



Investigating behavior, attitudes, knowledge, awareness and barriers to the implementation of evidence-based practice by physiotherapists in Egypt: A cross sectional study

Tamer Shousha^{a,b,c,*}, Asma Javed^a, Amira Bekhet^b, Alhadi M. Jahan^{d,e},
Mohamed Alayat^{b,f}, Mansour Alshehri^{f,g}, Ibrahim Moustafa^{a,b,c}

^a Department of Physiotherapy, College of Health sciences, University of Sharjah, United Arab Emirates

^b Faculty of Physical Therapy, Cairo University, Cairo, Egypt

^c Neuromusculoskeletal Rehabilitation Research Group, RIMHS – Research Institute of Medical and Health Sciences, University of Sharjah, P.O. Box: 27272, Sharjah, United Arab Emirates

^d School of Rehabilitation Sciences, University of Ottawa, Canada

^e Physiotherapy Department, College of Medical Technology, Misrata, Libya

^f Physical Therapy Department, Faculty of Applied Medical Sciences, Umm Al-Qura University, Mecca, Saudi Arabia

^g NHMRC Centre of Clinical Research Excellence in Spinal Pain, Injury & Health, School of Health and Rehabilitation Sciences, University of Queensland, Australia

ABSTRACT

Few studies exist regarding the attitudes and behaviours of Egyptian physiotherapists in relation to the use of evidence in practice (EBP). The purpose of this study was to describe the beliefs, attitudes, knowledge, and behaviours of Egyptian physical therapists as they relate to evidence-based practice. It also explores their perception of possible barriers to implement EBP. Four hundred and seventy Egyptian therapists responded to our questionnaire with results revealing participants' awareness towards EBP was quite diverse. Only terms of systematic review and randomized controlled trial were well understood while remaining terms showed various level of comprehension which were rather low. Results also revealed significant correlations between attitudes towards EBP and overall awareness as well as attitudes and knowledge ($r = 0.270$ and 0.107) respectively. In addition, a significant relationship was also found between EBP awareness and knowledge with ($r = 0.219$). With regards to the barriers, insufficient teaching in previous education was identified as the primary barrier (34.4 %), followed by lack of funding and resources (31.1 %), while lack of time (10.2 %) was reported as the least. These barriers highlight the need to enhance implementation of EBP within Egyptian Physiotherapists. Findings of this study can be used as a foundation for the implementation of EBP in various clinical settings by understanding the limitations and barriers reported. Our study concluded that despite Egyptian physiotherapists declare their awareness of EBP, nevertheless, knowledge is restricted to a small number of terms. More focus is required to enhance the knowledge and practice of EBP. Focusing on adjustable factors, including increasing the awareness of value of research would help reduce time and resource demands for physiotherapists when implementing EBP.

1. Introduction

Evidence based physiotherapy is a theme that is fast emerging and evolving in the field of rehabilitation and physiotherapy [1]. This can be attributed to increasing volume and accessibility to high quality research [2]. The World Confederation for Physical Therapy has also highlighted the high quality evidence of physiotherapy literature, that demonstrates its contribution towards the

* Corresponding author. Department of Physiotherapy, College of Health sciences, University of Sharjah, United Arab Emirates.
E-mail address: tshousha@sharjah.ac.ae (T. Shousha).

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treatment of several health conditions [3].

Evidence Based Practice (EBP) has been described by Sackett et al. as “the integration of best research evidence with clinical expertise and patient values” [4] and is categorised into 5 steps as shown in Figure (1) [5]. To apply this process, critical thinking must be used to evaluate sources of evidence followed by using decision-making skills to implement evidence into patient care [6].

Therefore, it can be said EBP is a leading model of care; by facilitating the increased use of research based evidence into clinical practice [7]. The proficiency of physical therapy clinical practice can be enhanced by engaging in both, research and clinical findings that in turn improves patient care [8]. Moreover, it is recognized that EBP has a contribution in minimalizing the “misuse, overuse and underuse of health care” [9]. Not only this, but adherence to EBP has been shown to yield better outcomes of treatment and reduction of costs [10].

Despite there being clear benefits to using EBP, its uptake within physiotherapy and other healthcare domains remains inconsistent [11]. Numerous barriers to EBP have been identified by literature, with lack of time being one of the primary factors [12,13]. Additional barriers reported are difficulty in appraising literature due to lack of skills, journal access and easy access to summaries of evidence [14–16]. Lastly, low levels of self-efficacy towards EBP activities and negative perceptions about research may also act as obstacles to using EBP [17].

According to the Global Health Observatory data repository by the World Health Organization, there are approximately 4498 Physiotherapy personnel working in Egypt [18] with the health care system comprising of both; public and private sectors [19]. Although EBP topics are covered in the Egyptian Physiotherapy education programs [20], the compliance to assessment with standardised guidelines from therapists’ within the country has not been reported in literature [21]. Additionally, it can also be seen that majority of Egyptian therapists assess patients informally without the use of standard tools [21].

