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RESEARCH ARTICLE

DETERMINANTS OF UTILIZATION OF INFORMATION COMMUNICATION TECHNOLOGY BY LECTURERS AT KENYA MEDICAL TRAINING COLLEGE: A CASE STUDY AT NAIROBI CAMPUS.

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Abstract:

Background: Information and Communication Technologies (ICTs) has become one of the driving forces in facilitation of learning in most colleges. The ability to effectively harness the technology varies from institution to institution globally. However, ICT has not been extensive in education systems worldwide as found in other fields, such as business and engineering. Reasons for the low adoption or absence of ICT in education systems also vary significantly depending on the prevailing circumstances. To improve on this, the study was aimed at investigating the extent to which lecturers' personal and institutional attributes influence their utilization of information communication technology.

Method: The study was a descriptive cross sectional survey conducted at the Kenya Medical Training College. The study population includes all lecturers employed by KMTC Nairobi campus; on permanent basis, those on secondment by the Ministry of Medical Services and all the external lectures who are contracted in all the faculties totaling 295. A sample size of 155 lecturers was selected using a table of random numbers. A stratified sampling was followed so as to get equal proportions basing on gender and depending on the number of lecturers in each faculty. A self administered and coded questionnaire was given to the lecturers to fill. Data from questionnaires were analyzed in frequencies and percentages using Statistical Package for Social Sciences (SPSS) version 19, this was reliable tool for quantitative data analysis.

Results: Of the 155 respondents, 93 (60%) of the respondents were males while 62 (40%). The results obtained showed that institutional support by provision of resources for ICT related training such as internet, computers, laptops and projectors had moderate impact on use of ICT. Statistically significant associations were observed on the use of ICT ($p=0.000$), institutional attributes with ICT use ($p=0.049$) and use of ICT with its policies ($p=0.013$). However, there was no significant different on the use of ICT with individual attributes ($p=0.661$).

Conclusion: The study concluded that institutional attributes and ICT policy were keys to utilization of ICT to facilitate learning by the lecturers at KMTC. The study observed that institutional support especially in provision of resources to fast track ICT utilization was critical in facilitating the use of ICT, need for a mandatory policy on use of ICT by lecturers to facilitate learning. However, in order to achieve ICT policies that support facilitation of learning in collages, a mechanism should be put in place to make the use of ICT in teaching and learning mandatory.

Key Words:- Computerization, lecturers, knowledge, attitude.

Background:-

Globally, many countries are trying to harness the power of ICT-mediated learning as part of a comprehensive strategy to reform their education systems. In the United Kingdom, British Educational Communication and Technology Agency (BECTA) was established in 1998 to promote the use of ICTs to transform

learning, teaching and leadership in schools and colleges. BECTA provides advice and support educational users in the effective integration of ICTs into facilitation of learning [1].

In the United States, the community colleges which constituted the largest providers of Teaching using ICT by 1987, reported statistics which indicated that, 87% of the colleges had the necessary infrastructure for satellite video-conferencing, 60% were equipped for two-way videoconferencing, and 4% expressed an interest in adopting distance education [2]. The government of China took major initiatives promoting the use of ICT-mediated learning through the Ministry of Education (MOE) with the hope that, by 2015 distance-learning networks would be available from basic to graduate education. The MOE established China Education and Research Computer Network (CERNET) to link all potential online service providers [3].

Regionally, new information technologies are rapidly changing the lives of a small but growing number of people in Africa, African Virtual University [4]. AVU uses satellite technology; the Internet, phone lines, and e-mail to link AVU centres across Africa to a studio classroom to provide learners with real-time interaction with the instructor. AVU centres have successfully trained thousands of students as technicians, engineers, managers, and scientists in more than 15 African countries. This has been possible through the Commonwealth of Learning for the training of untrained teachers in Botswana, Kenya, Swaziland, Tanzania, Uganda, Zimbabwe, Nigeria, Sierra Leone and Namibia [5].

