teachers was one hundred.

Data was collected using questionnaires administered to both Ordinary and Advanced level biology teachers. One lesson at Ordinary and Advanced level was observed at each of the fifty schools. The obtained results indicate that Biology teachers in Zimbabwe are still using more the traditional teaching method that is teacher centered rather than the current student-centered approach that promotes STEM education due to a number of challenges they are facing. These challenges include lack of digital classrooms, lack of consistent power supply, lack of fully equipped biology laboratories and lack of teachers who have the necessary skills such as computer skills. In order for STEM Education to be successfully implemented in Zimbabwe at secondary school level these issues must be addressed.

Introduction

STEM education is an approach to teaching and learning that integrates the content and skills of Science, Technology, Engineering, Mathematics and their application within the Society. STEM Education is an instructional strategy that aims to equip learners with scientific, technological, engineering and mathematical life skills that are essential in real life outside school (Clyton & Moses, 2017). STEMS education main goal is to prepare the learners to learn, apply, integrate, interpret and communicate information from STEM subjects in such a way that it has real life application and relevance in the 21st global world. Learners must engage in inquiry, logical reasoning when solving global challenges and real-life problems. Critical thinking, evidence-based argument, collaboration and creation of new technologies are inherent in STEMS education. STEM education ensures that life skills like problem solving and critical thinking are enhanced in students early. Herrell and Jordan (2008) stated that the purpose of integrating technology in teaching is to enhance learning and teaching as it supports both learners and teachers. Pitler, Hubbell, Kuhn and Malenoski (2007) emphasized on the need to have a clear understanding of the changes that must be done in regards to instructional methods used if the learning needs of our 21st century learners are to be satisfied.

The purpose of the study

The purpose of the study was to determine the challenges faced by Biology Secondary School teachers when using instructional methods that promote Science Technology, Engineering and Mathematic Education in Zimbabwe and possible solutions to the challenges.

Significance of the research

Findings of this research study may be used to inform the relevant stakeholder how STEM teaching may be improved in Zimbabwe.

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Literature review

The successful implementation of STEM education relies primarily on educators with a good understanding of STEM-based instructional methodologies. These STEMS based instructional methodologies reflect the actual teaching and learning environments subjected to the learners and the competences the learners will actually acquire. These STEM based instructional methodologies are endowed with pedagogical-content-knowledge, skills and attitudes to integrate science, technology and mathematics in the teaching and learning of STEM subjects, that address the knowledge, skills and attitudes of a 21st century global citizen, since development in the 21st century is hinged on STEM subjects. STEMS proficient learners be able to engage in critical thinking, problem solving and develop new technologies to solve societal problems. STEM teachers link theoretical constructs that are taught to practical, real-world context, recognizes that teaching and learning needs to occur in multiple contexts, assists students become self-regulated learners is a facilitator of learning, promotes active learning and embrace the use of ICTs as a critical tool in the process of teaching and learning.

Zimbabwe, in Africa leads the general literacy rate, however its Education system has not focused on STEM literacy and methodologies. Currently, nearly 28% of high school learners declare interest in STEM related subjects, but 57% of these learners will lose interest in these subjects by the time they graduate from high school (MoPSE, 2013).

This prompted the Zimbabwe Government to announce the 2009 “STEM Education” campaign to motivate and inspire learners to enroll in STEM subjects at Advanced level. This campaign focused only on the learners. Learners who took up STEM subject at Advanced level had their school fees paid by the government. A group of students actually visited the United States of America to have hands on experience in regards to STEM subjects. This was meant to try and motivate the Zimbabwean STEM students. Parents and the learners were very excited about this development. However, this campaign did not address the need to transform the current traditional Science, Mathematics and Technology (SMT) teachers into a new Science, Technology, Engineering, and Mathematics Teachers (STEM) who will have the pedagogical-content-knowledge and STEM based instructional methodologies, who can then educate learners in a STEM way. The STEM teacher should be able to use STEM based instructional methodologies that will foster problem solving creativity, critical analysis, teamwork, independent thinking, initiative, effective communication and digital literacy in students. The 21st century teaching and learning has become more and more technologically complex and pedagogically challenging for the traditional Biology teachers. The traditional instructional methodologies are dominated by the lecture method that is teacher centred and promotes rote learning greatly limiting the teachers’ capability to implement STEM education. STEM education advocates for teaching methodologies that are student centred. The teacher assumes a new role of being a facilitator of learning rather than an authority of learning. These traditional methods of teaching that are teacher centred have long been replaced methods of teaching that are student centred such as the Constructivism, connectivism and excellence theories of learning. Currently, Zimbabwe Education system has more of Science, Mathematics and Technology (SMT) teachers in schools due to a number of reasons such as when the teacher was trained, but lacks STEM educators who can teach learners using STEMS methodologies. A transition from Science, Mathematics and Technology (SMT) teacher to a Science, Technology, Engineering, mathematics and Society (STEM) teacher is inevitable if students are to learn STEMS subjects. The task that Zimbabwean education system has is to Transform Science, Mathematics and Technology (SMT) teachers into Science, Technology, Engineering, Mathematics and Society Teachers (STEM). The Government and Ministry of Tertiary and Higher Education partnered to create a joint national strategy to invest funds in STEM advocacy, increasing youth STEM engagement and reaching demographics underrepresented in STEM subjects. STEM grants selection programme by ZIMDEF was rolled out in 2016 (Morris, 2002). This initiative did not address the need to retrain the current teacher.

What separates STEM education from the traditional science and mathematics education is the blended learning environment showing learners how the scientific method can be applied to everyday life. It teaches learners computational thinking and focuses on the real- world applications of problem

solving. As such, STEM education begins while learners are very young facilitated by STEM educators.

Research questions

The study was guided by the following research questions:

1. What are the challenges faced by Biology teachers in using instructional methods that promote STEMS Education?

2. Which instructional methods do Biology teachers use during the teaching and learning of Biology?

Methodology

The purpose of the study was to determine the challenges faced by Biology Secondary School teachers when using instructional methods that promote Science Technology, Engineering and Mathematics Education in Zimbabwe and possible solutions to the challenges.

A questionnaire for biology teachers was administered to determine the challenges they face when using instructional methods that promote Science Technology, Engineering and Mathematics (STEM) Education. Lesson observations were done in order to determine the instructional methods that teachers are using and the logic behind the use of those instructional methods.

Results and discussions

Table 1. Distribution of biology teachers by age

Age (years)	Number	Percentage (%)
Below 26	9	9
26-35	37	37
36- 45	43	43
46-55	11	11

Tables 1 show the age ranges of the respondents. Table 3 shows the age ranges for teachers, 20 percent are below the age of 26; another 20 percent are between the age of 26 and 35. 30 percent in the age range 36-45, and also 30 percent in the age range 46-55. The majority of the respondents were aged above 35. The apparent diversity of the maturity of the respondents reflects several implications in the study's findings. Sixty percent of the teachers are above the age of 36, meaning they probably were trained before Advanced Educational Technologies and computers were introduced into the education system and when there was no formal training in the teacher training colleges. This has a negative impact on the successful integration of Advanced Educational Technologies in the process of teaching and learning. Most of these older teachers are the ones whom were found not to have the necessary ICT competence. Also, they are the ones who had negative attitudes towards the use of ICTs in the process of teaching and learning of biology.

Table2. Challenges faced by Biology teachers when using STEM methodologies

Factors Identified	Frequency	Percentage	Rank
Inadequate Advanced Educational Technologies resources	77	77	2
Unreliable source of power	65	65	3
Lack of Laboratory equipment	53	53	5
Lack of digital classrooms	80	80	1
Teachers computer illiterate	33	33	4

The use of Advanced Educational Technologies is vital when teaching biology using the STEM methodologies. A 21st teacher must have the necessary skills to use Information communication technologies (ICTs) well within the digital classroom of the 21st century. Digital classrooms connect the classroom the whole world and create an environment for learning to become student centered.

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The teacher assumes a new role of becoming a facilitator of learning. According to teachers lack of Advanced Educational Technologies in schools hinders them from effectively teaching biology in a STEM way. Both students and teachers may not have access to research on the Internet and in most schools the chalkboard and the prescribe textbook are still the greatest tool within the classroom. In such a situation teacher will concentrate on completing the syllabus so that they meet the immediate need of the pupils, which is passing examinations. In some cases, the teachers said they are not able to use the Advanced Educational Technologies since they were never exposed to them during their training and this applied only to the older teachers. The young teachers expressed concern over the lack of electronic boards or smart boards in their classroom. This means that they have no option but to use the chalkboard and the textbook. Digital classrooms in most schools are non-existent and, in most cases, the whole science department had one projector. Teachers were not very keen in preparing a lesson using Advanced Educational Technologies due to unreliable source of power. This means that in order for the lesson to proceed without any problems due to lack of power they have to use the traditional methods of teaching. Teachers in most schools said lack of laboratory equipment and chemicals means that the student cannot have a hand on approach when learning biology. Biology is a practical subject that requires hands on approach.

Teaching methods in use

The ways students acquire knowledge during learning experience at school depend on the methodology of teaching being applied by their teachers. During these learning experiences students must acquire knowledge, skills and the desired attitudes. There is no one teaching method said to be the panacea for all teaching all subjects. The methods to be employed varies with variables such as age of students, time needed to complete the syllabus in preparation of examinations and availability of resources. Biology lessons require hands-on-approaches and student-centered approaches if students are to learn it in a STEM way an aspect that is critical in the 21st century.

Table 3. Teaching methods used during the lessons observed

Teaching method	Number of teachers using this method in the observed lessons at Ordinary Level	Number of teachers using this method in the observed lessons at Advanced Level
Lecture	83	66
Group work	5	32
Problem solving	1	2
Demonstration	11	15
Carrying out experiments	0	9

The lecture method was the widely used teaching method. This type of method does not promote STEM education in the process of teaching and learning of Biology. This most widely used teacher centered method does not require the use modern teaching tools such as the computer. Generally, the student is not active and does not develop the skills needed in the 21st century digital world. Skills such as critical thinking, creativity and innovation are suppressed. Rote learning prevails in such learning environments. Teachers stated that this was the most convenient method to use in the current environment where electricity is not readily available, resource needed to have a digital classroom are not available and laboratory materials are not available. At Ordinary level most teachers indicated that the students sit for an alternative to practical examination paper hence less emphasis on real practical approach during the teaching and learning of biology.

Conclusions

The obtained results indicate that Biology teachers in Zimbabwe are still using more the traditional teaching method that is teacher centered rather than the current student-centered approach that promotes STEM education due to a number of challenges they are facing. These challenges include lack of digital classrooms, lack of consistent power supply, lack of fully equipped biology laboratories

and lack of teachers who have the necessary skills such as computer skills. In order for STEM Education to be successfully implemented in Zimbabwe biology at secondary school level these issues must be addressed.

Research recommendations

The study makes the following recommendations if STEM Education is to be successfully implemented in Zimbabwe:

1. All biology teachers who don't have the necessary ICT skills to handle a 21st century digital classroom must attend ICT workshops offered in the various institutions of higher learning in Zimbabwe.
2. Biology is a practical subject hence at Ordinary level it is necessary to have a practical examination rather than an alternative to practical paper.
3. Schools must have fully equipped Biology laboratories and power supply should always be available. May be schools should look at utilizing renewable energy such as solar to achieve this.

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Electronic Document Management System using DocuVision for Food Reserve Agency

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Abstract

This project entitled Food Reserve Agency (FRA) Document Automation system is a server-based application that client computers accesses in order to manage documents.

The server provides a facility for client computers to manipulate the internal documents that various departmental users make use of such letter, reports, photographs, images, etc.

