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Knowledge and Attitude Towards Bell's Palsy Rehabilitation Among Physical Therapists in Saudi Arabia: A Cross-Sectional Study

Alaa M Albishi, Hanan M Al-Ageel, Sami S AlAbdulwahab

Department of Health Rehabilitation Sciences, College of Applied Medical Sciences, King Saud University, Riyadh, Saudi Arabia

Correspondence: Alaa M Albishi; Hanan M Al-Ageel, King Saud University, P.O. Box 10219, Riyadh, 11433, Saudi Arabia, Email aalbeshi@ksu.edu.sa; hanan4pt@gmail.com

Background: Bell's Palsy (BP) is an acute lower motor nerve impairment of the facial nerve, causing sudden paralysis on one side of the face and significantly affecting the patient's quality of life. Physiotherapy is critical for rehabilitation after BP, aiding functional recovery. Various physical therapy interventions, such as dry needling, taping, and nerve mobilization, have proven effective in treating BP. However, different rehabilitation approaches and knowledge levels among therapists can result in varying treatment outcomes. Therefore, understanding rehabilitation specialists' knowledge and attitudes towards BP is essential for ensuring effective treatment. To date, no studies have examined the knowledge and attitudes of rehabilitation professionals in Saudi Arabia regarding BP.

Objective: This study aims to evaluate the knowledge and attitudes of physical therapists in Saudi Arabia regarding the rehabilitation of BP.

Methods: A cross-sectional observational study was conducted with 150 licensed physical therapists in Saudi Arabia, selected via convenience sampling. Participants completed an anonymous online survey covering demographics, knowledge of, and attitudes toward BP rehabilitation techniques. Descriptive and inferential statistics were used to analyze the data.

Results: The participants had a mean age of 33.13 ± 6.85 years, with 68.7% being female. Most held Bachelor's degrees (65.3%) and worked in general hospitals (72.7%). The average knowledge score was 8.99 ± 1.95, indicating moderate knowledge levels. Attitudes towards BP rehabilitation were positive, particularly regarding early intervention, emotional support, and coordination exercises. Significant differences in knowledge and attitudes were observed based on gender, experience, and practice location.

Conclusion: Physical therapists in Saudi Arabia demonstrate moderate knowledge and positive attitudes toward BP rehabilitation. Continued professional education and collaboration are recommended to improve clinical standards in treating BP.

Keywords: Bell's palsy, facial palsy, mime therapy, physical therapist, rehabilitation, knowledge, Attitudes, Saudi Arabia

Introduction

The facial nerve (CN VII) plays an important role in various complex functions in human life, including chewing, vocalization, and successful social communication through the expression of mood and emotion.[1–4] Facial nerve palsy can greatly affect a person's quality of life, leading to depression, anxiety, social isolation, and self-consciousness about their facial features.[5,6] Meanwhile, Bell's Palsy is acute lower motor nerve paralysis (or paresis) of the facial nerve of unknown cause, accounting for 60–80% of cases.[7–11] Individuals with Bell's palsy experience sudden unilateral (rarely bilateral) paralysis of the muscles that control facial expression on one side of the face.[7,12] They become unable to perform facial movements on the affected side, including furrowed brows, droopy eyelids, inability to close the eyelids, sagging of the lower eyelids when trying to close them, changes in the amount of tearing or running tears, and drooping corners of the mouth are presenting with facial asymmetry is demonstrated when facial movements are attempted.[7–11,13,14]

Bell's Palsy (BP) has an annual incidence rate of approximately 15–30 cases per 100,000 population and affects both males and females equally.[15,16] Many factors can cause BP, including age, pregnancy, epilepsy, obesity, hypertension, diabetes, respiratory infections, vaccination, exposure to colds, high-pressure air, influenza, and genetic susceptibility due