Nationally, the latest e-readiness survey by Kenya Education Network Trust (KENET) carried out in 2008 and presented at the Information Technology conference at Strathmore University; indicated that there is low usage of ICTs for teaching [6, 7]. In addition, most Higher Educational Institutions often use ICTs for operational functions rather than instruction [7]. Accordingly, the use of ICT in facilitation of learning has not just undergone evolution, but revolution [8]. This revolution in utilization of ICT can be influenced by many factors such as knowledge in ICT which is seen to be the central driving force, with the shift from 'information society' to that of 'knowledge societies' [8, 9]. The shift demands a re-evaluation of the existing traditional educational processes by the lecturers because; students' ICT literacy depends on ICT literate lecturer [10, 11].

The Kenya National ICT Policy was adopted in 2006 with the aim of improving the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services [12]. It is therefore imperative that every institution develops a policy that will guide the successful integration of ICT in the education system [12]. This is necessary to ensure standardization, reduce wastage and ineffective use of the technology and optimize its use to enhance teaching and learning. Policy awareness is crucial because it creates awareness of the opportunities offered by ICT as an educational tool of the education sector and exploits e-learning opportunities to offer Kenyan education programs for export [12]. A transparent purchasing policy must be established to ensure ethical, accountable and efficient use of the resources committed to ICT development. This purchasing policy should include the following elements: assessment of needs, requisition of ICTs, approval of requisition, and request for quotations from suppliers, selection of suppliers and submission of purchase orders, receiving and placing ICT equipment on inventory [1]. KMTC Lecturers ought to be aware of the purchasing policy, so that they can effectively participate in the budgeting for the relevant items. There should be a stock of hardware and relevant software to allow lecturers equitable access to the technology

It is therefore, imperative for KMTC lecturers to have current knowledge of ICT and the attitude to apply that knowledge in their area of expertise [13]. The knowledge acquired will assist the lecturers to provide interactive instruction to the medical students [14]. An ICT policy is an essential management tool that can enhance successful utilization of ICTs to facilitate learning [15]. Policies for the ICT integration to learning evolved around three main categories, namely: people, infrastructure, and content. A policy that recognized the use of ICT for teaching and learning and is supported by lecturers would go a long way to enhance its acceptance [7].

Method:-

This was a cross sectional descriptive study design targeting selected lecturers at KMTC in which the findings were used to determinants the utilization of information communication technology by lecturers at Kenya Medical Training College.

Population and sample:-

The study was a descriptive cross sectional survey conducted at the Kenya Medical Training College. The study population includes all lecturers employed by KMTC Nairobi campus; on permanent basis, those on secondment by the Ministry of Medical Services and all the external lectures who are contracted in all the faculties totaling 295. A sample size of 155 lecturers was selected using a table of random numbers. A stratified sampling was followed so as to get equal proportions basing on gender and depending on the number of lecturers in each faculty. A self-administered and coded questionnaire was given to the lecturers to fill. Data from questionnaires were analyzed in frequencies and percentages using Statistical Package for Social Sciences (SPSS) version 19, this was reliable tool for quantitative data analysis.

Inclusion and exclusion criteria:-

The inclusion and exclusion criteria for the study were as follows: All lecturers on duty who agreed to participate. Staffs on leave and those that were not there on the day of data collection were excluded.

Data collection instruments:-

A self-administered and coded closed-end questionnaire was given to the staffs to fill.

Data analysis:-

Collected raw data questionnaires from the respondents was sorted and then scrutinized for completeness and accuracy. The cleaned data was then coded to represent the data collected on questionnaires in a way that the SPSS program could effectively analyze. Data was analyzed in frequencies and percentages, and then presented in form of frequency tables and graphs and the data analyzed for descriptive and inferential statistics.

Results:-**Demographic characteristics:-**

Of the 155 respondents who participated in the study, the information considered includes: gender, age, length of time worked, job designation and the level of education. On gender, 93 (60%) of the respondents were male while 62 (40%) were female.