There is a paucity of literature existing concerning the attitudes and behaviours of Egyptian physical therapists towards EBP. Therefore, the purpose of this study is to describe the beliefs, attitudes, knowledge, and behaviours of Egyptian physical therapists towards EBP.

1.1. Materials and methods

A cross-sectional study with a convenient sample was adopted to investigate the beliefs, attitudes, knowledge, and behaviours of physiotherapists. The participants of the study were male and female Egyptian physiotherapists working either in an academic setting or in clinical practice, however physiotherapy students not yet graduated or doing their internship were excluded. In order to achieve the research aim, a valid and reliable survey was used, adopted from the study done by Alshehri et al. [3] which looked at the behaviours, attitude, awareness, knowledge and barriers to EBP in Saudi Arabia. This survey was used as it utilized a previously valid EBP questionnaire [22] as well as other studies with similar research objectives that looked at developing a survey for its target participants [12,23]. As the survey questions were related to EBP, it did not require any adaptations and all items were compulsory. This survey was also developed according to the five steps of the EBP cycle as described by Sackett et al. [4].

1.2. Data Collection

The survey was distributed online via a valid website (www.surveymonkey.com). Complete anonymity of data was ensured, with only the researchers having access to the responses. The study was approved by the research ethics committee of the Faculty of Physical

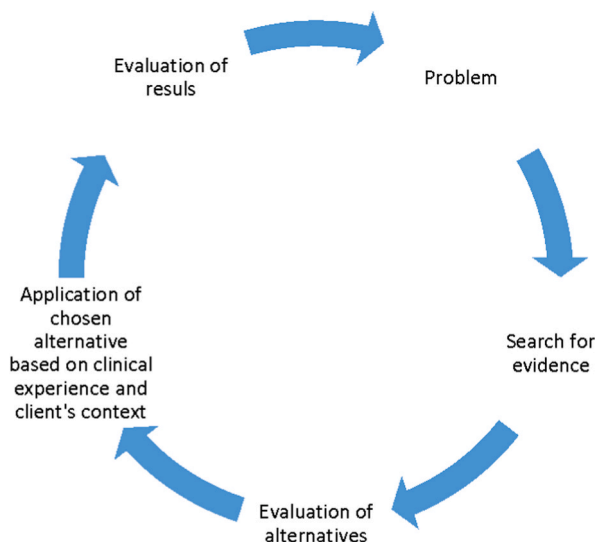


Fig. 1. EBP process.

Therapy, Cairo University, Egypt: P.T.REC/019/002876.

The study was executed over a period of 7 months from December 2019 to June 2020. It was distributed through electronic mail as well as social media (Twitter, Instagram, and Facebook). The survey (Appendix 1) comprised 14 closed-ended questions divided into: Demographics, Behaviours, Attitude, Awareness, Knowledge, Formal Training and Barriers. Online consent forms were signed by all participants prior to the start of the study (no minors were included).

1.3. Data analysis

The data collected through the surveys was collected in an Excel file, later analysed using the SPSS (IBM SPSS for Windows, Version 24.0. Armonk, NY: IBM Corp.). Percentages and frequencies were used to analyse and report the participant's response to each question. Additionally, a calculation was performed for the median score to allocate the participants into two groups: greater than or equal to or lower than the median. The chi-square test was used to investigate the association of tested variables in comparison with the participants' demographics. The results were considered statistically significant when $p < 0.05$. Data were reported as a quantitative summary or narrative description.

The results were analysed via MANOVA. The mean values and standard deviations of the subscales were calculated based on the answers given. The relationships between study variables were assessed via the Pearson's correlation coefficient.

Using the G-power software, considering a 95 % confidence interval, 0.5 null hypothesis proportion, and marginal 5 % error, the sample size estimation was 457 responses.

1.4. Results

Five hundred and fifty-two respondents participated in the study, from which 470 participants completed the survey providing data to be included in the analysis. The number of participants was almost even with 220 (46.8 %) male and 250 (53.2 %) female participants (Table 1). One hundred percent of the participants were from Egypt. It was found that majority of the respondents (57.9 %) were Diploma holders, 23.6 % and 14.3 % having completed their Doctor of Physical Therapy (DPT) and master's degree respectively. More than half (53.2 %) of the participants worked in a private setting whereas only 17.7 % stated working in academia (Table 1).

Table 1
Demographic data.

