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Perception and Associated Factors for the Implementation of Telemedicine During COVID-19 Pandemic Among Health Professionals Working At the Government Health Facility In Resource Limiting Setting, Ethiopia 202 : A Cross-section study.

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ABSTRACT

Background: The novel coronavirus(COVID-19) pandemic has been dramatically affecting healthcare organizations across the world. Accessing modern health care is still limited in developing countries due to different factors. Within physical distancing, telemedicine has become the preferred communication channel between health professions and patients. Therefore, this study was aimed to assess Perception and Associated factors for the implementation of telemedicine during the COVID-19 Pandemic among Health Professionals Working at Governmental health facility in Addis Ababa, Ethiopia, 2021.

Methods: -Institutional-based cross-sectional study design was conducted among 845 study participants. A structured interview administrative questionnaire using ODK(open data kit) data collection technique was used. A pre-test was done on 5% of the total sample size. The quality of data was assured by checking its completeness and consistency. Descriptive statistics Bivariable and multivariable logistic regression were fitted. Variables having P-value less than 0.25 during bi-variable logistics regression were entered into multivariable

logistic regression. Adjusted odds ratio (AOR) with 95% confidence level (CL) were used to declare association between dependent and the outcome variable. Model fitness was checked using Hosmer-Lemeshow

Result:- Over all 60.9% (95% CI: [57.5, 64.4]) of health professionals had a good perception towards telemedicine. Health professionals who had IT supporting staff (AOR:7.13, 95% CI: 4.264-13.201), health professionals ' being certified concerning with ICT (AOR:4.42, 95%CI: 2.69-7.524), frequency of using social media platforms (AOR=3.263, 95% CI: 1.621-6.561) were variables significantly associated with the perception of telemedicine among health professionals for control and prevention of COVID-19.

Conclusion:- More than half of respondents had a good perception of telemedicine. being trained with ICT, and Having IT support staff in their health facility were significantly associated with the level of telemedicine perception in the era of the COVID-19 pandemic. Therefore, the Ministry of health recommended to encourage the health professions and the stakeholders to collaborate on promotion of safe and evidence-based use of telemedicine during the current COVID-19 pandemic and future outbreaks.

Keywords: Perception, factors, Telemedicine, Health Professionals, COVID-19, Pandemic, Addis Ababa, Ethiopia.

INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus and it's transmitted primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes[1]. The COVID-19 pandemic has led to a dramatic loss of human life worldwide and presents an unprecedented challenge to public health and the clinical healthcare system[2, 3]. The economic and social disruption caused by the pandemic is devastating tens of millions of people are at risk of falling into extreme poverty, while the number of undernourished people, currently estimated at nearly 690 million, could increase by up to 132 million by the end of the year[4].

The overwhelming quantities of COVID-19 information and data that seem continually to be expanding can place a significant burden on health providers seeking to respond to patient questions[5]. With the rapid spread of COVID-19 across the world, the ability of countries to address and respond to Non-communicable diseases has been impacted[6].

Telemedicine helps for the control and prevention of communicable and non-communicable diseases remotely in the era of the COVID-19 pandemic, face-to-face interactions may not be preferred in some circumstances by patients or clinicians[7]. For patients with chronic conditions, telemedicine has been initiating to promote medication adherence, thus reducing readmissions and decreasing morbidity and mortality, improving access to follow-up care, and showing high patient satisfaction [8-11]. Despite the benefits of increased access to health care, quality improvements, and cost controls, telemedicine is not simple to implement, there are multiple challenges and barriers for sustainable implementation[12]. Understanding the perception of telemedicine among health professionals during this pandemic is essential for sustainable implementation.

The use of telemedicine technology approach in the 21ST century has been significantly impotent for a healthcare organization and understanding the perception and utilization of telemedicine among health professionals for control and prevention of COVID-19 pandemic among health professionals is indeed critical to its sustainable development for health system digitization and kept the health of the community and also to maximize the adoption of telemedicine services, user perception is necessary for system integration and advancement[13, 14].

Exchanging healthcare information and providing health care services across a geographic area and time has been considered as a potential solution to alleviate the current health care problem, it helps to Scale-up the health care system and delivering health care service to the rural and remote area for disease control and prevention[15].