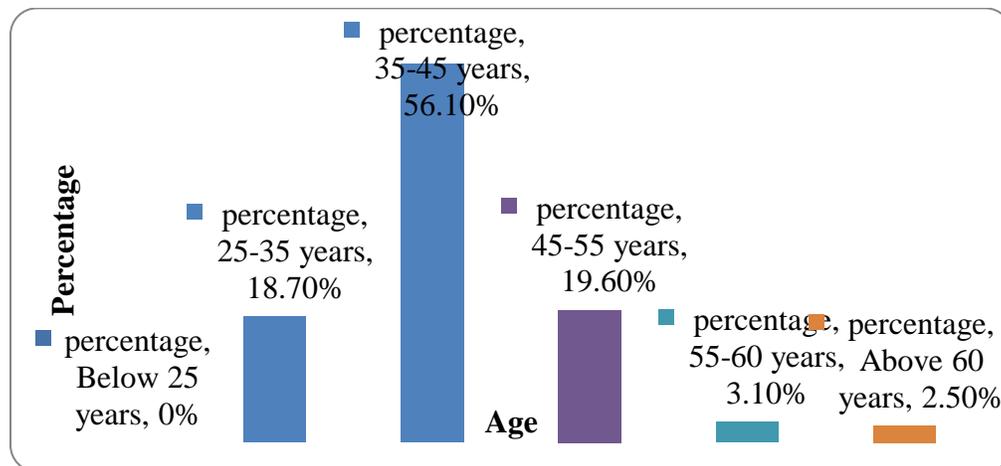


Figure 1:- Respondents by Age

Of the 155 respondents who participated in the study as shown in Figure 1, 29 (18.7%) are in the age range between 25-35 years, 87 (56.1%) 35-45 years, 30 (19.6%), 45-55 years, 5 (3.1%), 55-60 years, while 4 (2.5%) are above 60 years and none of the lecturers were below 25 years.

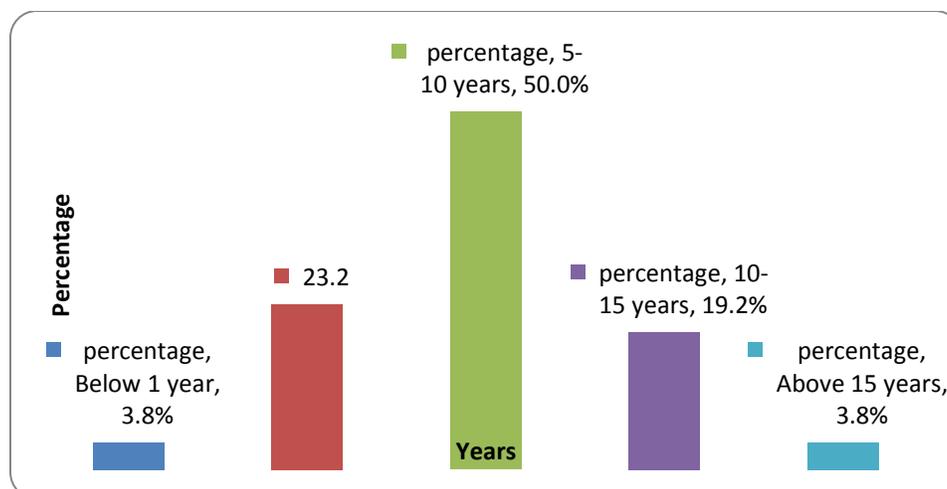


Figure 2:- Numbers of years as a lecturer

On the number of years as a lecturer as shown in Figure 2, 6 (3.8%) were below one year, 36 (23.2%) 1-5 years. 77 (50%), 5-10 years, 30 (19.2%) while 6 (3.8%) had worked for above 15 years.

Table 1:- Job designation of the respondents by their titles

Chief principal	28	18.10%
Principal lecturer	39	25.10%
Senior lecturer	54	34.90%
Lecturer	34	21.90%
Total	155	100%

Out of the 155 respondents who participated in the study as shown in Table 1, 28 (18.1%) are chief principal lecturers, 39 (25.1%) principal lecturers, 54 (34.9%) senior lecturers and 34(21.9%) are lecturers. study found out that a majority of the teaching staff 45 (29%) were senior lectures.

Table 2:- Distribution of Respondents by Level of Education

Education Level	Frequency	Percentage (%)
Postgraduate	31	20
Undergraduate	78	50
Tertiary college	46	30
Total	155	100

On the level of education as described in Table 2, 31 (20%) had attained post graduate level, 78 (50%) and 46 (30%) had attained undergraduate and tertiary college respectively.