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to relative marriage in Saudi Arabia.[17–19] After facial nerve injury, many patients regain movement after a period of flaccid paralysis.[20] Although in a small percentage, recovery is delayed with the development of synkinesis.[20] Synkinesis is defined as abnormal facial movements that occur during voluntary movements with unknown mechanisms that could be due to abnormal regeneration of the facial nerve in recovery or with ephaptic coupling or "cross-talk" between poorly remyelinated motoneurons or nuclear hyperexcitability.[20] In fact, research has suggested that a combination of early and precise diagnosis, utilizing a variety of diagnostic tools is often necessary to understand the causes of peripheral facial paralysis, which in turn plays a key role in guiding optimal treatment outcomes.[21]

Notably, the treatment of BP is a multidisciplinary team effort.[22–24] Many studies have reported that physiotherapy interventions such as dry needling, taping, and nerve mobilization techniques are effective in treating BP.[25–29] Some of the techniques that can be used are exercise therapy, massage, relaxation techniques, biofeedback,[30] and electrical stimulation.[31] Treatment could begin with education to learn to isolate specific muscles and gain conscious control of involuntary movements.[30,32] A recent systematic review in 2022 identified 19 new studies that provided evidence about the effectiveness of facial exercise therapy in 839 patients aged 12 to 80 and reported that the outcomes were significantly better for patients who received facial exercise therapy than those who did not, especially at younger ages.[33] Furthermore, improvements were greater after utilizing exercises combined with biofeedback through mirrors or other methods.[33] Although the usage of mirror biofeedback is helpful in preventing the development of synkinesis.[34] Another way to coordinate and decrease synkinesis is mime therapy, which is highly recommended for treating BP as it incorporates massage, facial tension recognition, mirror biofeedback, facial movement exercises, and education about verbal and non-verbal communication.[35,36] Furthermore, applying mime therapy[36] and physical therapy interventions utilizing neuroplasticity-based movement therapy, which focuses on retraining motor control and addressing neurological mechanisms, fosters long-term improvement and decreases synkinesis.[37]

Although mime therapy has demonstrated its effect in treating BP, rehabilitation therapy may vary from one therapist to another; as a result, treatment outcomes may also vary.[38] Studies from different medical disciplines, including physical therapy, have reported the association between practice patterns and care provider characteristics.[39–45] In specific, previous studies have demonstrated that the knowledge and attitude of rehabilitation specialists impact treatment applicability.[46,47] In support, a previous study was conducted regarding the knowledge level of BP among dentistry students in Saudi Arabia, confirmed that understanding the condition's anatomy and clinical significance is essential for accurate diagnosis and treatment of BP[48] and the variation of the attitude towards BP including mime therapy was conducted in Netherland among mime therapists form a variety of rehabilitations' specialists including physical therapists, could impact BP rehabilitation applications.[38]

However, no previous study has investigated the knowledge and attitude of BP rehabilitation, such as mime therapy, among physical therapy practitioners in Saudi Arabia. Therefore, to improve understanding of treatment outcomes in BP rehabilitation, this study aims to take the first step into gaining insight into therapists' knowledge and attitudes toward BP treatment and how these relate to therapist characteristics in Saudi Arabia.

Material and Methods

Study Design and Population

A cross-sectional observational study was carried out in Saudi Arabia to determine the knowledge and attitudes of physical therapists toward the rehabilitation of BP and mime therapy. Registered physical therapists were selected using convenience sampling and invited to complete an anonymous online survey. A previous study demonstrated that when a questionnaire was distributed to the vast majority of physical therapists in Saudi Arabia, the response rate was only 37.20%.[47] Therefore, a convenience sampling method was utilized to facilitate obtaining the required sampling size within the study time frame. The study followed the STROCSS criteria, which is a guideline used to report results from observational descriptive studies.[49] The study was conducted in Saudi Arabia from 20 February 2023 to 20 April 2024.