A document management system (DMS) is a system (based on computer programs in the case of the management of digital documents) used to track, manage and store documents and reduce paper. Most of these DMS are capable of keeping a record of the various versions created and modified by different users (history tracking). The term has some overlap with the concepts of content management systems. It is often viewed as a component of enterprise content management (ECM) systems and related to digital asset management, document imaging, workflow systems and records management systems.

In the case of our project, we procured a DMS from our Enterprise Resource Planning (ERP) company called Netone IT Ltd. The DMS is called the DocuVision.

It has the capabilities to create folders and various file types with varying attributes. This made our project easy and very reliable in terms of the solution provided to users. This was particularly very handy for our Registry department which receives and stores hard copy documents.

Keywords

1. Electronic Document Management System (EDMS)
2. Server based application
3. Client computers
4. document management system (DMS)
5. computer programs
6. digital documents
7. content management systems
8. Enterprise Resource Planning
9. enterprise content management
10. folders
11. secure storage
12. naming standards
13. document ownership
14. document revision control
15. inactive files

Introduction

In our organization, the Food Reserve Agency (FRA), all our departments have documents which we desire to store in a system that can help us to among other things:

- Store the documents in a secure storage
- Classify the documents based on different attributes
- Find your documents with only couple of mouse clicks
- Set authorization rules
- Link the document to different objects
- Check-In and Check-Out a document
- Create different versions and revisions of a document
- Record change history of a document etc.

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Electronic Document Management System (EDMS) is a system that allows user departments to manage documents electronically. The idea is that manual documents are converted into an electronic form using devices such as scanners. The starting point is to create folders for each type of files. In our situation, each department has a folder

There are a number of document management software available including but not limited to:

- DocuVision
- Zoho Docs
- Logical Doc
- Microsoft SharePoint Online
- M-Files DMS
- Ascensio System Only Office
- Evernote Business
- Etc

We went for DocuVision because it is cheap and easy to implement. This application has ease to use screens as will be seen later. The application can run on nearly any basic computer as a client.

Problem statement

FRA is a Government owned institution which was established under the 1995 Act Cap 225 of the laws of Zambia.

It has three mandates or key functions namely:

- Ensuring there is a strategic food reserve
- Proving market access to the small-scale farmers
- Providing market information

FRA deals with a lot of information which is mainly manual in nature. The documents are received and stored in the Registry. The documents are of various types and from different sources in different formats.

The Registry is made up of a building which is about 15meters by 45meters and 4 meters high. This is our center of documents both active and inactive files. The building is divided in two parts namely; the Registry for active files and the archive for dormant files.

The biggest issues in managing the documents are outlined below:

- Loss of documents
- Lack of naming standards of the documents
- Difficult to separate and classify documents
- Difficult to locate where a particular document is stored
- Difficult to trace document movements
- Compromised security and compliance
- Lack of document revision control
- Lack of document ownership etc.

There have been difficulties in handling documents with regards to the above areas. When documents are being manually managed, the above challenges are really difficult to manage and this calls for an automation of the process.

Approach / solution provided

As a result of the challenges mentioned above, we started looking out for a practical but affordable solution on the market. We came to know of a product called DocuVision software. This has an easy integration feature with Sage 300 ERP software which we are using.

The DocuVision was installed on a server and licensed users logon to access the folders that they been given access to only. The rest of the folders cannot be seen where the user has no access.

The biggest challenge during this process was the scanning of documents to convert them into electronic and assign them to corresponding user departments.

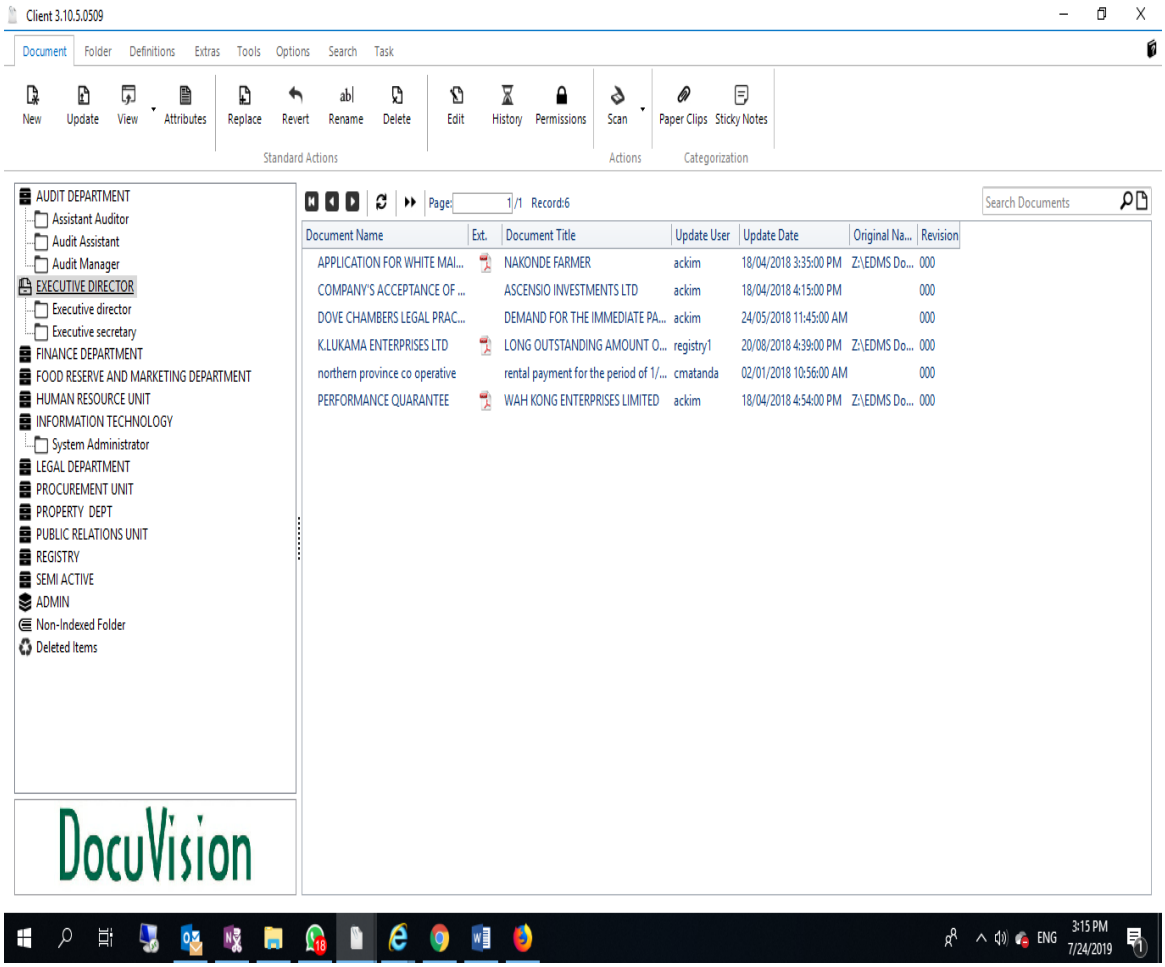
Each manual document or file is scanned and posted into a folder depending on where its ownership. Each folder belongs to a department and each has sub-folders which ends up drilling down to individual users.

For this project the following folders were created:

- Audit Department

- Executive Director
- Finance Department
- Food Reserve and Marketing Department
- Human Resource Unit
- Information Technology
- Legal Department
- Procurement Unit
- Property Department
- Public Relations Unit
- Registry

This can be seen in the diagram below which is a snapshot from the system.



As can be seen below, you can easily perform any function by just right-clicking on any part of the application and you get a drop-down menu to select what action you want to undertake.

You can perform the following tasks easily:

- Create new document
- Update document
- View document
- Add attributes
- Replace a document with another
- Revert to an older document
- Rename a document
- Delete a document
- Edit a document
- View document history
- Assign permission to a document
- Scan a document

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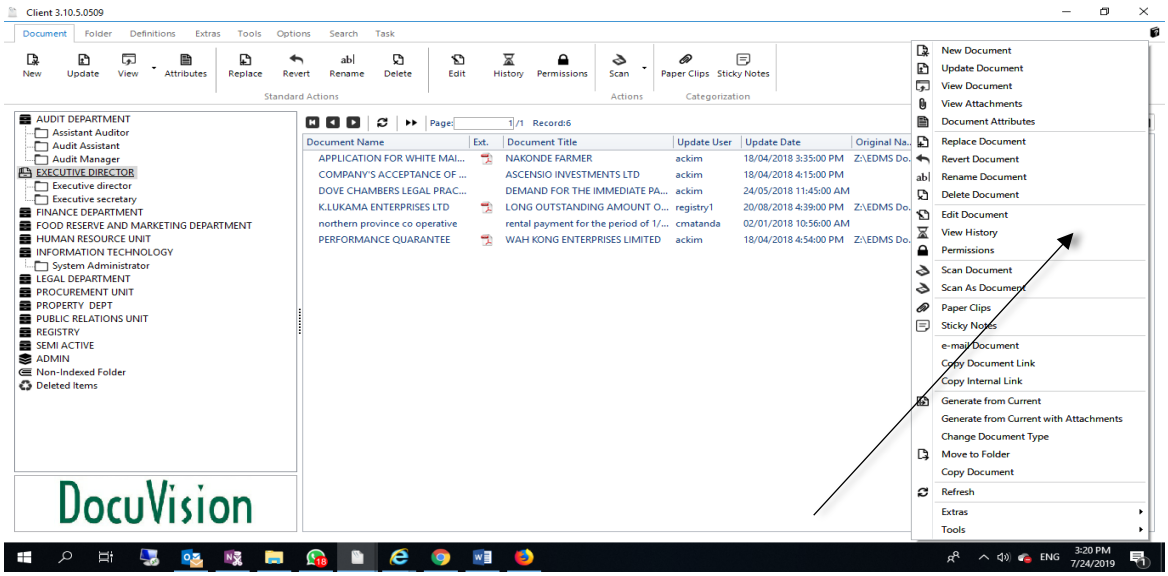
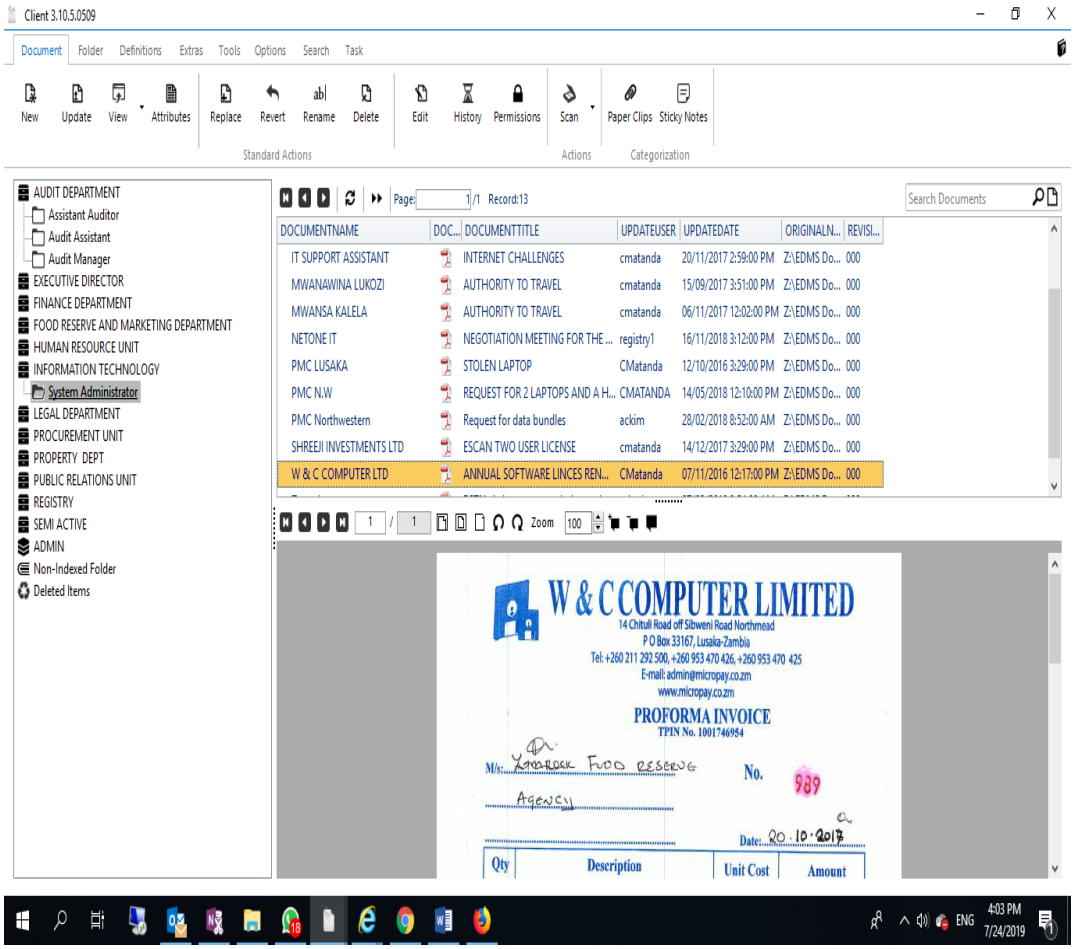
- Paper clip a document
- Add a sticky Notes to a document
- Send a document
- Distribute document
- Lock document

In short you can easily perform actions to electronic documents as if you are dealing with paper-based documents.



