Health Information Resources and Clinical Core Skills as Predictors of Medical Doctors Clinical Decision Making in Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria

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***Abstract*: The research investigated the extent of accessibility of various health information sources, assess the extent of versatility of Clinical Core Skills and Clinical Decision Making of Medical Doctors in OAUTH, Ile-Ife. The study employed the descriptive survey research design. The population for the study consisted of all the 822 Medical Doctors of various professional status and specializations in (OAUTH), Ile-Ife, Osun State, Nigeria. Four hundred and eleven (411) Medical Doctors formed the sample for this study. Proportionate sampling technique was used to assigned sample size to each area of specialization to ensure fair representation. Simple random sampling technique was employed to select sampled size assigned to each area of specialization. The survey instrument used to collect data was questionnaire titled "Health Information Resources, Clinical Core Skills and Clinical Decision Making of Medical Doctors (AHIRCCKDM) Data collected were analyzed using appropriate frequency count, mean and standard deviation. The findings indicated that health information resources for clinical decision making were accessible and used to a very high extent. The study concluded that Health Information were accessed and used for Clinical Decision Making among Medical Doctors in OAUTH. The study recommended that the university should make funds available for the OAUTH management to enable her procure modern health information equipment that will enhance easy accessibility of health information and enrich the routine Clinical Decision Making among Medical Doctors in OAUTH.**

***Key Words*: Health Information, Health Information Resources, Clinical decision making and Teaching hospital, clinical core skills.**

I. INTRODUCTION

Clinical decision-making is the process of making an informed judgment about the treatment necessary for patients. The process of clinical decision-making is the essence of everyday clinical practice of medical doctors. This process is complex involving several important steps in which patient involvement is also essential (Charles, Gafni, & Whelan, (1999); Coulter, & Ellins, (2006) and Whitney, Holmes-Rovner, & Brody, (2008)). Recognition and clarification of the problem; Identification of potential solutions; Discussing the options and uncertainties; Providing tailor-made information; Checking understanding and reactions; Checking patient's preferences; Exploring the patient's view; Agreeing with the patient about a course of action; Implementing the chosen course of action; Arranging follow-up with the patient; Evaluation of the outcome Bhugra, (2008).

Medical doctors are generally known to engage in the activities that are geared towards the provision of health services. including diagnosing, maintaining, or treating the patient's physical or mental condition. The heart of this is clinical decision-making, the essence of everyday clinical practice of medical doctors, which is the process of making an informed judgment about the treatment necessary for patients. This process is complex involving several important steps in which patient involvement is also essential (Charles, Gafni, & Whelan, (1999); Coulter, & Ellins, (2006) and Whitney, Holmes-Rovner, & Brody, (2008)). Bhugra, (2008) concluded that the complexity of the work involved rrecognition and clarification of patient's problem; identification of potential solutions; ddiscussing the options and uncertainties; providing tailor-made information; checking understanding and reactions; checking patient's preferences; exploring the patient's view; agreeing with the patient about a course of action; implementing the chosen course of action; arranging follow-up with the patient; evaluation of the outcome. It is a common knowledge that during patient consultations primary care Medical Doctors need patient-specific information to make a lifesaving clinical decision. Clinical decision making is a term frequently used to describe the fundamental role of the medical doctors, the process through which data are gathered, interpreted, and evaluated in order to select an evidence-based choice of action.

Decision making can range from fast, intuitive, or heuristic decisions through to well-reasoned, analytical, evidence-based

decisions that drive patient and client care. The activities that fall within health work in the context of this study include and not limited to administering a drug or other substance, chemotherapy; a physical examination of a patient; dental or oral health examinations and treatment; psychological assessment; interventions such as blood and blood product transfusions; invasive procedures, surgical operations, oral health interventions; pathological and radiological investigations or procedures, for example, taking a blood sample or biopsy for analysis; manipulation or joint immobilization; screening undertaken for pathological conditions, for example, breast or bowel cancer; services provided by the allied health disciplines such as the application of splints or heat packs; the transfer of a patient to another facility; and clinical trials or medical research (Sketcher-Baker, 2017).

Medical doctors engage in a spectrum of decision making. At one end of the spectrum, they use intuition and experience to make decisions, where there is typically a high volume of simple decisions to be made. The contributions of clinical informatics to a medical professional include the promotion of knowledge sharing, adequate health monitoring, statistics gathering analysis, and the delivery of effective healthcare services (Olatokun and Adeboyejo, 2009).

Many decisions that medical doctors take in the course of their daily practice are part of routine medical care, diagnostic or treatment dilemmas for which there are no easy answers and thus involve little thought, uncertainty, or risk. incorporating evidence, weighing difficult trade-offs between potential benefits and harms, and including patients' values for these outcomes can be a very complex challenge. Decision analysis and cost-effectiveness analysis are quantitative techniques that provide a systematic approach to integrating evidence within the context of a specific decision problem. The goal of decision analysis is to facilitate sound decisions in complex and uncertain situations by identifying the course of action that will, on average, maximize the desired outcome. Expected value decision making uses explicit values placed on different outcomes combined with the probability of those outcomes as a guide to choosing between options. Expected value is what would occur "on average" if the decision were repeatedly played out multiple times (Sox, Blatt, Higgins and Matron, 2007).

