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Attitude and Perception of Patients on Information System Approach in Health Care Delivery, a Case of a Ghanaian Hospital

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Abstract:
The use of modern information technology (IT) offers tremendous opportunities such as reducing clinical errors and supporting health care professionals in providing care. This study was motivated by the fact that computerization continued to grow in the hospital setting, programs to assist nurses in charting and care planning was developed. However according to Braithwaite et al. (2011) little is known on the attitudes, perceptions and barriers to the use of new Information and Communications Technology (ICT) solutions from the patients perspective. Hence the study sought to fill in the literature gap on the perspective of patients regarding the usage of health information systems in health care delivery. The study primary objective is to assess patients' perception and attitude towards Health Information System (HIS) approach in health care delivery using survey data on patients/clients of Atasemaso hospital. Convenience and strata sampling was used to collect data from 200 respondents. Findings also proved majority of awareness and understanding levels of HIS, its role in health care delivery and how communication of their results to patients influence their attitude of acceptance and adherence to treatment coupled with the disagreement that it suite only the educated clients and that the elderly are not comfortable with its usage.

Keywords: *Health Information System (HIS), Patients attitude and perceptions (Satisfaction), Ministry of Health (MOH), Community-based Health Planning and Services (CHPS)*

1. Introduction

The Ministry of Health (MOH) in Ghana has been concerned about quality of health care, but improvements in quality health care delivery have been slow partly because quality improvement activities have received inadequate priority (Doyle & Haran, 2000).There have been efforts to research into quality of healthcare and institutionalisation of quality assurance in Ghanaian health facilities. Poor quality of healthcare results in loss of customers, lives, revenue, material resources, time, morale, staff, recognition, trust and respectand in individual and communities apathy towards health services, all of which contribute to lower effectiveness and efficiency (Bannerman et al, 2002).The MOH has identified improving the quality of healthcare as one of its five key objectives of health sector reforms in Ghana. It envisages that quality of health care might be improved through paying more attention to the perspectives of clients, improving the competencies and skills of providers and improving working environment by better management, provision of medical equipment and supplies and motivation of staff (MOH, 2002).

Achieving such improvement in health care delivery has resulted in the usage of information systems in the health sector as witnessed in most of the health facilities in Ghana. The use of computerized information system in the health care industry is becoming a standard. The intent of initiating computerized documentation systems in various hospitals is to improve efficiency, safety and quality of patient care (Jha, et al 2009).

Understanding the major importance that electronic database systems have for the medical informatics systems led to their quick worldwide adoption, not to mention that this particular process is being sustained by certain standards and quality management methods. One cannot afford to overlook the difficulties and the fear associated with the migration of electronic medical database among which: technical limitations in what security is concerned, integrity and access to data, high costs, the lack of operating skills and trust in computerized systems along with the opposition to the new change, small diversity of software products, the absence of certain quality standards generally accepted and the lack of adequate laws.

Governments, healthcare managers and health professionals are increasingly turning to electronic health (e-health) information system and communication technologies to meet growing demands on the healthcare system, optimise healthcare delivery and drive better healthcare outcomes (Berger 2010; Hazin & Qaddoumi 2010).The health needs of many patients living in rural and remote areas are currently not being met. Access to essential services, including specialist care, diagnostic and imaging services and expert chronic disease centres are restricted by the distance to metropolitan healthcare centres (Smith et al 2005).

Little is known of the attitudes, perceptions and barriers to the use of new Information and Communications Technology (ICT) solutions by patients (Braithwaite et al 2011).This study is therefore aimed at assessing patient perceptions and attitude on information system approach in health care delivery at the Atasemanso hospital and to determine the benefits (if any) perceived to be associated with their use. The study will assist management of the hospital and policy makers including government to review the factors associated with patient satisfaction or dissatisfaction in relation to the usage of information system at the health facilities so as to improve the quality of health care service delivered to the people.

1.1. Statement of the Problem

Atasemanso hospital is a health facility which provides specialised services to patients in Atasemanso town and neighbouring communities in the Ashanti Region of Ghana. In comparison to developed countries, the provision of health services in developing countries is suboptimal as it relates to incorporating patients view and opinions in the delivery of quality health care service. Information technology systems were introduced to the healthcare arena in the 1960s to support financial and administrative functions. Subsequently, the use of computers expanded to include data entry and laboratory results for patients (Smith et al., 2005). As computerization continued to grow in the hospital setting, programs to assist nurses in charting and care planning were developed. Discovering methods to increase use and effectiveness of technology is an opportunity for nursing research. Nurses' acceptance of computer technology became integral to successful system implementation.