Viewing a document in the Information Technology folder.



Significance of study

The automation of the document management through the installation of the DocuVision system has directly benefited all the staff of the FRA. The number beneficiary is the staff that work in the Registry Department. Previously, they used to file documents manually and loss of documents was very rampant.

After the DocuVision was implemented, there are no more document losses as these are scanned and placed in departmental folders. The Executive Director's office receives any document on time as and when needed. The Head of Departments also receive documents as and when they need them.

All the departments now have access to the documents that they need to access and this is done by just a click of a button. The solution has brought a new way of managing documents.

Conclusion

The solution to the problem of manual document management in the Registry and other department was resolved by installing the DocuVision application software.

The automation was the only answer to the challenge at hand.

Currently, we are able to manage documents with pride and respond to any demands on document requirements.

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Investigating the most applied Head Teachers' Leadership Style in Motivating Teachers: The Case of Secondary Education Teachers in Kitwe District, Zambia

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Abstract

The purpose of the study was to investigate the most applied head teachers' leadership styles in motivating teachers' in secondary schools of Kitwe district, Zambia. The study was conducted using descriptive survey. Purposive and simple random sampling techniques were used to select 22 head teachers and 210 teachers respectively to participate in the study. Questionnaire instruments with likert scale questions were used as research tools in collecting data from teachers and head teachers. To test reliability of the instruments, data set on the questionnaires were subjected to chronbach`s alpha (α) test statistics using statistical package for social sciences version.20 (SPSS 20). Data collected from the participants were quantitatively analyzed and presented into tables using SPSS 20. The results for this study show that head teachers frequently apply democratic leadership style as they allow teachers to express their feelings about how things should be done and they put suggestions made by staff members into operation. It is recommended that head teachers in secondary schools of Kitwe district should equally apply all the three leadership styles (democratic, laissez-faire and autocratic) without favoring only one type of leadership style. (184 words).

Key words: *Head teachers' leadership styles, Teachers' motivation, Secondary education teachers, Kitwe district, Zambia.*

Introduction

Background information

In recent years, issues of teachers' motivation and quality assurance have become a matter of debate and concerns in educational system and standards (Ofjebe & Ejugo, 2010). Teachers' motivation is a key to guaranteed quality education, as such influences quality and assurance in the education system. Without efficient and effective teachers in education industry, quantitative learning outcomes cannot be achieved. It is very important to motivate teachers properly in order to enhance quality in education system (Ofjebe & Ejugo, 2010).

Leadership plays a vital role in the school effectiveness and school improvement and this importance has always been emphasized by the researchers from the school effectiveness and school improvement (Kuvale, 2016). Good school-based management requires effective school leadership where by, school head teachers are able to handle school environmental interaction (Machumu & Kaitila, 2014). Head teacher's leadership styles and teacher's motivation are two very important factors of the work of the school that is enhanced by head teachers and teachers.

The style of leadership from the head teacher is of great importance for the performance of teachers in schools. The school head teacher ensures that there is exertion of influence and provision of direction on teachers in order to achieve the school goals (Kinyanjui & Orodho, 2014). It is against this background that this study sought to investigate the most applied head teachers' leadership styles in motivating teachers' in secondary schools of Kitwe district, Zambia.

Literature review

Leadership is viewed as the social influence process through which one individual exerts influence intentionary over others to structure the behaviors and relationship within a group or an organization such as a school (Ukaidi, 2016). Ukaidi (2016) further expressed that organizational productivity,

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such as fora school is dependent on the leadership style adopted. Leadership style is the pattern of behaviors which is engaged in by a leader when dealing with the employee (Chua et al., 2018).

Lewin led a number of researchers to identify different leadership styles. The researchers identified three major leadership styles and these are Autocratic (authoritarian), democratic (participative) and Laissez leadership styles. In order to achieve the school goals the leader should use all the three leadership styles, with one of them being dominant, bad leaders tend to stick with one style of leadership (Kinyanjui & Orodho, 2014).

Ukaidi (2016) defined autocratic leadership style as one in which a leader gives orders and demands that should be carried out by the staff members. In this leadership style no questions are allowed and no explanations are given. Study conducted by Probst & Raisch (2005) found out that autocratic leadership style causes leaders to possess too much power which can resort to negative implications to the performance of an organization such as a school. Probst & Raisch (2005) further expressed that autocratic leadership style limits potentials of other members to excel and thus, discourage employee participation and contributes to low level of job satisfaction and trust in an organization.

Ojokuku et al. (2012) expressed that democratic leadership style is one where decision making is decentralized and shared by the subordinates. It encourages members of an organization to be part of the decision making. Amir et al. (2017), in their research found out that democratic leadership style is friendliness and helpfulness among the members of an organization. Democratic leadership style promotes the participation of staff in decision making (Raelin, 2012).

On laissez-faire leadership style, Muhammed et al., (2015) stressed that Laissez-faire leadership is the one in which the manager provides little or no direction and gives members of an organization as much freedom as possible. All authority or power is given to the employees and they must determine goals, make decisions, and solve problems on their own. Leaders who adopt Laissez-faire leadership style exercise little control over the followers who have freedom to carry out their assigned tasks without direct supervision.

Relationship between teacher motivation and head teachers' leadership styles

Motivation is important in ensuring that an individual get successful in achieving the established goals (Franklin, 2016). Graffari et al., (2017) stressed that motivation in organization is important and is needed for improving the performance of employees in an affirmative manner. Motivational encouragement of work force contributes to a higher quality of human resources and better performance in organizations (Graffari et al., 2017). Employee motivation is very important for organizations as every concern requires a physical, financial and human resources to accomplish the goals. Goals can be achieved if coordination and cooperation take place simultaneously which can be effectively done through motivation (Shalizadi et al., 2014). Employee motivation is the key factor to boost up the function of an organization. Motivated employees are always beneficial for the business organization in order to increase the production level and boost up the frequency of manufacturing (Datuck, 2018).

Study conducted by Kayii (2008) show that effective employee performance depends mostly on levels of staff motivation. The leadership style exhibited by head teachers should motivate teachers to contribute effectively towards the achievement of desired school objectives. Findings of the research conducted by Wasserman (2016) indicates that there is a correlation between the management style and teachers' commitment to work.

Theoretical framework

Study of Franklin (2016) show that researchers have linked the source of employee motivation to different leadership styles. Researchers have examined leadership styles and their influence on motivation of employees. Franklin (2016) used self-determination theory (SDT) in the context of employee motivation as influenced by leadership styles. This study is based on self-determination theory (SDT), study conducted by Gagne & Deci (2005) expressed that self-determination theory, encourages managerial autonomy support. Managerial autonomy support is defined as the leaders acknowledging their staff members perspectives, providing relevant information in a non-controlling

way, offering choice and encouraging self-motivation rather than pressing staff to act in specified ways. Self-determination theory is associated with employees being satisfied with their jobs, having a higher level of trust in corporate management, and displaying other positive work-related attitudes (Gagne & Deci, 2005).

Conceptual framework

According to the study conducted by Adom et al., (2018) defined conceptual framework in statistical perspective to be a relationship between the main concepts of the study. The conceptual framework is arranged in logical structure to provide a picture or visual display of how the variables are related to each other.

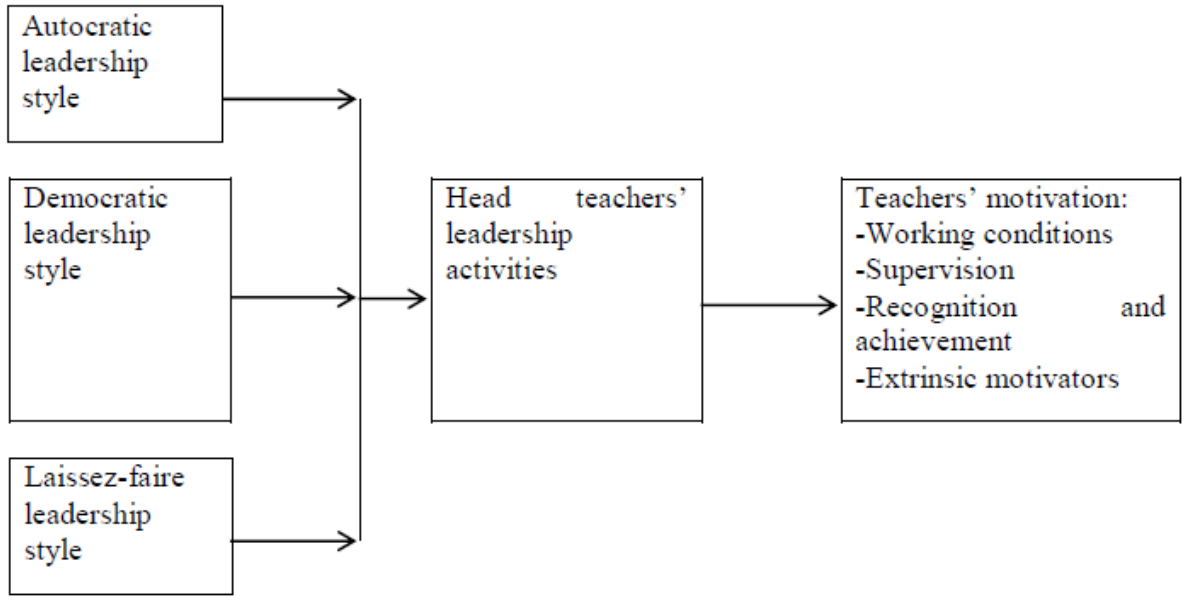

Figure 1. Relationship between head teachers' leadership styles and teachers' motivation.

The conceptual framework above shows that leadership style is the independent variable which has an influence on teachers' motivation. Intervening variables such as intrinsic and extrinsic motivators also influence teachers' motivation. Nevertheless, the leadership style applied by the head teacher has an impact on teachers' motivation. That is, teachers are motivated intrinsically from the required leadership style.

