PERCEPTION OF PHYSIOTHERAPISTS OF ASSAM, INDIA TOWARDS THE DELIVERY OF COMBINED KINETIC CHAIN EXERCISES VIA TELEREHABILITATION IN KNEE JOINT OSTEOARTHRITIS

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ABSTRACT

The COVID-19 pandemic has made it mandatory for the health care providers to explore options in delivering their services to lower the likelihood of further spreading the infection. The study analyzed the perceptions of physiotherapists of Assam, India regarding the usage of telephone and video conferencing for delivering Combined Kinetic Chain exercises in knee joint Osteoarthritis (OA) using an internet based survey via a questionnaire. Respondent physiotherapists agreed that, in the current scenario of COVID -19 pandemic, telerehabilitation provides the advantage of absence of physical contact between the patient and physiotherapist, thus preventing probabilities of corona virus transmission, if any. There was a majority agreement that both modes of telerehabilitation would maintain patients' privacy, save patient's time and money and would be an affordable and safe way for patients to receive combined kinetic chain exercises for OA knee. Statistical analysis revealed that physiotherapists having previous experience of telerehabilitation had higher odds of agreement to interest in delivering exercises via telephone as compared to those without experience (OR=1.824); and found statistically significant p=0.031. Overall, 13 out of 16 perception statements achieved majority agreement for video conference based telerehabilitation in comparison to only 6 for telephone based telerehabilitation in knee joint OA.

Keywords: *COVID-19, telerehabilitation, knee joint osteoarthritis.*

Introduction

Osteoarthritis (OA) is an extremely prevalent Rheumatic Musculoskeletal Disorder which affected 303 million people worldwide in 2017 (GBD 2017 Disease and Injury Incidence and Prevalence Collaborators). It affects many joints, but knee joint is the most commonly affected (Michael JW et al 2010). With a prevalence of 22% to 39% in India, osteoarthritis is considered the most frequently occurring joint disease and the second most common rheumatologic problem (Silman AJ, Hochberg MC 2001; Symmons D et al 2002). On one hand, to manage the osteoarthritis pain and to maintain physical mobility, the importance of self-management via lifestyle interventions such as exercise and physical activity are indispensible; on the other hand, access to qualified health professionals for evidence based advice is also of utmost importance. In a developing country like India, access to qualified health professionals is not possible for many patients. Furthermore, in the present scenario of pandemic like Corona virus disease 2019 (COVID -19), most of the complaints usually seen at a hospital or physiotherapy clinic, end up not being addressed or not being treated, as long as it does not pose an imminent threat. Hence, telerehabilitation or tele physiotherapy may prove to be a boon for patients as well as for physiotherapists to maintain the continuum of rehabilitation services.

The corona virus pandemic has made it mandatory for the health care providers to explore options in delivering their services so as to lower the likelihood of further spreading infection. The World Health Organization (WHO) has recommended postponing all treatments considered non-urgent in order to ensure safety in the COVID-19 pandemic scenario. As a consequence, almost all musculoskeletal physiotherapists have deferred their non-urgent professional activities. Although this decision emphasizes the high social responsibility of physiotherapists, it also may create a sense of bafflement—both among patients, who may be living with pain and disability, and among professionals who find their practice limited and their income reduced. Telerehabilitation has cropped up as medium of providing rehabilitation services utilizing technology to serve patients, therapists, and systems by

curtailing the barriers of distance, time and cost.

According to Medical Dictionary, 2009 Farlex and Partners, telerehabilitation is the use of internet or telecommunication to provide physical, occupational, or speech therapy to patients in their home (The Free Dictionary [Internet]). Telerehabilitation is the faraway conveyance of rehabilitation services using telecommunication technology and is supported by the Australian Physiotherapy Association and American Physical Therapy Association as a possible mode of service delivery especially in response to COVID -19 pandemic (Australian Physiotherapy Association Telehealth Guidelines 2020; American Physical Therapy Association).

It is evident from a systematic review that, following total knee arthroplasty, telerehabilitation using advanced videoconferencing software is a feasible substitute to conventional clinic or hospital based physiotherapy (Shukla H et al 2017). Another recent study reported that literature provides emerging evidence about telerehabilitation via telephone and internet-mediated video technologies being effective for, and acceptable to, people with OA (Hinman RS 2019). There is also prefatory evidence of the usefulness of physiotherapy delivered via telephone for patients suffering from knee joint osteoarthritis (Odole AC, Ojo OD 2014). A recent study by Adhikari SP et al reported that telephysiotherapy using telephone led to a significant decrease in pain occurring as a result of several musculoskeletal problems (Adhikari SP et al 2020). A randomized controlled trial reported that tele-rehabilitation physiotherapy protocol is as efficacious as office based physiotherapy in improving the functional capability of patients with knee osteoarthritis (Azma K et al 2018).

