Attitude towards tele rehabilitation-based therapy services and its associated factors among health professional working in specialized teaching hospitals in Amhara region, Northwest Ethiopia,2021

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Abstract

Background

Tele-rehabilitation is part of Tele-health (TH) which provides a rehabilitation service at a distance through telecommunication technology. Lack of enough trained professionals, lack of access, transportation cost, long waiting time, and difficulty of mobility to reach rehabilitation services are problems faced during face-to-face rehabilitation services. The significance of this study is to assess the attitudes and associated factors of health professionals about TR services.

Method

An institutional-based cross-sectional quantitative study design was conducted among 408 participants from March to April 2021. Study units were selected by using a simple random sampling technique. Epi-data 3.1 versions were used to enter data, while SPSS version 20 was used to conduct analysis. A bivariable and multivariable logistic regression was used to determine factors associated with the attitude of health professionals towards tele-rehabilitation.

Result

A total of 408 participants responded to the 423 survey questionnaires distributed. A response rate of 96.45 % was achieved for this study. Out of the 408 respondent's majority, 285(69.9%) of health professionals had good attitude towards tele rehabilitation-based treatment services. Among the factors good knowledge of tele rehabilitation AOR 1.76(95%CI: 1.078, 2.879), digitally literate AOR 1.74 (95%CI: 1.028, 2.954), perception on security and privacy AOR 0.56(95%CI: 0.333, 0.944), and owns smart mobile phone AOR 1.9 (95%CI: 1.007, 3.781) were significantly associated with attitude of tele rehabilitation.

Conclusion

The majority of the respondents had a good attitude towards tele rehabilitation services. Having own mobile, knowledge towards tele rehabilitation, digital literacy, perception on security and privacy to rehabilitation was found to be the most important determinant factor for the attitude of health professionals towards tele rehabilitation. As a result, the government and other responsible entities should consider enacting systems and strategies to encourage the use of mobile technologies for the management of disability and chronic diseases.

Background

Today, information communication technologies (ICTs) such as computer, mobile phones and others are accessible to most people(1). Information technology in healthcare is commonly used as an important tool in improving healthcare quality, accessibility, distribution and reducing discrimination based on shortage of access to information and as a technique of responding quickly to issues that threaten one's personal or community's well-being (2). Tele-rehabilitation is a part of tele-health, which uses telecommunication

technology to deliver rehabilitation services at a distance. Assessment, monitoring, prevention, intervention, management, education, consulting, counseling, and treatment through the education of impaired patients and family members are examples of such services(3). It is provided to people who live in remote areas or who are unable to travel to a rehabilitation center due to a disability, financial restrictions, or being elderly, as well as those who do not have access to a hospital. Tele rehabilitation requires technologies such as smartphones and computers(4). It can also use video communication technologies and social media accounts such as Facebook messenger video chat, Google Hangouts video, Skype, and email(5). Thus, with these applications, the patient will only need a mobile phone, a tablet, a computer, and an internet connection to communicate with the health care provider(5). Approximately fifteen percent of the world's population, or more than one billion people, live with some form of disability due to different complication(6). Around 80 million people are disabled in Africa(7). whereas, in Ethiopia it accounts for nine percent of the total population(8). Around 84% are assumed to live in rural areas and have limited access to basic services(9). The scarcity of medical specialists, the inadequate transportation infrastructure and due to the difficulty of mobility in reaching rehabilitation center makes it even more difficult to provide healthcare in remote and rural areas(10).a study conducted in Saudi Arabia(11), Pakistan(12) and Nigeria(3) shows using tele rehabilitation for patients who have disability is the best service method. This study will help the specialized teaching hospital better understanding how to use information technology to help people with disability.

This finding will serve as a basis for policymakers, researchers, and anyone interested in TR or disability patient care to build effective methods. Therefore, this study assesses the attitudes and associated factors of health professionals about TR services.