The reviewed literature gave the purpose of the study based on leadership style and teacher's motivation in the school work place in which head teachers exerts influence over teachers in order to reach the desired objectives in the school organization. In this study leadership style is defined as a particular behavioral applied by a leader to motivate his/her subordinates (Kinyanju, 2014). In the literature review three leadership style namely, the autocratic, democratic and Laissez-faire leadership style were discussed.

In autocratic leadership style, the leader held all authority and responsibility. There is little or no group participation in decision making and there is close supervision. In democratic leadership style the workers are involved in decision making and it promotes high morale on the workers. In Laissez-faire leadership style, the leader's waves responsibility and allows workers to work based on their decision with minimum interference. The study aimed at investigating the most applied head teachers' leadership styles in motivating teachers in secondary schools of Kitwe district, Zambia.

Statement of the problem

Learners' achievement in academic work depends on teachers' performance in secondary schools, poor performance of teachers' leads to poor academic achievement of the learners. Teachers' performance depends on both intrinsic and extrinsic motivation given to them through head teachers' leadership styles. In secondary school's head teachers are the ones with the highest authority; this means that they are the ones responsible for spearheading and monitoring of all the school activities.

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It is the head teachers' leadership style and teacher's motivation that the research wants to investigate. The current research investigates the most applied head teachers' leadership styles in motivating teachers' in secondary schools of Kitwe district, Zambia**.**

Purpose and objectives of the study

The purpose of the study was to investigate the most applied head teachers' leadership style in motivating teachers' in secondary schools of Kitwe district, Zambia. The following objectives guided the study:

i.) To determine the extent to which head teachers practice democratic leadership style in motivating teachers in secondary schools of Kitwe district.

ii.) To determine the extent to which head teachers practice laissez-faire leadership style in motivating teachers in secondary schools of Kitwe district.

iii.) To determine the extent to which head teachers practice Autocratic leadership style in motivating teachers in secondary schools of Kitwe district.

iv.) To identify the most used leadership style by the head teachers in motivating teachers in secondary schools of Kitwe district

Research methodology

Research Design

The study was conducted using descriptive survey. The target population was public secondary schools in Kitwe district. The district has 22 public secondary schools with 22 head teachers and 2101 teachers (Statistical data, from Kitwe district educational board office). Simple random sampling was used to select 210 teachers in Kitwe district from all 22 secondary schools. This was 10% of the total number of secondary education teachers. The head teachers were purposively selected from all the secondary schools. Two sets of questionnaires were prepared, one set of questionnaires were administered to the teachers and the other one to the head teachers. To test the reliability of the questionnaire instruments, data set on the questionnaires were subjected to chronbach's Alpha (α) test using statistical package for social sciences version.20 (SPSS 20). The chronbach's Alpha (α) provides an overall reliability coefficient for a set of variables. Overall chronbach's alpha (α) based on standardized head teachers' and teachers' questionnaire items are 0.801 and 0.782 respectively. For the two sets of questionnaire instruments tested, the results indicate that there is high level of internal consistency for the scale with specific data from the questionnaires.

Measures

The questionnaires administered to the head teachers and teachers consisted of the Likert scale questions that were used as the data collection. The questionnaire for the Head teachers consisted of 12 likert items (in Annex I). Among them democratic leadership styles are measured by items 1, 4, 7 and 10, laissez-faire leadership is measured by 2, 5, 8 and 11. Then Autocratic leadership style is measured by 3, 6, 9 and 12. Then the questionnaire for the teachers consisted of 9 likert items (Annex II). Among them democratic leadership style is measured by items 1, 4 and 7, laissez-faire is measured by items 2, 5 and 8. Then Autocratic leadership style is measured by items 3, 6 and 9. All responses for each statement item consisted of five choices, and these choices were given values which are strongly disagree as 1, disagree as 2, neutral as 3, agree as 4 and strongly agree as 5. For responses strongly disagree represents the minimum extent in the scale and strongly agree refers to the maximum extent in the scale relating to a specific extent.

For the measuring purposes of the responses the researcher followed a procedure, for calculating a composite score for each likert item responses. It was done by calculating a mean-item summated score. Warmbrod, (2014) explained that a mean item summated score is an individual summated score divided by the number of items consisting the scale or the subscale, and thereby creating a mean item score for each individual likert item that falls within the range of the values for the continuum options. Warmbrod (2014) further expressed that all items comprising a scale or subscale is assumed to have equal weight when calculating a summated score or a mean item score.

The questionnaires were self-administered to the respondents who are the teachers and head teachers. For this purpose, the researcher distributed self-administered questionnaires to the respondents and assured them that the information provided from them is to be kept confidential. The researcher collected the filled questionnaires on the same day and checked the research tool for ensuring its quality.

Data analysis

The data collected from the respondents with compatibility of addressing the research objectives and research problem was quantitative data. The quantitative data was collected from the likert scale closed ended questions in the questionnaires. The obtained quantitative data from the questionnaires were analyzed using statistical package for social sciences version.20 (SPSS 20) to generate tables of mean scores and standard deviations.

Findings and discussions

Application of democratic leadership style and motivation of teachers

The first objective was to determine the extent to which head teachers practice democratic leadership style in motivating teachers in secondary schools of Kitwe district.

Table 1. Head teachers' mean item scores on democratic leadership style

		Statement no.1	Statement no.4	Statement no.7	Statement no.10
N	Valid	22	22	22	22
	Missing	0	0	0	0
Mean		3.7273	3.7727	4.3182	3.7727
Std. Deviation		1.42032	1.15189	1.08612	1.37778

Table 1 contains results of four likert statements (1, 4, 7 & 10) from the head teachers' questionnaire in Annex I, and it carries information which indicates that head teachers practice democratic leadership style in managing secondary schools in Kitwe district. The study revealed that majority of the head teachers make decisions through consultative forum from the teachers as shown by mean of 4.32, they allow teachers to express their feelings about how things should be done and they look out for personal welfare for teachers as indicated by mean scores of 3.77 for the two statements in Table 1. It has been indicated that head teachers put suggestions made by staff into operation as shown by mean of 3.73.

Table 2. Teachers mean item scores on democratic leadership style

		Statement no.1	Statement no.4	Statement no.7
N	Valid	210	210	210
	Missing	0	0	0
Mean		4.1952	4.5095	4.1524
Std. Deviation-		.83292	.79617	.74860

Table 2 contains results of three statements (1, 4 & 7) from teachers' questionnaire in Annex II, the information from Table 2 shows that teachers have supported that head teacher's practice democratic leadership style in motivating teachers in secondary schools through proper management of secondary schools. The results in table 2 indicates that majority of the head teachers invites teachers to participate in decision making process as shown by a mean of 4.51, the study further shows that teachers get adequate chance to give suggestions on policy matters as indicated by a mean of 4.20, it has been shown that head teachers welcomes questioning by the staff in matters related to school affairs as indicated by a mean of 4.15.

The results in table 1 & 2 are in line with the study conducted by Obi (2003), which reveals that managers who adopt democratic leadership style are most likely to have high performance level from subordinates. Mohammed et al., (2015) expressed that democratic leadership styles requires a leader to be a coach who has the final say, but gather the information from staff members before making the decisions. The research conducted by Datuck, (2018) found that motivated employees are always

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beneficial for the business organization in order to increase the production level and boost up the frequency of manufacturing.

Application of laissez-faire leadership style and motivation of teachers

The second objective was to determine the extent to which head teachers practice laissez-faire leadership style in motivating teachers in secondary schools of Kitwe district.

Table 3. Head teachers mean item scores on laissez-faire leadership style

		Statement no.2	Statement no.5	Statement no.8	Statement no.11
N	Valid	22	22	22	22
	Missing	0	0	0	0
Mean		3.8182	2.1818	2.3636	1.4545
Std. Deviation		1.13961	1.09702	1.49747	.91168

Table 3 contains results of four statements (2,5, 8 & 11) from head teachers questionnaire in Annex I, the information from table 3 shows that Head teachers in secondary schools delegate responsibilities to the teachers as shown by the mean of 3.81, this implies that teachers are motivated as they become responsible and gaining of experience in conducting delegated tasks given to them. The results indicate that head teachers do not allow teachers to diagnose their own problems as shown by mean of 2.36. The responses also show that teachers do not make decisions on their own as indicated by the mean of 2.18. Head teachers gave strongly disagree response to statement number 11 of not supervising teachers as shown by a mean of 1.45.

Table 4. Teachers mean item scores on laissez-faire leadership style

		Statement no. 2	Statement no. 5	Statement no. 8
N	Valid	210	210	210
	Missing	0	0	0
Mean		1.8619	4.2905	1.9190
Std. Deviation		1.01424	1.01491	1.19333

Table 4 above contains the results of the statements (2, 5 & 8) from teachers questionnaire in Annex II, the information from table 4 shows that head teachers delegates some of their responsibilities to their teachers as shown by the mean of 4.29, the responses further indicates that head teachers does not permit staff to use their own judgment in solving problems, it has been shown by the mean of 1.92, teachers responses show that head teachers do not allow teachers to take their own initiatives it has been indicated by a mean score of 1.86.

The results in Table 3 & 4 shows that head teachers are not in favor of using laissez-faire leadership style in governing secondary schools. As it is said that, “more freedom more problems”, laissez-faire leadership style gives more freedoms to the staff in decision making processes. The results in Table 3 & 4 are in line the study conducted by Muhammed et al., (2015) in which they stressed that laissez-faire leadership style leads to high danger to supervision laws. The study conducted by Franklin (2016) show that laissez-faire leadership gives complete autonomy to employee in completing duties in their time frames. Franklin (2016) further stressed that Laissez-Faire leadership style is not useful when the group members lack necessary knowledge, experience to make the decisions, or when they cannot manage their deadlines.

Application of autocratic leadership style and motivation of teachers

The third objective was to determine the extent to which head teachers practice autocratic leadership style in motivating teachers in secondary schools of Kitwe district.

Table 5. Head teachers mean item scores on Autocratic leadership style

		Statement3	statement6	Statement9	Statement12
N	Valid	22	22	22	22
	Missing	0	0	0	0
Mean		1.7273	2.5909	3.1364	2.0000
Std. Deviation		1.27920	1.09801	1.20694	1.23443

Table 5 above contains the results for the statements (3, 6, 9 & 12) from head teachers' questionnaire in Annex I. The information from table 5 shows that head teachers gave a neutral response to the statements that states, " I give orders to the teachers regarding what is to be done and how it should done," and, "I issue detailed instructions and supervise teachers work closely," this have been indicated by mean item summated scores of 3.14 and 2.59 respectively. The head teachers gave a disagree response to the statement that head teachers are slow to accept new ideas, as indicated by an accurate mean score of 2.00. Then head teachers gave a disagree response to the statement that they refuse to explain their actions to the teachers as shown by a mean of 1.73.

Table 6. Teachers mean item scores on Autocratic leadership styles

		Statement no.3	Statement no.6	Statement no.9
N	Valid	210	210	210
	Missing	0	0	0
Mean		1.7619	1.8381	1.5286
Std. Deviation		.99303	1.26130	.98876

Table 6 above contains the results for statements (3, 6 & 9) from teachers' questionnaire in Annex II. It has been shown that head teachers guide as a friend and not as a dictator as shown by a mean of 1.84, teachers gave the response that head teachers in Kitwe district acts with consultation from the teachers as shown by a mean of 1.76, teachers further responded that head teachers make decisions with consultations from teachers, and teachers are free to express their views as it has been shown by a mean of 1.53.

From the results in table 5 & 6, it has been shown that head teachers in secondary schools of Kitwe district are not favor of autocratic leadership style. Misusing of autocratic leadership style styles enables a leader to be rigid in decision making. The results in Tables 5 & 6 are in line with the study conducted by Muhammed et al., (2015) in which they expressed that in autocratic leadership style, the manager does not consult employees and employees are expected to obey orders without giving any explanation. Autocratic leadership style gives less or no confidences to the employees and good interest of the employees are suppressed. Chukwusa (2018) expressed that autocratic leadership style prevents the use of creative ideas to problem solving.