Literature review related to telerehabilitation reveals that patients suffering from hip and / or knee osteoarthritis are receptive towards the usage of telephone and internet video mediated physiotherapy service models (Lawford B et al 2017). Though limited, some research studies have tried to investigate the perceptions and experiences of physiotherapists while delivering education and exercise in context of a clinical trial (Salisbury C et al 2013; Russell TG et al 2004; Tousignant M et al 2011; Hinman RS et al 2017). But these studies included physiotherapists who were trained and experienced in telerehabilitation and hence may be more positive towards the usage of telerehabilitation than the inexperienced therapists. A study by Lawford et al analyzed the views of physiotherapists across Australia towards their eagerness to use phone and internet mediated video for prescribing exercise to patients with knee and /or hip osteoarthritis and found that physiotherapists prefer video services more than telephone services in prescribing exercises and agree it to be time saving than face-to- face consultations (Lawford BJ et al 2018).

According to Rao K et al telerehabilitation is a promising service delivery model to improve access to physiotherapists for individuals in rural communities suffering from OA (Rao K et al 2012). Review of literature on assessment of reliability and validity of telerehabilitation reported that measures for knee are valid and demonstrates inter- and intra-rater reliability (Cabana F 2010; Russell TG et al 2003). Mani S et al concluded that it was feasible to conduct telerehabilitation with good concurrent validity and excellent reliability and also found that commonly performed assessments by physiotherapists to measure the levels of pain, degrees of range of motion, grades of muscle strength, balance, gait, and functional assessment also demonstrated good concurrent validity (Mani S et al 2017).

Although telerehabilitation is a new field to a great extent, the developed countries of the world are shifting towards this digitalization quite swiftly. Many research studies on the effectiveness of telerehabilitation in developed countries have already exhibited an enormous amount of improvement in the clinical outcomes (Odole AC, Ojo OD 2014; Azma K 2018 ;Zheng H., Black ND 2005). Literature review has revealed that there are no studies probing into the perceptions of a larger sample of physiotherapists who may be naïve users of telerehabilitation in context of developing countries like India, especially in northeastern states of India. The most powerful tool of physiotherapists is direct contact with their patients and performing physical assessment as a way of communicating and connecting with

their patients (Bjorbaekmo WS, Mengshoel AM 2016; Hiller A 2015; Roger J et al 2002), and therefore, they may be skeptical about the practicality of remote models of service delivery and/or reluctant to implement such models in their clinical setting. Furthermore, in a pandemic situation like COVID-19 wherein social distancing is the mantra of preventing the transmission of the virus, tele-physiotherapy may evolve as an asset in the clinical practice of Physiotherapists.

Therefore, the aim of the present study is to analyze the perceptions of physiotherapists of Assam, India regarding the usage of telephone and video conferencing for delivering combined kinetic chain exercises in the treatment of patients suffering from knee joint osteoarthritis.

Materials and Methods

A descriptive, cross-sectional web-based survey using Google Form was undertaken. This study was approved by the Institutional Ethical Committee. Physical therapists across Assam were recruited between August 2020 and September 2020. The aim was to accomplish a wide range of sample of physiotherapists from villages, towns as well as cities, spanning both private and public practice. Participants were recruited by contacts on social media (Facebook), as well as via official Whats App group message to members of Assam Physiotherapy Association and Indian Association of Physiotherapists, Assam Branch. Finally, other known physical therapists who had previously volunteered for research studies conducted by the researcher, and who had consented to be contacted for future studies, were also e-mailed an invitation to participate.

Survey instrument

Physical therapists completed a survey via Google forms about their perceptions of delivering Combined Kinetic Chain exercises over the telephone and via video conferencing (e.g., Skype/ Whats App video call) for people with knee OA. Prior to completion, participants were provided with introductory plain language statements detailing the purpose of the questionnaire. The survey comprised 3 sections. Section A ascertained demographic information and asked about previous experience with telerehabilitation (if any). Sections B and C included statements each about delivering combined kinetic chain exercises for treatment of subjects with knee joint OA over the telephone (Section B), and via video conferencing (Section C). The survey questionnaire was adapted from a previous similar study done in Australia and few questions were modified according to the objectives of the present study (Lawford BJ et al 2018). Permission for using the questionnaire was obtained from the corresponding author of the above mentioned study via Email.

Statistical analysis

Data were downloaded from Google form and processed in a Microsoft Excel spreadsheet. Data analysis was carried out with the Statistical Package for the Social Sciences (SPSS 21.0 version), and P value less than 0.05 was considered significant, $p<0.01$ was considered highly significant and $p<0.001$ was considered very highly significant. Data related to perception statements about telephone based and video conferencing based telerehabilitation were described as number (percentage).To estimate levels of agreement amidst physiotherapists within each perception statement, the percentage of respondents who agreed and strongly agreed to each of the statements were clubbed together. Using the same approach as utilized by a previous study (Lawford BJ et al 2018), agreement percentages were defined as follows: 100% respondents in agreement as unanimity, 75–99% respondents in agreement as consensus, 51–74% respondent in agreement as majority view, and 0–50% respondents in agreement as no consensus.