Health Information sources are those materials that are capable of storing health data in any form or allow data pass through them. Health informatics resources includes information and communication technology (ICT) equipment and facilities such as ECG machine, CT scan, computerized BP gauge, x-ray machine, Hemoglobin electrophoresis, Centrifuge machine, Autoclave, Glucometer, Orthoscopic, Sphygmomanometer, Microscope GSM phones, i-pad, i-pod and the internet. Others are computer systems, CD-ROMs, VCDs, DVDs, scanners, Printers-Daniel and Oyetunji (2013) identified various sources through which medical doctors gather clinical information such as professional colleagues through instant transmission/receipt of mail message, electronic file system, and power search utilities to locate information stored in millions of computers around the world and effective communication through the use of internet, and diagnosis of patients. At the other end of the variety, there may be complex decisions to be made, where the level of uncertainty is high and an analytical and evidence-based approach is needed to support the rules-based heuristics or experience we have gained over time in 'similar' situations. An effective practitioner is tasked with making clinical decisions with patients and clients many times during their sheath and care journey. Clinical decision making is a balance of experience, awareness, knowledge and information gathering, using appropriate assessment tools, colleagues and evidence-based practice to guide.

In a nutshell, medical doctors' decision-making is a herculean task that often require decision makers to weigh serious trade-offs, consider patients' values, and incorporate evidence in the face of uncertainty. Medical decisions are made implicitly by clinicians and other decision-makers on a daily basis. Decisions based largely on personal experience are subject to many biases. Decision analysis and cost-effectiveness analysis are systematic approaches used to support decision-making under conditions of uncertainty that involve important trade-offs. These mathematical tools can provide patients, medical doctors and policy makers with a useful approach to complex medical decision making.

It is a common knowledge that during patient consultations, primary care medical doctors need patient-specific information. Accessing information in a timely way is essential for the clinical decision-making process. Information needs remain unanswered at the time the medical doctors are making clinical decisions, then delayed or uninformed decisions might occur. Consequently, there may be medical errors such as incorrect diagnosis, error in administering treatment or failure to provide prophylactic treatment which impacts the quality and outcome of decisions. Information needs of medical doctors are defined as expressions of missing information that is required to accomplish a specific task, which in this case is managing patient care (van Osch, Wakker, Van den Hout, and Stiggelbout, 2004).

Accessing information services has over the years been greatly enhanced with the emergence of various information and communication technologies. The successful utilization of health information resources depends upon the availability of information resources and more importantly, their level of accessibility. Information availability is not enough to make it useful. Its usefulness also depends on its physical accessibility to those who need them. Health information infrastructural facilities are the basic framework of any health services providing organization. Effective health information resources accessibility depends on uninterrupted power supply, information technology, internet facilities, free slots to use the machine, adequate training and skill to use the facilities. Terry (2005) presents four elements of information

accessibility, which are sources, nearness, cost and literacy level. Accessing information in a timely way is essential for the clinical decision-making process.

If information needs remain unanswered at the time the Medical Doctors are making clinical decisions, the consequence may be medical errors such as incorrect diagnosis, error in administering treatment or failure to provide prophylactic treatment which impacts the quality and outcome of decisions. The information required to take adequate clinical decision at one point or the order is known as information needs. Information needs of Medical Doctors are defined as expressions of missing information that is required to accomplish a specific task, which in this case is managing patient care (Van-Osch, et al, 2004). Information-seeking behaviour of the Medical Doctors can then be defined as the way Medical Doctors search for and utilize information to satisfy their information need (Peul, et al, 2008). In addition, the frequency of information needs that arise during clinical consultations can range from one question for every 10 patient encounters to four questions per encounter (Weinstein, et al, 2006).

Information sources are used by the Medical Doctors to supplement their knowledge and clinical experience and to keep themselves up to date thereby making the accessibility of health information resources that the Medical Doctors use an important topic to investigate since the information use by the Medical Doctors depends largely on the accessible information. Electronic clinical information resources continue to expand in accessibility and are an important reference for the medical doctors. Further, developers of electronic information resources are integrating these efficient and effective resources with clinical information systems (CISs) to meet the information needs of the medical doctors. Access to adequate medical information is imperative for successful healthcare delivery, particularly, for Medical Doctors all over the world. Moon, et al (2012) admit that access to accurate medical information, in various health care facilities, is very necessary for Medical Doctors to take effective medical decision. Attama and Ezema (2005) argue that access and use of information are necessary for Medical Doctors for problem solving and decision making.

However, medical doctors' use of these resources is still impacted by many limitations, such as usability and relevance to clinical tasks. An information retrieval system's performance is dependent on the ability of a user to convert their information need into a query that can be understood by the retrieval system. Natural language query systems are available, but the translation into a structured query is difficult to accomplish with accuracy. Medical doctors' information needs are often unmet and there are multiple reasons preventing the Medical Doctors from meeting those needs, such as lack of time and skills to complete searches efficiently and lack of integration in the search process into clinician workflow. In a study carried out by Gonzalez (2002), primary care health workers only tried to find an answer to 23% of questions, and of those questions they did attempt to answer, they were successful in finding an answer 86% of the time. The low percentage for seeking answers to questions may be due to a time and workflow limitation during patient visits for these medical doctors. In survey results by the Commonwealth fund, medical doctor believed that spending more time with their patient is effective in improving patient care, and they were not satisfied with the limited time available for patient consultations. According to the World Health Organization's (WHO) 2006 World Health Report, 57 countries face severe shortages in their healthcare workforce. Nuq (2012) indicate that there is a shortage of 4.3 million doctors and other health workers all over the world, WHO estimates that there is a global shortage of approximately 4.3 million Medical Doctors required for delivering essential healthcare services to populations in need.