The most used leadership style by the head teachers

The fourth objective was to identify the most used leadership style by the head teachers in motivating teachers in secondary schools of Kitwe district. Head teachers and teachers' responses shows that the most used leadership style by head teachers in Kitwe district is democratic leadership style. Results show that democratic leadership style received "strongly agree" and "agree" responses to the statements that support head teachers in using democratic leadership style than laissez-faire and autocratic leadership style from the questionnaire likert scale questions. It has been indicated by the mean item scores of nearly precisely to 'agree' and 'strongly agree' responses from Table 1 and 2 in agreement of head teachers using democratic leadership style. Then the mean item summated scores from Table 3, 4, 5 and 6, are nearly precisely to 'disagree' and 'strongly disagree' responses which implies that head teachers do not mostly use laissez-faire and autocratic leadership styles. The finding has showed that head teachers in Kitwe district mostly use democratic leadership style in motivating teachers to teach effectively in secondary schools. The study results are in line with what Obi (2003) suggested that managers who adopt democratic leadership style are most likely to have high

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performance level from the subordinates. Democratic leadership style has the greatest advantages in motivating teachers in secondary schools than Autocratic and Laissez-Faire leadership styles.

Conclusions and recommendation

The study found that the most used leadership style by head teachers in managing secondary schools of Kitwe district is democratic leadership style. The results show that sometimes head teachers use Laissez-faire leadership style, and then autocratic leadership style posted the worst results as it has not been commonly practiced by the head teachers.

The findings from the study indicates that teachers are motivated when the head teacher is applying democratic leadership style, as in democratic leadership style head teachers invites teachers for support in decision making process, in this way teachers get adequate chance to give suggestions on policy matters. It has been supported from the study that head teachers who adopt democratic leadership are most likely to have high performance level from the teachers.

The results show that head teachers delegate tasks and responsibilities to teachers by applying laissez faire leadership style. It has shown that head teachers do not commonly apply laissez-faire leadership style because it gives more freedom to the staff members in decision making process. The findings have shown that head teachers in secondary schools do not supervise teachers work closely and head teachers accept new ideas, and they explain their actions to the teachers. It has been shown from the responses that head teachers make decisions with consultations from the teachers and teachers are free to express their views. From this study it has been indicated that head teachers in secondary schools of Kitwe district do not commonly practice autocratic leadership style in managing their secondary schools.

Based on the results of the study, the following recommendations were made:

i. The ministry of general education (MoGE) should engage inspectors at district and provincial level in educational sector to inspect head teachers regularly in secondary schools of Kitwe district and Zambia at large, in order to ensure that head teachers apply all the three (3) leadership styles (democratic, autocratic and laissez-faire) equally without favoring only one type of leadership style .

ii. Head teachers in secondary schools of Kitwe district should apply a specific leadership style for a specific situation at the right time in order to motivate teachers. Each leadership style is suitable to be applied in a required condition.

iii. Head teachers sometimes should collect information from the teachers about what is required for them to be motivated, so that head teachers should identify the best required leadership style that is to be applied for a specific situation.

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Annex

Likert scale

Please tick mark (√) the appropriate number according to the following given indicator.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

Head teachers' perceptions on their leadership styles towards motivation of teachers.

S. N	**Statement**	**Scale**				
1	I put suggestions made by staff into operation.	1	2	3	4	5
2	I allow teachers to make decisions on their own.	1	2	3	4	5
3	I refuse to explain my actions.	1	2	3	4	5
4	I allow teachers to express their feelings about how things should be done.	1	2	3	4	5
5	I delegate responsibilities to the teachers.	1	2	3	4	5

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6	I issue detailed instructions and supervise teachers work closely.	1	2	3	4	5
7	I make decisions through consultative forum.	1	2	3	4	5
8	I let teachers diagnose their own problems.	1	2	3	4	5
9	I give order to the teachers regarding what is to be done and how it should be done.	1	2	3	4	5
10	I look out for personal welfare for teachers.	1	2	3	4	5
11	I do not supervise teachers.	1	2	3	4	5
12	Am slow to accept new ideas.	1	2	3	4	5

Likert scale

Please tick mark (√) the appropriate number according to the following given indicator.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

Teachers' motivation based on head teachers' leadership styles in secondary schools.

S. N	**Statement**	**Scale**				
1	Teachers get adequate chance to give suggestions on policy matters.	1	2	3	4	5
2	Teachers take their own initiatives.	1	2	3	4	5
3	My head teacher acts without consulting the staff.	1	2	3	4	5
4	My head teacher invites teachers to participate in the decision-making process.	1	2	3	4	5
5	My head teacher delegates some of his or her responsibilities to his teachers.	1	2	3	4	5
6	My head teacher does not guide as a friend but as a dictator.	1	2	3	4	5
7	My head teacher welcomes questioning by the staff in matter related to school affairs.	1	2	3	4	5
8	My head teachers permit staff to use their own judgment in solving problems.	1	2	3	4	5
9	My head teachers make the decisions without consulting staff and teachers are not free to express their views.	1	2	3	4	5

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Patients' Satisfaction and its Determinants in Outpatient and Inpatient Departments of Tertiary Hospitals in Ghana: Case Study of Greater Accra Regional Hospital

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Abstract

Background: *One of the most important objectives of any health system is patient satisfaction, yet there is considerable difficulty in the measurement of satisfaction and gauge the responsiveness of healthcare systems. This study assessed the level of satisfaction of patients who utilize the outpatient department and inpatient services of tertiary hospitals in Ghana and also identified the factors that influence patient satisfaction.*

Method: *The study employed quantitative research approach with a cross-sectional study design. A two-stage sampling process based on stratified sampling and convenient sampling was employed. A structured questionnaire was administered to 1000 patients from the outpatient and inpatient departments of Greater Accra Regional Hospital to elicit their satisfaction level with both core-clinical and non-core/system services. The data was analyzed with SPSS version 22.0. Some of the analysis strategies were descriptive statistical tests of comparing means of the various predictors of overall patient satisfaction. Multivariable linear regression analysis was performed to find the factors or determinants that influence patient satisfaction.*

Results: *The satisfaction derived from treatment outcome (β = 0.298, $p < 0.001$) and involvement of patients in treatment decision (β = 0.173, $p < 0.001$) were the strongest determinants of patient satisfaction at the OPD care service. Patient satisfaction with technical service (β = 0.232, $p < 0.001$), service format (β = 0.293, $p < 0.001$) and nursing care (β = -0.187, $p < 0.001$) were the key areas that associated with patient overall satisfaction at the OPD. Patient satisfaction with doctor services (β = 0.20, $p < 0.001$), privacy during treatment (β = 0.14, $p < 0.001$) and complaint handling (β = 0.12, $p < 0.001$) during admission at the ward were the strongest determinants of patient satisfaction at the inpatient setting. The number of nurses on duty, doctors' time spent with patients, communication and behaviors of healthcare staff as well as quality of healthcare support provided by paramedical staff were some of the elements of healthcare that patients place a lot of value on.*

Conclusion: *Majority of the patients in both OPD and inpatients were satisfied with the set of core-clinical service and thus perceived that core clinical service contributed most to their satisfaction as against non-core/system service. Patients' satisfaction can be increased by focusing on improving treatment effectiveness, communication and behavior, doctors spending enough time with patients, reduced waiting time, organized care at OPD, making technical staff available and effectiveness in handling patient complaints.*

Keywords: *Satisfaction, Determinants, Inpatient, Outpatient, Core clinical, Non-core/system service.*

Introduction

Health care systems and particularly tertiary hospitals are the centre of patient care delivery and represent an organisational hub of the bigger health care provider network. Given this role, hospitals now compete in an ever-increasing role as provider of outpatient and inpatient care in a more competitive health environment and also play a leading role in the broader managed health care system. One of the most important objectives of any health system is patient satisfaction, yet, there is considerable difficulty in the measurement of satisfaction and gauge the responsiveness of health care systems. This is because patient satisfaction is influenced not only by clinical factors but also non-clinical factors and outcomes which are usually ignored by health care providers and administrators in

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developing countries (Sanjeewa and Senevirathne, 2017). According to Baalbaki, et al., (2008) patient satisfaction is influenced by many factors which include: quality of clinical (core) services provided, availability of drugs, behaviour of doctors and other health care professionals, cost of services, physical comfort of patients at the hospital, emotional support given to patients, respect for patient preferences and level of hospital infrastructure. They noted that a mismatch of service expectations of patients and quality of health care service received leads to decreased satisfaction, therefore assessing the perspectives of patients gives them the voice which provides the important input to make public health services more responsive to patient needs and expectations.

In recent times, studies on patient's satisfaction with health care delivery has gained popularity and usefulness as it provides health care providers and administrators the opportunity to improve their services especially in public health facilities. Assessing patient's feedback is important to identify problems that need resolution to enhance the quality of health care delivery as well as triggering interest that leads to change in hospital employee culture and their perception of delivery of health care to patients, (Sanjeewa and Senevirathne, 2017). As a result, measuring satisfaction of patients has become an integral part of hospital management and strategies for assuring quality and accreditation in most countries. It is also a way of assessing the process of health care, eliciting patient's viewpoint and evaluating health care by incorporating the views of patients back into the healthcare system.

Problem statement

In spite of all the commitment of the Ghana government, the Ghana Health Service and Donor agencies as well as other stakeholders to improve the level of quality of health care services in the country, there is still a strong perception of unsatisfactory services provided by health professionals in public health facilities in the areas of relationship with patients, care and treatment, consent and confidentiality of patients, access to basic information about their rights and sanitation of working environment, (MOH, 2007). Ghana's Ministry of health (MOH) has over the years concerned itself with quality of healthcare which yields patient satisfaction. However, pace of quality improvements has been slow and objectives have not been met. According to Ahenkan and Aduo-Adjei (2017) this is the result of inadequate priority given to improvement of healthcare quality. In lieu of this, there is the growing need to research into quality of health service delivery in the country especially with respect to patient satisfaction which is a key indicator of and integration of quality assurance in Ghana's health care system and facilities. In Ghana many of the studies of health care quality have focused on service quality dimensions. Also, studies conducted in public hospitals in Ghana have provided empirical evidence of inadequate level of quality of health care services both in terms of objective measures of patient opinions and that of health care providers (Ahenkan and Aduo-Adjei, 2017). Extensive research revealed that, there have not been studies that have looked at how patient satisfaction is influenced differentially by clinical factors (core services) and non-clinical (health system) factors and outcomes. Also, the objects of the studies carried out in Ghana have been outpatients' service experience and no study has focused on adding inpatients service experience in measuring the level of service quality delivered by hospitals (Essiam, 2013, Ahenkan and Aduo-Adjei, 2017).

The continuous monitoring and evaluation of views on the quality of healthcare is important for quality improvement commitments. This study focuses on the assessment of the relative contribution of core hospital clinical services and non-clinical services to patient satisfaction relying on post patient discharge survey.

Aim and objectives

The main aim of the study was to assess the level of satisfaction of patients who utilise the Outpatient department (OPD) and inpatient services of tertiary hospitals in Ghana and to identify the factors that influence patient satisfaction using the case of the Accra Regional Hospital. To achieve this aim the following fourfold objectives were pursued:

i. To measure the levels of patient satisfaction with all aspects of health care service encounter both in the outpatient and inpatient settings of the Accra Regional Hospital.

ii. To find out the elements, that patient's value and factors that influence satisfaction or dissatisfaction.
iii. To assess the level to which non-medical customer services influence patient satisfaction at the Accra Regional Hospital.