Variable	Demographic	N (%)
Gender	Male	220 (46.8)
	Female	250 (53.2)
Age	20–25	123 (26.2)
	26–30	103 (21.9)
	31–35	94 (20.0)
	36–40	73 (15.5)
	41 or more	77 (16.4)
Nationality	Egyptian	470 (100)
	Non-Egyptian	0 (0.0)
Education ^a	Diploma	272 (57.9)
	B.Sc.	20 (4.3)
	DPT	111 (23.6)
	M.Sc.	67 (14.3)
University ^b	Cairo University	203 (43.2)
	Baniswaif University	29 (6.2)
	Six of October University	87 (18.5)
	Misr University	151 (32.1)
	Governmental	126 (26.8)
Work setting	Private setting	550 (53.2)
	Others such as Armed Forces, police sector	11 (2.3)
	University/College (academic)	83 (17.7)
Job title ^c	Therapist	213 (45.3)
	Specialist	90 (19.1)
	Consultant	79 (16.8)
	Instructor	54 (11.5)
	Lecturer	12 (2.6)
	Assistant Professor	10 (2.1)
	Associate Professor	2 (0.4)
	Full professor	10 (2.1)

^a The highest qualification received by participants.

^b The university degree.

^c Job title descriptions:(1)Therapist: BSc with one year of clinical experience(2)Specialist: BSc with four years of clinical experience/MSc(3)Consultant: PhD degree(4)Instructor: MSc with a total of four years/a doctorate degree with less than three years of experience.(5)Lecturer: MSc degree holders.(6)Assistant Professors: Doctorate degree.(7) Associate Professors: Doctorate degree with at least four years of experiences(8) Full Professor.

1.4.1. Behaviours and attitudes to EBP

Clinical decisions were “always or often” based on the internet (64.9 % and 23.4 % respectively), followed by expert opinions (45.1 %), research articles (30.6 %), colleagues’ opinion (27.2 %), books (21.5 %) and personal experience (18.1 %) (Table 2). Moreover, physiotherapists reported favourable views towards EBP. 95.3 % of the participants stated that they strongly agreed/agreed that treatment interventions need to be supported by evidence (45.7 % and 49.6 % respectively) with 90.3 % also being of the opinion that research methodology should be included in physiotherapy curriculums across universities (23.6 % and 67.2 % respectively). In addition, it was also found that 87.9 % physiotherapists believed that it was necessary to update their knowledge by reading relevant articles (24.5 % and 63.4 % respectively) and 72.7 % thought that understanding methods of research and designs is vital to practice in physiotherapy (20.4 % and 52.3 % respectively) (Table 3).

Among the participants of this study, the median attitudes score was found to 90 %. (Table 4). Statistical significance was found in associations regarding participants’ attitude score and their level of education university, work-setting, and job-title ($p = 0.0001$ for all variables). This study also observed that participants with a master’s or DPT degree demonstrated a higher than 90 % attitudes score as compared to Bachelor or Diploma holders.

1.4.2. Awareness and knowledge of EBP

Awareness towards EBP was quite diverse (Table 5). It was seen that 24.9 % and 12.6 % could completely understand EBP as a term and EBP with steps/cycles respectively, whereas 15.1 % stated to have not heard the term EBP previously. Terms such as ‘systematic review’ and ‘randomized controlled trial’ were better understood by the respondents at 40.2 % and 42.3 % as well. 26.8 % never heard of the “Patient/Population, Intervention, Comparison, and Outcomes” (PICO), whereas 7.4 % completely comprehended the term completely. This was quite similar to the term ‘forest plot’ as well with 27.4 % not having heard it before, 25.3 % understanding it a little and only 6.8 % understanding it completely.

While looking at the level of knowledge towards EBP, it could be seen there were considerable concerns.

The knowledge of EBP was explored through six statements that required responses about agreement, disagreement, or a state of being unsure from the respondents. Amongst the six statements, three were reverse coded to control errors by the respondents. In these statements, “EBP is a process of systematic investigation to generate knowledge and test theories” was agreed to by the greatest number of respondents (50.2 %), followed by “The main aim of EBP is to identify the causes of research problems and how to solve them” (63.6 %). However, the reverse coded, “Patient’s values and preferences are not one of the main requirements of EBP” received the least agreement responses (8.7 %) followed by “EBP requires a short period of time to search for, evaluate and integrate evidence into practice” (13.8 %). It is pertinent to mention here that all unsure responses were counted as disagreement as they reflected doubt and lack of clarity among the respondents.

Only 13.2 % of the respondents correctly identified the definition of EBP whereas only 10 % identified the aim of EBP (Table 6). However, participant response to some other items was more positive. For example, 44.9 % made the distinction that patients values, preferences were important, and 46.6 % felt that the physiotherapists’ clinical experience was important. Lastly, 56.2 % were apprehensive that long periods of implementation was required for EBP.

The results of participant responses towards EBP training were also favourable with 58.5 % having taken formal EBP training (Table 7).

The median percentage score for awareness was 55 % (Table 8).