To probe whether a respondent physiotherapist's characteristics influenced their answer to the statement "I would be interested in being involved in a service offering physical therapist–prescribed exercise over the telephone/via video conferencing using internet for patients with knee OA", physiotherapists were classified as being either in agreement (i.e., marked strongly agree or agree) or not in agreement (i.e., marked unsure, disagree, or strongly disagree) with the

particular statement. Chi square test was utilized to obtain a p value to analyze if there was any significant difference in agreement and disagreement percentages which can be attributed to the individual characteristics of the respondent physiotherapists. Odds ratio was also calculated. Some response categories were grouped together due to small numbers of responses in those categories.

Results

272 Physiotherapists were contacted via various mediums such as email, social media (facebook messenger), and WhatsApp groups of Physiotherapists. Of the 272 physiotherapists who were contacted, 214 (78.7%) questionnaires were reverted back with complete response.

Table 1: Characteristics of the respondent physiotherapists (n = 214)

CHARACTERISTICS	VALUE (%)
Sex	
• Male	109(50.1%)
• Female	105(49.1%)
Clinical experience	
• 0-5 years	132(61.7%)
• 6-10 years	51(23.8%)
• 11-15 years	27(12.6%)
• More than 15 years	4(1.9%)
Post graduate qualifications	
• Yes	88(44.1)
• No	126(58.9%)
Work setting	
• Public	30(14%)
• Private	113(52.8%)
• Combination of public and private	71(33.2%)
Clinical practice	
• Less than 30 hours	115(53.7%)
• 30-40 hours	50(23.4%)
• More than 40 hours	49(22.9%)
Main focus of clinical work	
• Musculoskeletal outpatients	46(21.5%)
• Musculoskeletal inpatients	4(1.9%)
• Both musculoskeletal inpatients and outpatients	113(52.8%)
• Other	51(23.8)
Geographic location of clinical practice	
• City	138(64.5%)
• Town	61(28.5%)
• Village	15(7.0%)
Frequency of treating patients over 40 years of age with knee OA	
• Infrequently (≤1 in the last 6 months)	68(31.8%)
• Somewhat frequently (2–5 in the last 6 months)	57(26.6%)
• Frequently (≥1 patient/month)	46(21.5%)
• Very frequently (≥1 patient/week)	43(20.1%)
Belief about whether exercise is beneficial for knee OA	
• Never	2(0.9%)
• Occasionally (to a minority of patients)	7(3.3%)
• To approximately 50% of patients	26(12.1%)
• Usually (to most patients)	77(36.0%)
• Always (to all patients)	102(47.7%)
Previous experience with telerehabilitation	
• Yes	96(44.9%)
• No	118(55.1%)
Confidence of using video calling service using the internet	
• Not at all	20(9.3%)
• A little	47(22.0%)
• Moderately	71(33.2%)
• Quite a bit	55(25.7%)
• Extremely	21(9.8%)
Currently offer physiotherapy care by telephone	
• Yes	96(44.9%)
• No	118(55.1%)
Currently offer physiotherapy care via video conferencing	
• Yes	59(27.6%)
• No	155(72.4%)

*Values are the number of respondents/percentage of respondents. OA: osteoarthritis.

Table 2: Perception of Physiotherapists regarding usage of telerehabilitation for prescribing combined kinetic chain exercises in the management of patients with knee osteoarthritis (n = 214)

Statement	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
I would get a good understanding of a patient's OA over					
• Phone	7(3.3%)	87(40.7%)	73(34.1%)	36(16.8%)	11(5.1%)
• Video conferencing	15(7.0%)	100(46.7%)	68(31.8%)	28(13.1%)	3(1.4%)
A patient's privacy would not be violated if i prescribed them an exercise program over					
• Phone	34(15.9%)	114(53.3%)	50(23.4%)	12(5.6%)	4(1.9%)
• Video conferencing	23(10.7%)	122(57%)	51(23.8%)	18(8.4%)	0
Using the _____ to consult with an OA patient and prescribe an exercise program would be easy for me.					
• Phone	1(0.5%)	95(44.4%)	67(31.3%)	42(19.6%)	9(4.2%)
• Video conferencing	11(5.1%)	105(49.1%)	69(32.2%)	29(13.6%)	0
I would be as satisfied talking to an OA patient over the _____ as I would be talking to the patient in person in my consulting room.					
• Phone	7(3.3%)	82(38.3%)	54(25.2%)	54(25.2%)	17(7.9%)
• Video conferencing	12(5.6%)	90(42.1%)	61(28.5%)	46(21.5%)	5(2.3%)
An exercise program consisting of combined kinetic chain exercises prescribed by a physiotherapist over the _____ would improve a patient's OA.					
• Phone	8(3.7%)	92(43.0%)	83(38.8%)	26(12.1%)	5(2.3%)
• Video conferencing	10(4.7%)	103(48.1%)	79(36.9%)	19(8.9%)	3(1.4%)
An exercise program prescribed by a physiotherapist over the _____ would save patient money.					
• Phone	28(13.1%)	114(53.3%)	50(23.4%)	18(8.4%)	4(1.9%)
• Video conferencing	21(9.8%)	120(56.1%)	51(23.8%)	20(9.3%)	2(0.9%)
I would be able to adequately monitor a patient's OA over					
• Phone	7(3.3%)	75(35.0%)	72(33.6%)	55(25.7%)	5(2.3%)
• Video conferencing	12(5.6%)	94(43.9%)	74(34.6%)	29(13.6%)	5(2.3%)
I like that there would be no physical contact with an OA patient when consulting over the					
• Phone	31(14.5%)	96(44.9%)	45(21.0%)	33(15.4%)	9(4.2%)
• Video conferencing	24(11.2%)	109(50.9%)	43(20.1%)	33(15.4%)	5(2.3%)
Receiving an exercise program from a physiotherapist over the _____ would be a convenient form of health care for an OA patient.					
• Phone	7(3.3%)	100(46.7%)	63(29.4%)	39(18.2%)	5(2.3%)
• Video conferencing	13(6.1%)	104(48.6%)	66(30.8%)	27(12.6%)	4(1.9%)
Receiving an exercise program consisting of combined kinetic chain exercises from a physiotherapist over the _____ would save the patient time.					
• Phone	20(9.3%)	120(56.1%)	50(23.4%)	20(9.3%)	4(1.9%)
• Video conferencing	25(11.7%)	121(56.5%)	43(20.1%)	22(10.3%)	3(1.4%)