Methods

The study employed quantitative research approach, with a cross-sectional study design. The study location was the Greater Accra Regional Hospital. The study population comprised of all the people who visited the GARH to access their clinical services both outpatient and inpatient. All participants were Ghanaians of age 18 years and above and have direct experience with the Greater Accra Regional Hospital; either have received health service at the OPD or have been on admission for at least two days as inpatient or both. Patients who were unconscious or in critical health conditions as well as isolated wards were excluded from the study. A two-stage sampling process based on stratified sampling and convenient sampling was employed to sample 1000 patients from both outpatient and inpatients service settings. A post patient discharge structured survey was administered to patients. The survey questionnaire was designed to test the successive steps of the patient experience and how it affects the overall satisfaction. To measure the level of satisfaction with each event in a service set or overall service experience, a seven-point Likert scale ranging from "very dissatisfied=1, dissatisfied=2, somewhat dissatisfied=3, neutral=4, somewhat satisfied=5, satisfied=6 to "very satisfied=7" was employed. Also, at the end of the second and third section of the questionnaire a question was inserted to capture information from patients concerning the service experience that affect their satisfaction most, with respect to core clinical services and non-core health system services. A total of 29 measures were employed to assess the service perceptions of patients in nine categories: admissions, nursing, food services, housekeeping, technical services, doctor's services, orderly services, service format and discharge. To assess the level of satisfaction with outpatient department services, 19 measures in six categories (admission, nursing, doctor's services, technical services, service format and discharge) were used. With regards to assessment of level of satisfaction with inpatient services, 10 measures within nine categories (admissions, nursing, food services, housekeeping, technical services, doctor's services, orderly services, service format and discharge) were used. To measure the overall satisfaction with service encounter in both cases of outpatient and inpatient service encounters, two additional measures were used. Data collected from the structured questionnaire was coded and analysed with SPSS version 22. Descriptive analysis such as frequency tables were used to present patients satisfaction levels. Some of the analysis strategies were descriptive statistical tests of comparing means of the various predictors of overall patient satisfaction. Multivariable linear regression analysis was performed to find the factors or determinants that influence patient satisfaction.

Results

Levels of patient satisfaction with services in the outpatient

The primary purpose of this study was to gain an understanding of patient level of satisfaction and its determinants. A 7- point Likert-type questionnaire was used to illicit the satisfaction of patients with regards to the services they received. Level of satisfaction with OPD services was quantified by the following 6 aspects/dimensions: Core clinical involving nursing care**,** doctor services and technical services; then Non- Core/ System services involving admissions, discharge and service format.

The proportion of patient satisfaction with most nursing care at OPD was generally low. For example, only 30.2 % of patients were satisfied with the number of nurses on duty. The highest and lowest satisfaction levels were seen in the dimensions of responsiveness of nurses (36%) and answers to importance and understanding of those answers (27%) respectively. The illustration can be found in Table 1 in additional file.

Generally, the proportion of patients who were satisfied with doctor services was average. The highest satisfaction level was 61.2% which is doctors allowing patients to ask questions and getting

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answers which, they understood. However, the lowest satisfaction level was 38.2% which is doctor spending enough time with patients. This is illustrated in Table 2 in additional file.

The proportion of patient satisfaction with the technical services was a little below average. The highest of the satisfaction level was 45% of the patients were satisfied with the availability of technical staff (lab technicians, pharmacists, radiologists etc.) while, the lowest 31.2% patients were satisfied with the waiting time or the period spent at the lab testing and other diagnostic test sections. This is illustrated in Table 3 in additional file.

The proportion of patients who were satisfied with the admission services at the non – core clinical segment was generally high as there were some highly satisfied respondents. For instance, 68.4% were satisfied with the cleanliness of the reception area and examination room. The lowest satisfaction level was 40.2% which was the length of time patient had to wait at the reception/waiting area before seeing a doctor. This is illustrated in Table 4 in additional file.

The section of discharge recorded a relatively low satisfaction levels by the patients. Only 37.8% of the patients were satisfied with the explanation of the purpose of the medicines they were given to take home and could understand. The lowest among them was 27.4% of the patients were satisfied with doctors or nurses giving information needed for patient recovery at home to a family or close friend of patient. This clearly shows that the satisfaction level was very low at the discharge of the patients at the OPD. This is illustrated in Table 5 in additional file.

The proportion of respondents who ascertain that they were satisfied with the service format was averagely good. The highest of the proportion was 60% of the patients were satisfied with the level of privacy when discussing their condition, being examined and during treatment. Whiles on the lowest side, 29.8% of the patients were satisfied with the process of finding someone on the hospital staff to talk to about their worries and fears and given emotional support. This is illustrated in Table 6 in additional file.

Perceived overall satisfaction with OPD services

At the OPD, 52.4% patients were satisfied with the way they were treated and cared for while in the hospital. Also, 43.85% of the patients indicated that they were satisfied with the overall services they received from the OPD whiles 34.2% indicated that they were not satisfied with the overall service they received at the OPD. This is illustrated in table 7.

Table 7. Perceived overall satisfaction with OPD services

Item/aspect of dimension	**Frequency (n)**	**Percentage (%)**
Overall, how satisfied were you with the way you were treated and cared for while you were in the hospital		
Very dissatisfied	48	9.6
Dissatisfied	46	9.2
Somewhat dissatisfied	55	11.0
Neutral	89	17.8
Somewhat satisfied	116	23.2
Satisfied	91	18.2
Very satisfied	55	11.0
Thinking about all aspects of your hospital stay, how satisfied were you?		
Very dissatisfied	20	4.0
Dissatisfied	59	11.8
Somewhat dissatisfied	92	18.4
Neutral	110	22.0
Somewhat satisfied	95	19.0
Satisfied	78	15.6
Very satisfied	46	9.2

Of the 500 out-patients interviewed 231 (46.2 %) considered the services to be high satisfaction. The highest satisfaction mean score was in admissions (M=30.4) and lowest mean score was in discharge procedures and instructions (M=22.8) as illustrated in Table 8.

Table 8. Descriptive statistics of OPD satisfaction scores

	N	Minimum	Maximum	Mean	Std. Deviation
Patient satisfaction with nursing clinical services score	500	9.00	42.00	23.3	6.61
Patient satisfaction with doctor services score	500	14.00	42.00	27.3	5.91
Patient satisfaction with technical services score	500	11.00	37.00	24.2	7.14
Non- Core/ System Services: admissions score	500	13.00	49.00	30.7	6.62
Non- Core/ System Services: discharge score	500	10.00	40.00	22.8	6.28
Service format score	500	11.00	42.00	25.0	6.59
Overall satisfaction with OPD services score	500	83.00	216.00	153.3	22.86
Valid N (listwise)	500				

Determinants of patient satisfaction in an out-patient setting

Being satisfied with treatment outcome [beta coefficients (β) = 0.298, p <0.001] and involvement in treatment decision (β = 0.173) were the strongest predictors of patients' satisfaction with OPD care services. The set of determinants accounted for 34.6 % of the variance in out-patient overall satisfaction (Adjusted R Square = 0.346). This is illustrated in Table 9.

Table 9. Determinants of global patient satisfaction (Multivariable linear regression analysis)

	Standardized Coefficients			95.0% Confidence Interval for β		Collinearity Statistics	
Model	Beta (β)	T	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
(Constant)		0.814	0.416	-.584	1.410		
Treatment satisfaction	0.298	6.62	<0.001	.185	.342	.842	1.187
Type of health insurance	0.084	2.00	0.047	.004	.549	.963	1.039
Confidence and trust	-0.194	-4.09	<0.001	-.256	-.090	.759	1.317
Communication and behaviour	0.148	3.10	0.002	.055	.246	.747	1.338
Enough time spent with doctor	0.118	2.79	0.006	.031	.179	.954	1.048
Availability of technical staff	0.104	2.21	0.028	.011	.183	.766	1.306
Reduced waiting time	0.114	2.37	0.019	.020	.213	.732	1.366
Patient complaints handling effectiveness	0.092	2.11	0.036	.006	.174	.894	1.118
Comfortability at the reception	-0.133	-2.85	0.005	-.214	-.039	.780	1.282
Organized care at OPD	0.124	2.40	0.017	.021	.212	.640	1.562
Involvement in treatment decision	0.173	3.39	0.001	.068	.256	.653	1.531

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In terms of domains, patient satisfaction with technical services, service format and patient satisfaction with nursing care were the key areas that associated with patient satisfaction at OPD as illustrated in Table 10.

Table 10. Determinants of overall patient satisfaction at OPD (Multivariable linear regression analysis)

Model	Standardized Coefficients	T	Sig.	95.0% Confidence Interval for β		Collinearity Statistics	
	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)		6.24	<0.001	1.537	2.950		
Patient satisfaction with technical services score	0.232	5.02	<0.001	0.032	.073	.820	1.220
Service format score	0.293	6.88	<0.001	0.051	.092	.970	1.031
Patient satisfaction with nursing care score	-0.187	-4.00	<0.001	-0.068	-.023	.800	1.250

Levels of patient satisfaction with in-patient services

Majority of the patients 31.0 %, 49.4 %, 32.2 %, were least satisfied with the availability of nurses for consultation, getting understood answers for important questions from a nurse, confidence and trust in the nurses treating them respectively. However, 59.8% of patients were satisfied with nurses' dispensing/providing prescribed medication in timely manner. This is illustrated in Table 11 in additional file.

Patient satisfaction with technician and non-core clinical services was highest for clarity of billing process and itemized list of charges (60.6%). Patients were least satisfied (29.6 %) with the way complaints were handled whilst on admission at the ward as illustrated in Table 12 in additional file.

Most patients (69.6 %) were satisfied with the variety of meals served. Orderly staff courtesy recorded the least satisfaction of 44.8 % among the orderly services but their punctuality met 65.6 % patient satisfaction. This is illustrated in Table 13 in additional file.

Of the 500 inpatients interviewed, 45.8 % (95 % CI: 41.4 - 50.2) were satisfied with health care services received for inpatient care. The highest satisfaction mean score expressed by patients was in discharge services (M=4.1) and lowest score was in admission procedures and instructions (M=1.2) as illustrated in Table 14.

Table 14. Descriptive statistics of in-patient satisfaction scores

	N	Minimum	Maximum	Mean	Std. Deviation
Total satisfaction score for nurse clinical services	500	0.00	6.00	2.8	2.05766
Total satisfaction score for doctor services	500	0.00	6.00	3.3	1.79313
Total satisfaction score for technician services	500	0.00	6.00	2.7	1.92388
Total satisfaction score for admission services	500	0.00	3.00	1.2	.93261
Total satisfaction score for discharge services	500	0.00	8.00	4.1	1.68680
Total satisfaction score for support services	500	0.00	6.00	3.7	1.59875
Total satisfaction score for food services	500	0.00	5.00	3.2	1.32647
Total satisfaction score for orderly services	500	0.00	5.00	2.9	1.63222

Total satisfaction score for housekeeping services	500	0.00	3.00	1.7	.97851
Total satisfaction score for inpatient care	500	12.00	44.00	25.6	5.27853
Valid N (listwise)	500				

Determinants of patient satisfaction at in-patient setting

The most influential determinants of overall in-patient satisfaction at inpatient setting were total satisfaction with doctor services (β = 0.20, p <0.001), privacy during patient treatment (β = 0.14, p = 0.001) and complaint handling during admission at the ward (β = 0.12). However, with laboratory testing and other diagnostic tests waiting time was significantly associated with a reduction in overall in-patient satisfaction.

Regarding the performance of service component, higher ratings for quality of health care / support provided by paramedical staff resulted in an increase of 0.31 in global patient satisfaction in the ward. The set of determinants accounted for 21.2 % of the variance in in-patient overall satisfaction (Adjusted R Square = 0.212). This is illustrated in Table 15.