A significant association was found between attitude scores and education, university, work-setting, and job-title ($p = 0.0001$ for all variables). Factors not having significant associations included gender, age, nationality and EBP training (Table 8).

Similarly, a significant association was found between the score for participants’ awareness and age ($p = 0.006$), nationality ($p = 0.039$), education ($p = 0.0001$), university ($p = 0.0001$), work setting ($p = 0.0001$) and job title ($p = 0.0001$). Factors not having significant associations included gender, and EBP training (Table 8).

It was found that those with a Masters’ degree, DPT, and Bachelors’ degree had a higher likelihood of a higher awareness score (73.1 %, 75 % and 69.4 %) as compared to a Diploma (32 %). In addition, academic physiotherapists had a higher score percentage (90 %–100 %) in comparison to physiotherapists working in other clinical settings (30 %–77.1 %). Respondents with EBP training also scored higher (54.5 %) than participants without training (40 %).

The median percentage of participants’ knowledge score was found to be 33 % (Table 9). A significant association was found while looking at the participants’ knowledge score and age ($p = 0.0001$), education level ($p = 0.0001$), university ($p = 0.0001$), job title ($p = 0.0001$) and having received EBP training ($p = 0.0001$). Physiotherapists aged 41 or older were found to have higher knowledge scores

Table 2
Participants’ behaviour to the use of research and other sources.

Sources	N (%)				
	Always	Often	Sometimes	Rarely	Never
“My personal experience”	85 (18.1)	71 (15.1)	89 (18.9)	120 (25.5)	105 (22.3)
“My colleagues’ opinions”	128 (27.2)	69 (14.7)	101(21.5)	167 (35.5)	5 (1.1)
“My supervisor or expert opinions”	212 (45.1)	100 (21.3)	65 (13.8)	84 (17.9)	9 (1.9)
“Internet”	305 (64.9)	110 (23.4)	55 (11.7)	0 (0.0)	0 (0.0)
“Books”	101 (21.5)	93 (19.8)	102 (21.7)	153 (32.6)	21 (4.5)
“Research reviews and articles”	144 (30.6)	80 (17.0)	87 (18.5)	158 (33.6)	1 (0.2)

Table 3
Participants' attitudes towards implementation of EBP.

Items	N (%)			
	Disagree	Neutral	Agree	Strongly agree
"Understanding of research methods and research designs is important in physiotherapy practice"	13 (2.8)	115 (24.5)	96 (20.4)	246 (52.3)
"Research theory and methodology should be included in the physiotherapy curriculum"	20 (4.3)	23 (4.9)	111 (23.6)	316 (67.2)
"Physiotherapists need to read relevant articles regularly to update their knowledge"	4 (0.9)	53 (11.3)	115 (24.5)	298 (63.4)
"Physiotherapists should apply treatments that are supported by evidence"	0 (0.0 %)	22 (4.7)	215 (45.7)	233 (49.6)

Table 4
Association between participants' characteristics and their attitudes' score (percentage).

Variable	Characteristics	Participants attitudes' score ^a		Chi-square test	P-value			
		Median ≤90 %	Median >90 %					
Gender	Male	119 (54.1)	101 (45.9)	12.367	0.261			
	Female	151 (60.4)	99 (39.6)					
Age	20–25	83 (67.5)	40 (32.5)	50.714	0.119			
	26–30	68 (66.0)	35 (34.0)					
	31–35	56 (59.6)	38 (40.4)					
	36–40	32 (43.8)	41 (56.2)					
	41 or more	31 (40.3)	46 (59.7)					
Nationality	Egyptian	270 (57.4)	200 (42.6)	0.508	0.476			
	Non-Egyptian	0 (0.0)	0 (0.0)					
Education ^a	Diploma	179 (65.8)	93 (34.2)	31.809	0.0001 ^b			
	B.Sc.	15 (75.5)	5 (25.0)					
	DPT	55 (49.5)	56 (50.5)					
	M.Sc.	21 (31.3)	46 (68.7)					
University ^b	Cairo University	98 (48.3)	105 (51.7)	62.382	0.0001 ^b			
	Baniswaif University	17 (58.6)	12 (41.4)					
	Six of October University	57 (65.5)	30 (34.5)					
	Misr University	98 (64.9)	53 (35.1)					
Work setting	Governmental	85 (67.5)	41 (32.5)	34.087	0.0001 ^b			
	Private	151 (60.4)	99 (39.6)					
	Others such as Armed Forces, police sector	9 (81.8)	2 (18.2)					
	University/College (academic)	25 (30.1)	58 (69.9)					
Job title ^c	Therapist	168 (78.9)	45 (21.1)	136.931	0.0001 ^b			
	Specialist	51 (56.7)	39 (43.3)					
	Consultant	26 (32.9)	53 (67.1)					
	Instructor	16 (29.6)	38 (70.4)					
	Lecturer	1 (8.3)	11 (91.7)					
	Assistant Professor	2 (20.0)	8 (80.0)					
	Associate Professor	1 (50.0)	1 (50.0)					
	Full professor	5 (50.0)	5 (50.0)					
	EBP training	Yes	149 (54.2)			126 (45.8)	11.429	0.325
		No	121 (62.1)			74 (37.9)		

^a Median attitudes score: 90 %.