The role of health information technology in clinical practice is growing as well. More Medical Doctors are using electronic health records (EHRs) which are 'patient records of health information created by encounters in any care delivery setting'. Sometimes a physician wants to review the record of a patient's visit in a very detailed way, and other times, medical doctors' desire a quick snapshot of what happened. Lack of usability considerations, such as ease of use and usefulness in the design of EHR systems creates potential human–computer interaction issues, including increased workflow complexity that may result in loss of productivity and decreased quality of patient care (Weinstein, et al, 2004). While a number of studies have examined the information needs of medical doctors, Medical Doctors also have many responsibilities in the clinical setting, which include providing family planning and immunizations, and carrying out the treatment recommended by the health workers (Kassier and Angela, 2005).

Medical Doctors partner with other healthcare professionals to assess and treat the patient's problem, protect the patient by preventing infection and ensuring a safe and healthy environment, educate the patient and family about the proposed treatment plan given by the physician, and advocate for patients when necessary (Hansson and Hansson, 2007). Health workers must also be able to practice according to current guidelines and, therefore, must be well informed of research findings to keep informed about technology, research and patient care (Tosteson, et al, 2008). In a study by Cogdill (2006), medical practitioners experienced information needs as a result of patient encounters and also pursued answers for a larger portion of the clinical questions that arise.

Good and effective clinical decision making of medical doctors requires a combination of experience and skills. According to Nuq (2012), these skills include pattern recognition which is learning from experience; critical thinking, removing emotion from our reasoning, being 'skeptical', with the ability to clarify goals, examine assumptions, be open-minded, recognize personal attitudes and bias, able to evaluate evidence; communication

skills, active listening the ability to listen to the patient, what they say - what they don't say, their story, their experiences and their wishes thus enabling a patient-centered approach that embraces self-management; information provision the ability to provide information in a comprehensible way to allow patients/clients, their careers and family to be involved in the decision making process and evidence-based approaches, using available evidence and best practice guidelines as part of the decision making process.

Other skills required for effective clinical decision making according to Nuq (2012) are team work, using the gathered evidence to enlist help, support and advice from colleagues and the wider multi-disciplinary team. It is important to liaise with colleagues, listen and be respectful, whilst also being persistent when one needs support so that one can plan as a team when necessary; Sharing learning and getting feedback from colleagues on your decision making; reflection; using feedback from others, and the outcomes of the decisions to reflect on the decisions that were taken in order to enhance practice delivery in the future. It is also important for Medical Doctors to reflect on their whole decision-making strategies to ensure that they their decision

Information technology skill is otherwise known as clinical informatic skill is another important skill that is required of a Medical Doctor for better decision making, Afterall, two good heads are better than one so the saying goes. Daniel and Oyetunji (2013) identified various purposes in which medical doctors utilise clinical informatics. Examples of such utilisation are the provision of adequate access to professional colleagues through instant transmission/receipt of mail message, electronic file system, and power search utilities to locate information stored in millions of computers around the world and effective communication through the use of internet, and diagnosis of patients. At the other end of the variety, there may be complex decisions to be made, where the level of uncertainty is high and an analytical and evidence-based approach is needed to support the rules-based heuristics or experience we have gained over time in 'similar' situations. An effective practitioner is tasked with making clinical decisions with patients and clients many times during their sheath and care journey. Clinical decision making is a balance of experience, awareness, knowledge and information gathering, using appropriate assessment tools, colleagues and evidence-based practice to guide. However, medical doctors' use of these resources is still impacted by many limitations, such as usability and relevance to clinical tasks. For example, an information retrieval system's performance is dependent on the ability of a user to convert their information need into a query that can be understood by the retrieval system. Harder (2007) suggested that innovation for doctors is a complex decision process rather than a single decision point.

Natural language query systems are available, but the translation into a structured query is difficult to accomplish with accuracy. Medical doctors' information needs are often unmet and there are multiple reasons preventing the medical doctors from meeting those needs, such as lack of time and skills to complete searches efficiently and lack of integration in the search process into clinician workflow. McDonald, Waring, Harrison, Walshe & Boaden (2005) concluded that while the creation of a safety culture requires a shared set of beliefs, attitude and norms in relation to what is seen as safe clinical practice, differences of opinion on these issues exists which cannot be easily reconciled since they reflect deeply ingrained beliefs about what constitutes professional conduct.

There are many sources of information available today for the medical doctors to find answers to their patient-related questions. The availability and accessibility of information received which supposed to be potentially useful could becomes more of a hindrance rather than a help when the skill to tap and apply them is inadequate and inability to assess and process right information sources and resources due to limited time to review and process patient data, which may result in errors during the information retrieval and decision-making processes. Possible effects of these deficiencies could be failing to process some of the inputs, processing information incorrectly, delaying the processing of information, accepting lower-quality information and giving up the search for needed information (Chapman, Berger, Weinstein, Weeks, Goldie & Neumann, 2004). The choice of appropriate source required the possession of some clinical core skill. To what extent are these variables intertwined to take better clinical decision-making is the task of this research.

