Clinical practice pattern of low back pain among physiotherapists in a low-income country

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Abstract

Background: Low back pain (LBP) is the top global cause of disability and physiotherapy interventions are used to manage it. However, the practice pattern of physiotherapists dealing with LBP patients in low-income countries are limited. Aim: The study aims to explore the LBP practice pattern of a low-income country's (i. e., Bangladeshi) physiotherapists by their demographic and professional factors. Methods: In a cross-sectional survey study, we have analyzed data from randomly selected 423 physiotherapists of Bangladesh who have invited to fill-up an online survey questionnaire about practice patterns. The first part of the questionnaire contained question demographic and professional background, second part included current intervention choices in the management of patients with LBP, the final part consisted of information on diagnosis, patient type and self-reported cure rate of LBP patients. Ethical approval: Clinical Trial Registry India: CTRI/2020/05/025313. Results: The Majority of the physiotherapists (54.8%) were non-government service holders and 87.7% worked in the town area. Regarding recommended interventions, only 12.3% frequently used those and 21.5% didn't either offer or know about those interventions. For not recommended interventions, 69.3% occasionally, 13.5% frequently and 17.3% never used such interventions. The prevalence of good, moderate, and poor practice patterns was 14%, 62.4%, and 23.6% respectively. Participants' marital status (P = 0.003) and graduation institute category (P = 0.002) were significant factors for practice pattern variation. Conclusion: The study justified physiotherapy management status in a low-income country by comparing evidence-based practice guidelines. This finding set as a low-income country database to exhibit future research, clinical practice, and education for better LBP physiotherapy management adherence to evidence-based public health care.

Running title: Low back pain practice pattern of Physiotherapist

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Abstract

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The study aims to explore the LBP practice pattern of a low-income country's (i. e., Bangladeshi) physiotherapists by their demographic and professional factors.

Methods:

In a cross-sectional survey study**,** we have analyzed data from randomly selected 423 physiotherapists of Bangladesh who have invited to fill-up an online survey questionnaire about practice patterns. The first part of the questionnaire contained question demographic and professional background, second part included current intervention choices in the management of patients with LBP, the final part consisted of information on diagnosis, patient type and self-reported cure rate of LBP patients.

Ethical approval:

Clinical Trial Registry India: CTRI/2020/05/025313.

Results:

The Majority of the physiotherapists (54.8%) were non-government service holders and 87.7% worked in the town area. Regarding recommended interventions, only 12.3% frequently used those and 21.5% didn't either offer or know about those interventions. For not recommended interventions, 69.3% occasionally, 13.5% frequently and 17.3% never used such interventions. The prevalence of good, moderate, and poor practice patterns was 14%, 62.4%, and 23.6% respectively. Participants' marital status (P = 0.003) and graduation institute category (P = 0.002) were significant factors for practice pattern variation.

Conclusion:

The study justified physiotherapy management status in a low-income country by comparing evidence-based practice guidelines. This finding set as a low-income country database to exhibit future research, clinical practice, and education for better LBP physiotherapy management adherence to evidence-based public health care.

Keyword: Low back pain, physiotherapy, practice pattern

1. Introduction

Low back pain (LBP) is the top global cause of disability[1] and the incidence rate varies from 0.024-7.0%[2]. The prevalence of LBP is higher among the population groups with low socioeconomic status [3,4]. Data indicated that middle and low-income countries in Asia, Africa, and the Middle East are becoming the epicenter of LBP related disabilities due to an increased number of aged populations and poor health systems in these regions [5]. Previous studies found that the poor referral system, less availability of essential services in the rural areas, lack of proper guidelines for LBP intervention made the situation worst especially in the Indian subcontinent[6,7]. There is a tremendous opportunity to reduce the gap between existing and efficient intervention system for patients in low-income countries by identifying the improvement opportunities.