Method

Study design and setting

An institutional-based cross-sectional quantitative study design was conducted in the Amhara region, north west Ethiopia. The Amhara region is located in the North-Western part of Ethiopia. It has 10 administrative zones, one special zone, 181 woredas, and 78 urban centers. The capital city of the State of Amhara is Bahir-Dar. It has around 85 hospitals (2 specialized teaching referral hospitals, 6 referral hospitals, more than 4 general hospitals, and around 73 primary hospitals), more than 850 health centers, and around 3,350 health posts. Currently, there were more than five rehabilitation center offices in teaching, referrals, and general hospitals of the region. These studies were conducted at specialized teaching hospitals namely the University of Gondar and Tibebe Ghion Specialized teaching referral hospitals. Each hospital is estimated to serve five million people in their catchment area. More than two thousand health professionals are working in these two hospitals.

Study population and data collection

All health professionals who were currently working at Amhara region specialized teaching referral hospitals were the study population, the sample size was determined based on the assumption of single population proportion formula. A stratified sampling procedure was used by considering professions as strata. Finally, participants were chosen from each profession using a simple random sampling technique. In this Study attitude was measured by a five-point Likert scale of attitude question which categorized into good and poor

depending on the threshold which was computed using the demarcation threshold formula. Self-administered pretested structured questionnaires adapted and modified from different kinds of literature. Data was collected by four trained data facilitators guided by two supervisors. To control the quality of data training was given for the data facilitator for one day.

Statistical data analysis

The data was cleaned to check for errors and missed values and corrected accordingly. The data entry form was prepared with Epi-data 3.1 versions and analyses were conducted using SPSS version 20. The binary logistic regression method was used to identify independent variables associated with dependent Variables having a p-value of <0.2 and multivariate analysis were conducted to show the relationship between multiple independent variables and dependent variables. P-value less than or equal to 0.05 was taken as a cut of value to be significant. Adjusted odds ratio (AOR) with a 95% confidence interval (CI) was used to make interpretations of the result.

Ethics approval and consent to participate

Ethical clearance was obtained from the ethical review board institute of public health at the University of Gondar. Written consent was taken from university of Gondar and Tibebe Ghion teaching specialized hospital.

Results

Socio-demographic characteristics of health professionals in Amhara Region Teaching hospital, 2021

A total of 408 health professionals completed the survey questionnaires with a response rate of 96.5 %. The majority (73.3%) of the non-respondents were from the University of Gondar teaching hospital. In this study, the majority of the participants were males, 259(63.5%). The mean age was 27.85 ± 3.951 SD years and the majority of respondents were less than 30 years of age. Regarding to educational level, the majority (81.1%) of the participants were bachelor's degrees and below. Majority 69.9% of the participants have working experience of less than or equal to four years (Table 1)

Access to basic technology among health professional in Amhara Region Teaching Specialized Hospital, 2021

The majority of 288 (70.6%) of health professionals have a personal computer. However, less than 50% of health professionals indicated their personal computers had internet capabilities. Regarding smartphones, more than 86% of health professionals have their own smartphones. Furthermore, from the participants, only 35 (8.6%) of health professionals indicated that they did not have a social media account. (Table 2)

Knowledge of Health professionals towards Tele-rehabilitation

The majority 261(64%) of health professionals had good knowledge of Tele-rehabilitation-based therapy services. Among the respondents, 243(64.3%) were heard about Tele rehabilitation-based therapy services (figure 1).

Organizational related variable on attitudes of HP towards Tele rehabilitation

Of the total respondents, 160(39.2%) of the study participants were took computer-related training. More than half 217(53.2%) of the health professionals had internet access in the office or clinical practice (Table 3)

Technological related variable of health professional

Among the total of the respondents, 241(59.1%) have high digital literacy. More than half 210(51.5%) of health professionals had negative perceptions of the security and privacy of Tele rehabilitation technology (figure 2).

Attitude of health professionals towards Tele-rehabilitation

From the total of 408 respondent's majority, 285(69.9%) of health professionals had good attitude towards Tele rehabilitation-based treatment services (figure 3)

Factors associated with the attitude of health professionals towards Tele-rehabilitation-based therapy services.

In a Bivariate analysis educational level, profession, experience, own computer, own smartphone, computer-related training, IT support staff in the organization, internet access in an organization, knowledge towards tele-rehabilitation, digital literacy, perception on security and privacy, were found significantly associated with attitudes towards tele rehabilitation at a $p\text{-value} < 0.2$. In multivariate analysis knowledge towards tele-rehabilitation, digital literacy, perception of security and privacy on tele rehabilitation, and own smart phone were significantly associated with attitudes towards tele rehabilitation at $P\text{-value} < 0.05$ (table 4).