II. OBJECTIVES OF THE STUDY

The General Objective of this Work is to investigate the Accessibility of Health Information Resources and Clinical Core Skills of Medical Doctors for Clinical Decision Making in Obafemi Awolowo University Teaching Hospital. Other specific objectives of the study are to:

i. examine the extent of accessibility of health information resources for clinical decision making among Medical Doctors in OAUTH.
ii. determine the extent of use of various Clinical Core Skills for clinical decision making among Medical Doctors in OAUTH.
iii. determine the relationship between extent of accessibility of health information resources and Medical Doctors Clinical Decision Making in OAUTH
iv. determine the relationship between extent of use of various Clinical Core Skills and clinical decision making by Medical Doctors in OAUTH

III. RESEARCH QUESTIONS

The research provided answers to the following questions:

i. What is the extent of accessibility of health information resources for clinical decision making by

Medical Doctors in OAUTH?

ii. What is the extent of use of various Clinical Core Skills for clinical decision making by Medical Doctors in OAUTH?

Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

H_{01}: There is no significant relationship between the extent of accessibility to health information resources and clinical decision making by Medical Doctors in OAUTH

H_{02}: There is no significant relationship between the extent of use of various Clinical Core Skills and clinical decision making by Medical Doctors in OAUTH

H_{03}: There is no significant joint effect of extent of accessibility to health information resources and the extent of use of various Clinical Core Skills for clinical decision making on clinical decision making by Medical Doctors in OAUTH

IV. METHODOLOGY

The study adopted descriptive research design. The study is set to obtain data on Accessibility of health Information Resources and Clinical Core Skills as Predictors of Medical Doctors Clinical Decision Making in Obafemi Awolowo University Teaching Hospital. The population for this study comprises all the eight hundred and twenty-two (822) Medical Doctors of various specialisations and status in OAUTH, Ife. The sampling technique adopted for this study was multi-stage sampling procedure. At first stage, purposive sampling technique was used to select the teaching hospital to be used. Obafemi Awolowo University Teaching hospital for this study because of its age-long and federal status. Proportionate sampling technique was used to assigned sample to each category of workers so as to have fair representation from each category of workers. At the third stage, a simple random sampling technique was employed to select sample assigned to each group of Medical Doctors from the teaching hospital under this study. Hence, a total number of four hundred and eleven (411) Medical Doctors was used as sample size. The research instrument used for data collection for this study was a set of Questionnaire tagged 'Accessibility of health Information Resources and Clinical Core Skills of Medical Doctors (AHIRCCSMD). Descriptive and inferential statistics were used to analyses the data. While the descriptive statistics was used to answer the research questions, inferential statistics help to generalize from a sample to a whole population and in testing the hypothesis (Foster, 2001).

V. RESULTS AND DISCURSION

Research Questions

*Research Question One***:** What is the extent of accessibility of health information sources for clinical decision making by Medical Doctors in OAUTH?

Table 1 showing the extent of accessibility of health information sources for clinical decision making among Medical Doctors in OAUTH

S/N	Health Information resources	NA	RA	MA	HA	$\bar{X}$	S.D
1	ECG machine	5 1.9%	15 5.8%	99 38.2%	140 54.1%	3.44	0.69
2	CT Scan	6 2.3%	8 3.1%	167 64.5%	78 30.1%	3.22	0.61
3	GSM phones, I pad, I pod	27 10.4 %	25 9.7%	108 41.7%	99 38.2%	3.08	0.95
4	Autoclave	21 8.1%	33 12.7%	113 43.6%	92 35.5%	3.07	0.90
5	Teleconferenci ng	18 6.9%	45 17.4%	103 39.8%	93 35.9%	3.05	0.90
6	Internet	23 8.9%	35 13.5%	111 42.9%	90 34.7%	3.03	0.92
7	Hemoglobin electrophoresis	29 11.2 %	32 12.4%	100 38.6%	98 37.8%	3.03	0.98
8	Sphygmomano meter	16 6.2%	33 12.7%	136 52.5%	74 28.6%	3.03	0.81
9	VCD	24 9.3%	38 14.7%	107 41.3%	90 34.7%	3.02	0.93
10	Microscope	12 4.6%	11 4.2%	198 76.4%	38 14.7%	3.01	0.61
11	DVD	29 11.2 %	42 16.2%	88 34.0%	100 38.6%	3.00	1.00
12	Orthoscopic	21 8.1%	30 11.6%	136 52.5%	72 27.8%	3.00	0.85
13	CD ROM	34 13.1 %	37 14.3%	89 34.4%	99 38.2%	2.98	1.03
14	Glucometer	21 8.1%	44 17.0%	114 44.0%	80 30.9%	2.98	0.90
15	Centrifuge machine	29 11.2 %	23 8.9%	134 51.7%	73 28.2%	2.97	0.91
16	Video	37 14.3 %	30 11.6%	102 39.4%	90 34.7%	2.95	1.02
17	Videoconferen cing	37 14.3 %	35 13.5%	105 40.5%	82 31.7%	2.90	1.01
18	Projectors	28 10.8 %	51 19.7%	98 37.8%	82 31.7%	2.90	0.97
19	Computer system	26 10.0 %	52 20.1%	108 41.7%	73 28.2%	2.88	0.93
20	Telemedicine	41 15.8 %	33 12.7%	100 38.6%	85 32.8%	2.88	1.04
21	X-ray machine	20 7.7%	90 34.7%	82 31.7%	67 25.9%	2.76	0.93
22	Electronic BP Gauge	65 25.1 %	30 11.6%	78 30.1%	86 33.2%	2.71	1.17
Weighted mean = 3.00							

KEY: NA=Not Accessible, RA=Rarely Accessible, MA=Moderately Accessible, HA=Highly Accessible