Early studies evaluated nurses' attitudes toward computers in relation to years of education and years of nursing. Results revealed nurses with more education had more favourable attitudes toward computers. However according to Braithwaite et al (2011)little is known of the attitudes, perceptions and barriers to the use of new Information and Communications Technology (ICT) solutions from the patients' perspective. Hence the study sought to add to the body of knowledge and fill in the literature gap on the perspective of patients regarding the usage of health information systems in health care delivery.

To achieve this broad objective of the study, the under listed specific objectives will be considered as a guide.

- To identify the awareness level of patients' on health information system at Atasemanso Hospital.
- To assess how patient perceive health information system usage in the exam room and its role in quality health care delivery at Atasemanso Hospital.
- To determine whether good communication between patient and provider influence the level of patient attitude and perception on health information system in health care delivery.
- To identify the benefits of health information system in health care delivery as perceived by patients.

1.2. Research Questions

The research is guided by the following questions

- Are patients aware of the existence of health information system at Atasemanso Hospital?
- How do patients understand the role of health information system in quality health delivery?
- What role does communication between patient and service providers play in patients' perception and attitude towards the understanding of health information in health care delivery?
- What are the benefits and challenges perceived by patients on health information system in health care delivery?

1.3. Significance of the Research

The results of the study seek to provide the opportunity for the prioritization and institutionalization of a quality assurance health information system to help various Ghanaian hospitals achieve its goal of better healthcare for patients. It will also build on existing literature patients' attitude and perceptions on health information system in health care delivery in Ghana and provide management of various hospitals with how the usage of their health information system in health care delivery is perceived by patients.

2. Literature Review

2.1. Ghana's health Status and Demographic Indicators

United Nations International Children and Emergency Fund (UNICEF), an independent body which undertook a review of the Ghana health system in 2011, statistical analysis of the data revealed that 45% of the population is below the age of 18 while 41% is above the age of 18. Life expectancy at birth for a Ghanaian was estimated at 64 years; with females as a percentage of males 103. Malaria was the commonest condition seen at the Out Patient Department (OPD) accounting for about 44% of all conditions recorded.

The trend in early child mortalities in Ghana has shown a gradual decline in neonatal, infant and under-five mortality (Annual rate of reduction (%) Under-5 mortality rate, 2000-2011 is 2%). This augurs well for the country's bid to achieve the MDG4. There have been no deaths from measles in Ghana for the past seven years. Most of the decline in childhood mortality has been in the under-five, where immunization has contributed greatly to reducing preventable deaths.

2.2. Access to Health Care Facilities

According to the Ghana Health Service (GHS) annual report for 2011, the Health Service has sustains its purpose of increasing and improving access to health care and services through the expansion of Community-based Health Planning and Services (CHPS) for a population of 24.966 million according to 2011 statistics. This is evident in the continuous expansion of functional CHPS zones in all

Regions, a profound effort that has been driven in large part by increasing District Assembly involvement and the availability of community health nurses.

The proportion of OPD attendance by insured clients increased from 55.81% in 2010 to 82.11% in 2011, OPD per capital increased from 0.98 in 2010 to 1.07 in 2011, with CHPS contributing approximately 5 % to the total OPD attendance countrywide. There has been a corresponding progressive and significant increase in Internally Generated Fund (IGF) from increasing attendance of insured clients at Ghana Health Services (GHS) facilities. During 2011, attendance of insured clients at GHS facilities contributed to more than 80% of their total IGF after suffering a dip in 2010 (72%) in comparison to 77.9% in 2009.

The safe motherhood indicators show fairly sustained Ante Natal Care (ANC) coverage's over the three-year period being reviewed that is, 92.1% (2009); 93.3% (2010) and 94.4% (2011). This has been in spite of the proportion of clients achieving the 4+ visits, which has continued to decline - 88% (2009) 82.4% (2010) 74.9% (2011). The national rate of skilled delivery has continued to improve from 45.6 % (2009), 49.5% (2010) to 52.2% (2011). The national Expanded Programme on Immunization (EPI) recorded marginal increase in the coverage of all the antigens, although the 90% coverage target for all the antigens was not achieved. There has been significant progress in developing a general Ghana Health Service Monitoring and Evaluation Framework as well as providing a manual on Standard Operating Procedures to guide definition of indicators and data management.