The potential impacts of the telemedicine system in healthcare delivery are well known. However, particularly in developing countries, have been failed to sustain and integrate with the health care system[16]. The accessibility to medical and specialty services is normally expensive and frequently concentrated in some areas and it is costly and risky to providing high-quality face-to-face health services for the community in the era of the COVID-19 outbreak[17]. Therefore , this study was aimed to assess Perception and Associated factors for the implementation of telemedicine during the COVID-19 Pandemic among Health Professionals Working at Governmental health facility in Addis Ababa, Ethiopia, 2021

METHODS

Study design and setting

An Institutional based cross-sectional study design study was conducted at Addis Ababa Governmental health facility among health Professionals. Addis Ababa has population of more than 4,00,0000 and 10 sub cities. Addis Ababa is the capital city of the country and AU and had more 80 Governmental health facility in city 50 private health facility , the total health professions of city was more 20,000 . The was conducted from October 12/2020 to February 08/2021.

Source and study Populations

All health professionals who were working at a governmental health facility in Addis Ababa, Ethiopia, 2020 were source population. While the health professional who was working at selected governmental health facility found in Addis Ababa,2021 were the study population of this study.

Inclusion and Exclusion criteria

All selected health professionals working at Governmental health facility found in Addis Ababa and available during data collection time were included in the study were included in this study. while Health professionals who were seriously ill, unable to respond, and positive to Covid-19 were excluded from the study.

Sample size determination and sampling procedures

The sample size was determined by using single population proportion formula of 50% health professionals' proportion because we couldn't find any study conduct to determine the perception of telemedicine among health professionals. by considering a 10% non-response rate and stratified the health professionals to their respective departments, so the design effect two and the total sample size was 845.

Were

- ✓ n_1 = was the calculated sample size
- ✓ Z = Confidence interval [95%]
- ✓ P = (Proportion of perception of Telemedicine health professionals =50%)
- ✓ $1-p$ = proportion of No perception of Telemedicine health professionals
- ✓ d = marginal error [5%]
- ✓ design effect =2

$$n1 = \frac{(Z\alpha/2)^2 p(1-p)}{d^2} = \frac{(1.96)^2 * 0.5 * (1-0.5)}{(0.05)^2} = 384 * 2 + 768 * 0.1 = 845$$

Study participants were selected from Ten hospitals, two health centers from each sub-city in Addis Ababa Administration, and a proportionate allocation from each hospital in the Administration, and then a simple random sampling method was employed used.

Study Variables

Dependent variable: -Perception of telemedicine

Independent variables

Age, gender, work experience, profession, educational level, computer access, internet access, E-health training, having IT support staff. Computer basic Skills, Internet application utilization, Source of Information and information sharing culture

Operational definition

Telemedicine system: the use of electronic information and telecommunication technologies to support long-distance clinical health care, patient and professional health-related education, public health, and health administration by using video conferencing, the internet, email, store-and-forward imaging, and wireless communications to diagnose or treat a patient, providing remote patient monitoring services, or consulting with other health care providers regarding a patient's diagnosis or treatment [18, 19].

Telemedicine: Use of teleconsultation, Tele-education, teleradiology, mobile data dissemination, and other telemedicine components with interactive video conferencing online, store and forward, remote patient monitoring application, and email to diagnose or treat a patient, patient monitoring services, or consulting with other health care providers for prevention and control of COVID-19 Pandemics [20, 21].

Good perception Telemedicine: Study participants who were scored above the median in the five points Likert scale of perception question were categorized they had good perception and those who score below the median were categorized as they had poor perception[22].

Data Collection Tool and procedures

Face to Face interview administrative structured questionnaire with Open data kit (ODK) data collection was adopted[23-25] . Both the data collectors and study participants were used COVID-19 protective equipment like a mask, sanitizer, keeping a 2-meter distance. The questionnaire was prepared in the English language. Outcome variables measure with

eighteen items with a five-point Likert scale ranging from 1-5 i.e., '1' for very disagree, '2' disagree, '3' for neutral '4' for agree, and '5' for very agree was used. One can score a minimum of '18' and a maximum of '90' related to measure the perception of the study participant towards telemedicine during the COVID-19 Pandemic.