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There are a plethora of surgical, pharmacological, and non-pharmacological treatment options for LBP whereas, very few of them are effective to reduce LBP burden[8,9]. Physiotherapy is an effective treatment option for LBP, but all the interventions are used in this method are not equally beneficial [10,11]. Frequently used modalities for LBP in low and middle-income countries such as short wave diathermy, ultrasound, interferential therapy, transcutaneous electric stimulation, traction, and back support [6,12,13] are found ineffective and not recommended [14–17]. Guidelines recommended mainly cognitive behavioral therapy, progressive relaxation, and mindfulness-based stress reduction and combined packages of physical and psychological intervention for LBP [14–16]. However, a systematic review and meta-analysis in 2019 concluded that the rate of interventions provided by the physiotherapist for LBP that were 35% recommended, 44% not recommended, and 72% had no recommendations [18]. Nonetheless, studies included in this review mostly were from high-income countries. Thus very few are known about the current practice pattern of the physiotherapist for LBP in low-income countries such as Bangladesh.

Bangladesh is the 8th most populous and 12th densely populated country in the world with 160 million people [19]. Unsurprisingly, there is a substantial difference between the numbers of physiotherapists for per million people in high-income and middle or low-income countries. In contrast with 209 thousand and 52 thousand registered physiotherapist in the US and UK for 329 million and 65 million people respectively[20,21], there are currently only 1.7 thousand registered physiotherapists for 160 million people in Bangladesh[22]. On the other hand, previous studies found a high prevalence of LBP among different groups of the population in Bangladesh[23–26]. To ensure quality management by utilizing limited resources for a large number of LBP patients in Bangladesh, exploring the practice pattern of the treatment provider is warranted. Furthermore, to make a promising guideline of a country to improve health-care outcomes and potentially reduce costs by effectively implementing known best practice recommendations, we must need to know the practice pattern of physiotherapists' dealing with LBP patients in that particular country. The study aims to explore the LBP practice pattern of Bangladeshi Physiotherapists considering their demographic and professional factors.

2. Methods

2.1. Design and materials

A cross-sectional descriptive survey with a self-administered questionnaire was conducted using the STROBE cross-sectional reporting guidelines [27] from May 23 to June 6, 2020. The format of this questionnaire was proved successful in previous studies of physiotherapy management for LBP [6,13]. Before distribution, the questionnaire was piloted with a convenient 20 Bangladeshi physiotherapists. These physiotherapists were asked to give their opinion regarding the questionnaire format, its content, wording, instructions, and ease of completion. The questionnaire was slightly revised as the feedback given.

The content of the questionnaire was divided into three parts. In the first part, the respondent was asked about their demographic and professional background. In the second part, physiotherapists were asked to provide details on their current intervention choices in the management of patients with LBP. The final part consisted of information about the use of x-ray for LBP diagnosis, patient type, and self-reported cure rate of LBP patients.

2.2. Inclusion-exclusion criteria and ethical consideration

Registered graduate physiotherapists who are currently living and practicing in Bangladesh, age 18-65 years, see a minimum of one LBP patient per day in their practice, willing to participate in this study were the inclusion criteria. We exclude who are registered in Bangladesh but currently living or practicing outside of Bangladesh, age more than 65 years. Voluntary informed consent was taken from all the participants.

We have taken prospective observational trial registration from the World Health Organization (WHO) endorsed Clinical Trial Registry- India (CTRI/2020/05/025313 [Registered on 22/05/2020]). The ethical review committee of Uttara Adhunik Medical College and Hospital has also approved the study.

2.3. Sample size determination

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There were 1793 registered physiotherapists in Bangladesh at the time of our study commenced. Using finite population sample size formula[28–30], we have calculated the minimum sample size 317 after considering a 95% confidence interval and 5% marginal error. However, we invited 1000 randomly selected physiotherapists using digital communication tools (e.g. Email, Messenger) for participating in this study. 98 communication account was not either valid or active. However, 639 physiotherapists filled and returned the form (response rate of 70.80%). After considering the inclusion and exclusion criteria, we found 423 data eligible for this study. We have put these final data for analysis in a password encrypted personal computer with a new unidentifiable code number after removing participants' names and registration digit to ensure confidentiality.