2.3. Health Service Delivery

The World Health Organization (WHO) defines *service delivery* as the way inputs are combined to allow the delivery of a series of interventions or health actions (WHO 2001b). As noted in the *World Health Report 2000*, "the service provision function of the health system is the most familiar; the entire health system is often identified with just service delivery." The report states that service provision, or service delivery is the chief function the health system needs to perform (WHO, 2000). As such, see (Figure 1) shows the relationship between service delivery and the other modules of this health systems assessment and their relationship with health system objectives.

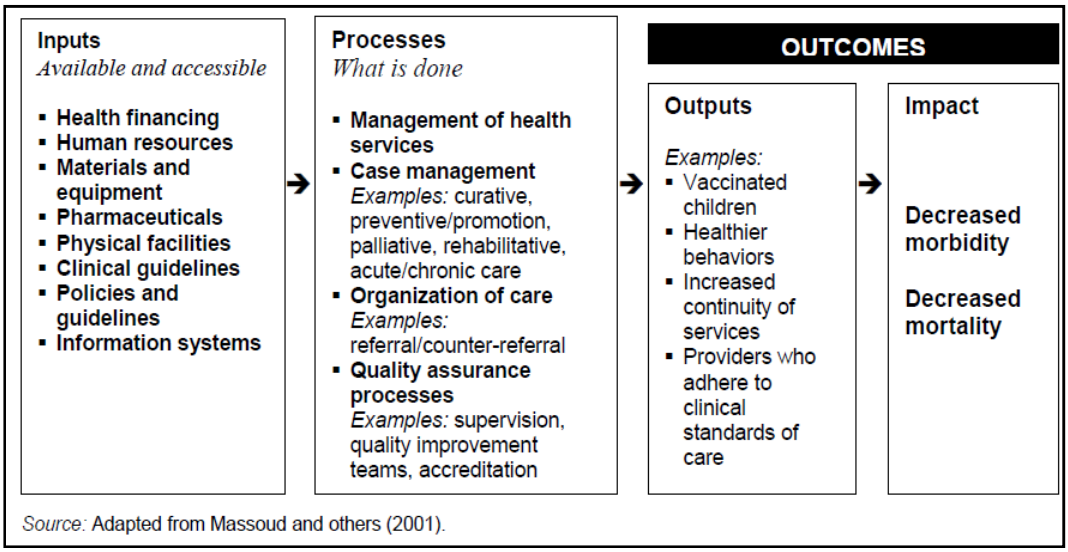

Figure 1: Systemic View of Service Delivery
Components of health delivery system

2.3.1. Availability of Service Delivery

According to the WHO, availability coverage refers to the proportion of people for whom sufficient resources have been made available, the ratio of human and material resources to the total population, and the proportion of facilities that offer specific resources, equipment and materials, and other health service delivery necessities (WHO 2001a). In other words, it is the degree to which health facilities that are functional, adequately staffed, equipped, and supplied are available to the population in a country.

2.3.2. Service Delivery Access, Coverage, and Utilization

Service delivery access refers to the ability of a population to reach appropriate health services. (In this assessment, the WHO-defined concepts of accessibility, coverage, and acceptability coverage have been combined.) Various factors can reduce access, including presence of geographical and transportation barriers, lack of financial resources, or lack of cultural appropriateness. *Effective coverage* refers to the proportion of the population in need of an effective intervention that actually received the intervention. The *utilizationrate* refers to the number of times per year the population uses health services. The utilization of health services represents effective access to health care, assumed to be the result of the interaction between supply and demand factors (Acuña et al. 2001). There are various indicators of utilization; among the most common are the number of outpatient visits per person per year and the number of hospital admissions per 100 persons per year, coverage of prenatal care, coverage of professional childbirth delivery, and coverage of immunizations (Acuña et al. 2001).

2.3.3. Organisation of Service Delivery

Organisation of service delivery has been defined by WHO (2001b) as "choosing the appropriate level for delivering interventions and the degree of integration. "This assessment will focus on integration and continuity of care – two areas that can feasibly be covered within the scope of this assessment and that are not covered by other modules. The higher the degree of integration and the greater the continuity of care, the more efficient the organization of care is in attending to patient needs (the efficiency gains have an upper limit, and many would argue that there may be a trade-off with effectiveness and trade-off is partly how vertical programs are justified).

The questions in the following indicators can be asked at the primary care level, at the regional health authority, and at national Ministry of Health (MOH) programs. The answers may differ regionally, so as much as possible, attempt to find at the central level what the pattern might be for the country as a whole. Assessment of the organization of service delivery will rely more on key informant interviews and produce more descriptive information than the previous sections.