Data quality assurance

A pre-test was done on 5% of the study participants, the internal reliability of the tool was checked and its Cronbach alpha coefficient value was 0.79. Before the actual data collection, modifications were done based on the pre-test. The data collectors and the supervisor were selected and trained before participating in the actual data collection process. Creating awareness about respondents, the purpose of the study, their rights, and confidentiality issues. Sufficient time was given to respondents for reading and filling materials carefully. There was Continuous supervision up to the end of data collection. After collecting data, the supervisor and the investigator were checked its consistency, completeness and we had a backup system to storing and minimize data duplication and data loss.

Data Processing and Analysis

Data was edited and cleaned on the ODK data collect then exported to Statistical Package for Social Science (SPSS) version 26 for further analysis and Generate descriptive statistics of the collected data to describe variables in the study using statistical measurements. The binary logistic regression was used to analyze the association between individually the independent variable to the dependent variable with Chi-square.

Then if P-Value <0.2, multivariable logistic regression analysis was carried out to assess the perception of telemedicine. A significant association was interpreted using odds ratio, 95% confidence interval, and a p-value less than 0.05, and the Hosmer-Lemeshow test was used to test the model fitness and model multicollinearity was check by using VIF (variance inflation factor).

Ethical consideration

Ethical clearance was obtained from the Ethiopian midwife association's ethical review committee on the behalf of MOH and Support letters from the Addis Ababa health bureau and MOH. Written consent was obtained from each participant after telling the objective of the study. The data collection procedure was anonymous and their privacy and confidentiality were kept.

RESULT

Sociodemographic characteristics

A total of 845 study participants were selected from Addis Ababa administration governmental health facility for the assessment of perception and level of utilization of telemedicine among health professionals during the COVID-19 pandemic for prevention and control of the pandemic. Seven hundred thirty-seven (87.2% response rate) of them were written consented and responded to complete all the questionnaires. Among the study participants, 507(62.8%) of the respondents were male, the mean age of the participants was 31.32+7.33 SD years and the majority of the respondents were within the age group of 20-29 years. In terms of educational status, most of the respondents were bachelor degree 380 (51.6%). Regarding their professional of the respondents 150 (20.4%) medical doctors and 155 (21.0%) were nurses. The mean working experience was 3+_1.2 SD years and nearest to half 341(46.3%) of the respondents were within the range of 1-5 years and 701(95.1%) of the study participant have their computers or, pc or smartphone to perform different tasks for internet (42.8%)(Table 1).

Table 1: Sociodemographic characteristics of the health professional at Addis Ababa governmental health facility, Central Ethiopia 2021 (N=737).

Variables	Categories	Frequency (#)	Percentages (%)
GENDER	Male	507	62.8%
	Female	230	31.2%
AGE (YEARS)	20-29	350	47.4%
	30-39	314	42.5%
	Age>40	73	9.9%
PROFESSIONAL	Medical Doctor	150	20.4%
	Nurse	155	21.0%
	Midwifery	71	9.6%
	Pharmacy	84	11.4%
	Medical laboratory	55	7.5%
	Radiology	70	9.5%
	Aesthesia	36	4.9%
	Optometry	41	5.6%
	Psychiatry	41	5.6%
	Others1	34	4.6%

EDUCATIONAL STATUES	Specialist	80	10.9%
	Resident	44	6.0%
	GP	42	5.7%
	Master's Degree	166	22.5%
	Bachelor degree	380	51.6%
	Others2	25	3.4%
WORK EXPERIENCE	Less than 5years	341	46.3%
	6-10 years	169	22.9%
	11-15 years	71	9.6%
	16 and above years	156	21.2%
Do you have computers or, pc or smartphone?	Yes	701	95.1%
	No	36	4.9%

Others1, HIT Environmental health; others2, Diploma, PHD

Information Communication Technology exposure of Basic Computer skill and internet use,

More than one-third of 457 (62.0%) of the respondent just had an introductory level of ICT training, 701(95.1%) were used their computer or laptop or smartphone for their work, and sometimes 321 (43.6%) of the study participant have searched information online for giving information 584(29.4%) and, more than one-third 578(78.4%) of the study participant were questioned by the pat patient's for online advice during COVID-19 Pandemic, 238(32.3%) of the study participant were interact with patients via e-mail or through social media(Table 2).