I would be interested in being involved in a service offering physiotherapist prescribed exercise over the _____ for my people with OA.					
• Phone	17(7.9%)	88(41.1%)	59(27.6%)	42(19.6%)	8(3.7%)
• Video conferencing	18(8.4%)	107(50.1%)	52(24.3%)	32(15.0%)	5(2.3%)
Using the _____ would be an acceptable way for me to deliver an exercise program consisting of combined kinetic chain exercises to patients with OA.					
• Phone	10(4.7%)	84(39.3%)	69(32.2%)	45(21.0%)	6(2.8%)
• Video conferencing	12(5.6%)	101(47.2%)	64(29.9%)	33(15.4%)	4(1.9%)
Using the _____ would be a useful (practical) way for me to deliver an exercise program consisting of combined kinetic chain exercises to patients with OA.					
• Phone	11(5.1%)	77(36.0%)	74(34.6%)	42(19.6%)	10(4.7%)
• Video conferencing	10(4.7%)	104(48.6%)	58(27.1%)	36(16.8%)	6(2.8%)
Using the _____ would be an effective way for me to deliver an exercise program consisting of combined kinetic chain exercises to patients with OA.					
• Phone	9(4.2%)	73(34.1%)	72(33.6%)	53(24.8%)	7(3.3%)
• Video conferencing	10(4.7%)	98(45.8%)	66(30.8%)	34(15.9%)	6(2.8%)
Using the _____ would be an affordable way for patients to receive a physiotherapist prescribed exercise program consisting of combined kinetic chain exercises for their OA.					
• Phone	17(7.9%)	103(48.1%)	59(27.6%)	30(14.0%)	5(2.3%)
• Video conferencing	19(8.9%)	112(52.3%)	60(28.0%)	20(9.3%)	3(1.4%)
Using the _____ would be a safe way for patients to receive a physiotherapist prescribed exercise program consisting of combined kinetic chain exercises for their OA.					
• Phone	20(9.3%)	103(48.1%)	54(25.2%)	30(14.0%)	7(3.3%)
• Video conferencing	26(12.1%)	108(50.5%)	54(25.2%)	24(11.2%)	2(0.9%)

*Values are the number of respondents/percentage of respondents. OA: osteoarthritis.

Table 3: Physiotherapists' perceptions of comparison of cost of telerehabilitation versus face-to-face physiotherapy session for prescribing combined kinetic chain exercises in the management of patients with knee osteoarthritis (n = 214)

Cost Perception	A session of pt prescribed exercise over the_____for patients with knee OA should cost patients	
	Phone	Video Conferencing
50% or more	20(9.3%)	17(7.9%)
25% more	10(4.7%)	21(9.8%)
Same	61(28.5%)	66(30.8%)
25% less	69(32.2%)	70(32.7%)
50% less	54(25.2%)	40(18.7%)

*Values are the number of respondents/percentage of respondents. OA: osteoarthritis.

Figure 1: Representation of percentage of survey respondents who agree and strongly agree with the perception statements