Table 1 shows the extent of accessibility of health information resources for clinical decision making by Medical Doctors in OAUTH. It shows that "ECG machine" ($\bar{X}$ =3.44) ranked

highest by the mean score rating and was followed in succession by "CT Scan" ($\overline{X}$ = 3.22), "GSM phones, I pad, I pod" ($\overline{X}$ = 3.08), "Autoclave" ($\overline{X}$ =3.07), "Teleconferencing" ($\overline{X}$ =3.05), "Internet" ($\overline{X}$ =3.03), "Hemoglobin electrophoresis" ($\overline{X}$ =3.03), "Sphygmomanometer" ($\overline{X}$ =3.03), "VCD" ($\overline{X}$ =3.02), "Microscope" ($\overline{X}$ =3.01), "DVD" ($\overline{X}$ =3.00), "Orthoscopic" ($\overline{X}$ =3.00), "CD ROM" ($\overline{X}$ =2.98), "Glucometer" ($\overline{X}$ =2.98), "Centrifuge machine" ($\overline{X}$ =2.97), "Video" ($\overline{X}$ =2.95), "Videoconferencing" ($\overline{X}$ =2.90), "Projectors" ($\overline{X}$ =2.90), "Computer system" ($\overline{X}$ =2.88), "Telemedicine" ($\overline{X}$ =2.88), "X-ray machine" ($\overline{X}$ =2.76), "Electronic BP Gauge" ($\overline{X}$ =2.71) respectively.

Table 2 showing Test of Norm showing the extent of accessibility of health information resources for clinical decision making by Medical Doctors in OAUTH

Interval	Mean index	Level of accessibility	Frequency	Percentage
1-29		Not accessible	2	0.8
30-58		Moderately accessible	80	30.9
31-88	**65.8880**	Highly accessible	177	68.3

Table 2 shows the extent of accessibility of health information resources for clinical decision making by Medical Doctors in OAUTH. 0.8% (n=2) of the Medical Doctors indicated that the health information resources were not accessible, 30.9% (n=80) indicated moderately accessible and 68.3% (n=177) indicated that the resources were highly accessible. Hence, it could be deduced that the degree of accessibility of health information resources for clinical decision making among Medical Doctors in the study area is high.

*Research Question Two***:** What it the extent of use of various Clinical Core Skills of clinical decision making by Medical Doctors in OAUTH?

Table 3 Utilization of Clinical Core Skills for clinical decision making by Medical Doctors in OAUTH

S/N	Clinical Core Skills for clinical decision making	SD	D	A	SA	$\overline{X}$	S. D
1	Pattern recognition from experience	12 4.6%	5 1.9%	131 50.6%	111 42.9%	3.32	0.73
2	Critical thinking without emotion	13 5.0%	18 6.9%	142 54.8%	86 33.2%	3.16	0.76
3	Hypothesis updating (ability to get up-to-date information about other colleagues	14 5.4%	40 15.4%	118 45.6%	87 33.6%	3.07	0.84
	propositions or suggestions						
4	Perception based confidence	27 10.4%	34 13.1%	117 45.2%	81 31.3%	2.97	0.93
5	Proactive decision making	23 8.9%	37 14.3%	127 49.0%	72 27.8%	2.96	0.88
6	Overcoming environment task complexity	19 7.3%	42 16.2%	129 49.8%	69 26.6%	2.96	0.85
7	Team work using gathered evidence from colleagues	32 12.4%	38 14.7%	100 38.6%	89 34.4%	2.95	0.99
8	Reflection using feedback from others	28 10.8%	35 13.5%	121 46.7%	75 29.0%	2.94	0.93
9	Age and educational level	26 10.0%	46 17.8%	106 40.9%	81 31.3%	2.93	0.94
10	Communication skills from active listening	28 10.8%	45 17.4%	106 40.9%	80 30.9%	2.92	0.95
11	Knowledge sharing among the professionals	30 11.6%	45 17.4%	102 39.4%	82 31.7%	2.91	0.97
12	Time pressure balance	22 8.5%	56 21.6%	111 42.9%	70 27.0%	2.88	0.90
13	Evidence-based approaches	24 9.3%	68 26.3%	95 36.7%	72 27.8%	2.83	0.94
	Weighted mean = 2.98						

Key: SD = Strongly Disagree, D = Disagree, A = Agree, SA = Strongly Agree proposition

Table 3 shows the extent of use of various Clinical Core Skills for clinical decision making by Medical Doctors in OAUTH. It shows that "Pattern recognition from experience" ($\overline{X}$ = 3.32) ranked highest by the mean score rating and was followed in succession by "Critical thinking without emotion" ($\overline{X}$ = 3.16), "Hypothesis updating" ($\overline{X}$ = 3.07), "Perception based confidence" ($\overline{X}$ = 2.97), "Proactive decision making" ($\overline{X}$ = 2.96), "Overcoming environment task complexity" ($\overline{X}$ = 2.96), "Team work using gathered evidence from colleagues" ($\overline{X}$ = 2.95), "Reflection using feedback from others" ($\overline{X}$ = 2.94), "Age and educational level" ($\overline{X}$ = 2.93), "Communication skills from active listening" ($\overline{X}$ = 2.92), "Knowledge sharing among the professionals" ($\overline{X}$ = 2.91), "Time pressure balance" ($\overline{X}$ = 2.88) and lastly "Evidence-based approaches" ($\overline{X}$ = 2.83) respectively.