2.3.4. Quality Assurance of Care

To assure the clinical quality of health services, health systems must define, communicate, and monitor the level of quality of care. This information is used by policy makers and providers to improve the level of quality of care. Defining quality of care is often achieved by establishing national evidence-based standards, which represent an ideal of how clinical care should be implemented. Unfortunately, in many developing countries, the gap between such standards and what is possible to implement at the facility level is wide due to limited resources (e.g., lack of supplies and equipment). Even when resources are available, many providers may not have the time or motivation to implement new standards of care.

To help providers perform according to standards, policy documents need to be adapted into a practical form that providers can use, such as clinical guides or manuals, job aids, charts, forms, checklists, or posters. (MOH, 2010)

In addition, adherence to standards must be monitored to close the quality gap. Supervisors are instrumental in assuring quality of care by giving feedback on performance according to clinical standards. They usually assess the quality of care during site visits or from facility level service delivery data and documentation. Consult with the Health Financing module assessor (if health financing is being assessed), to see if he or she has found any example of provider payment mechanisms that reward quality.

2.3.5. Community Participation in Service Delivery

Although utilization reflects the intersection of supply and demand, community participation refers to the demand side of the service delivery equation and demonstrates accountability and responsiveness to local needs. These indicators look at governance issues. For the purposes of this assessment of service delivery, clients and patients will be included as part of the community.

2.4. Health Information System (HIS)

Health information systems became a standard for manipulating medical data. A well-functioning HIS is vital for efficiency of administration and improvement of delivering health-care services. A health information system can be defined as "A system comprising all computer-based components which are used to enter, store, process, communicate, and present health related or patient related information, and which are used by health care professionals or patients themselves in the context of inpatient or outpatient care." (Elske and Nicolette, 2005).

Conrick (2006),outlines his chapter about health data systems by saying:

"Healthcare is an information-intensive industry in which quality and timely information is a critical resource." Health information systems as an application of information systems in the health area are sources of decisions for health management.

2.5. Quality and Health Information Technology

In 2000, the Institute of Medicine (IOM) released a report focusing on patient safety estimating that 44,000 to 98,000 people die in U.S. hospitals annually as a result of medical errors. Many of these errors involve medications. In a subsequent report, the IOM identified IT as one of the four critical forces that could significantly improve health care quality and safety (IOM 2001). Partly in response to these reports, the Leapfrog Group, a group of large employers committed to patient safety improvements, made hospital adoption of CPOE a major goal for large employers and health plans. These influential external forces linking IT to improved quality and patient safety have contributed to a widespread belief that adoption of IT in health care will improve quality and safety.

Some studies have shown that the use of IT in health information management can reduce the frequency of medication errors and improve quality and safety through one of the following actions:

- Reducing medication errors, including adverse drug events;
- Decreasing dosage errors;
- Prescribing certain medicines more precisely; or
- Prescribing with improved accuracy by faculty and residents (Oren et al. 2003).

Although more limited in the types of errors it can prevent, bar coding is probably the most proven technology of those we discuss. Bar coding prevents errors at the patient's bedside by averting the administration of the wrong drug when other levels of review have failed. Studies document that bar coding reduced ambulatory and inpatient medication error and the number of adverse drug events (Oren et al., 2003).

The quality benefits of investment in IT are often achieved after tremendous efforts and some initiatives have failed. A recent study of the effect of computerized guidelines for managing heart disease in primary care found that sophisticated reminders from an

Electronic Health Record (EHR) failed to improve adherence to accepted practice guidelines or outcomes for patients with heart disease (Tierney et al., 2003). A Department of Veterans Affairs hospital that is the test site for a new computer software program recently reported surgery delays and other problems with its new computer system (De La Garza, 2004).
Other research has shown that automated systems are also subject to errors: U.S. Pharmacopeia reported that 10 percent of medication errors it studied resulted from computer-entry errors (Armstrong, 2003). IT can be a tool for improving quality and safety, but is not the only one and is often used by providers as part of a broader effort.
In 2001, the Agency for Healthcare Research and Quality (AHRQ) determined that safety practices had greater strength of evidence regarding their impact and effectiveness than any practice which relied on IT. They include such low-cost items as appropriate provision of nutrition, with a particular emphasis on early enteral nutrition in critically ill and surgical patients, and use of maximum sterile barriers while placing central intravenous catheters to prevent infections (AHRQ 2001). This is not to say that these practices are superior to IT; ideally, organizations would pursue them all.