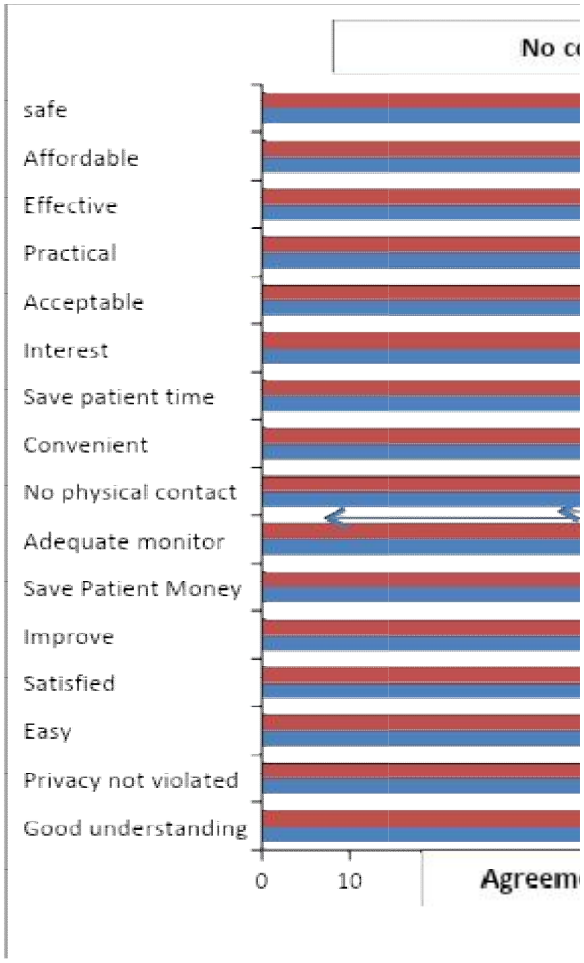

Table 4: Influence of Physiotherapist characteristics on interest in offering physical therapist prescribed exercise program consisting of combined kinetic chain exercises over the telephone for knee OA

CHARACTERISTICS [Values are the number (%)]	AGREE	DISAGREE	χ^2	df	P
Sex • Male • Female	 48(44.0%) 57(54.3%)	 61(56.0%) 48(45.7%)	2.248	1	0.134
Years of experience • 0-5 years • 6-10 years • 11-15 years • More than 15 years	 73(55.3%) 18(35.3%) 13(48.1%) 1(25.0%)	 59(44.7%) 33(64.7%) 14(51.9%) 3(75.0%)	6.861	3	0.076
Postgraduate qualification • Yes • No	 39(44.3%) 66(52.4%)	 49(55.7%) 60(47.6%)	1.348	1	0.246
Work setting • Public • Private • Combination of public and private	 12(40.0%) 58(51.3%) 35(49.3%)	 18(60.0%) 55(48.7%) 36(50.7%)	1.219	2	0.544

Geographic location of clinical practice • City • Town • Village	 62(44.9%) 39(63.9%) 4(26.7%)	 76(55.1%) 22(36.1%) 11(73.3%)	9.353	2	0.009*
Frequency of treating patients with knee OA • Infrequently (≤1 in the last 6 months) • Somewhat frequently (2–5 in the last 6 months) • Frequently (≥1 patient/month) • Very frequently (≥1 patient/week)	 38(55.9%) 20(35.1%) 25(54.3%) 22(51.2%)	 30(44.1%) 37(64.9%) 21(45.7%) 21(48.8%)	6.310	3	0.097
Previous experience with telerehabilitation • Yes • No	 55(57.3%) 50(42.4%)	 41(42.7%) 68(57.6%)	4.714	1	0.030*
Currently offer physiotherapy care by telephone • Yes • No	 55(57.3%) 50(42.4%)	 41(42.7%) 68(57.6%)	4.714	1	0.030*
Belief about cost of telephone delivered care • 50% or more than face-to-face • 25% more than face-to-face • Same as face-to-face • 25% less than face-to-face • 50% less than face-to-face	 12(60.0%) 5(50.0%) 33(54.1%) 36(52.2%) 19(35.2%)	 8(40.0%) 5(50.0%) 28(45.9%) 33(47.8%) 35(64.8%)	6.008	4	0.199

Characteristics [Values are the number (%)]	Agree	Disagree	Fisher' exact test	df	P
Belief that exercise is beneficial for knee OA • To less than 50% of patients • To 50% or more than 50% of patients	 2(22.2%) 103(50.2%)	 7(77.8%) 102(49.8%)	1.642		0.171

Values are the number of respondents/percentage of respondents.*Significantly associated, $p < 0.05$ statistically significant, chi-square (χ^2) test applied, df: degrees of freedom, OA: Osteoarthritis.

Table 5: Influence of Physiotherapist characteristics on interest in offering physical therapist–prescribed exercise program consisting of combined kinetic chain exercises via video conferencing for knee OA