^b Statistically significant difference.

(63.6 %) as compared to younger physiotherapists. In addition, participants with a master's, DPT, and bachelor's degree also had a higher knowledge score (74.6 %, 69.4 %, 60 %) as compared to diploma holders (20.6 %). Moreover, seniority of position was also associated with a higher score with consultants at 67.1 % as compared to an instructor with 29.6 %. Academic physiotherapists (36.1 %) however, did not perform much differently than physiotherapists in other clinical settings (36.4 %) when it came to a higher knowledge score.

1.4.3. Perceived barriers to the use of EBP

Figure (2) is a visual demonstration of the barriers faced while implementing EBP as conveyed by the respondents with one being the barrier of least importance and ten being the barrier of most importance. These percentages were calculated by adding factors nine and ten respectively. Inadequate teaching in prior education was flagged as the primary barrier (34.40 %), followed by lack of funding and resources (31.1 %). Additional barriers identified were lack of research knowledge (27.1 %), lack of interest (18.1 %), lack of support and encouragement (14.7 %) and lack of time (10.2 %).

1.4.4. Pearson correlation between study variables

As seen in Table 10, there were significant correlations between attitudes towards EBP with overall awareness and EBP with attitudes and knowledge ($r = 0.270^{**}$ and $r = 0.107^{**}$). A significant relationship was also found between EBP awareness and

Table 5
Participants' awareness towards implementation of EBP.

Terms or phrases	N (%)				
	Never heard it	Have heard it but do not understand	Understand (a little)	Understand (very well)	Understand (Completely and could explain to others)
"EBP as a term"	71 (15.1)	42 (8.9)	58 (12.3)	182 (38.7)	117 (24.9)
"EBP steps/cycle"	72 (15.3)	52 (11.1)	124 (26.4)	163 (34.7)	59 (12.6)
"Quality of evidence"	113 (24.0)	40 (8.5)	163 (34.7)	114 (24.3)	40 (8.5)
"Systematic review"	76 (16.2)	34 (7.2)	130 (27.7)	189 (40.2)	41 (8.7)
"Randomized controlled trial"	39 (8.3)	56 (11.9)	123 (26.2)	199 (42.3)	53 (11.3)
"PICO"	126 (26.8)	97 (20.6)	123 (26.2)	89 (18.9)	35 (7.4)
"Critical appraisal"	86 (18.3)	56 (11.9)	112 (23.8)	165 (35.1)	51 (10.9)
"Forest plot"	129 (27.4)	83 (17.7)	119 (25.3)	107 (22.8)	32 (6.8)
"Relative risk"	89 (18.9)	48 (10.2)	119 (25.3)	165 (35.1)	49 (10.4)
"Likelihood ratio"	69 (14.7)	66 (14.0)	129 (27.4)	160 (34.0)	46 (9.8)
"Confidence interval"	50 (10.6)	58 (12.3)	130 (27.7)	162 (34.5)	70 (14.9)
"Effect size"	42 (8.9)	42 (8.9)	117 (24.9)	177 (37.7)	92 (19.6)
"Risk of bias"	58 (12.3)	48 (10.2)	92 (19.6)	197 (41.9)	75 (16.0)
"Healthcare databases"	29 (6.2)	55 (11.7)	61 (13.0)	185 (39.4)	140 (29.8)

Table 6
Participants' knowledge towards implementation of EBP.

Items	N (%)		
	Agree	Disagree	Unsure
"EBP is a process of systematic investigation to generate knowledge and test theories"	236 (50.2)	62 (13.2)	172 (36.6)
"The main aim of EBP is to identify the causes of research problems and how to solve them"	299 (63.6)	47 (10.0)	124 (26.4)
"Physiotherapy interventions are mostly supported by EBP"	220 (46.8)	105 (22.3)	145 (30.9)
"Patient's values and preferences are not one of the main requirements of EBP"	41 (8.7)	211 (44.9)	218 (46.4)
"EBP does not take into consideration the clinical experience of the physiotherapist"	88 (18.7)	219 (46.6)	163 (34.7)
"EBP requires a short period of time to search for, evaluate and integrate evidence into practice"	65 (13.8)	264 (56.2)	141 (30.0)

Table 7
Participants' responses regarding EBP training.