Table 2 Information Communication Technology exposure of Basic Computer skill and internet use among health professional at addis ababa governmental health facility

Variable	Categories	Frequency (#)	Percentages (%)
Training related to ICT.	Just an introductory level	457	62%
	Certificate in the ICT	102	13.8%
	never attended the ICT training	178	24.2%
Having computers or, pc or smartphone?	Yes	701	95.1%
	No	36	4.9%
Tasks perform with their computers or, pc or smartphone?	Microsoft office	317	21.0%
	Internet access	647	42.8%
	Entertainment like	492	32.6%
	use social media		3.6%

	Others3	54	
Frequency of search information from online?	Always or	95	12.9%
	Often	233	31.6%
	Sometimes	321	43.6%
	Rarely	13	1.8%
	Never	75	10.2%
reason/purposes for searching information online social media platform	Obtaining information to give patients	584	29.7%
	Patient consultation	541	27.5%
	Literature search	495	25.1%
	Maintain your knowledge and skills	349	17.7%
The frequency of interacting with patients via e-mail or through social media?	Always	145	19.7%
	often	127	17.2%
	Sometimes	238	32.3%
	rarely	128	17.4%
	Never	99	13.4%
Have you been questioned by the patient's online advice during the covid-19 pandemic?	Yes	578	78.4%
	No	159	21.6%

Others3, Tiktok , Zoom meeting ,Microsoft teams

Level of understanding Towards Healthcare digitization and information revolution

More than half 497 (67.4%) of the participants know the health care digitations or E-health from those who knew E-health the source of information was internet 505(23.6%) and 306 (60.59%) of the study participant had visited web sites related to telemedicine on the Internet. 555(75.3%) of the respondent were shared information with their friends to consultate health care providers and patients during the COVID-19 pandemic. Even though 627(85.1%) of the respondent had known the factors that inhibit the use of telemedicine services in the health facility,576(25.56%) of study participant said that lack of awareness towards telemedicine and 524(23.25%) lack of professionals related to E-health was factors that affect for the implementation and use of telemedicine system(Table 3)and (Figure 1).