2.4. Demographic and professional factors

In this survey, demographic factors of the participant such as age, sex, and marital status were recorded. The physiotherapists were also asked to provide their professional factors (e.g. highest qualification, specialization, type of institute from where they were graduated, type of organization currently working, service type, working station, and patient load per day).

2.5. Practice pattern

Eighteen interventions were included in this study (list of the interventions are in Table 1). We evaluated practice patterns in two different ways based on these interventions' use frequency and evidence level.

Firstly, the respondents were asked to report the frequency of each intervention on a Likert scale from 1 to 3; with 1 indicating frequent use, 2 for occasional use and 3 indicating never use. We have also included additional 'unknown intervention' options for cognitive behavioral therapy, progressive relaxation, and mindfulness-based stress reduction, and interdisciplinary rehabilitation intervention. We sub-categories these 18 interventions into (i) not recommended (ii) partially recommended and (iii) recommended groups considering treatment guidelines for LBP [14–17,31–33]. The frequency and percentage of the physiotherapists who used these eighteen different intervention options are used as the first way to explain practice patterns.

Secondly, to segregate practice pattern to the poor, moderate and good; we calculated points in the following way: (a) for not recommended interventions, physiotherapists were given 0 points for selecting frequent use, 1 point for occasional use, 2 points for never use; (b) for partially recommended interventions, never use selectors were given 0 points, while occasional and frequent selectors were given 1 point; (c) for recommended interventions, 0 for never use and unknown intervention, 1 for occasional use and 2 for frequent use. The total point was ranging from 0-28. The median, first quartile, and the third quartile of the points were 15, 13, and 17 respectively. Participants who scored equal and/or above the third quartile were categorized as a "good practitioner", equal and/or below the first quartile were separated as a "poor practitioner" and finally, the physiotherapist who scored between first and third quartile was identified as a "medium practitioner" in this study.

2.6. Data analysis

To analyze the data, we use Statistical Package for the Social Science (SPSS) software version 20.0, SPSS Inc., Chicago, IL, USA. Descriptive statistical analysis was done to find the physiotherapists' frequency and percentage for different categories and the different interventions. When testing the differences between groups, P-value is calculated from the chi-square test. A significance level of p<0.05 was used.

3. Result

3.1. Demographic and professional factors

Table 2 shows the demographic and professional factors of physiotherapists in Bangladesh. Participants were dominated by young age groups where 66% were from 26-35 years' age group. 76.8% of participants were male while the percentage of graduate and post-graduate physiotherapists were the same (49.2% vs 50.8%). 44.7% physiotherapists were specialized in musculoskeletal physiotherapy followed by no specialization group (28.1%). 63.6% physiotherapists have been graduated from the private institute and 31.2% worked in general hospital/clinic followed by 30.7% and 26.7% worked in rehabilitation institutes and private

chambers respectively. More than half of the physiotherapists (54.8%) were non-government service holder and 32.9% are self-employed. Among all the participants, 87.7% worked in town and the majority (67.1%) have the patient load in between 1-5 patients per day.

3.2. Practice pattern

Firstly, we calculate the frequency and percentage of a physiotherapist who used eighteen different intervention options (in **table 1**) . Among all eighteen interventions, the highest 92.4% physiotherapist frequently used exercise therapy, 83.2% occasionally used mechanical traction and 66.9% never used acupuncture, while the highest 37.6% participants said that Mindfulness-based stress reduction therapy was unknown to them. **Figure 1** shows the average number of participants used three groups of interventions according to the frequency of use (frequently, occasionally, never). On average, 293 participants (69.3% of total) occasionally used not recommended intervention, 57 (13.5% of total) frequently and only 73 (17.3% of total) participants never used such intervention. For the partially recommended group, the average number of participants for frequent, occasional, and never used intervention was 141 (33.3% of total), 185 (43.7% of total), and 97 (23% of total) respectively. Nonetheless, only 52 (12.3% of total) participants frequently used recommended intervention on an average. One the other hand, on an average, 91 (21.5% of total) physiotherapist either do not offer or do not know about the recommended interventions.