With respect to knowledge respondents who have good knowledge towards tele rehabilitation-based therapy services were 1.7 (AOR: 1.761(1.078, 2.879) times higher to have a good attitude on tele rehabilitation-based therapy services than those who have poor knowledge about TR services.

Participants who have high digital literacy were 1.7 (AOR: 1.743(1.028, 2.954), times more likely to have good attitudes towards tele-rehabilitation-based therapy services than those who did not have digital literacy. Health professionals who had a negative perception of security and privacy about tele rehabilitation-based treatment services were 44% (AOR: 0.561(95%CI: 0.333, 0.944), less likely to have good attitudes towards tele rehabilitation than those who have a positive perception of privacy and security towards tele rehabilitation services. Respondents who have their smartphones were 1.9(AOR: 1.951(95%CI: 1.007, 3.781) times higher to have a good attitude towards tele rehabilitation-based therapy services than those who did not have smartphones or access to mobile phones. (Table 4)

Discussion

This study aimed to assess the attitude and associated factors of health professionals towards tele rehabilitation for a disability, chronic disease management, and for diseases that require physical distancing.

Our findings indicated that the overall attitudes of health professionals toward TR were good, with 69.9% of health professionals had to have a good attitude (CI: 65.38-74.32). This finding is following the study conducted in Tehran majority of health care providers had a positive attitude towards Tele rehabilitation (13).

Also similar to the study in Saudi Arabia on tele rehabilitation (11). In the same way, studies conducted in India reported that the attitude of healthcare providers was good, such as a survey conducted on the attitude towards tele-dentistry shows 70% of healthcare providers had a positive attitude (14), a similar study on postgraduate dental students shows 71.1% of respondents had positive attitudes (15), a survey on the attitude of telemedicine reported that 70% of health professional have a favorable attitude towards telemedicine (16) And a study on attitude towards a mobile-based exercise majority of care provider had a good attitude(17). Likewise, a survey that assesses the attitude towards healthcare ICT and home follow up in Sweden, indicated that 70% of health professionals have a positive attitude (18). On the other hand, this finding is slightly lower than the study conducted in Germany on app-based therapy among health professionals (77.2%) of participants who had a good attitude (19). Similarly, slightly higher findings were reported in the study conducted in Egypt on telemedicine where 75% of dermatologists have a good attitude towards telemedicine (20). Also, a study in Libya was higher than this study indicated (82%) of health professionals had a good attitude to telemedicine during covid 19 pandemics(21). This discrepancy might be due to technological infrastructure, training towards e-health, low attention to e-health, and management support. But, this finding is better compared to a study conducted in Ethiopia on telemedicine which indicated, 64% of health professionals have a good attitude (22). The possible explanation is due to the study period (the study was conducted 4 years ago). Further, this could be due to taking courses towards e-health and telemedicine for clinical staff and also graduates of clinical fields and due to studies conducted about telemedicine and another e-health program.

In this finding, knowledge of tele rehabilitation was significantly associated with the attitude of tele rehabilitation (AOR: 1.761(95%CI: 1.078, 2.879). Health professional who had good knowledge of TR were a positive attitude towards TR services. This is in line with other studies which indicate knowledge towards tele rehabilitation could have a positive association with having a good attitude. (23). This finding is supported by the study conducted in Saudi Arabia on knowledge and attitudes towards tele rehabilitation indicates that lack of knowledge of tele rehabilitation is limiting the use of tele rehabilitation(24). These findings is similar to those of Pakistan who maintain that lack of ICT knowledge among practitioners and concerns around patient confidentiality were among the factors that limit the practice of tele rehabilitation(12). This study is consistent with the study conducted in Tehran (13) and Saudi Arabia (25).

The most important technology to address tele rehabilitation services is the mobile phone. In this study, the majority of health professionals have mobile phone access and own smartphones, which were significantly associated with health professionals' attitudes toward tele rehabilitation (AOR: 1.951). (95 percent CI: 1.007, 3.781). Participants who own smartphones were 1.9 times more likely to have a good attitude towards tele-rehabilitation than those who didn't have smartphones. This finding was consistent with the study conducted in Ethiopia(26) and Germany (19).