Characteristics [Values are the number (%)]	Agree	Disagree	Pearson Chi Square value	df	P
Sex					
• Male	56(51.4%)	53(48.6%)	4.526	1	0.033*
• Female	69(65.7%)	36(34.3%)			
Years of experience					
• 0-5 years	91(68.9%)	41(31.1%)	16.767	3	0.001*
• 6-10 years	20(39.2%)	31(60.8%)			
• 11-15 years	13(48.1%)	14(51.9%)			
• More than 15 years	1(25.0%)	3(75.0%)			
Postgraduate qualification					
• Yes	46(52.3%)	42(47.7%)	2.318	1	0.128
• No	79(62.7%)	47(37.3%)			
Work setting					
• Public	14(46.7%)	16(53.3%)	3.367	2	0.186
• Private	72(63.7%)	41(36.3%)			
• Combination of public and private	39(54.9%)	32(45.1%)			
Geographic location of clinical practice					
• City	78(56.5%)	60(43.5%)	1.128	2	0.569
• Town	39(63.9%)	22(36.1%)			
• Village	8(53.3%)	7(46.7%)			
Frequency of treating patients with knee OA					
• Infrequently (≤1 in the last 6 months)	47(69.1%)	21(30.9%)	7.887	3	0.048*
• Somewhat frequently (2–5 in the last 6 months)	26(45.6%)	31(54.4%)			
• Frequently (≥1 patient/month)	29(63.0%)	17(37.0%)			
• Very frequently (≥1 patient/week)	23(53.5%)	20(46.5%)			
Frequency of prescribing exercise for patients with knee OA occasionally to approximately 50%					
• Never/ Occasionally	5(55.6%)	4(44.4%)	0.875	3	0.831
• To approx 50% of patients	17(65.4%)	9(34.6%)			
• Usually ,to most patients	46(59.7%)	31(40.3%)			
• Always ,to all patients	57(55.9%)	45(44.1%)			
Previous experience with telerehabilitation					
• Yes	61(63.5%)	35(36.5%)	1.886	1	0.170
• No	64(54.2%)	54(45.8%)			
Confidence of using video calling service using the internet					
• Not at all	2(10.0%)	18(90.0%)	29.571	4	0.000*
• A little	22(46.8%)	25(53.2%)			
• Moderately	46(64.8%)	25(35.2%)			
• Quite a bit	41(74.5%)	14(25.5%)			
• Extremely	14(66.7%)	7(33.3%)			

Currently offer physiotherapy care by telephone • Yes • No	 65(67.7%) 60(50.8%)	 31(32.3%) 58(49.2%)	6.195	1	0.013*
Currently offer physiotherapy care by video conferencing • Yes • No	 42(71.2%) 83(53.5%)	 17(28.8%) 72(46.5%)	5.473	1	0.019*
Belief about cost of video conferencing delivered care • 50% or more than face-to-face • 25% more than face-to-face • Same as face-to-face • 25% less than face-to-face • 50% less than face-to-face	 10(58.8%) 13(61.9%) 43(65.2%) 41(58.6%) 18(45.0%)	 7(41.2%) 8(38.1%) 23(34.8%) 29(41.4%) 22(55.0%)	4.303	4	0.367

*Significantly associated, $p < 0.05$ statistically significant, chi-square (χ^2) test applied, df: degrees of freedom, OA: Osteoarthritis.

Table 6: Calculation of Odds Ratio related to influence of Physiotherapist characteristics to their response in being interested in prescribing combined kinetic chain exercises over the telephone/video conferencing using internet for patients with OA

Variable	Mode of telerehabilitation	Significance	OR (95% CI for ExpB)
Gender	TELEPHONE	0.134	1.509 (0.880-2.587)
	VIDEO CONFERENCING	0.034*	1.814(1.046-3.147)
Years of Experience	TELEPHONE	0.878	0.939(0.418-2.107)
	VIDEO CONFERENCING	0.221	0.602(0.268-1.355)
Post graduation	TELEPHONE	0.246	0.724(0.419-1.250)
	VIDEO CONFERENCING	0.129	1.535(0.883-2.667)
Work settings	TELEPHONE	0.788 0.393	1.085(0.599-1.964) 0.686(0.288-1.630)
	VIDEO CONFERENCING	0.236 0.448	0.694(0.379-1.270) 1.393(0.592-3.279)
Location	TELEPHONE	0.014* 0.184	2.173(1.168-4.043) 0.446(0.135-1.469)
	VIDEO CONFERENCING	0.328 0.813	0.733(0.394-1.365) 1.137(0.391-3.312)
Frequency of treating knee OA patient	TELEPHONE	0.764 0.357	1.136(0.494-2.614) 1.375(0.698-2.710)
	VIDEO CONFERENCING	0.362 0.583	1.483(0.636-3.460) 1.215(0.606-2.438)
Belief that exercise is beneficial for OA	TELEPHONE	0.245 0.122	1.423(0.785-2.578) 1.897(0.842-4.274)
	VIDEO CONFERENCING	0.605 0.754	1.171(0.643-2.135) 0.877(0.385-1.997)
Previous	TELEPHONE	0.031*	1.824(1.058-3.146)

experience of telerehabilitation			
	VIDEO CONFERENCING	0.170	0.680(0.392-1.180)
Confidence of using Video Conferencing using internet	VIDEO CONFERENCING	0.001* 0.000*	0.082(0.018-0.368) 0.042(0.009-0.199)
Currently offering physiotherapy over	TELEPHONE	0.031*	1.824(1.058-3.146)
Currently offering physiotherapy over	VIDEO CONFERENCING	0.021*	0.467(0.245-0.890)

*Significantly associated, $p < 0.05$ statistically significant, OR: odds ratio was calculated, OA: Osteoarthritis.