Utilization of Information and Communication Technology:-

The respondents were asked to rate various components on utilization of ICT to facilitate learning on a five point likert scale. The range was strongly agree (5) to strongly disagree (1). The scores of strongly disagree and disagree were taken to represent a component that had an impact to a small extent (S.E) equivalent to a mean score of 0 to 2.5 on a continuous likert scale; ($0 \leq S.E \leq 2.4$). Scores of neutral were taken to represent a component that had an impact of a moderate extent (M.E) equivalent to a mean score of 2.5 to 3.4 on the continuous likert scale: ($2.5 \leq M.E \leq 3.4$). The scores for both agree and strongly agree were taken to represent a component which had an impact to a large extent (L.E) equivalent to a mean score of 3.5 to 5 on a continuous likert scale; ($3.5 \leq L.E \leq 5.0$). A standard deviation (SD) of 1.5 implied a significant difference on the impact of the variable among respondents. This scale was used in Table 2-5.

Table 2:- Utilization of Information and Communication Technology (n = 155)

Constructs	N	Minimum	Maximum	Mean	Std Deviation
Technology involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities, and among lecturer's technology can be used to change or alter how students access, gather, analyze, present, transmit and simulate information	155	2	5	3.94	.843
Use of information and communication technology (ICT) creates a powerful learning environment and it transforms the learning and teaching process in which students deal with knowledge in an active, self directed and constructive way	155	2	5	4.26	.719
ICT is seen as an important instrument to support new ways of teaching and learning. It should be used to develop student's skills for cooperation, communication, problem solving and lifelong learning	155	1	5	3.97	1.035
Technology should be used as a tool to support the educational objectives such as skills for searching and accessing information, communication and problem solving which are important for the preparation of student for the knowledge society	155	1	5	3.19	1.179
Lecturers' can become effective agents to be able to make use of technology in the classroom	155	2	5	3.81	1.001
Utilization of ICT by lecturers can facilitate learning in the classroom	155	2	5	3.74	1.167
Institution's ICT vision is essential for effective ICT integration to teaching.	155	1	5	3.16	1.351

On the utilization of information and communication technology as shown in Table 2, the study found that learning environment and process (mean: 4.26) had the greatest impact on the use of information and communication technology (ICT) at Kenya medical training college (KMTC). Other components that were found to have the greatest impact on use of ICT at KMTC included; students skills for cooperation, communication and lifelong learning (mean: 3.97), the issue of problem solving and extended human capabilities (mean: 3.94), effectiveness of lecturers in classrooms (mean: 3.81), and facilitation of learning exercise (mean: 3.74). In addition, learning objectives (mean: 3.19) and effective ICT integration and the college's ICT vision (mean: 3.16) were found to have moderate impact on use of ICT in teaching and learning at KMTC. The study observed a significant different on the use of ICT ($p < 0.05$)

Table 3:- Lecturer Individual Attributes

Constructs	N	Minimum	Maximum	Mean	Std. Deviation
Lecturers' characteristics(e.g. individual's educational level, age, gender, educational experience, can influence the adoption of an innovation	155	2	5	3.65	1.005
Lectures' personal knowledge, readiness, confidence and ability can influence the adoption of ICT for instructional delivery	155	1	5	3.58	1.343

Personal upgrading knowledge in internet access can influence electronic facilitation of learning, access of electronic journal from the library and electronic searching	155	1	5	3.42	1.012
Incorporation of ICT as instructional tools in the learning environment provides an excellent means of individualizing instruction	155	1	5	3.32	1.232
Lecturers' own beliefs, values, ideas and the environments where facilitation of learning occurs play important part in their usage of ICT for teaching,	155	1	5	3.06	1.394
Technology is disruptive because it demands changes in the way people do things. The change create a form of stress, if the individual lacks knowledge to catch-up with the speed of transformation	155	1	5	3.55	1.191
Higher learning institution should recognize the lecturer's who utilize ICT to facilitate learning during the yearly performance appraisal as an indicator for promotion.	155	1	5	3.32	1.450
Lecturers are techno-phobic and this affects their effective use in teaching.	155	1	5	3.32	1.309

The respondents were asked to rate the extent to which the lecturer's individual attributes affected the utilization of information and communication technology (ICT) at Kenya medical training institute (KMTC) on a five point likert scale. The study as describe in Table 3 observed that individual's educational level, age, gender and educational experience had the greatest impact on use of information and communication technology (ICT) at Kenya medical training college (KMTC). Other components found to have the greatest impact included; personal knowledge, readiness, confidence (mean: 3.58) and lack of ICT knowledge (mean: 3.55). The study also found out that personal upgrading knowledge in internet access (mean: 3.42), excellent means of individualizing instruction (mean: 3.32), lecturer techno-phobic (mean: 3.32) and lecturers' own beliefs, values, ideas and thinking (mean: 3.32) had moderate impact on use of ICT and KMTC. The study found that there was no significant different on the use of ICT with individual attributes ($p>0.05$).