Table 4 showing Test of Norm showing the extent of use of various Clinical Core Skills for clinical decision making by Medical Doctors in OAUTH

Interval	Mean index	Extent of use	Frequency	Percentage
1-17		Low	5	1.9
18-35		Moderate	85	32.8
36-52	38.8069	High	169	65.3

Table 4 shows the extent of use of various Clinical Core Skills for clinical decision making of Medical Doctors in OAUTH. 1.9% (n=5) of the Medical Doctors had low extent of use, 32.8% (n=85) had moderate extent of use and 65.3% (n=169) had high extent of use. Hence, it could be deduced that the extent of use of various Clinical Core Skills for clinical decision making of Medical Doctors in the study is high.

VI. RESEARCH HYPOTHESES

Hypothesis One: H_{01}: There is no significant relationship between extent of accessibility to health information resources and clinical decision making by Medical Doctors in OAUTH

Table 5 Showing Pearson Product Moment Correlation (PPMC) showing the relationship between extent of accessibility to health information resources (HIR) and clinical decision making by Medical Doctors in OAUTH

Variable	Mean	Std. Dev.	n	r	P-value	Remark
Access of health inform ation resources (HIR)	138.8996	20.8815	259	.347*	.000	Sig.
Clinical decision making	39.3012	6.1419				

* Sig. at 0.05 level

It is shown in table 5 that there is a significant relationship between extent of accessibility to health information resources and clinical decision making by Medical Doctors in OAUTH (r = .347, n= 259, P (.000) < 0.05). The hypothesis is rejected.

Hypothesis Two (H_{02})*:* There is no significant relationship between extent of use of various Clinical Core Skills for clinical decision making and clinical decision making by Medical Doctors in OAUTH.

Table 6 Showing Pearson Product Moment Correlation (PPMC) showing the relationship between extent of use of various Clinical Core Skills for clinical decision making and clinical decision making by Medical Doctors in OAUTH

Variable	Mean	Std. Dev.	n	r	P-value	Remark
Use of Core Clinical Skills	143.1969	25.2629	259	.352*	.000	Sig.
Clinical Decision Making	39.3012	6.1419				

* Sig. at 0.05 level

It is shown in table 6 that there is a significant relationship between use of Clinical Core Skills and clinical decision making by Medical Doctors in OAUTH (r = .352, n= 259, P (.000) < 0.05). The hypothesis is not accepted.

Hypothesis Three: H_{03} - There is no significant joint effect of extent of accessibility to health information resources and the extent of use of various Clinical Core Skills for clinical decision making on clinical decision making by Medical Doctors in OAUTH

Table 7 Showing regression analysis of the joint effect of extent of accessibility to health information resources and the extent of use of various Clinical Core Skills on clinical decision making by Medical Doctors in OAUTH

R	R Square		Adjusted R Square		Std. Error of the Estimate	
.390	.152		.146		5.6773	
A N O V A						
Model	Sum of Squares	DF	Mean Square	F	Sig.	Remark
Regression Residual Total	1481.066 8251.443 9732.510	2 256 258	740.533 32.232	22.975	.000	Sig.

Table 7 shows the joint contribution of accessibility of health information resources and the extent of use of various Clinical Core Skills on clinical decision making by Medical Doctors in OAUTH. The table also shows a coefficient of multiple correlation of R = .390 and a multiple R^2 of .152. This means that 15.2% of the variance was accounted for by two predictor variables when taken together. The significance of the joint contribution was tested at $\alpha = 0.05$. The table also shows that the analysis of variance for the regression yielded F-ratio of 22.975 (significant at 0.05 level). This implies that the joint contribution of the independent variables to the dependent variable was significant and that other variables not included in this model may have accounted for the remaining variance.

VII. DISCUSSION OF FINDINGS

The study investigated effects of extent of accessibility to health information resources and Core Clinical skill on clinical decision making by Medical Doctors in OAUTH. The findings to the research question one showed that medical doctors in the study area adjudged that the health information resources for clinical decision making is highly accessible. Panos (2001) in Alarape (2015) states that access to information is an essential condition for development and empowerment. Accessibility to health information is seen in relation to nearness, ease of use and opportunities for interaction with people and other agencies while proximity and physical distance to a source or channel have been found to be factors influencing use of information. Aguolu and Aguolu (2002) in Alarape (2015) reveal that efforts are being made worldwide to promote access to information. They however lament the attendant features of underdevelopment such as power failure, machine breakdowns, and lack of spare parts and technicians, which intermittently stall the performance of modern gadgets of information storage and

transfer in developing countries. This finding is in support of earlier researchers like Moon, et al. (2012) who in their study admit that access to accurate medical information, in various health care facilities, is very necessary for Medical Doctors to take effective medical decision. Attama and Ezema (2005) argue that access and use of information are necessary for Medical Doctors for problem solving and decision making. The findings also showed that Medical Doctors in the study area agreement to the fact that health information resources for clinical decision making are highly accessible.

The findings also revealed the extent of use of various Clinical Core Skills of clinical decision making by Medical Doctors in the study to be of very high extent. This is in consonance with Timmermans and Mauck (2005), who opined that the sociology of being a medical professional, which holds physicians that have expert knowledge and clinical competence in high regard, might explain this behaviour. However, this is contrary to the submission of Kahane (2011) who concludes that the act and perception of needing to seek knowledge may reflect negatively on a physician's competence and professionalism. He further stressed that cognitive processes that complicate how physicians arrive at their decisions, exemplified the role of confidence in clinical reasoning and information seeking behavior. Wolf (2001) corroborates this by saying that Medical Doctors who believe that their accumulated clinical knowledge is all they need to reach a correct decision will not be motivated to access external resources and may possibly be inflexible to change a planned management course when information in the EBM literature that may be contrary to their belief is presented.