Items	Answers	N (%)
"Have you formally undertaken any training in EBP?"	Yes	275 (58.5)
	No	195 (41.5)
"If yes, what type of training course have you been involved in?"	EBP course as part of University education	91 (9.4)
	Comprehensive course (11–20 h)	50 (10.6)
	Short course (3–10 h)	101 (21.5)
	One lecture (1–2 h)	35 (7.4)
	All of the above	1 (0.2)
	Non	191 (40.6)

knowledge ($r = 0.219^{**}$).

2. Discussion

This present study aimed to study physiotherapists behaviours, attitudes, knowledge, and barriers in relation to EBP in Egypt. Even though there is a positive influence towards EBP, 66.4 % of the respondents base their clinical decisions on experts' opinion. This however can be contradictory as EBP should be primarily centred on high quality clinical research [24]. Literature also supports having EBP and research methodology being added to programs across universities citing improved critical appraisal skills [25,26]. In addition, educational level and workplace setting play an important role in a positive attitude towards EBP as seen in our study as well [8,27].

Certain terminologies like EBP, EBP with steps/cycles, systematic review and randomized controlled trial are well recognized. However, terms like PICO and forest plot are not well understood with only 7.4 % and 6.8 % of the respondents stating that they were able to understand it completely. This result is quite similar to by findings by Alketbi et al. [5], where they have mentioned that there is a lack of proficiency to assess research designs that are quantitative [28]. These results are also supported by earlier studies that demonstrate awareness of EBP among physiotherapists is not up to par [5,11]. Additional studies have shown that there is an infrequent understanding of EBP as a term, and its use in healthcare professionals with there being certain challenges in understanding technical terms [8,26]. Positive findings were reported by Ramírez-Vélez et al. [29] where 71.6 % respondents were in agreement that

Table 8
Association between participants' characteristics and their awareness score (percentage).

Variable	Characteristics	Participants awareness score ^a N (%)		Chi-square test	P-value
		Median \leq 55 %	Median >55 %		
Gender	Male	109 (49.5)	111 (50.5)	35.370	0.953
	Female	133 (53.2)	117 (46.8)		
Age	20–25	68 (55.3)	55 (44.7)	258.588	0.006 ^b
	26–30	70 (68.0)	33 (32.0)		
	31–35	41 (43.6)	53 (56.4)		
	36–40	29 (39.7)	44 (60.3)		
	41 or more	34 (44.2)	43 (55.8)		
Nationality	Egyptian	242 (51.5)	228 (48.5)	4.282	0.039 ^b
	Non-Egyptian	0 (0.0)	0 (0.0)		
Education ^a	Diploma	185 (68.0)	87 (32.0)	266.354	0.0001 ^b
	B.Sc.	5 (25.0)	15 (75.0)		
	DPT	34 (30.6)	77 (69.4)		
	M.Sc.	18 (26.9)	49 (73.1)		
University ^b	Cairo University	62 (30.5)	141 (59.5)	267.458	0.0001 ^b
	Baniswaif University	15 (51.7)	14 (48.3)		
	Six of October University	62 (71.3)	25 (28.7)		
	Misr University	103 (68.2)	48 (31.8)		
Work setting	Governmental	68 (54.0)	58 (46.0)	271.862	0.0001 ^b
	Private	148 (59.2)	102 (40.8)		
	Others such as Armed Forces, police sector	7 (63.6)	4 (36.4)		
	University/College (academic)	19 (22.9)	64 (77.1)		
Job title ^c	Therapist	149 (70.0)	64 (30.0)	592.900	0.0001 ^b
	Specialist	40 (44.4)	50 (55.6)		
	Consultant	37 (46.8)	42 (53.2)		
	Instructor	15 (27.8)	39 (72.2)		
	Lecturer	0 (0.0)	12 (100.0)		
	Assistant Professor	1 (10.0)	9 (90.0)		
	Associate Professor	0 (0.0)	2 (100.0)		
	Full professor	0 (0.0)	10 (100.0)		
	EBP training	Yes	125 (45.5)		
No	117 (60.0)	78 (40.0)			

^a Median awareness score: 55 %.

^b Statistically significant difference.

EBP is necessary and 61.39 % revealed the importance of recent literature in practice.

Favourable results were reported in participant responses towards EBP with 58.5 % having taken formal EBP training. This is consistent with findings by Manspeaker et al. [30] that demonstrated that students who had studied using the EBP model at the undergraduate level had better attitude and clarity regarding scientific concepts. This is further supported by a study done by Castellini et al. [27]. Moreover, it can be seen in our study that those respondents having a postgraduate degree have scored better than those with a diploma which is also endorsed by literature [3,8]. It would be important to reiterate here that 67 % of the respondents are master's degree holders. Therefore, EBP training is vital to encourage clinicians and decision-makers to adopt it more frequently in practice [31].