Table 4:- Institutional Attributes

Structs		Minimum	Maximum	n	Std. Deviation
Availability of information and communication system like laptops, projectors increases the use of all the components of ICT for processing data and information	155	1	5	2.74	1.139
Distributing multimedia files such as podcasts and vodcasts to higher institution can encourage wide spread ICT use.	155	1	5	3.19	1.151
Institutional support by provision of resources for ICT related training influence the utilization of ICT to facilitate learning	155	1	5	3.23	1.423
Frequent power disruptions result in limited access to ICT in the institution	155	1	5	2.94	1.323
Some lecturers are reluctant to use ICT because of difficulty in accessibility to ICT methods	155	1	5	3.00	1.195

The respondents were asked to rate the extent to which institutional attributes affected the utilization of information and communication technology (ICT) at Kenya Medical Training College (KMTC) on a five point likert scale. The study as shown in Table 4 observed that institution support by provision of resources for ICT related training (mean: 3.23), distribution of multimedia files such as podcasts and vodcasts (mean: 3.19) including availability of information and communication system like laptops, projectors (mean: 2.74) had moderate impact on use of ICT at KMTC. The study observed that lecturers were reluctant to use ICT because of difficulty in accessibility to ICT methods (mean: 3.00), frequent power disruptions (mean: 2.94). The study found that there was a significant different on the use of institutional attributes ($p<0.05$).

Table 5: Information and Communication Technology Policies

Structs		imum	imum	n	Deviation
College has adequate technical staffs that lecturers draw support from when they have problem with the ICT equipment during their facilitation of learning	155	1	5	3.52	1.219
Every higher learning institution should develop an ICT policy that guide the successful integration of ICT in the facilitation of learning and standardization	155	0	5	2.99	1.492
Institutional policies that promote lecturers mandatory ICT use would go a long way to enhance its acceptance	155	1	5	3.06	1.138
Policies guide the lecturers to exploit the interactive potential of Information and Communications Technology in the provision of lifelong learning	155	1	5	2.87	1.390
Colleges should have transparent ICT purchasing policy that ensures accountability and efficient use of the resources committed to ICT its use	155	1	5	2.97	1.235

The respondents were asked to rate the extent to which information and communication technology (ICT) policies affected the utilization of ICT at Kenya medical training institute (KMTC) on a five point likert scale as shown in Table 5. The study observed that institutional policies (mean: 3.52) had the greatest impact on utilization of ICT at KMTC. The policy that promote lecturers mandatory ICT use (mean: 3.06) and that which guide successful integration of ICT in facilitation of learning and standardization (mean: 2.99) were found to have moderate impact on utilization of ICT at KMTC. Other policies that were found to have moderate impact included policy on transparency and accountability in the purchase of ICT facilities (mean: 2.97) and policy guiding exploitation of interactive potential of ICT by lecturers in the provision of lifelong learning (mean: 2.87). The study found that there was a significant different on the use of ICT with and institutional policies ($p < 0.05$).

Discussion:-

The purpose of this study was to establish determinants of utilization of information communication technology to facilitate learning by lecturers at Kenya Medical Training College, Nairobi Campus. In regards to the demographic information of the respondents (155), the study found that majority of lecturers at KMTC were in the age bracket of 35-45 years 89 (57.7%), the employees (therefore) were well distributed across the age profile and there was existence of gender equality. On the length of period worked, 77 (50%) of the respondents have worked for between 1-5 years. This implied that the respondents had sufficient knowledge and background information to adequately respond to the questions asked during the survey. On job designation, the study found out that a majority of the teaching staff 45 (29%) were senior lectures while on level of education, 50% of the respondents were found to be undergraduates. The level of education is crucial for health professional lecturers since they are expected to facilitate learning and make it meaningful to individuals rather than just to provide knowledge and skills [16]. This is in line with a similar study which observed that age is another factor that greatly contributes to the use of ICT to facilitate learning [17]. As much as an increasing number of Web sites are devoted to providing health information to both young and older adults, many sites have usability problems unique to the older population. Aspects identified as inappropriate for seniors by experts were as follows: small font size, too much information on one page, and a failure to provide instructions. The older adults preferred a simple design with clear instructions.