Secondly, **table 2** has shown the result of the analysis of good, moderate, and poor practice patterns after calculating given points to each physiotherapist for the choice of different group interventions. The prevalence of good practice among physiotherapist of Bangladesh were 14%, however, 62.4% and 23.6% did moderate and poor practice respectively. A higher number of the younger group (18-25 years of age) of physiotherapists do good practice. Among all the demographic and professional factors in this study, only the marital status (P = 0.003) and graduation institute category (P = 0.002) were significant factors for practice pattern variation (Table 2).

In addition to 18 interventions, we evaluated a diagnostic (radiological imaging) dependency, LBP patient category has commonly seen, and cure rate patterns. We estimated the dependency of a physiotherapist on radiological imaging for LBP diagnosis and found 97.8% physiotherapists either frequently or occasionally use x-ray and/or MRI. For LBP patient category, 67.2% of participants said that they have seen mainly chronic LBP patients in their practice. When asked cure rate, 46.8% physiotherapists claimed that the cure rate of their LBP patients was 71-90% and 35.7% said this rate was between 51-70%.

4. Discussion

We found a high prevalence of moderate practice habits and a low prevalence of good practice habits for LBP among the physiotherapist in Bangladesh. Though most of the currently practicing physiotherapists in Bangladesh were young, only less than one fourth was female. Half of the participants had a post-graduate degree and the impressive number of them had a specialization in musculoskeletal physiotherapy. However, data showed that there is a scarcity of physiotherapists in the government's health sector in Bangladesh and most of them had worked in the city area. Dependency on passive electrical and physical modalities and exercise therapy were very high among the physiotherapist in Bangladesh. Very few used recommended intervention for example Mindfulness-based stress reduction therapy for LBP. Unsurprisingly, for diagnosis of LBP, all most all the physiotherapists advise radiological imaging, though most of the respondents reported that they mainly have seen chronic LBP patients in their practice.

Little is known about current practice patter of physiotherapists in low and middle-income countries compared to high-income countries. A most recent study that seen the practice pattern of physiotherapists in the low-income country has been done in Ghana in 2013. Like our study, this study reported that most physiotherapists used not recommended and partially recommended interventions [34]. In our study, we have found 92.4% of physiotherapists offer exercise therapy for LBP. However, this rate was 100% in Ghana, although most of our participants were young and less experienced like Ghana. This indicated that physiotherapy is a relatively newer profession for low-income countries. However, a study conducted in 2010 in India, found the same picture as our study regarding the use of electrotherapy and exercise therapy[6]. Previous studies from

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Thailand (in 2005) and Nigeria (in 2007) reflected the same scenario [12,13]. It means the practice pattern of physiotherapists in low and middle-income countries is almost the same over the one and half-decade. More studies from other low and middle-income countries can give us a recent practice pattern of physiotherapists. For an example of data from high-income countries, a systematic review estimated 50% of physiotherapists used not recommended interventions for LBP[18]. However, homogenous studies from low and middle-income countries are not yet enough for making a valid conclusion on practice pattern, more specifically for LBP.

In our study, we found half of the physiotherapists have masters and above degrees, and most of them are specialized in musculoskeletal physiotherapy, however, very few of them are a good practitioner. This indicates the necessity of revision of postgraduate courses in Bangladesh. It was impressive that the prevalence of good practice among young physiotherapist was higher than the aged. It is probably that the young generation is more connected with the outer world and conscious of modern treatment techniques. One the other hand, our study shows a higher number of physiotherapists who was graduated from a private institute and worked in the non-government institute were engaged in good practice. This finding is similar to the findings of other studies conducted in Bangladesh where the author found governments' impassivity about the physiotherapy profession in Bangladesh [22].