Eligibility Criteria

This study involved 150 physical therapists licensed to practice in Saudi Arabia. After the study was approved by the Internal Review Board at King Saud University (No. E-23-8346), all participants signed informed consent before participating in the study.

Data-Collection Tools and Procedure

An online survey was conducted to evaluate physical therapy practitioners' knowledge and attitudes toward BP rehabilitation, such as mime therapy (a commonly used treatment for BP). The survey was distributed to registered physical therapists at Universities Medical Centers, general and private hospitals, and Non-hospitals affiliated online. Before participating in the study, the participants were provided a detailed explanation of the research procedures and objectives, and their informed consent was obtained. Informed consent involves providing details about the participants' right to withdraw from the study at any point in time. The confidentiality of the information provided was also ensured. Each participant was assigned a code, and the collected data sheets were stored securely in a locked online folder to maintain the confidentiality of the subjects.

Questionnaire Validation

The proposed questionnaire in this study was adopted from the previous two studies;[38,48] the knowledge section was obtained from a survey conducted among dentists and dental students in Saudi Arabia,[48] while the attitude section was adapted from a study that measures therapists' perceptions and attitudes toward facial palsy rehabilitation therapy in the Netherlands.[38] The questionnaire contained 38 questions, which were divided into three main sections. The first section contained (10 questions) about the participants' demographics, such as their gender, age, level of education, workplace region, type of workplace, years of experience, and if they had any experience with BP.[38] It also included questions regarding treatment goals, options, and when they prefer to administer the treatments.[38] The second section (13 questions) assessed the participant's general knowledge of BP anatomy, diagnosis, and treatment.[48] The third section (15 questions) evaluated the practitioner's attitude toward the management of BP.[38]

Six independent experts with post-degrees in physical therapy working in different hospitals were chosen to evaluate the questionnaire content's validity based on their seniority level and research experience. The research objectives, domains (knowledge and attitude), and the representing items were sent to the experts with clear instructions to assess each item's clarity and relevance to the tested domain. The experts assessed every item on a scale from 1 to 4 based on relevance and clarity, with 1 being irrelevant or unclear and 4 being highly relevant or clear. Also, the exports feedback and comments included defining the abbreviations, adding a question regarding whether air exposure can cause BP, and comments regarding simplifying the presented cases questions, were incorporated in the final questionnaire content to enhance the questionnaire's face validity and item clarity.

To evaluate the modified survey's content validity, the expert's item scores were converted to 1 (if the item relevance score was 3 or 4) or 0 (if the item was given a relevance score of 2 or 1). The scale-level content validity index was computed using the average method (S-CVI/Avg) to assess the scale's content validity.[50] To attain satisfactory content validity, an S-CVI/Avg score of at least 0.83 is required.[50] The modified questionnaire attained satisfactory levels of content validity, with 0.99 and 0.98 for the knowledge and attitude domains, respectively.

Minimum Sample Size Estimation

Based on the data provided by the Saudi Commission for Health Specialties (SCFHS), there were 1618 registered or licensed Saudi physical therapists in 2018. To ensure statistical significance, a study with a statistical power of 80%, a population size of 1618, and a 5% margin of error required a minimum of 149 participants.[51]

Data Analysis

The IBM SPSS statistics software, version 27.0, was used to analyze the data. Each correct response earned one point, while incorrect answers received zero points in the knowledge assessment. The knowledge score was determined by

adding up the scores for each question. Each respondent's knowledge scores were categorized using Bloom's cut-off point method.[46,47,52] The scores were divided into ranges based on the accomplished scores. If the knowledge score was between 5 and 13 points, it was considered sufficient, whereas if it was less than 4 points, it was deemed insufficient. The scores were also classified as low knowledge (0–4), moderate (5–9), and high (10–13) knowledge.[46,47,52]