Table 15. Factors influencing in-patient's satisfaction (Multivariable linear regression analysis)

	Standardized Coefficients			95.0% Confidence Interval for β		Collinearity Statistics	
Model	Beta (β)	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
(Constant)		0.861	0.390	-.080	.205		
Total satisfaction score for doctor services	0.20	4.916	<0.001	.032	.074	.958	1.044
Lab testing and other diagnostic tests waiting time	-0.13	-3.144	0.002	-.196	-.045	.980	1.021
Complaint handling during admission at the ward	0.12	2.812	0.005	.037	.207	.922	1.085
The hospital routine and procedures (visiting hours, doctors' visits, etc.)	0.10	2.504	0.013	.021	.177	.925	1.081
Finding hospital staff to talk to about worries and fears	0.12	2.686	.007	.032	.204	.859	1.164
Privacy when discussing patient treatment	0.14	3.376	.001	.058	.218	.875	1.143
Facilities cleanliness	0.09	2.295	.022	.013	.165	.962	1.040
Quality of health care / support provided by para medical staff	0.31	7.634	.000	.224	.379	.952	1.051

Most satisfied service

Majority of the respondents were mostly satisfied with the set of Core- clinical service {Nursing services, doctor services and technical services} which represents about 55% of the sample patients whiles, the set of Non-core clinical/system service {Admission, discharge, service format, food service, housekeeping service and orderly service} had 45%. Thus, majority of the respondents at both the outpatient and inpatient departments perceive that core clinical services contribute most to their satisfaction. This is illustrated in Table 16.

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Table 16. Most Satisfied Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Core Clinical Service** (Nursing Care, Doctor Services, Technical Services)	550	55.0	55.0	55.0
	Non-Core clinical / System Services (Admission, Discharge, Service Format, Food services, Housekeeping Service, Orderly Service)	450	45.0	45.0	100.0
	Total	1000	100.0	100.0	

Discussion

Nursing care and doctor services are major aspects of the core-clinical services at the OPD; hence they have a lot of influence on patient satisfaction. In this study, patients' satisfaction with nursing care at the OPD was generally low. However, the satisfaction with doctor services was fairly average despite majority of the patients (45.8%) were dissatisfied with the time doctors spent with them. This could be as a result of patients expecting more from the nurses but the number of nurses on duty at any point in time was not enough. Also, the inadequate doctor to patient ratio does not allow the doctors to spend enough time on each patient, hence the dissatisfaction.

The other core-clinical service at the OPD is technical service. Generally, the level of patient satisfaction with technical service was a little below average. Though 45% of the patients were satisfied with the availability of technical staff, only 31.2% were satisfied with the time they had to wait for a laboratory test or other diagnostic test. Long waiting time is a challenge at the hospital as patients become frustrated with delays in seeking healthcare. Aldana et al., (2001) confirmed in a study that a significant reduction in waiting time at the hospital is more significant to patients' satisfaction in healthcare delivery.

Admissions, discharge and service formats are the non-core/system services at the OPD. Patients were largely satisfied with the admission process. The cleanliness of the reception area and examination room attracted a satisfaction level of 68.4% as well as 63% for the comfort of the reception area and examination rooms. This finding is supported by Andaleeb (1988) who showed that if physical facilities including cleanliness, modern equipment and the general feeling that the hospital is in a good physical condition are well perceived, then patient satisfaction increases.

Despite the high level of satisfaction with the admission process, only 40.2% were satisfied with the length of time patient had to wait at the reception /waiting area before seeing a doctor. Atinga et al., (2011) confirmed that waiting time is an important tool of measuring perceived quality healthcare from the perspective of patients who utilize healthcare service.

The section of discharge recorded a relatively low satisfaction levels by the patients. Most patients were not given any information about the drugs they were given to take home and the side effects they should watch out for. Also most had no idea whom to contact at the hospital should their condition get worse at home after discharge.

The level of satisfaction with service format at the OPD was averagely good. Greater number of the patients (60%) was satisfied with the level of privacy during treatment and examination. However, the process of finding someone on the hospital staff to talk to about patients' worries and fears as well as emotional support attracted a low satisfaction level of 29.8%. The inability to find a health staff to

alley one's fears and receive emotional support reduced the satisfaction levels of patients. This finding is supported by Crosby (1990) who maintains that staff performance of service influence patients' perception of quality healthcare delivery in a hospital and thus affects patients' satisfaction. Generally, majority of the patients (52.4%) were satisfied with the healthcare they received at the OPD despite the few challenges.

The study found out that the satisfaction derived from treatment outcome and involvement of patients in treatment decision was the strongest determinants of patient satisfaction with OPD care service. Thus, the ultimate expectation of every patient who visits the hospital is to recover from the illness. Involvement of the patient in the treatment decision is also imperative in order to boost compliance and adherence to treatment guidelines that will lead to early recovery.

Improving treatment effectiveness, communication and behaviour, reducing waiting time and doctors spending enough time with patients as well as effectively handling patient complaints would eventually increase the level of patient satisfaction at the OPD.

At the inpatient setting, nursing care which is a core-clinical service recorded a low satisfaction level. The availability of nurses for consultation, provision of answers to questions and confidence and trust in nurses' treatment at the inpatient setting attracted low satisfaction levels of 31%, 49.4% and 32.2% respectively. This means either nurses do not avail themselves to listen to patients and provide answers to their questions or they are preoccupied with their core duty of nursing patients and leaving the consultations for the doctors. This finding is supported by John (1991) who alleged that service quality perceptions in hospitals could be improved through communication between patients and healthcare providers. Thus, when communication between the healthcare provider and the patient is lacking, it affects the level of satisfaction with healthcare service.

The way patients' complaints were handled whilst on admission at the ward recorded low level of satisfaction (29.6%). Patients normally become frustrated and disoriented when their complaints are not handled properly and that affects their level of satisfaction with healthcare services.

Doctors spending enough time with patients at the inpatient setting attracted a low level of satisfaction of 27.4% just as it pertains to the OPD and could account for same reason. However, the limited time the doctors spent with the patient, they allowed patients to ask questions concerning their treatment and they received answers which contributed to the increased level of satisfaction of 76.6% in that regard.

The study found that the satisfaction derived from doctor services, privacy during treatment and complaints handling during admission to the ward were the influential determinants of patient satisfaction at the inpatient setting. Thus, when patients are satisfied with the doctor services and their privacy is assured as well as addressing their complaints while on admission, and then patients would be satisfied with the service at the inpatient setting.

The divergence between patient's satisfaction at the outpatient (OPD) and in-patient department was clearly ascertained that in the OPD, patient satisfaction with treatment outcome $\beta = 0.298$ and their involvement with the treatment decision $\beta = 0.173$ had high influence on satisfaction than other overall healthcare services of the core clinical services. These results back the assertion of Boris & Yuvel (2012), who ascertain that in measuring patient satisfaction in hospitals in North Carolina, there is the need to ascertain what services the patients were in for, either inpatient or outpatient. This is because, in many instances, their aspirations and expectations to satisfactions differ very much.

Whereas in the inpatient services the doctor services $\beta = 0.20$ and privacy during patient treatment $\beta = 0.14$ had a lot of impact on patient satisfaction. This had a backing from the literature coming from Ameta (2012) on patient's satisfaction between OPD and inpatient; it showed the level of difference of divergence between the satisfactions gained by the patients after the healthcare delivery has been made.

The process of ascertaining the elements and factors which patients' value and that influences satisfaction or dissatisfaction is very important to the healthcare delivery system. The study revealed that outpatients (OPD) tends not to be satisfied with the nurses on duty, which means that they value the number of nurses taking care of the patients. This agreed with Robinson (2011) who ascertained that nurses plays a core role in healthcare delivery and the quality elements of healthcare depends on whether there is enough of them available.

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Also, the doctors' time spent with patients (β = 0.148) at the core clinical service has huge value element on patients. The treatment provided by the doctors influenced their satisfaction during the doctor services as against the availability of technical staff during the technical services really improved their satisfaction. This tends to agree with Boris & Yuvel (2012) who found that every patient in hospitals in Israel had variant degree of satisfaction they value most at various hospitals. However, Patel (2013) made it known that doctors are the core foundation of healthcare delivery and the time they spent with a patient will be valued based on the effective outcome ensured in the process of patient's expectations on the healthcare delivery.

Another value element was in the context of the communication and behaviour of nurses and doctors at the hospital. With β = 0.759 of the impact on patient's satisfaction level of communication in the healthcare delivery, this means that communication and behavioural factor of nurses and doctors forms a core value element for patients. This was confirmed by Yeboah (2011) who illustrated that nurses are most rated on the communication and good behaviour they showed towards patients who needed their help. However, according to the MoH (2013), nurses to patient ration is about 1: 839 and as a result, they are much stress and need to assist a lot of patients in the process, making their communication and behaviour tend to fall below expectations.

There was marginal level of impact from non-core clinical services, starting from the OPD; there was average level of satisfaction from patients who have to wait a longer period of time before seeing a doctor (40.2%). This finding was backed by Majory (2012), who ascertained that most patients always appreciate the time they could book an appointment with a doctor and not have to wait for so long. Because, the higher they wait, the less satisfied they become with the healthcare delivery.

At the inpatient service settings in as much as the patients were very satisfied with the food served, orderly services and other cleanliness of the hospital, it does not affect their level of satisfaction that much. This was in line with Smith (2012) who established that patients' level of satisfaction could not be affected by many non – core clinical factors like neatness and appropriate response given to patients during the healthcare delivery.

Conclusion

Generally, patients from both outpatient and inpatient settings had some level of satisfaction with the services that were provided. Some of the services recorded high levels of satisfaction while others recorded low levels of satisfaction.

Patients' satisfaction with healthcare delivery at the hospital is divergent between the outpatient and inpatient settings. Therefore, factors which influence patient satisfaction at the outpatient department might not necessarily have the same impact on patients' satisfaction at the inpatient setting. Thus, what matters most to patients varies greatly with respect to the setting or department.

The number of nurses on duty, doctors' time spent with patients, communication and behaviors of healthcare staff as well as quality of healthcare support provided by paramedical staff were some of the elements of healthcare that patients place a lot of value on.

Patients' satisfaction can be increased by focusing on improving treatment effectiveness, communication and behavior, doctors spending enough time with patients, reduced waiting time, organized care at OPD, making technical staff available and effectiveness in handling patient complaints.

Although the level of satisfaction of patients concerning healthcare delivery depends on both core and non – core clinical services, the composition variables have different level of impact on each patient.

Limitation

- The study suffers from certain limitations, namely non-utilization of case-mix adjustment methodologies and failure to explore patient satisfaction with individual OPD and Diagnostic services departments or services.
- The study did not delve into the behavior intentions of patients who are receiving the services provided by the hospital.
- The study employed a cross sectional design instead of a longitudinal research design.

- The research involves patient surveys and questionnaires, which reflects the patient's personal views which are then applied to a generalized population.

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Ethical consideration

Ethical clearance and approval to conduct the study was obtained from Ghana Health Service Ethical Review Committee. Permission was sought from the management of the Greater Accra Regional Hospital to conduct the study at their facility. An informed consent of the respondents was sought. The prospective respondents were provided with information sheet which explained in detail the study objectives and significance of the study as well as what is expected from respondents. Anonymity and confidentiality of the actual source(s) of information obtained from the study was ensured by not indicating the names of individuals who took part in the study.