Factors That Inhibits Telemedicine System Implementation In The Health Facility

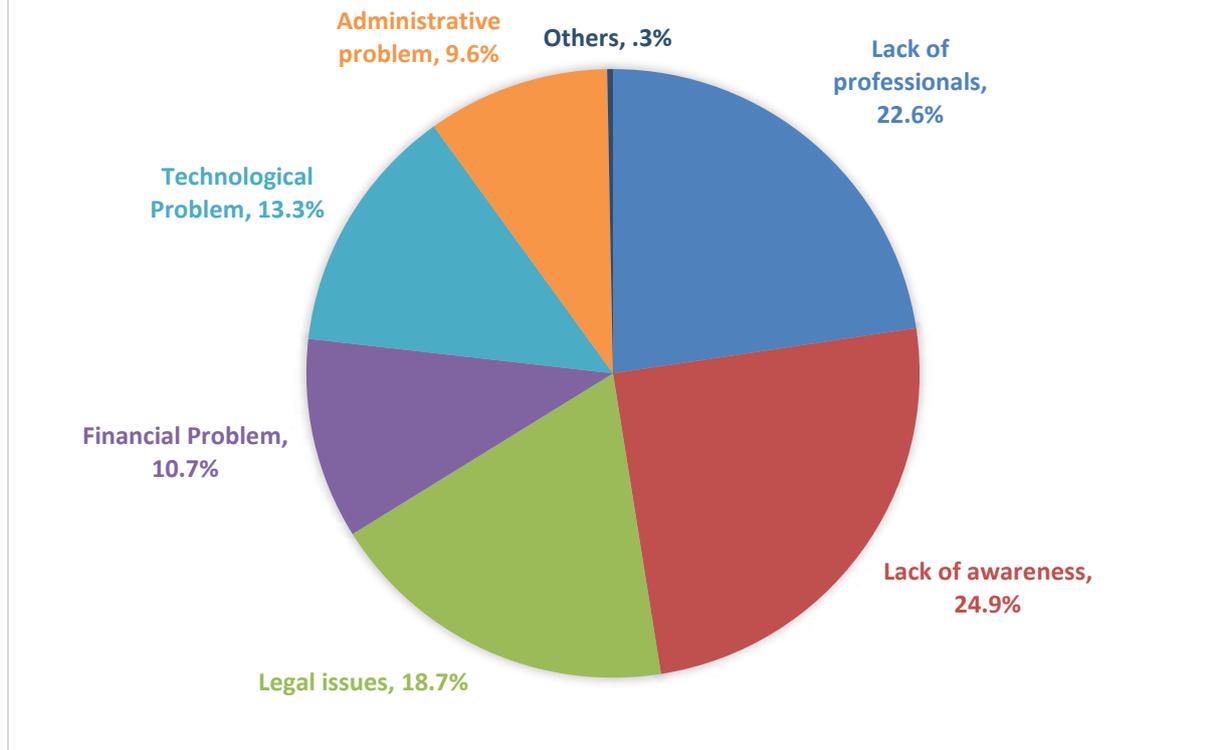


Figure 1 Factors that Inhibits Telemedicine System Implementation In the Health Facility

Table 3 Level of understanding related to Healthcare digitization and information revolution Among health professionals at Addis Ababa governmental health facility, Central Ethiopia 2021 (N=737)

Variable	Categories	Frequency (#)	Percentages (%)
Do you know health care digitization or E-health	Yes	497	67.4%
	No	240	32.6%
Source of information for health care digitization or e-health	Internet	505	23.6%
	Colleagues	456	21.3%
	Medical literature	364	17.0%
	Professional training/conference	273	12.7%
	Seminar/workshop	277	12.9%
	Radio or TV	267	12.5%
Have you ever visited websites related to telemedicine from the internet?	Yes	306	60.59%
	No	199	39.41%
Do you share information with your friends to consulate patients during covid-19?	Yes	555	75.3%
	No	182	24.3%
What Type of telemedicine	Store and forward	531	29.3%
	Real-time	333	18.45%
	Remote patient monitoring	373	20.6%

approach do you know?	Communication via telephone	553	30.6%
	I don't know	20	1.1 %
Do you know the factors that affect telemedicine implementation in your health facilities?	Yes	627	85.1%
	No	110	14.9%

Organizational factors Among health professional at governmental health facility,

According to this finding majority of the study participant, 514 (69.7%) had sufficient computers for their work, 525 (71.2%) of the participant had internet access within their health facility and 241(45.90%) of them had both Wi-Fi and Broadband types of internet access. Similarly, 555 (75.3%) of the respondent of health professionals had an information-sharing culture with other health care providers or patients and 461 (62.6%) of the study participant was attend training to E-health or health information revolution, and also 498(67.6%) of the study participant had IT support staff in their health facility(Table 4).

Table 4 Organizational factors Among health professionals at Addis Ababa governmental health facility, Central Ethiopia 2021 (N=737).

VARIABLE		FREQUENCY (#)	PERCENTAGES (%)
Accessibility of computers in health facilities?	Yes	513	69.7%
	No	223	30.3%
Accessibility of internet health facilities?	Yes	525	71.2%
	No	212	28.8%
If you don't have internet in your health facility, how do you access information?	Private	79	37.26%
	Internet	127	59.99%
	Mobile data	6	0.28%
	Others4		
Type of internet access in your health facility?	Wi-Fi	182	34.66%
	Broadband	102	19.42%
		241	45.90%
	Both		
Have you ever taken any training on the e-health or telemedicine system?	Yes	461	62.6%
	No	276	37.4%
Do you have ICT supporting staff in your health facility?	Yes	498	67.6%
	No	239	32.4%

The Factors associated with Perception of telemedicine Among health professional

The variables including computer accessibility, being ICT certified, the frequency of use of social media, Having IT support staff in their health facility, Information source(colleges and professional training) were positively associated with the perception of telemedicine among health professionals working at Addis Ababa Administration health bureau.