The findings from research hypothesis one showed that there is a significant relationship between extent of accessibility to health information resources and clinical decision making by Medical Doctors in OAUTH. This implies that access to adequate medical information sources and resources are imperative for successful healthcare delivery, particularly, for Medical Doctors all over the world. Moon, Hossain and Shin (2012) admit that access to accurate medical information, in various health care facilities, is very necessary for Medical Doctors to take effective medical decision. Attama and Ezema (2005) argue that access and use of information are necessary for medical doctors for problem solving and decision making. Panos (2001) states that access to information is an essential condition for development and empowerment

The findings from research Hypothesis two showed that there is a significant relationship between use of various Clinical Core skills and effective clinical decision making among Medical Doctors in OAUTH. This is in line with Nuq (2012) who concluded that good and effective clinical decision making requires a combination of experience and skills such as pattern recognition which are pattern recognition which is learning from experience; critical thinking, removing emotion from our reasoning, being 'skeptical', with the ability to clarify goals, examine assumptions, be open-minded, recognize personal attitudes and bias, able to evaluate evidence; communication skills, active listening the ability to listen to the patient, what they say - what they don't say, their story, their experiences and their wishes thus enabling a patient-centered approach that embraces self-management; information provision the ability to provide information in a comprehensible way to allow patients/clients, their careers and family to be involved in the decision making process and evidence-based approaches, using available evidence and best practice guidelines as part of the decision making process. This is pertinent given the multidimensional and complex nature of clinical decision making, factors influencing it may arise from multiple sources, resulting in differing effects for different individuals

The result of regression analysis used to determine the combined influence of accessibility and use of core clinical skills and use of health information resources on clinical decision making among Medical Doctors in OAUTH. This implies that the joint contribution of the independent variables to the dependent variable was significant and that other variables not included in this model may have accounted for the remaining variance. Physicians who do not perceive the need to access information when faced with a clinical question, may err in their clinical decision. This is particularly important as the decision making is situated within a broader contextual ethos, with dimensions particular to the practice in the specific workplace. Traversing all of these factors, to manage and make sense of them requires four key capabilities: cognitive, emotional, social and reflexive (Smith, Higgs & Ellis, 2008). The task of decision making is to make action related choices. Decisions can be defined in terms of attributes such as stability, certainty, familiarity, urgency, congruence, risk, and relevance and number of variables (Connolly, Arkes, Hammond, 2000, Eraut 2004, Whitney 2003). In each clinical practice situation decisions are characterized by a unique combination of these attributes. Past research showed that individual decision attributes have poles of difficulty contending with stable versus unstable, familiar versus unfamiliar, with further difficulty and complexity arising from the summation and interplay between attributes (Smith 2006).

Conclusion

From the findings of this study, it was concluded that: Health Information Resources required for effective and efficient clinical decision making by Medical Doctors in OAUTH, Ile-Ife were highly accessible; The extent of use of various clinical core skills for clinical decision making by Medical Doctors in OAUTH Ile Ife is very high; and finally that there is significant joint contribution of the extent of accessibility and use of clinical core skill to effective clinical decision making among Medical Doctors in the study area.

VIII. RECOMMENDATIONS

On the basis of the findings of this study, the following recommendations were made:

Despite the fact that there is a high extent of accessibility of health information resources, there is still need to organize on regular basis, efforts should be intensified to procure ultra-modern clinical health information resources.

Although the findings showed a high extent of use of various Clinical Core Skills by Medical doctors in the study area, the management should device new method for quality service promotion together with evaluation to measure the effectiveness of the medical doctors.

Since it has been established that the extent of accessibility and use of Clinical Core Skill significantly predict clinical decision making among Medical Doctors, Government and its agencies should make funds available for the OAUTH management to enable her procure modern equipment, organize workshops and seminars on the use of modern equipment to enhance effective and efficient clinical decision making among Medical Doctors in OAUTHC.

REFERENCES

[1] Attama and Ezema (2015). *Library and information services: A practical approach*. Nigeria: E-Press (Nig.).

[2] Aguolu, C.C. & Aguolu, I.E. (2002) *Librarians and information management in Nigeria*. Maiduguri: Ed-Linform Services.

[3] Bawden D. (2008). The Worlds of Health Information. *Journal of information science*, 23(2). https://doi.org/10.1177101655515020280010 6 on 18th March 2019

[4] Buckland, M.K. (1991) Information as thing. *Journal of American Society for Information Science, 42(5):351-360.*

[5] Bhugra D. (2008) Decision making in psychiatry: what can we learn? *Acta Psychiatr Scan* 2008;118:1–3 [PubMed] [Google Scholar]

[6] Chapman R, Berger M, &Weinstein M (2002) When does quality-adjusting life-years matter in cost- effectiveness analysis? Health Economics. 2004;13:429–436.

[7] Charles C, Gafni A. & Whelan T. (1999) Decision making in the physician patient encounter: revisiting the shared treatment decision-making model. *Soc Sci Med* 1999;49:651–61 [PubMed] [Google Scholar]

[8] Hansson E, Hansson T (2007) The cost-utility of lumbar disc herniation surgery. Eur Spine J.; 6:329–337.

[9] Panos, K. (2001) The internet and poverty: real help or real type. Panos Media briefing No. 28, June. http://digitalcommons.unl.edu/libphilprac/2371

[10] Peul W, van den Hout W, Brand R & Thomeer R, Koes B. (2008) Prolonged conservative car) versus early surgery in patients with sciatica caused by lumbar disc herniation: two-year results of a randomised controlled trial. BMJ;336:1355–58.