The attitude section used an 11-point Likert scale,[53–55] where 10 indicated "Absolutely agree, 100% of the consult or Very important" and 0 indicated "Absolutely disagree, 0% of the consult or Very unimportant ". There were 15 items for the attitude section, each with a maximum score of 150 points. The attitude score was classified as negative for an attained score of 0–75 points and positive for an achieved score of 76–150 points. The questionnaire items were rated on a scale of 0–4 for negative statements and on a scale of 5–10 for positive statements.[46,47]

The study described participants' characteristics and exposure to BP management using descriptive statistics like frequency, mean, and standard deviation. The normality of the knowledge and attitude scores were evaluated using the Shapiro–Wilk test. The nonparametric tests were used as the scores were found to be skewed for both knowledge and attitude values (Shapiro–Wilk, $P < 0.05$). However, no outliers or missing data were found. Kruskal–Wallis, Mann–Whitney U, and Spearman's rank correlation tests were used to examine the effects of different factors on the knowledge and attitudes of BP among physical therapists. The study results were considered significant at $P > 0.05$.

Ethical Considerations

The study was conducted in compliance with the guidelines of the Declaration of Helsinki and was approved by the Institutional Review Board of King Saud University (No. E-23-8346). Participants were informed that their participation in the study was completely voluntary, and they had the freedom to decide whether or not to participate. To ensure the confidentiality of the participants, they were given a study code, and their information was securely stored. The analysis used the subjects' codes to avoid potential bias, and the subjects' identities remained anonymous throughout the study. These ethical standards were implemented to safeguard participants' rights and well-being throughout the research process.

Results

Participant Characteristics

A survey was conducted on 150 physiotherapy practitioners across Saudi Arabia to determine their demographics, education, work experience, and experience dealing with BP patients presented in Table 1. The mean age of the participants was 33.13 ± 6.85, and 68.7% of them were female. The majority of the participants (65.3%) had Bachelor's Degrees, followed by senior specialists with a Master's degree (26.7%), Technicians with diploma degrees (6%), and those with doctoral degrees (2%). The participants were from all regions of Saudi Arabia, with the western region having the highest participation rate (58.7%) and the northern region having the lowest (3.3%). Most participants (72.7%) were employed in general hospitals, and their years of experience varied. 31.3% of them had less than five years of experience, and 36% had more than ten years of experience. Around 80.7% of respondents reported receiving BP patients for rehabilitation, with an average of 6.95 ± 9.97 new patients per year, indicating the high prevalence of this condition in their practice.

Also, when participants were asked general questions regarding BP treatment, a large proportion of the participants (78.7%) said that the main goal of mime therapy was to restore the symmetry of the face. They also preferred to see the patient within a week of the BP incident. Regarding the type of exercise, controlled coordination exercises were considered the most important treatment for patients with massive facial synkinesis by 62.7% of respondents compared to Relaxation and massage.

Table 1 Demographic Data

Variable	Subcategory	N (%)
Age group	Less than 25	13 (8.7%)
	25–35	90 (60%)
	36–45	38 (25.3%)
	More than 45	9 (6%)
Gender	Male	47 (31.3%)
	Female	103 (68.7%)
Education Level	Technician	9 (6.0%)
	Bachelor Degree	98 (65.3%)
	Master Degree	40 (26.7%)
	Doctoral Degree	3 (2.0%)
Region of Workplace in Saudi Arabia	Western	88 (58.7%)
	Eastern	16 (10.7%)
	Southern	17 (11.3%)
	Central	24 (16%)
	Northern	5 (3.3%)
Main place of work	Non-hospital affiliated	6 (4%)
	General Hospital	109 (72.7%)
	Private Clinic	23 (15.3%)
	University Medical Center	6 (4%)
	Others	6 (4%)
Years of Experience	<5 years	47 (31.3%)
	5–10 years	49 (32.7%)
	>10 years	54 (36%)
Do you manage/treat individuals with Bell's Palsy?	Yes	121 (80.7%)
	No	29 (19.3%)
What is the most important goal of BP therapy (mime therapy), according to you?	Restoring symmetry of the face (both static and dynamic)	118 (78.7%)
	Improving the expression of emotions	27 (18%)
	Learning to live with facial palsy	5 (3.3%)
How early would you like to see the patients with BP?	Within a week	118 (78.7%)
	When the patient starts to develop synkinesis	32 (21.3%)
What do you consider the most important in treating BP patients?	Relaxation and massage	56 (37.3%)
	Controlled coordination exercises	94 (62.7%)