Accordingly, in this study, computer accessibility was significantly associated with the perception of telemedicine among health professionals for control and prevention of COVID-19. The study participants who had sufficient computers were 7.2 times more likely to have a positive perception towards using telemedicine as compared with those who didn't have sufficient computers in their organization (AOR=7.13, 95% CI: [4.264-13.201]). Health professionals who had IT supporting staff in their health facility were 4.42 times more likely to have a positive perception towards telemedicine system for control and prevention of COVID-19 than those who had no IT supporting staff (AOR=4.42, 95%CI: [2.69-7.524]). Moreover, health professionals ' being certified concerning ICT was strongly associated with the perception of telemedicine for control and prevention of COVID-19. Health professionals who certified in related to ICT areas were 3.26 times more likely to perceived positively than those who never attend training (AOR=3.263, 95% CI: [1.621-6.561]).

The frequency of using social media platforms was another factor for the perception of health professionals towards telemedicine. Health professionals who always use social media were 3.2 times more likely to perceived positively than those who never use social media (AOR=3.224, 95% CI: [1.496-6.945]).

And also, Information source was one of the factors that positively associated with the perception of telemedicine. Health professionals whose source of information for telemedicine is professional training were 1.15 times highly perceived than those sources of information were others (AOR=1.66, 95%CI: [1.149-2.401]). Colleagues' other significant source of information for telemedicine for control and prevention of COVID-19 were 2.3 times more likely than the counterpart (AOR=2.244, 95%CI: [1.598-3.293]) (Table 5).

Table 6 bivariable and multivariable binary logistic regression of factors associated with Perception of telemedicine Among health professional working at Addis Ababa governmental health facility, Central ,Ethiopia 2021 (N=737)

Variables	Categories	Perception towards Telemedicine		COR (95% CI)	AOR (95% CI)
		Good	Poor		
Gender	Female	150	80	1.3(0.943-1.803)	0.67(0.443-1.029)
	Male	299	208	1	1
Work experience	Less than 5years	225	116	1.42(0.964-2.098)	0.64(0.396-1.016)
	6-10 years	88	81	0.797(0.514-1.235)	0.773(0.435-1.376)
	11-15 years	46	25	1.389(0.754-2.413)	0.341(0.196-0.78)
	16 and above years	90	66	1	1
Do you have smartphone/pc/laptop	Yes	442	259	7.07(3.05-16.364)	7.13(4.262-14.50)
	No	7	29	1	1
Training on ICT	Just an introductory level	190	267	1.927(1.318-2.817)	1.713(0.951-3.083)
	Just have a certificate in the ICT area	50	52	2.604(1.564-4.337)	3.263(1.621-6.568)
	Never attended training in the ICT area	48	130	1	1
How often do you use social media platform or Gmail	Always	63	82	3.035(1.682-5.477)	3.224(1.496-6.944)
	Often	57	70	3.216(1.761-5.871)	2.657(1.309-5.393)
	Sometimes	100	138	2.862(1.645-4.981)	2.192(0.997-4.817)
	Rarely	48	80	2.370(1.291-4.350)	1.742(0.834-3.639)
	Never	20	79	1	1
Source of information	Yes	310	146	2.17(1.87-2.944)	2.294(1.598-3.293)
	No	139	142	1	1
Colleagues	Yes	231	133	1.235(0.918-1.661)
	No	218	155	1	1
Professional training	Yes	191	82	1.86(1.355-2.554)	1.663(1.149-2.408)
	No	258	206	1	1
/workshop/conference	Yes	177	100	1.223(0.894-1.664)
	No	272	288	1	1
Seminar	Yes	276	229	0.411(0.292-0.580)	0.545(0.347-0.857)
	No	173	59	1	1
Internet	Yes	154	113	0.808(0.585-1.098)	0.651(0.432-1.02)
	No	295	175	1	1
Radio/TV	Yes	52	130	0.541(0.376-0.777)	0.502(0.209-1.110)
	No	236	319	1	1
Having Information sharing culture	Yes	157	307	0.572(0.421-1.775)	0.520(0.436-1.070)
	No	131	145	1	1
Training on E-health	Yes	110	129	1.53(1.120-2.097)	4.424(2.69-7.524)
	No	178	320	1	1
Availability of IT/ICT supporting staff in the health facility	Yes	110	129	1.53(1.120-2.097)	4.424(2.69-7.524)
	No	178	320	1	1

AOR, adjusted odds ratio ; COR, crude odds ratio

Discussion

The study was conducted at Addis Ababa governmental health facility among health professionals for control and prevention of COVID-19 Pandemic. From this study, 64.2% (95% CI: [60.7, 67.4]) of health professionals had a good perception towards telemedicine.