Imaging has a very limited role in LBP management and unnecessary lumbar imaging is a harmful exposure to radiation. Imaging rates for LBP diagnosis are high all over the world. For example, 53.7% and 56% of patients with LBP are referred for imaging by general practitioners in the USA and Italy respectively [35,36]. Surprisingly, this rate is up to 100% in India and China [37,38]. In our study, we found 97.8% physiotherapist refer their patients for radiological imaging to diagnose LBP which is a clear waste of health-care resources in Bangladesh.

In our study, data have shown that Bangladeshi physiotherapist mainly relied on not recommended and partially recommended interventions. However, four out of five physiotherapists claim that the cure rate of their LBP patients is between 50-90%. Nonetheless, two systematic reviews and meta-analysis suggested that only those patients who received evidence-based physiotherapy were satisfied and feel confident about physiotherapy interventions [39,40]. A large scale cohort study addressing the effect of physiotherapy on LBP patients in Bangladesh is needed to find the actual efficacy rate.

The first study in Bangladesh that evaluated the LBP practice pattern of an important professional group who are dealing with LBP predominantly. The study is focused on the top global cause of disability (i.e. LBP) and justified its management status (compared to evidence-based practice guidelines) in a low-income country. The response rate for this study was considerably high (70.8%) and a good number of representatives from the city and rural area appropriately reflect the national situation for Bangladesh. Despite this, limitations such as the measuring bias in self-reported data [41] should be recognized. The current data were based on participants' freedom opinion and relied on their memory, which might oppose to actual intervention pattern of patients. The difference in interpretation might lead due to the use of predominantly closed questions. Future research with the combination of quantitative and qualitative data can overcome the limitation. Another important limitation of this study is that it does not characterize between cases of acute and chronic LBP according to guideline recommendation. For example, cognitive behavioral therapy is recommended for chronic low back pain but not for acute low back pain. However, the majority of the participant said that they mainly treat chronic LBP patients in their practice.

Our findings help advance the scientific literature in this area as an example of professional practice pattern evidence from a low-income country. This study has valuable implications for the management of LBP by the physiotherapist, especially in a low-income country like Bangladesh. The findings set as a database to exhibit future research, clinical practice, and education for the physiotherapy profession. Although, future clinical trials focusing on the specific evidence-based application of interventions used by Bangladeshi physiotherapists are needed to provide acuteness into the outcome of LBP management in Bangladesh. The current practice pattern is known from this study, which is a baseline reference point for further upgrades, and it's helpful to reduce the burden of disability by improving LBP physiotherapy management adherence to evidence-based public health care.

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Discloser

*Consent to Publish***:** Not applicable.

Availability of data

Data are available upon reasonable request. The data sets used and analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest

The authors declare that they have no conflict of interests.

Author's contributions

MA participated in study conception, design, formal statistical analysis, and coordination of the manuscript. ZU and AH reviewed and helped to draft the manuscript. ZU supervised the study. All authors read and approved the final manuscript.

Table 1: Interventions offered by physiotherapists and their practice frequency distribution (n=423)

List of interventions	Frequency of use (n, %)	Frequency of use (n
	Frequently	Occasionally
Not recommended Intervention[14–17,31,32]	**Not recommended Intervention[14–17,31,32]**	**Not recommende**
Short wave diathermy	22 (5.2)	254 (60.0)
Ultrasound therapy	70 (16.5)	269 (63.6)
Infrared radiation	65 (15.4)	305 (72.1)
Transcutaneous electric nerve stimulation	98 (23.2)	289 (68.3)
Mechanical traction	25 (5.9)	352 (83.2)
Paracetamol	12 (2.8)	298 (70.4)
Bed rest	107 (25.3)	284 (67.1)
Partially recommended intervention[33,42–44]	**Partially recommended intervention[33,42–44]**	**Partially recomm**
Exercise therapy	391 (92.4)	30 (7.1)
Spinal manipulation	88 (20.8)	305 (72.1)
Massage	62 (14.7)	236 (55.8)
Acupuncture	8 (1.9)	132 (31.2)
Yoga	18 (4.3)	132 (31.2)
Superficial heat	144 (34.0)	253 (59.8)
Postural education	383 (90.5)	36 (8.5)
Back belt	37 (8.7)	354 (83.7)
Recommended intervention[14–16,33]	**Recommended intervention[14–16,33]**	**Recommended in**
Cognitive behavioral therapy	47 (11.1)	192 (45.4)
Mindfulness-based stress reduction therapy	30 (7.1)	174 (41.1)
Interdisciplinary rehabilitation	78 (18.4)	203 (48.0)