2.6. Patients' Perception and Attitude towards HIS
Appari and Johnson, (2008), a survey of researches on health care confidentiality made by Sanker et al. (2003) revealed four conclusions.

- First, patients strongly believe that their information should be shared only with people involved in their care.
- Second, patients do identify with the need of information sharing among physicians, though HIV patients are less likely to approve sharing of their health information.
- Third, many patients who agree to information sharing among physicians reject the notion of releasing information to third parties including employers and family members.
- Lastly, the majority of patients who have undergone genetic testing believe that patients should bear the responsibility of revealing test results to at-risk family members. In the same line it is stated that very limited research has examined patients 'perception on sharing of anonymized health records, perhaps 10 with exception of more recent studies that examine patients perception about consent to health information use for other than their own care (Bansal, et al. 2007; Campbell et al. 2007).

Being one of a few attempts in studying patients perception, Bansal et al. (2007), reported that user's current health status, personality traits, culture, and prior experience with websites and online privacy invasions play a major role in user's trust in the health website and their degree of security and privacy concerns. Campbell et al. (2007) also showed that significant numbers of patients are neutral to their health related information disclosure.
In connection to this, Angst et al. (2006) investigated divergence of perception among patients toward different types of Personal Health Record (PHR) systems, including paper based, personal computer based, memory devices, portal and networked PHR, which are in the increasing order of technological advancement. The study found that patient's relative perception of privacy and security concern increased with the level of technology, e.g. relative security and privacy concern for networked PHR is twice that of memory device based PHR. Technologically advanced PHR systems were found to be favoured by highly educated patients.
In another study, Chalmers and Muir (2003) stated that, patients should have the right to exercise some control over the acquisition, use, and disclosure of their personal health information. In connection to this their perception towards it, will have a positive or negative implication on service delivery and user satisfaction.

3. Methodology
The research was conducted using the Atasemanso hospital in Ghana as the case of study. The research was based on cross-sectional survey method since data was collected once through the use of questionnaire. It was also an exploratory study in nature because it sought to obtain attitude and perception of patients' on health information system in health care delivery in quantitative data analysis. 200 patients were conveniently selected and interviewed after visits to the health facility using a pretested questionnaire. The 5 anchored liker scales (Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree) was employed as measurement scale.

4. Analysis of Results
The collected data pertaining to the attitudes and perceptions of patients towards health information system in health care delivery at Atasemanso Hospital were analysed.

4.1. Demographic Data

Variables	Frequency	Percentage
AGE		
21 – 30	87	43.5
31 – 40	41	20.5
41 – 50	29	14.5
50+	43	21.5
GENDER		
Male	93	46.5
Female	107	53.5
MARITAL STATUS		
Single	73	36.5
Married	103	51.5
Divorced/Separated	10	5.0
Widowed	14	7.0
EDUCATIONAL LEVEL		
No Formal	11	5.5
Basic	29	14.5
Secondary	52	26.0
Tertiary	108	54.0
YEARS OF SERVICE RECEIVED		
0 - 2	59	29.5
3 - 5	74	37.0
5+	67	33.5
NATIONALITY		
Ghanaian	200	100

Table 1: Demographic Data of Respondents
Source: Field Survey, 2016

In analysing the background information of the respondents, it was important to know the age range of the respondents. From the table above, it can be seen that respondents between the ages of (21 – 30) were higher forming a percentage of 43.5 as compared to those between (31 – 40), 41 – 50 and 50 and above.

It can be seen that 93 males responded consisting 46.5% while 107 females also responded to the questionnaire giving us 53.5%. The figure therefore shows that the number of female patients who responded to the questionnaire were more than the male patients.

From the table, it is realized that, respondents who are married recorded high with 51.5%, followed by patient respondents who are single with 36.5%. Divorced or separated and widowed respondents recorded low with 5% and 7% respectively.

It can also be seen that respondents who have attained tertiary education recorded 54 % indicating a greater percentage of the respondents. Those who have attained secondary education followed with 26%, while basic and no formal education recorded low with 14.5% and 5.5 % respectively.

The table also shows the number of years respondents have received services from the Atasemanso hospital. It is shown that 37% of the respondents have received services from the hospital between 3-5 years, followed by 33.5% patients who have been served by the hospital for more than 5years and the least is 29.5% respondents who have had their service from 2 years and below.