An additional criterion for better implementation of EBP as a positive attitude, can be seen from the results of our study where there are significant correlations between attitudes towards EBP and overall awareness/knowledge. It can be seen from previous evidence that utilization of evidence in practice is improved by overcoming negative attitudes [32] and a positive attitude also significantly predict self-reported EBP use [33].

Furthermore, insufficient teaching in previous education has been identified as the primary barrier to EBP implementation followed by lack of resources, knowledge, interest support and time. This has been identified through various previous studies [3,11,24,25,34], therefore it is extremely vital to address these barriers urgently.

Although several physiotherapists demonstrated a positive attitude towards EBP principles, this did not reflect consistency in high-quality EBP.

It is important to note that "one size fits all" intervention for enhancing EBP isn't possible since physiotherapists due to the nature of work being in different settings, still EBP can be enhanced by targeting the barriers identified.

There is now increasing clarity to the various barriers to EBP implementation, such as: clinical decisions based on experts' opinion, lack of time and skills, lack of high-quality research therefore, interventions should focus on factors that are modifiable, including an increase in the awareness of research value, adding resources that are open-access as well as peer-reviewed publications that would assist in reducing time and demand of resources for physiotherapists for the implementation of EBP. In addition, greater organizational obligations to direct physiotherapists to crucial changes in policies, regulations, or research evidence is crucial for therapists to keep themselves updated with latest research evidence and apply it within their own practice.

Table 9
Association between participants' characteristics and their knowledge score (percentage).

Variable	Characteristics	Participants knowledge score ^a		Chi-square test	P-value
		N (%)			
		Median ≤33 %	Median >33 %		
Gender	Male	128 (58.2)	92 (41.8)	5.923	0.205
	Female	147 (58.8)	103 (41.2)		
Age	20–25	95 (77.2)	28 (22.8)	67.738	0.0001 ^b
	26–30	70 (68.0)	33 (32.0)		
	31–35	52 (55.3)	42 (44.7)		
	36–40	30 (41.1)	43 (58.9)		
	41 or more	28 (36.4)	49 (63.6)		
Nationality	Egyptian	275 (58.5)	195 (41.5)	0.120	0.729
	Non-Egyptian	0 (0.0)	0 (0.0)		
Education ^a	Diploma	216 (79.4)	56 (20.6)	161.661	0.0001 ^b
	B.Sc.	8 (40.0)	12 (60.0)		
	DPT	34 (30.6)	77 (69.4)		
	M.Sc.	17 (25.4)	50 (74.6)		
University ^b	Cairo University	67 (33.0)	136 (67.0)	146.058	0.0001 ^b
	Baniswaif University	23 (79.3)	6 (20.7)		
	Six of October University	66 (75.9)	21 (24.1)		
	Misr University	119 (78.8)	32 (21.2)		
Work setting	Governmental	67 (53.2)	59 (46.8)	11.448	0.491
	Private	148 (59.2)	102 (40.8)		
	Others such as Armed Forces, police sector	7 (63.6)	4 (36.4)		
	University/College (academic)	53 (63.9)	30 (36.1)		
Job title ^c	Therapist	164 (77.0)	49 (23.0)	105.253	0.0001 ^b
	Specialist	34 (37.8)	56 (62.2)		
	Consultant	26 (32.9)	53 (67.1)		
	Instructor	38 (70.4)	16 (29.6)		
	Lecturer	5 (41.7)	7 (58.3)		
	Assistant Professor	5 (50.0)	5 (50.0)		
	Associate Professor	1 (50.0)	(50.0)		
	Full professor	2 (20.0)	8 (80.0)		
EBP training	Yes	137 (49.8)	138 (50.2)	25.699	0.0001 ^b
	No	138 (70.8)	57 (29.2)		

^a Median knowledge score: 33 %.

^b Statistically significant difference.