Furthermore, respondents who had high digital literacy were 1.7 times more likely to have a good attitude towards TR compared to those who have low digital literacy (AOR: 1.743(95%CI: 1.028, 2.954). This finding is consistent with the study finding in Ethiopia (26)(27), Sweden(18), Saudi Arabia(23), Pakistan(12), German (19) and Libya (21) (28).

In this finding perception of security and privacy towards tele rehabilitation is significantly associated with attitudes towards tele rehabilitation (AOR: 0.561(955CI:0.333, 0.944). More than half of health professionals (51.5%) had a negative perception of privacy and security of information about tele rehabilitation technology-based therapy services. Health professionals who had a negative perception of security and privacy towards tele rehabilitation are 44% less likely than those who had positive perceptions of security and privacy towards Tele rehabilitation. this finding is supported by the study conducted in Saudi Arabia on Tele rehabilitation among health care providers indicated the majority of the participants considered that patient data security and patient privacy are at risk is associated with Tele-rehabilitation services (24) (25). In the other comparison, this study is similar to the study in Germany on app-based therapy. (19) Australia (29) and Pakistan (12).

Conclusion

This research has found significant proportions of healthcare providers from teaching hospitals have a favourable attitude towards Tele rehabilitation-based therapy services. Overall, this research identifies that access to basic technologies, individual, and tele rehabilitation-related factors can affect the attitude of health professionals. Having own mobile, knowledge towards Tele rehabilitation, digital literacy, perception on security and privacy to rehabilitation was found to be the most important determinant factor for the attitude of health professionals towards Tele rehabilitation. According to this finding, the majorities of participants had a smartphone and have strong feelings about Tele rehabilitation-based therapeutic services. As a result, the government and other responsible entities should consider enacting systems and strategies to encourage the use of mobile technologies in disability and chronic disease management.

Abbreviations

Adjusted odd ratio (AOR), Confidence interval (CI), Corona virus disease 2019(COVID19), Crude odd ratio (COR), Information communication technology (ICT), Information technology (IT), Odd ratio (OR), Tele rehabilitation (TR), Tele therapy (TT).

Declarations

Ethics approval and consent to participate

Ethical approval to conduct the study was obtained from the University of Gondar ethical review board. Communication with the different official administrators of each teaching hospital was made through a formal letter obtained from the University of Gondar. The purposes and data privacy issues of the study were enlightened to every individual study participant and their written informed consent was taken before the study. We confirm that all methods were carried out in accordance with the relevant guidelines and regulations.

Consent for publication

Not applicable.

Availability of data and materials

Full data set and materials pertaining to this study can be obtained from corresponding author on reasonable request

Competing interests

The authors declare that they have no competing interests.

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Contributions

Proposal preparation, acquisition of data, analysis and Interpretation of data was done by HS. Drafting the article, revising it critically for intellectual content, and final approval of the version to be published was done by HS, AD, GD, BT, BF and SA. All authors read and approved the final manuscript.

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Tables

Table 1 Socio-demographic characteristics of health professionals in Amhara region specialized teaching hospital, North West Ethiopia, 2021

Variable	Frequency	100%
GENDER		
Male	259	63.5
Female	149	36.5
AGE		
<30	308	75.5
>=30	100	24.5
PROFESSION		
Nurse	195	47.5
Physician	178	43.6
Others	35	8.6
EDUCATIONAL LEVEL		
Degree and below	331	81.1
Master and above	77	18.9
WORK EXPERIENCE		
<4yrs	285	69.9
>=4yrs	123	30.1
SALARY		
<6000	61	15
6001-8000	135	33.1
8001-10000	137	33.6
>10000	71	8.4

Table 2 Access to basic technologies among health professionals at the University of Gondar and Tibebe Ghion Specialized teaching hospitals, North West Ethiopia, 2021

VARIABLE	Frequency	Precent
having personal computer		
Yes	288	70.6
No	120	29.4
having internet on computer		
Yes	185	45.8
No	103	24.8
having smartphone		
Yes	351	86
No	57	14
having internet on a smartphone		
Yes	272	66.7
No	86	21.1
having social media account		
Yes	373	91.4
No	35	8.6