Discussion

This study aimed to evaluate the perceptions of practicing physiotherapists of Assam, India about the usage of telephone and video conferencing for delivering Combined Kinetic Chain exercises in the treatment of patients suffering from knee osteoarthritis.

The respondent physiotherapists were 49% females and 51% males, out of which 52.8% worked exclusively in the private sector which is reflective of the Indian Physiotherapy workforce engaged mostly in the private sector due to lack of much job opportunities in the government sector in India. 64.5% of the Physiotherapy workforce of Assam practiced in its only city Guwahati, followed by 28.5% in different towns of the state and only 7% in the villages. In a way, it reflects the lack of physical rehabilitation in the remote areas of the state accentuating the need and benefits of tele-physiotherapy services in the state irrespective of the COVID-19 pandemic scenario. Out of 214, only 4(1.9%) physiotherapists had more than 15 years of experience, 27 (12.6%) had 11-15 years of experience, 51(23.8%) had 6-10 years of experience and majority (61.7%) had 0-5 years of experience. This data delineates the fact that majority of the workforce in the region is young and possess less amount of experience.

Collectively, 41.6% of therapists treated patients with knee OA very frequently or frequently. Out of the 214 respondents, 47.7% of them believed that exercise is always beneficial to all patients with knee OA and 36% believed it to be usually beneficial to most patients with knee OA. Thus, majority of the physiotherapists agreed about the pivotal role of exercise in OA knee treatment. This is in concordance with various published research studies suggesting exercise to be one of the crucial tools in managing OA knee. Most of the physiotherapists (60.7% agreement for telephone, 63.5% agreement for video conferencing) felt that prescribing combined kinetic chain exercises using telerehabilitation should cost either same or 25% less than a face-to-face physiotherapy consultation, whereas 25.2% for telephone and 18.7% for video conferencing supported the charges to be 50% lesser than the cost of a face-to-face consultation.

For both video conferencing and telephone-delivered services, it was a majority agreement amidst the respondent physiotherapists that both modes would maintain patient privacy, would save patient's time as well as money, would like the fact that there would be no physical contact while treating an OA patient and would be an affordable as well as a safe way for patient to receive combined kinetic chain exercises for OA knee. Overall, the respondent physiotherapists in the current study favored telerehabilitation via video

conferencing over telephone with 13 out of 16 perception statements achieving majority agreement for video conference based telerehabilitation compared to 6 out of 16 statements achieving majority agreement for telephone based telerehabilitation in knee OA. These results are in line with previous similar study (Lawford et al 2018). The results also broadly exhibit prior quantitative studies (in research settings) exploring physiotherapists' contentment while utilizing advanced videoconferencing software in rehabilitation post total knee arthroplasty (Russell TG et al 2004; Tousignant M 2011; Russell TG et al 2011; Kairy D et al 2009). Cumulatively, these erstwhile research papers reported that physiotherapists were content with the patient-therapist alliance and accomplishment of therapeutic goal (Tousignant M et al 2009) as well as the convenience and usefulness of videoconferencing for service delivery (Kairy D et al 2009). Although physiotherapists in previously published studies perceived that the video technology was easy and safe to use (Russell TG et al 2004; Tousignant M et al 2011), but in the present study 45.8% physiotherapists didn't agree that using video conferencing would be easy to deliver exercises for OA knee patients and 37.3% physiotherapists didn't agree it would be a safe way for patients to receive an exercise program. The results are similar to a study done by Lawford et al on Australian physiotherapists where the disagreement percentages for being easy and safe ranged between 37-45% of the respondents (Lawford BJ et al 2018). The rationale behind these findings might be because of the fact that 55.1% of the respondent physiotherapists had no previous experience of telerehabilitation, in contrast to the prior studies where physical therapists had first-hand experiences to reflect upon. Physiotherapists' perceptions about video-delivered telerehabilitation align with those of people with OA as reported by a previously published study (Lawford B et al 2017), who achieved consensus agreement that video-based care would be time-saving, convenient, and easy to use, and would protect their privacy. Videoconference-based physiotherapy has also been regarded as a feasible method for improving strength and range of motion in other populations like the homebound geriatric individuals (Bernard MM et al 2009).

A pragmatic randomized controlled trial by Salisbury C et al reported that Physio Direct services introduced in the UK in which a patient seeks care by calling a physiotherapist using telephone for initial assessment and treatment advice demonstrated equal clinical effectiveness in comparison to usual waiting-list–based care, also provided earlier access to treatment, and appeared have safety and acceptability by the patients (Salisbury C et al 2013). Another study reported that providing physiotherapy exercises using telephone improved quality of life in patients with knee joint OA and the positive effects of treatment were equivalent to clinic based treatment (Odole AC, Ojo OD 2014). In contrast to such studies in literature, the respondent physiotherapists in the present study did not reach majority agreement on perception statements related to ease, effectiveness, practicality, convenience, monitoring the patient and satisfaction while interaction with the patient using telephone as the medium of telerehabilitation in OA knee. Dale J et al in their study, reported that general practitioners feel dissatisfied on over phone consultation due to omission of visual cues and in person examination to confirm the diagnosis as compared to the usual face to face consultation (Dale J et al 1995); a similar rationale and concern might be the reason of physiotherapists in the current study being skeptical about using telephone to prescribe exercises for OA knee patients. A recently published study states that physiotherapist with no experience of telerehabilitation were of the opinion that it should be utilized only for follow-up instead of delivering therapeutic instructions and exercises because they believed the absence of visual and physical contact would be negative factors for the consultant physiotherapist. The views changed after delivering care, when the same physiotherapists accepted that telephysiotherapy via telephone led to decrease in pain perception and enhanced function and confidence in their patients. Consequently, it is evident that training and firsthand experience in telerehabilitation may be the necessary

factors for the therapists to adopt and accept telephone as a new way of delivering their services (Hiller A et al 2015).