The end-user perception of E-health may important for the implementation of telemedicine to facilitate healthcare delivery for a rural and remote location, Providing sufficient information for health professionals about telemedicine technologies can help to gain can improve their perceptions [24]. This finding shows that 64.2%of the study participant had a positive perception of the telemedicine system.

This study is high as compared with the previous cross-section study conducted in Addis Ababa[26] only 52.6% of the study participant had aware of the telemedicine application. This might be due to the time gap this was conducted(2013) and the Ethiopian government gives more attention to ICT. This study is comparable with the study conducted in Iran[24]. And also this study low from the study conducted in Australia[25] that would improve the dental practice to enhancing communication with their colleagues and referral of new patients. It might be an infrastructure difference in developing with compared with developed country.

A study conducted in Saudi Arabia[23] was a high level of perception towards telemedicine compared with this research finding. it might be due to infrastructure and E-health literacy differences between the two countries.

The utilization of telemedicine has been reduced the risks of the COVID- 19 infections for both the client and the health workers and it provides continued access to very crucial health care services[27]. In this study, we investigated the current utilization of telemedicine was 60.9% at a governmental health facility in Ethiopia to determine practice patterns in response to the novel coronavirus (COVID-19) pandemic. This study is in line with the study conducted in Europe shows that the availability of technology, access to the internet, and lack of telemedicine training the main Significant factors for the utilization and perception of healthcare providers[28]. This study in line with a study conducted in Indonesia shows that study participant's poor internet connectivity was a significant obstacle in using the system[24].

A training intervention that was carried out in India among nursing staff for telemedicine in Bengaluru shows that this is an effective method to increase the awareness toward

telemedicine and increase adoption[29]. This pandemic had been a positives value on the perception of physicians and other stakeholders toward telemedicine and the adoption of this new technology is changing due to the present conduction of COVID-19[30]. Another study conducted in developing countries indicates that many health care providers and clients cannot fix the technical problem arising from a computer system and ICT network. So for the proper and smooth functioning of the telemedicine system, they need trained and expert manpower to establish stable and continuous communication during teleconsultation[31]. it might be a lack of technical support, training, and governmental concern.

Conclusion

More than half of respondents had a positives perception of telemedicine. Lack of professionals, Internet accessibility, lack of awareness, being trained with ICT, and Having IT support staff in their health facility were significantly associated with the level of telemedicine perception in the era of the COVID-19 pandemic.

The Ministry of health should encourage the health professions and the stakeholders to collaborate to promote the safe and evidence-based use of telemedicine during the current COVID-19 pandemic and future outbreaks we must adopt the necessary regulatory frameworks for supporting the wide adoption of health information revolutions.

Abbreviations

BSC: Bachelor of Science; E-Health: Electronic Health; Epi-info: Epidemiological Information; ETB: Ethiopian Birr; FMOH: Federal Ministry of Health; GP: General Practitioners; HI: Health Informatics; HIT: Health Information Technician; HP: Health professionals; MPH: Master of Public Health; ICT: Information communication technology; IT: Information technology; SPSS: Statistical Package for Social Science; WHO: World Health Organization ;

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from Ethiopia midwife association ethical review board on the behalf of Ministry of health and a support letter from the Addis Ababa administration health beuro. Written consent was obtained from each study participant after telling the objective of the study. The data collection procedure was anonymous.

Consent for publication

Not applicable

Availability of data and materials

All major data have been presented in the manuscript.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Funding

Ethiopia Ministry of Health. The funding body has no role in the design of the study and collection, analysis, interpretation of the data, in writing the manuscript and publication as well.