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Table 1. Patient satisfaction with nursing care at the OPD

Item/aspect of dimension	**Frequency (n)**	**Percentage (%)**
1.There were enough nurses on duty to care for you in hospital		
Very dissatisfied	17	3.4
Dissatisfied	28	5.6
Somewhat dissatisfied	120	24.0
Neutral	184	36.8
Somewhat satisfied	81	16.2
Satisfied	35	7.0
Very satisfied	35	7.0
2. When you had important questions to ask a nurse, you got answers that you could understand		
Very dissatisfied	40	8.0
Dissatisfied	68	13.6
Somewhat dissatisfied	128	25.6
Neutral	129	25.8
Somewhat satisfied	49	9.8
Satisfied	60	12.0
Very satisfied	26	5.2
3. Confidence and trust in the nurse treating you	**Frequency (n)**	**Percentage (%)**
Very dissatisfied	63	12.6
Dissatisfied	66	13.2
Somewhat dissatisfied	106	21.2
Neutral	101	20.2
Somewhat satisfied	69	13.8
Satisfied	50	10.0
Very satisfied	45	9.0
4.Communication/ behaviour of nursing staff towards you		
Very dissatisfied	40	8.0
Dissatisfied	54	10.8

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Somewhat dissatisfied	123	24.6
Neutral	134	26.8
Somewhat satisfied	70	14.0
Satisfied	39	7.8
Very satisfied	40	8.0
5.Dispensing/ providing prescribed medications in timely manner		
Very dissatisfied	46	9.2
Dissatisfied	45	9.0
Somewhat dissatisfied	112	22.4
Neutral	118	23.6
Somewhat satisfied	73	14.6
Satisfied	70	14.0
Very satisfied	36	7.2
6.Responsiveness of nurses- respond immediately when I try to get their attention		
Very dissatisfied	41	8.2
Dissatisfied	46	9.2
Somewhat dissatisfied	110	22.0
Neutral	122	24.4
Somewhat satisfied	91	18.2
Satisfied	41	8.2
Very satisfied	49	9.8

Table 2. Patient satisfaction with doctor services

Item/aspect of dimension	**Frequency (n)**	**Percentage (%)**
1.Doctor spent enough time with you		
Very dissatisfied	63	12.6
Dissatisfied	86	17.2
Somewhat dissatisfied	80	16.0
Neutral	78	15.6
Somewhat satisfied	99	19.8
Satisfied	68	13.2
Very satisfied	26	5.2
2.Being polite, making you feel at ease, courtesy, explaining your condition and treatment		
Very dissatisfied	7	1.4
Dissatisfied	15	3.0
Somewhat dissatisfied	81	16.2
Neutral	91	18.2
Somewhat satisfied	126	25.2
Satisfied	110	22.0
Very satisfied	70	14.0
3.Listening to you and Involving you in decisions about your care and treatment		
Very dissatisfied	7	1.4
Dissatisfied	42	8.4
Somewhat dissatisfied	89	17.8
Neutral	144	28.8

Somewhat satisfied	111	22.2
Satisfied	69	13.8
Very satisfied	38	7.6
4.Providing or arranging treatment for you		
Very dissatisfied	26	5.2
Dissatisfied	97	19.4
Somewhat dissatisfied	80	16.0
Neutral	94	18.0
Somewhat satisfied	116	23.2
Satisfied	87	17.4
Very satisfied	26	5.2
5.Doctor allowed you to ask questions and gave you answers that you understood		
Very dissatisfied	19	3.8
Dissatisfied	25	5.0
Somewhat dissatisfied	39	7.8
Neutral	83	16.6
Somewhat satisfied	112	22.4
Satisfied	126	25.2
Very satisfied	96	19.2
6. Confidence and trust in the doctors treating you		
Very dissatisfied	28	5.6
Dissatisfied	20	4.0
Somewhat dissatisfied	99	19.8
Neutral	111	22.2
Somewhat satisfied	112	22.4
Satisfied	63	12.6
Very satisfied	67	13.4

Table 3. Patient satisfaction with technical services

Item/aspect of dimension	**Frequency (n)**	**Percentage (%)**
1. Availability of technical staff (lab technician, pharmacists, radiologist)		
Very dissatisfied	23	4.6
Dissatisfied	63	12.6
Somewhat dissatisfied	86	17.2
Neutral	103	20.6
Somewhat satisfied	57	11.4
Satisfied	87	17.4
Very satisfied	81	16.2
2. Lab testing and other diagnostic tests waiting time		
Very dissatisfied	49	9.8
Dissatisfied	68	13.6
Somewhat dissatisfied	88	17.6
Neutral	139	27.8
Somewhat satisfied	90	18.0
Satisfied	55	11.0
Very satisfied	11	2.2

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3.Availability of investigations results		
Very dissatisfied	37	7.4
Dissatisfied	42	8.4
Somewhat dissatisfied	123	24.6
Neutral	98	19.6
Somewhat satisfied	72	14.4
Satisfied	99	19.8
Very satisfied	29	5.8
4.Availability / provision of medicines by hospital		
Very dissatisfied	28	5.6
Dissatisfied	45	9.0
Somewhat dissatisfied	95	19.0
Neutral	119	23.8
Somewhat satisfied	107	21.4
Satisfied	72	14.4
Very satisfied	34	6.8
5.Approach/ behaviour of technical staff (lab technician, pharmacists, radiologist)		
Very dissatisfied	52	10.4
Dissatisfied	80	16.0
Somewhat dissatisfied	56	11.2
Neutral	106	21.2
Somewhat satisfied	79	15.8
Satisfied	78	15.6
Very satisfied	49	9.8
6. Availability of other technical services (x-ray, eye testing, CT scan etc)		
Very dissatisfied	48	9.6
Dissatisfied	63	12.6
Somewhat dissatisfied	141	28.2
Neutral	62	12.4
Somewhat satisfied	78	15.6
Satisfied	63	12.6
Very satisfied	45	9.0

Table 4. Non- Core/ System services: admissions

Item/aspect of dimension	**Frequency (n)**	**Percentage (%)**
1.Helpfulness and support of the Staff at registration desk and OPD		
Very dissatisfied	26	5.2
Dissatisfied	78	15.6
Somewhat dissatisfied	98	19.6
Neutral	86	17.2
Somewhat satisfied	96	19.2
Satisfied	62	12.4
Very satisfied	54	10.8
2.The length of time you had to wait before you were registered		
Very dissatisfied	15	3.0

Dissatisfied	36	7.2
Somewhat dissatisfied	86	17.2
Neutral	123	24.6
Somewhat satisfied	156	31.2
Satisfied	62	12.4
Very satisfied	54	10.8
3.Length of time you had to wait in the reception/ waiting area before seeing a doctor		
Very dissatisfied	60	12.0
Dissatisfied	49	9.8
Somewhat dissatisfied	71	14.2
Neutral	119	23.8
Somewhat satisfied	104	20.8
Satisfied	61	12.2
Very satisfied	36	7.2

4.Total time spent at the OPD		
Very dissatisfied	29	5.8
Dissatisfied	50	10.0
Somewhat dissatisfied	69	13.8
Neutral	124	24.8
Somewhat satisfied	115	23.0
Satisfied	66	13.2
Very satisfied	47	9.4
5.Effectiveness in handling patient complaints		
Very dissatisfied	40	8.0
Dissatisfied	67	13.4
Somewhat dissatisfied	40	8.0
Neutral	130	26.0
Somewhat satisfied	131	26.2
Satisfied	53	10.6
Very satisfied	39	7.8
6.The comfort of the reception area and examination rooms		
Very dissatisfied	28	5.6
Dissatisfied	30	6.0
Somewhat dissatisfied	46	9.2
Neutral	81	16.2
Somewhat satisfied	110	22.0
Satisfied	128	25.6
Very satisfied	77	15.4
7. The cleanliness of the reception area and examination room.		
Very dissatisfied	3	0.6
Dissatisfied	14	2.8
Somewhat dissatisfied	65	13.0
Neutral	76	15.2
Somewhat satisfied	122	24.4
Satisfied	126	25.2
Very satisfied	94	18.8

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Table 5. Non- Core/ System Services: Discharge

Item/aspect of dimension	Frequency (n)	Percentage (%)
1.Explanation of the purpose of the medicines you were to take at home in a way you could understand		
Very dissatisfied	19	3.8
Dissatisfied	29	5.8
Somewhat dissatisfied	117	23.4
Neutral	146	29.2
Somewhat satisfied	95	19.0
Satisfied	53	10.6
Very satisfied	41	8.2
2.Information about medication side effects to watch for when you go home		
Very dissatisfied	91	18.2
Dissatisfied	70	14.0
Somewhat dissatisfied	89	17.8
Neutral	108	21.6
Somewhat satisfied	85	17.0
Satisfied	21	4.2
Very satisfied	36	7.2
3.Information on danger signals you should watch for after you go home		
Very dissatisfied	54	10.8
Dissatisfied	78	15.6
Somewhat dissatisfied	116	23.2
Neutral	85	17.0
Somewhat satisfied	65	13.0
Satisfied	71	14.2
Very satisfied	31	6.2
4.Doctors or nurses gave your family or someone close to you all the information they needed to help you recover		
Very dissatisfied	32	6.4
Dissatisfied	107	21.4
Somewhat dissatisfied	115	23.0
Neutral	109	21.8
Somewhat satisfied	67	13.4
Satisfied	38	7.6
Very satisfied	32	6.4
5.Hospital staff told you who to contact if you were worried about your condition or treatment after you left hospital		
Very dissatisfied	65	13.0
Dissatisfied	69	13.8
Somewhat dissatisfied	81	16.2
Neutral	111	22.2
Somewhat satisfied	60	12.0
Satisfied	62	12.4
Very satisfied	52	10.4

6.Billing process was clear and itemized list of charges		
Very dissatisfied	35	7.0
Dissatisfied	64	12.8
Somewhat dissatisfied	112	22.4
Neutral	94	18.8
Somewhat satisfied	96	19.2
Satisfied	56	11.2
Very satisfied	43	8.6

Table 6. Noncore/ System Services: Service format

Item/aspect of dimension	**Frequency (n)**	**Percentage (%)**
1.How organised was the care you received in the OPD or Accident & Emergency		
Very dissatisfied	15	3.0
Dissatisfied	60	12.0
Somewhat dissatisfied	90	18.0
Neutral	53	10.6
Somewhat satisfied	119	23.8
Satisfied	95	19.0
Very satisfied	68	13.6
2. Your involvement in decisions about your care and treatment		
Very dissatisfied	26	5.2
Dissatisfied	69	13.8
Somewhat dissatisfied	80	16.0
Neutral	107	21.4
Somewhat satisfied	81	16.2
Satisfied	97	19.4
Very satisfied	40	8.0
3. Giving you adequate information about your condition or treatment given to you		
Very dissatisfied	27	5.4
Dissatisfied	43	8.6
Somewhat dissatisfied	66	13.2
Neutral	137	27.4
Somewhat satisfied	104	20.8
Satisfied	82	16.4
Very satisfied	41	8.2
4. Finding someone on the hospital staff to talk to about your worries and fears and given emotional support		
Very dissatisfied	110	22.0
Dissatisfied	123	24.6
Somewhat dissatisfied	69	13.8
Neutral	49	9.8
Somewhat satisfied	88	17.6
Satisfied	46	9.2
Very satisfied	15	3.0
5. Operating hours of the OPD is convenient		
Very dissatisfied	50	10.0

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Dissatisfied	51	10.2
Somewhat dissatisfied	97	19.4
Neutral	74	14.8
Somewhat satisfied	118	23.6
Satisfied	64	12.8
Very satisfied	46	9.2
6.Level of privacy when discussing your condition, being examined or treatment		
Very dissatisfied	14	2.8
Dissatisfied	31	6.2
Somewhat dissatisfied	47	9.4
Neutral	108	21.6
Somewhat satisfied	144	28.8
Satisfied	110	22.0
Very satisfied	46	9.2

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