Table 3 Organization related variable on the attitude of health professional in Amhara Region Specialized Teaching Hospital, North West Ethiopia, 2021

Variable	Category	N (%)
Have you taken any computer-related training that can support your patient management?	yes	160(39.2)
	No	248(60.8)
Does your organization have IT, support staff?	yes	243(59.6)
	No	165(40.4)
Do you think you have internet access in your office or clinical practice?	yes	217(53.2)
	No	191(46.8)

Table 4 Bivariable and multivariable analysis of the selected variables associated with attitudes towards Tele rehabilitation service among healthcare providers, in Amhara region Specialized Teaching Hospital, North West Ethiopia, 2021.

Attitude towards Tele rehabilitation					
Characteristics		Good(n=285)	poor(n=123)	COR-95%CI	AOR-95%CI
Gender	Male	178(68.7%)	81(31.2%)	1.159(0.744,1.806)	0.776(0.463,1.302)
	Female	107(71.8%)	42(28.18%)	1	1
Profession	nurse	129(66.1%)	66(33.8%)	1	1
	physician	129(72.47%)	49(27.52%)	1.347(0.865,2.097)	1.387(0.736,2.614)
	others	27(77.1%)	8(22.8%)	1.727(0.743,4.011)	2.316(0.873,6.142)
Educational level	Degree& below	233(70.3%)	98(29.7%)	1.143(0.671,1.946)	1.496(0.759,2.949)
	Masters & above	52(67.5%)	25(32.4%)	1	1
Age	<30	216(70.13%)	92(29.87%)	1.055(0.647,1.720)	0.906(0.452,1.817)
	>=30	69(69%)	31(31%)	1	1
Salary	<6000	44(72.1%)	17(27.9%)	1	1
	61000-8000	93(68.8%)	42(31.2%)	0.856(0.439,1.668)	0.639(0.306,1.336)
	81000-10000	91(66.42%)	46(33.58%)	0.764(0.394,1.483)	0.451(0.203,1.004)
	>10000	57 (76%)	18(24%)	1.223(0.566,2.644)	0.662(0.253,1.734)
Experience					
	<4 years	192(67.36%)	93(32.6%)	0.666(0.412,1.077)	0.526(0.273,1.016)
	>4 years	93(75.6%)	30(24.9%)	1	1
own computer	Yes	207(71.87%)	81(28.12%)	1.376(0.873,2.168)	

					1.028(0.581,1.820)
	No	78(65%)	42(35%)	1	1
own smartphone	Yes	254(72.15%)	98(27.85%)	2.090(1.175,3.719)	1.951(1.007,3.781)*
	No	31 (55.35%)	25(44.65%)	1	
Knowledge	Good	200(70.63%)	61(23.37%)	2.392(1.548,3.695)	1.761(1.078,2.879)*
	Poor	85(58.95%)	62(41.05%)	1	1
digital literacy	Yes	189(78.43%)	52(21.57%)	2.688(1.742,4.419)	1.743(1.028,2.954)*
	No	96(57.49%)	71(42.5%)	1	1
security and privacy	Yes	160(80.8%)	38(19.19%)	1	1
	No	125(59.53%)	85(40.47%)	0.349(0.223,0.547)	0.561(0.333,0.944)*
	Yes	125(78.125%)	35(21.875%)	1.964(1.245,3.100)	1.102(0.637,1.908)
computer training	No	160(64.52%)	88(35.48%)	1	
internet support staff	Yes	182(74.8%)	61 (25.2%)	1.796(1.170,2.756)	1.061(0.593,1.899)
	No	103(62.42%)	62(37.5%)	1	
internet access in office	Yes	169(77.89%)	48 (22.11%)	2.276(1.477,3.508)	1.510(0.860,2.651)
	No	116(60.74%)	75(39.26%)	1	1

Figures

Source of information about Telerehabilitation

Figure 1

Source of information about Tele rehabilitation among health professionals in Amhara Region Specialized teaching Hospitals, North West Ethiopia, 2021

Figure 2

Technological factors towards Tele rehabilitation among health professional in Amhara region specialized teaching Hospital, 2021

Figure 3

Attitudes towards tele rehabilitation-based therapy services among health professional in Amhara Region specialized teaching hospital, North West Ethiopia, 2021