When patients were asked their awareness of the use of Health Information System at Atasemanso hospital, 95.5% of respondents, indicating a greater percentage were aware of the use of HIS at the hospital while 4.5% indicated that they are not aware of the use of Health Information System (HIS) at the hospital.

Respondents were asked if they understand the use of the Health Information System (HIS) in health care delivery. From the 200 respondents, 92% of the respondents responded they understand the use of the system in health care delivery. While 16% responded they do not understand the use of the Health Information System (HIS) in health care delivery.

Soliciting the views of respondents concerning indicators of health information system, with the use of electronic health records, 95% strongly agreed that the use of electronic health records is effective, while 5% disagreed. 100% of respondents agreed to the existence and usage of computer at the hospital whereas on the scanning equipment's 97% agreed with 3% disagreed. 99% of respondents also assert to the use and existence of electronic laboratory instruments and systems links at the hospital whiles only 1% disagreed.

4.2. Patients Perception and Satisfaction with HIS

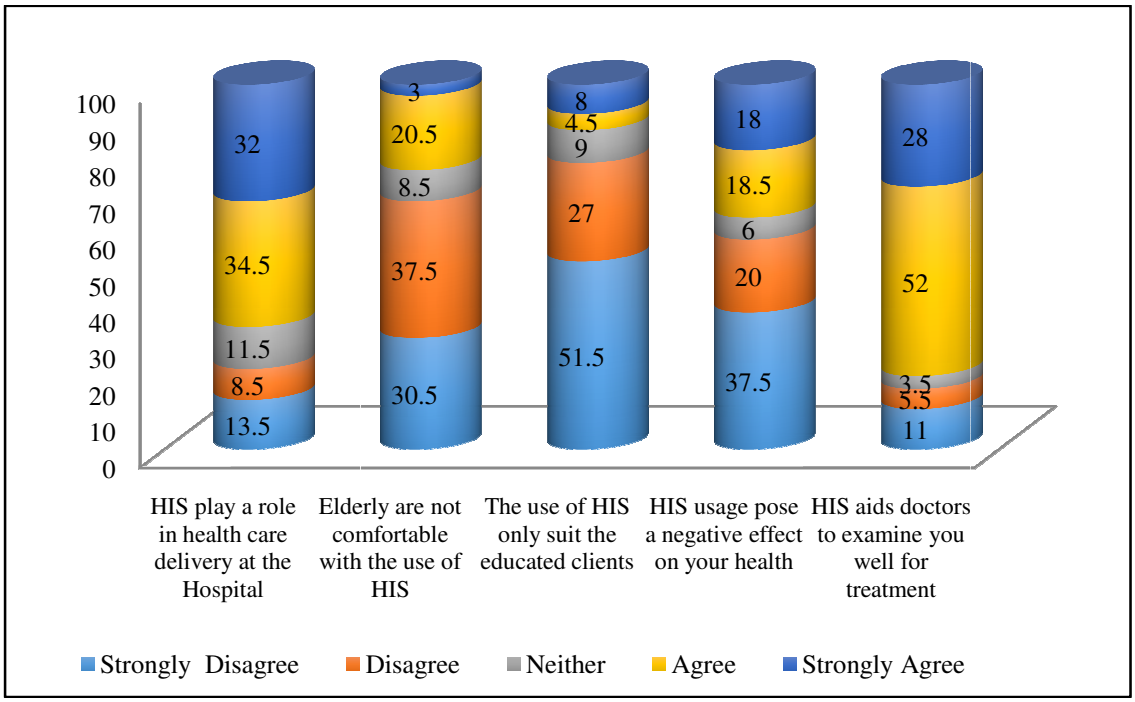

Figure 2: Patients Perception and Satisfaction with HIS (%)
Source: Field Survey, 2016

With regards to patients perception and satisfaction with health information system in health care delivery, it was shownfrom the chart above (figure 2) that, majority of 66.5% perceived it plays a role in health care delivery with 22% of respondents who disagree to that HIS plays a role in health care delivery while 11.5% were indecisive on the role HIS play in health care delivery. 68% of respondents do not perceive that the elderly are not comfortable with its usage at the hospitals while 78.5% depicting their perception that HIS usage does not only suit the educated clients. 57.5% of respondent perceive the use of HIS have no negative side effect on their health while 36.5% perceive it has a negative effect on their health. Majority of respondents constituting 80% perceive HIS aids doctors to examine them well for treatment with a minority of 16.5% think otherwise.