Authors' Contributions

BT substantially contributed to the conception and design, analysis, and interpretation of the study. TM, ZR, GH, KB and BE involved in the analysis, interpretation and all authors participated in the write-up of the article. All authors approved the manuscript for publication

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Figures

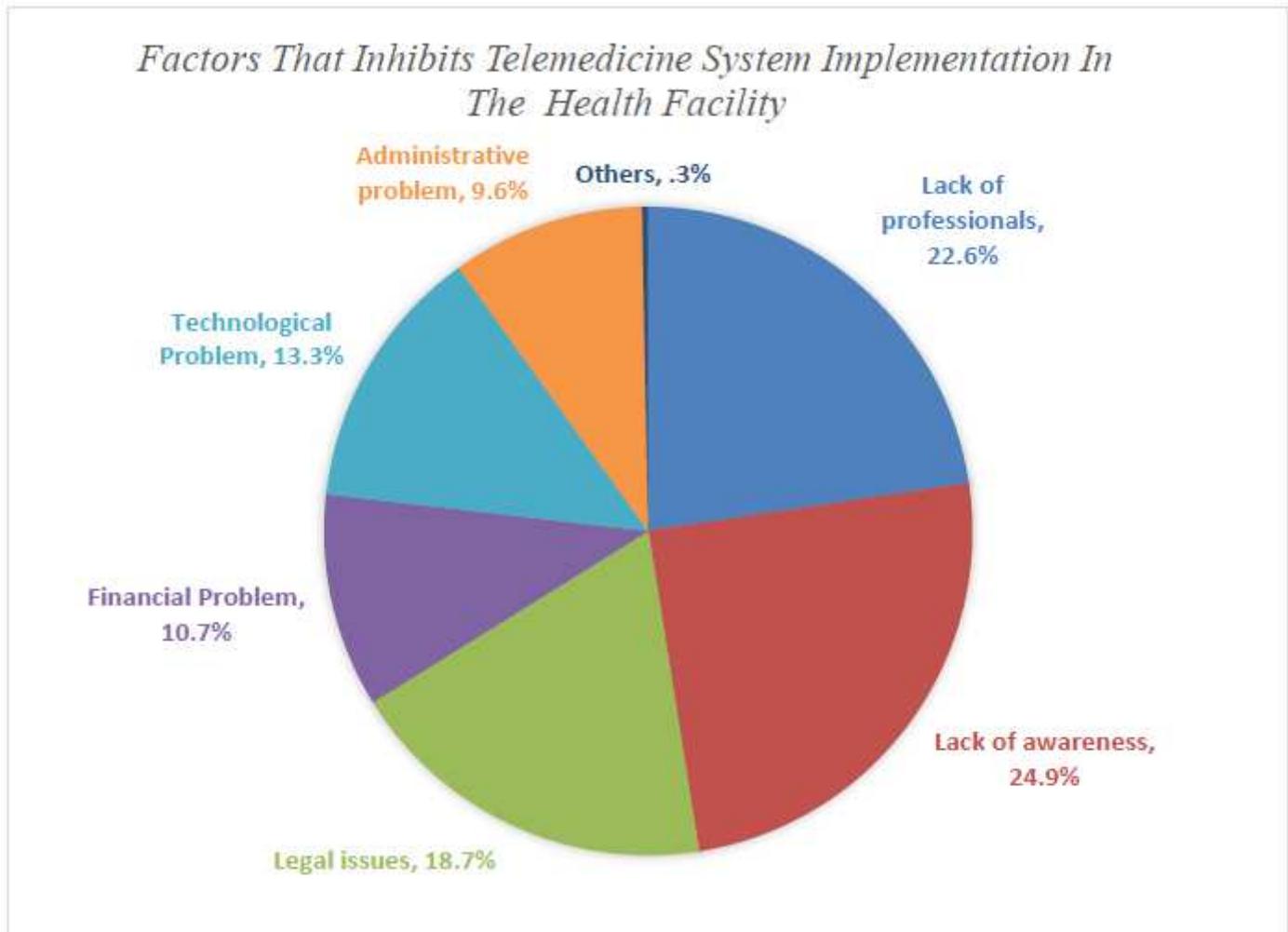


Figure 1

Factors that Inhibits Telemedicine System Implementation In the Health Facility