In a similar study (Lawford BJ et al 2018), only 8% agreement amidst respondent physiotherapists was found for the statement that they would like the lack of physical contact when consulting over the telephone and only 14% agreed for the same when consulting via videoconferencing in contrast to 59.4% and 62.1% of respondents respectively in the present study, who acknowledged that they would like the lack of physical contact. This might be justified because of the mindset of physiotherapists related to social distancing protocols as advised by the WHO and the health departments of Assam in the current scenario of the ongoing COVID-19 pandemic wherein lack of in-person contact may lessen the chances of spreading the corona virus. These particular findings are in contrast with the perceptions of people suffering from osteoarthritis as reflected in a previous study (Lawford B 2017).

Though a higher percentage of physiotherapists agreed that they would like the lack of physical contact keeping in view the current scenario of COVID-19 pandemic, but physical assessment is the main method of evaluating a patient and in-person consultation is the usual way of delivering combined kinetic chain exercises for OA knee, hence 40.6% physiotherapists didn't agree that they would like the lack of physical contact in delivering exercises via telephone and 37.9% didn't agree with the same via videoconferencing using internet. This might be due to the thinking imbibed in the physiotherapy community that traditionally physiotherapy has been considered as a hands-on profession (Thornquist E 2006), and as physical therapists frequently use touch to communicate with and connect to their patients (Bjorbaekmo WS, Mengshoel AM 2016; Hiller A et al 2015;Roger J et al 2002). Another reason may be the fact that the curriculum of physiotherapy in India doesn't train a therapist to provide care through telerehabilitation; hence they might be lacking the confidence to deliver it effectively. This assumption is well supported by the statistical analysis of the data of the present study which revealed that physiotherapists having previous experience of telerehabilitation had higher odds of agreement to interest in delivering exercises via telephone as compared to those without experience (OR=1.824); and found significant p=0.031 ($p < 0.05$) and physiotherapists currently offering care via telephone had higher odds of agreement to interest in delivering exercises via telephone as compared to those who are not offering such care (OR=1.824);and found statistically significant($p < 0.05$). The results intimate that specified training and practice may mould therapists well towards the delivery of physiotherapy care via telerehabilitation.

Physiotherapists practicing in the urban areas of Assam (44.9% physiotherapists practicing in Guwahati city and 63.9% physiotherapists practicing in various towns of Assam) showed a significantly higher interest (p=0.009) in being involved in telerehabilitation using telephone for prescribing combined kinetic chain exercises in OA knee patients in comparison to only 26.7% physiotherapists practicing in the rural areas or villages of Assam. As reported in a published research article by Kapou Malakar in 2015, the corresponding Assam tele density figures are about 14.9 percent (rural) and 75 percent (urban) which makes it clear that there is a lack of telecom connectivity in the rural areas of Assam (Malakar K 2015). This might be one of the reasons that physiotherapists practicing in rural areas are not that keen in being involved in service delivery via telephone or video conferencing using internet.

Conclusion

The allure of telerehabilitation is in its ability to establish a communication between a patient and a physiotherapist over a distance. In the present scenario of Covid 19 pandemic when social distancing is the norm proposed by the WHO as well as the Health department of the State and patients are reluctant to visit a hospital or clinic seeking physiotherapy care for pain due to conditions such as OA knee because of the fear of contracting the corona virus while travelling or in the health set ups, telerehabilitation either by telephone or video conferencing is the best way out to maintain the continuum of rehabilitation services. The present survey reveals that Physiotherapists agree that apart from other benefits like saving

time and money of the patient, one of the biggest advantage of telerehabilitation is the absence of physical contact with the patient in the scenario of COVID-19 pandemic .Telerehabilitation may be a boon to a physiotherapist who can continue delivering services easing patient's pain and discomfort and still avoiding face-to-face contact, thus preventing chances of corona virus transmission, if any. Furthermore, people living in the villages of India are more vulnerable candidates for osteoarthritis of the knee since agriculture is their main occupation. Once diagnosed with OA, the patients find it burdensome to go to a specialized health care delivery unit because of either the long travel hours or the fear of loss of their daily income. Thus taking these matters into consideration, telerehabilitation demonstrates excellent potential to improve access and reduce costs associated with receiving care for OA for patients during pandemics like COVID-19 and also for patients from rural communities.

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