In utilization of information and communications technology to facilitate learning by lecturers, this study found out that learning environment and process had the greatest impact on the use of information and communication technology (mean: 4.26) at KMTC. These findings were similar to several studies that observed individual creativity, innovation, and inventiveness are encouraged and facilitated by improving the environments in which interaction with the technology take place [18]. However, in other studies, observation has been made that ICT alone cannot create this kind of learning environment [18]. Other components that were found to have the

greatest impact on use of ICT included; students skills for communication and lifelong learning, problem solving, extended human capabilities and effectiveness of lecturers in classrooms. Despite the fact that ICT facilitate learning, it may also distort the objective of learning such that the learners concentrate on searching for information rather than understanding the content [19].

The study found out that institutional support by provision of resources for ICT related training such as internet, computers, laptops and projectors had moderate impact on use of ICT. However, that even where the resources are available, accessibility is still a challenge hence reluctance to use ICT to facilitate learning [20]. A similar study found that, even with the best ICT resources, proper maintenance is important [21]. Frequent power disruptions also had moderate impact on limited access in the current study. Similar studies observed that power disruptions especially in third world limit ICT access in institutions of higher learning [20, 21].

The study further found out that the policy which provides for adequate technical staff that lecturers draw support from when in problem had the greatest impact on utilization of ICT. This observation was similar to a study in South Africa which observed that technical support was major resource for lecturers during their facilitation of learning [22]. The policy that promote lecturers mandatory ICT use and that which guide successful integration of ICT in facilitation of learning and standardization were found to have moderate impact on utilization of ICT at KMTC. Other policies that were found to have moderate impact included policy on transparency and accountability in the purchase of ICT facilities and policy guiding exploitation of interactive potential of ICT by lecturers in the provision of lifelong learning.

The study concluded that institutional attributes and ICT policy were keys to utilization of ICT to facilitate learning by lecturers at KMTC and that institutional support especially in provision of resources to fast track ICT utilization was critical in facilitating the use of ICT by lecturers. In addition, the management of KMTC required setting in motion administrative actions to operationalize the use of ICT by lecturers in teaching and learning at the institution and that the successful utilization of ICT in teaching could be realized at the college if the institutional policies on ICT emphasized more the availability of a technical team to aid lecturers in the event of problems. This study therefore recommends that mechanism should be devised to ensure that authorities provide relevant institutional support to fast track the use of ICT that can achieve resources in form of material, human capability and finances, ensuring adequate technical support and to put in place a mechanism that eliminates frequent power disruptions that limits access, revise its policy to in cooperate use of ICT in teaching and learning as a mandatory undertaking. In addition, similar study be undertaken to enhance in-depth analysis that understand data sets on ICT utilization to facilitate learning in different colleges.

Strengths of the study:-

This study is one of the few studies done to determine the utilization of information communication technology by lecturers at Kenya Medical Training College

Limitation of study:-

The findings obtained could not be generalized because the sample size and the study prospectively recruited a small number of respondents and only those that were present during data collection and consented were included in the study. However we were able to achieve the objectives of the study on the utilization of information communication technology by lecturers at Kenya Medical Training College at Nairobi campus

Declarations:-

Competing interest:-

The authors declare that they have no competing interests.

Authors' contributions:-

JA designed the study, collected and analyzed data and drafted the manuscript. JA, GK, JM and GK designed the study, critically reviewed and revised the manuscript for important intellectual content. All authors read and approved the final manuscript.

Ethical approval:-

Ethical approval for this study was obtained from Kenya Methodist University Scientific and Ethics Review Committee.

Consent to Participate:-

Informed consent and assent was obtained from the respondents that participated in the study.

Consent to Publish:-

Written Informed consent for publication of the results of study was obtained from the respondents and that their names should not be used. A copy of the consent form is kept in individual file with the respondent signature and can be available for review by the editor of this journal if needed.

Availability of data and materials:-

The data analyzed during the current study is available from the corresponding author on reasonable request

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