Table 2: Univariate analysis of demographic, professional factors and practice pattern (n=423)

Categories	Categories	n (%)	Practice (n, Row %)	Practice (n, Row %)	Practice (n,
			Good	Moderate	Poor
Age	18-25	54 (12.8)	10 (18.5)	27 (50.0)	17 (31.5)
	26-35	279 (66.0)	43 (15.4)	175 (62.7)	61 (21.9)
	36+	90 (21.2)	6 (6.7)	62 (68.9)	22 (24.4)
Sex	Male	325 (76.8)	43 (13.2)	201 (61.8)	81(25.0)
	Female	98 (23.2)	16 (16.3)	63 (64.3)	19 (19.4)
Marital status	Unmarried	153 (36.2)	31 (20.3)	81 (52.9)	41 (26.8)
	Married	270 (63.8)	28 (10.4)	183 (67.8)	59 (21.8)
Highest qualification	Graduate	208 (49.2)	33 (15.9)	120 (57.7)	55 (26.4)
	Post graduate	215 (50.8)	26 (12.1)	144 (67.0)	45 (20.9)
Specialization	Musculoskeletal	189 (44.7)	30 (15.9)	117 (61.9)	42 (22.2)
	Neurology	29 (6.9)	3 (10.4)	19 (65.5)	7 (24.1)
	Pediatrics and gynecology	23 (5.5)	5 (21.7)	17 (74.0)	1 (4.3)
	Public health and others	63 (14.9)	6 (9.5)	39 (62.9)	18 (28.6)
	No specialization	119 (28.1)	15 (12.6)	72 (60.5)	32 (26.9)
Graduation institute	Public	154 (36.4)	17 (11.0)	86 (55.9)	51 (33.1)

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Categories	Categories	n (%)	Practice (n, Row %)	Practice (n, Row %)	Practice (n,
	Private	269 (63.6)	42 (15.6)	178 (66.2)	49 (18.2)
Working institute	Medical college hospital	48 (11.3)	7 (14.6)	24 (50.0)	17 (35.4)
	Rehabilitation institute	130 (30.7)	24 (18.5)	83 (63.8)	23 (17.7)
	General hospital/clinic	132 (31.2)	15 (11.4)	89 (67.4)	28 (21.2)
	Private chamber	113 (26.7)	13 (11.5)	68 (60.2)	32 (28.3)
Service type	Government	52 (12.3)	4 (7.7)	36 (69.2)	12 (23.1)
	Non-government	232 (54.8)	40 (17.2)	144 (62.1)	48 (20.7)
	Self employed	139 (32.9)	15 (10.8)	84 (60.4)	40 (28.8)
Working station	City	371 (87.7)	53 (14.3)	230 (62.0)	88 (23.7)
	Village	52 (12.3)	6 (11.5)	34 (65.4)	12 (23.1)
Patient load per day	1-5	284 (67.1)	44 (15.5)	171 (60.2)	69 (24.3)
	6-10	88 (20.8)	11 (12.5)	55 (62.5)	22 (25.0)
	More than 10	51 (12.1)	4 (7.8)	38 (74.5)	9 (17.6)
Total	Total	423 (100)	59 (14.0)	264 (62.4)	100 (23.6)

*P-value is calculated from the chi-square test. The significant values are bolded.

Figure 1: Practice pattern showing by the number of physiotherapists offering three categories of interventions and frequency of practice.

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Fig_1_Clinical.docx available at https://authorea.com/users/348308/articles/473708-clinical-practice-pattern-of-low-back-pain-among-physiotherapists-in-a-low-income-country