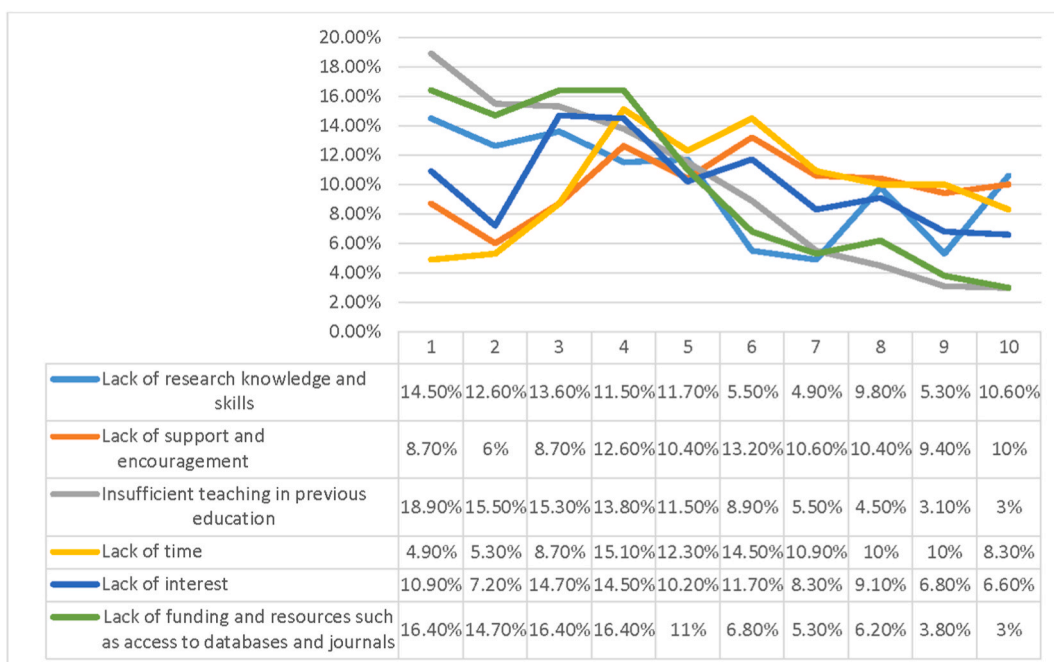


Fig. 2. Perceived barriers to the use of EBP.

Table 10
(a, b & c): Correlations.

a - Attitudes and awareness			
Correlations			
		Overall attitudes	Overall awareness
Overall_attitudes	Pearson Correlation	1	.270 ^a
	Sig. (2-tailed)		.000
	N	470	470
Overall_awareness	Pearson Correlation	.270 ^a	1
	Sig. (2-tailed)	.000	
	N	470	470
b - Attitudes and knowledge			
Correlations			
		Overall attitudes	Overall knowledge
Overall_attitudes	Pearson Correlation	1	.107 ^b
	Sig. (2-tailed)		.020
	N	470	470
Overall_knowledge	Pearson Correlation	.107 ^b	1
	Sig. (2-tailed)	.020	
	N	470	470
c- awareness and knowledge			
Correlations			
		Overall_awareness	Overall_knowledge
Overall_awareness	Pearson Correlation	1	.219 ^c
	Sig. (2-tailed)		.000
	N	470	470
Overall_knowledge	Pearson Correlation	.219 ^c	1
	Sig. (2-tailed)	.000	
	N	470	470

^a Correlation is significant at the 0.01 level (2-tailed).

^b Correlation is significant at the 0.05 level (2-tailed).

^c Correlation is significant at the 0.01 level (2-tailed).

3. Limitations

One of the limitations arising in the study was the lack of detail of the practice settings of the physiotherapists which might make the results not generalizable to the intended population. Additionally, there were no measures to prevent non-clinicians from completing the survey or the same respondents from repeating the survey.

Another limitation to add, although the authors believe the questions in the survey actually reflect the different levels of engagement in EBP there was no direct question about how participants engage or utilize EBP. Lastly, the reliability and validity of the survey could be a concern as it is a self-reported measure.

4. Conclusion

Physiotherapists' awareness and knowledge towards implementation of EBP was quite low suggesting apparent disparity in comprehending and applying of EBP in Egypt. This study clearly indicates how different variables involving awareness, attitudes, knowledge, and behaviour towards EBP affects its implementation in practice by physiotherapists.

Findings of this study can be used as a foundation for the implementation of EBP in various clinical settings by understanding the limitations and barriers reported.

Focusing on adjustable factors, including increasing the awareness of research value, addition of resources that are open-access and peer-reviewed publications that would assist in reducing time and demand of resources for physiotherapists for the implementation of EBP. In addition, greater organizational obligations to direct physiotherapists to crucial changes in policies, regulations, or research evidence is crucial for therapists to keep themselves updated with latest research evidence.

Recommendations

Further studies should be conducted including details of the practice settings as well as a direct question about how participants engage or utilize EBP.

Also, future studies comparing the behaviour, attitudes, knowledge, awareness and barriers to the implementation of EBP between Physiotherapists and other health practitioners in Egypt should be conducted to identify common and different perspectives with

regards to EBP.

Data Availability

Data associated with the study has not been deposited into a publicly available repository, however, all data are included in article/supplementary material within the article and are available upon request from the corresponding author.

CRedit authorship contribution statement

Tamer Shousha: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Asma Javed:** Project administration, Resources, Software, Writing – original draft, Writing – review & editing. **Amira Bekhet:** Data curation, Investigation, Validation. **Alhadi M. Jahan:** Formal analysis, Investigation, Software. **Mohamed Alayat:** Conceptualization, Investigation, Methodology, Project administration, Writing – review & editing, Data curation. **Mansour Alshehri:** Conceptualization, Methodology, Validation. **Ibrahim Moustafa:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2023.e22951>.

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