[11] Tosteson A, Skinner J, Tosteson T, Lurie J, Andersson G, Berven S, (2008) The Cost Effectiveness of Surgical Versus Nonoperative Treatment for Lumbar Disc Herniation Over Two Years. SPINE; 33(19):1–8.

[12] Van Osch S, Wakker P, van den Hout & Stiggelbout A (2004) Correcting biases in standard gamble and time tradeoff utilities. *Medical Decision Making*;24(511-517)

[13] Foster, A. (2004) A nonlinear model of information-seeking behavior. *Journal of the American Society r Information Science and Technology*, 55(3):228–237.

[14] Foster, A. and Ford, N. (2003) Serendipity and information seeking: An empirical study. *Journal of Documentation*, 59(3):321–340.

[15] Hardy D & Smith B. (2008) Decision making in clinical practice. *Br J Anaesth* 2008;9:19–21 [Google Scholar]

[16] Elwyn G, Edwards A, Gwyn R, & Grol R. (1999) Towards a feasible model for shared decision making: focus group study with general practice registrars. *BMJ* 1999;319:753–6 [PMC free article] [PubMed] [Google Scholar]

[17] Coulter A, & Ellins J. (2006) Improving clinical decision-making. In: Coulter A, Ellins J. *Patient-focused intervention: a review of the evidence*. London: The Health Foundation; 2006. pp. 56–84 [Google Scholar]

[18] Moon, B. Y., Hossain and Shin (2012) Bo Youn Moon, Jung-Ho Youn, Sook Shin, Sun Young

[19] Hwang,1 Yong (2012) Ho Park1 Genetic and phenotypic characterization of methicillin-resistant staphylococci isolated from veterinary hospitals in South Korea. *Journal of Veterinary Diagnostic Investigation* 24(3) 489–498 DOI: 10.1177/1040638712440985 http://jvdi.sagepub.com

[20] Ojedokun, A.A. (2007). *Information literacy for tertiary education students in Africa. Nigeria:* Print-marks Ventures.

[21] Connolly, T., Arkes, H. R. & Hammond, K. R., (2000) *Judgment and Decision Making: An Interdisciplinary Reader* (Cambridge Series on Judgment and Decision Making) 2nd Edition, Cambridge University Press; 2nd Edition ISBN-13: 978-0521626026, ISBN-10: 0521626021

[22] Eraut, M., & Hirsh, W., (2007) *The Significance of Workplace Learning for Individuals, Groups and Organisations* , SKOPE Monograph 9, Oxford University Department of Economics, 96pp.

[23] Eraut, M., Steadman, S., Furner, J., Maillardet, F., Miller, C., Ali, A. & Blackman, C. (2004) Learning in the professional workplace: relationships between learning factors and contextual factors , AERA Conference (Division I Paper Session), (San Diego, April).

[24] Nuq P (2012). Toward a Better Understanding of the Intention to use Health Service by Medical Professional, the case of Developing Countries PhD thesis submitted to the school of management. University of Nestle.

[25] Hinson J. M, Jameson T. L, Whitney P.Hinson J. M, (2003) Impulsive decision making and orking memory. J Exp Psychol Learn Mem Cogn. 2003 Mar;29(2):298-306. doi: 10.1037/0278-7393.29.2.298.J Exp Psychol Learn Mem Cogn. 2003. PMID: 12696817

[26] Sox H. C Jr, Blatt M. A, Higgins M. C, Marton K. I. Medical Decision Making. B: Butterworth-Heinemann ; (1988). Weinstein M. C, Fineberg H. V. (1980) Clinical Decision Analysis. Philadelphia: Saunders.

[27] Kassirer J, Angell M. (1994;331:669–70)*The Journal's policy on cost-effectiveness analyses*. New England Journal of Medicine. 1994;331:669–70.

[28] Vakkari, P. & Talja, S. (2005). The influence of the scatter of literature on the use of electronic resources across disciplines: A case study of FinELib. *In Proceedings of the 9th European Conference on Digital Libraries.* Berlin & Heidelberg: Springer, 207-217.

[29] Van Osch S, Wakker P, van den Hout & Stiggelbout A (2004) Correcting biases in standard gamble and time tradeoff utilities. *Medical Decision Making*;24(511-517)

[30] Von Neumann J, Morgenstern O. (1944). *Theory of games and economic behavior*. PrincetonUniversity Press; Princeton, NJ

[31] Weinstein J., Lurie J& Tosteson T., (2006) Surgical vs non-operative treatment for lumbar disck herniation: the Spine patient Outcomes Research Trial (SPORT) observational cohort. JAMA;296:2451–9.

[32] Weinstein J, Tosteson T& Lurie J (2006). Surgical vs non-operative treatment for lumbar diskherniation: The Spine Patient Outcomes Research Trial (SPORT): a randomized trial. JAMA;296:2441–50.

[33] Weinstein M, Stason W (1977). Foundations of cost-effectiveness analysis for health and medical practices. *New England Journal of Medicine*;296(13):716–21.

[34] Weinstein M, Siegel J, Gold M, Kamlet M, Russell L (1996). *Recommendations of the panel on cost-effectiveness in health and medicine*. JAMA;276(15):1253–58.

[35] Whitney S, N, Holmes-Rovner M, & Brody H, (2008) Beyond shared decision making: An expanded typology of medical decisions. *Med Decis Making* 2008;28:699–705 [PubMed] [Google Scholar]