4.3. HIS Communication Influence on Patients Attitude and Perception

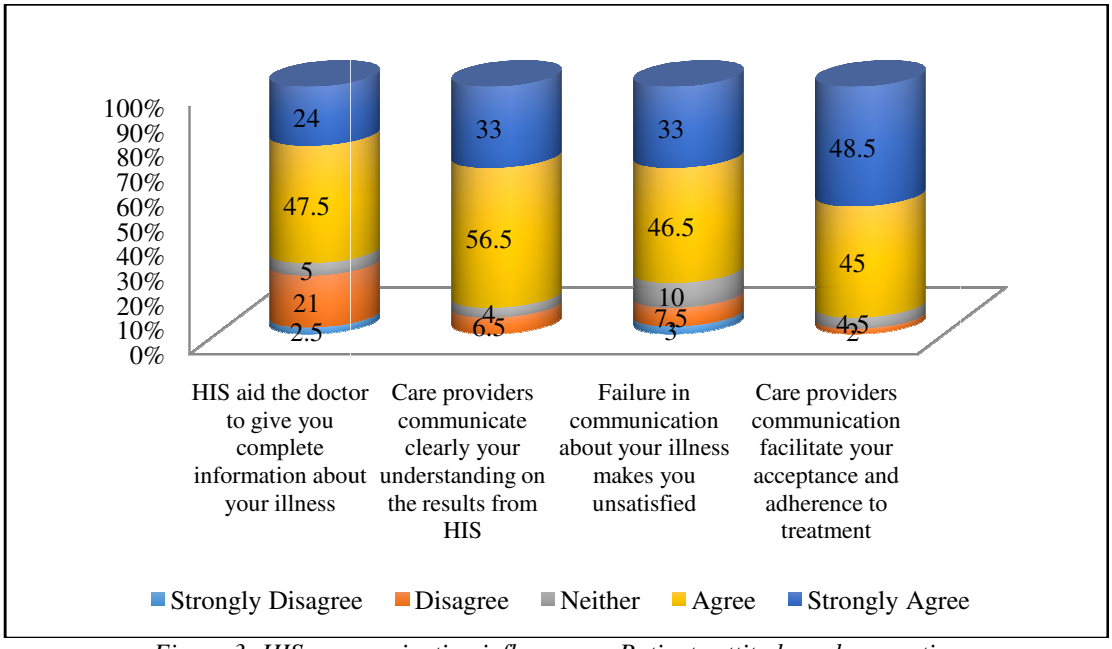

Figure 3: HIS communication influence on Patients attitude and perception
Source: Field Survey, 2016

From the chart (figure 3), 71.5% of patients agreed that HIS aid the doctors to give them complete information about their illness whereas 23.5% disagreed to that with 5% remaining undecided. 89.5% of patients agree that care providers communicate clearly the result from the HIS to their understanding. 79.5% and 93.5% of patients agree that failure in communication about their illness unearth their unsatisfactory attitude and communication by care providers facilitate their attitude of acceptance and adherence to treatment.

4.4. Benefits of HIS in Health Care Delivery, Patients Assessment

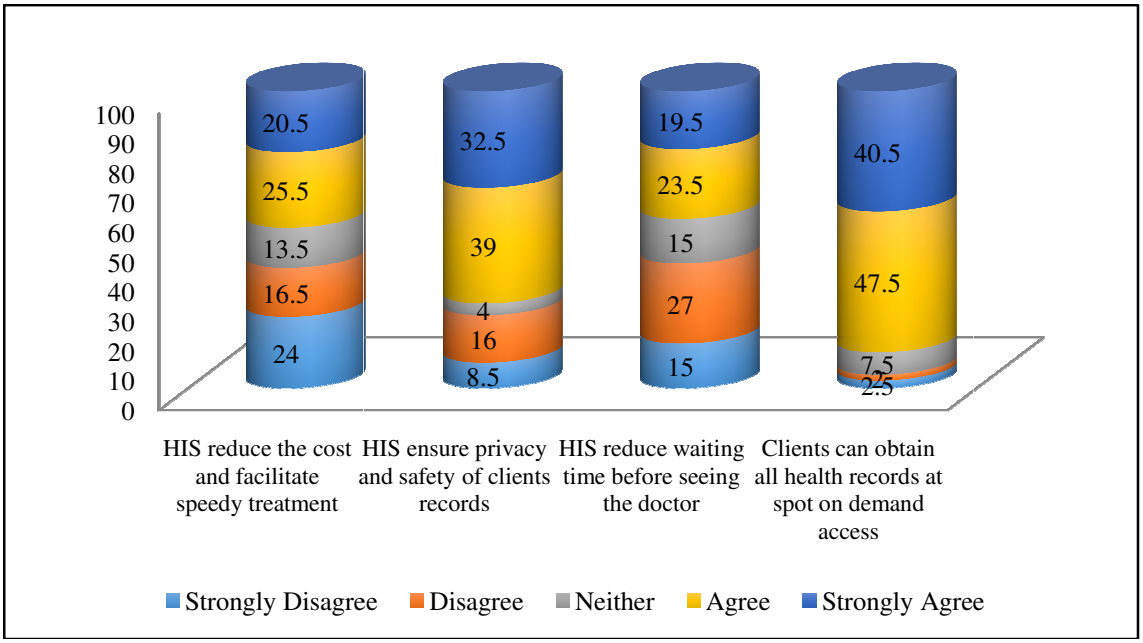

Figure 4: Benefits of HIS in health care delivery, Patients assessment (%).
Source: Field Survey, 2016

Regarding the benefits of HIS in health care delivery Figure 4 illustrate that 46% of respondents agree that HIS reduce cost and facilitate speedy treatment. 40.5% disagreed and 13.5% were inconclusive on the issue. 71% majority of respondents agreed and perceived HIS usage ensure privacy and safety of clients' records with only 24.5% disagreeing to that. 43% agreed that HIS reduces waiting time before seeing the doctor whereas 42% disagreed with 15% holding neither assertion.
When respondents were asked if they will recommend the hospital under study to other patients for health care, it was revealed that 99.5% of respondents are willing to recommend Atasemanso hospital to friends and family members based upon their experience with the existence and usage of HIS in health care delivery which provide faster and accurate results. Only 0.5% thought otherwise.

5. Discussion

The study revealed that with a higher rate of awareness and understanding of HIS in health care delivery at Atasemanso hospital clients or patients are able to adhere to the process involved in health care delivery without any resistance or avoidance.
The study findings concerning indicators of health information system, with the use of electronic health record indicating most of the respondents strongly agreed that the use of electronic health record is effective. This indicate that, the usage and existence of Health Information System at Atasemanso Hospital prove adherence of quality health service delivery as indicated in the guidelines issued by the WHO (2001), Elske and Nicolette, (2005) and Conrick (2006) on definition and components of Health Information System for Health care delivery.
Angst et al. (2006) study revealed that Technologically advanced HIS were found to be favoured by highly educated patients which is in contrast to the findings of this study as 78.5% respondents perceive HIS usage does not only suit the educated clients hence benefiting all clients. With 68% respondents not perceiving that the elderly are not comfortable with HIS usage goes in line with the WHO (2001a) guidelines for health care service delivery of *Equitable*; delivering health care which does not vary in quality because of personal characteristics such as gender, race, ethnicity, geographical location, or socioeconomic status.
The findings of the study also reported that better interaction with patients, Electronic networks or HIS make it easier for doctors to review patients information, find patterns in patient history, provides patients with relevant information, monitor adherence to treatment as reported in earlier researchers like Vincent &Norman, 2010.
Robert J. B. (2002) study suggests that doctors who effectively use information technologies in their practices will have more time to spend with patients, both in the clinical setting and through non-traditional means of communications such as e-mail. This will affect the time waiting for next clients at the hospital which is not surprise as the study findings revealed and proved that using HIS effectively reduce waiting time to meet a doctor on health issues.

6. Conclusion and Recommendation

The results of the study showed Health Information System (HIS) have significant impact on patient's Satisfaction (attitude and perception) and have a positive perception about its role and benefits in health care delivery. By developing a model that predicts patients' attitudes and perception (Satisfaction) behavior on Out-patient department, laboratory, X-ray and records healthcare information system, this study not only provides a direction for further theory building in healthcare research but also suggests that including HIS in healthcare research may potentially be very productive in theory development.

Moreover, the study results contribute to the patients' perception and attitude towards HIS literature since they show the robustness of its theories in the context of acceptance of a healthcare information system by patients based upon their awareness level and understanding of its role.

From a practical point of view, the results of this study suggest that HIS usage at Atasemanso Hospital significantly have a positive impact on clients such that their experience with it makes them willing to recommend the hospital to others hence management must continue to improve upon its usage and education. The researchers therefore recommend that various hospitals within the country and other countries especially the developing countries to make Health Information System (HIS) an important technological tool to enhance effective health care delivery. We also recommend further study by other researchers to dive into how this HIS could be used effectively to reduce death rate at the hospitals.

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