Assessment of Knowledge

The results of the study that examined participants' knowledge about BP are presented in Table 2. Overall, the average knowledge score was 8.99 ± 1.95 SD, indicating that participants had a moderate level of knowledge about BP. Only 1.3% of participants had low knowledge levels, while 56.7% had moderate knowledge levels, and 42% had high knowledge levels. The study found that a large majority (96.7%) of participants were aware that BP was caused by the 7th cranial nerve effect. However, only 82.7% of respondents correctly identified BP as a type of peripheral facial palsy. Participants had varying knowledge about whether BP can affect both sides of the face. The study found that most participants (ranging from 68.7% to 85.3%) had a good understanding of the factors that may cause BP, such as viral infection, low temperature, high air pressure, and some chronic diseases (diabetes, hypertension, and obesity). 83.3% of participants correctly identified the early eye complications, and 72% of them had knowledge about the disease duration. However, participants showed low knowledge levels regarding the outcome measure and grading system. On a positive note, over 65.3% of therapists knew about diagnosing and treating BP.

Statistical investigation of other factors, such as gender, age group, region, education, main working place, years of experience, and whether they managed/treated patients with BP were conducted. The results revealed that the average knowledge scores of diploma, bachelor, master, and doctoral degrees were 7.8 ± 1.8, 8.9 ± 1.8, 9.7 ± 2, and 7.7 ± 3, respectively, showing that specialists with master's education had higher knowledge scores compared with other degrees. There was significant variation among educational levels (Kruskal–Wallis test: $p = 0.012$), and post-hoc analysis showed that master's education had significantly higher scores compared with diploma degrees (Mann–Whitney *U*-test: $Z = -2.44$, $p < 0.05$).

Table 2 Assessment of Bell's Palsy Knowledge

Questions	Frequency (%) of Responders		Mean ± SD
	Correct	Incorrect	
Knowledge Regarding Anatomy and Bell's Palsy			
1. Which Cranial nerve is affected in a patient with Bell's palsy?	145 (96.7)	5 (3.3)	0.97 ± 0.18
2. Do you think that Bell's palsy is Central or Peripheral Facial palsy?	124 (82.7)	26 (17.3)	0.83 ± 0.38
3.Can Bell's palsy sometimes affect both sides of the face?	67 (44.7)	83 (55.3)	0.45 ± 0.5
4.Is Bell's palsy triggered by a viral infection?	128 (85.3)	22 (14.7)	0.85 ± 0.35
5.Is Bell's palsy could be resulted by low temperature and high air pressure?	103 (68.7)	47 (31.3)	0.69 ± 0.47
6.Which of the following diseases can be a risk factor for Bell's palsy?	126 (84)	24 (16)	0.84 ± 0.37
7.What is the early ocular "eye "complications?	125 (83.3)	25 (16.7)	0.83 ± 0.37
8.Are you aware of House-Brackmann Grading system?	51 (34)	99 (66)	0.34 ± 0.48
9.Incomplete eye closure happened in which of the following grade of Bell's palsy according to House-Brackmann Grade system	40 (26.7)	110 (73.3)	0.27 ± 0.44
10. How long does Bell's palsy could last?	108 (72)	42 (28)	0.77 ± 0.45
Knowledge Regarding Diagnosis and Treatment of Bell's Palsy			
11. Which of the following studies measures facial nerve impairment in patients with Bell palsy?	98 (65.3)	52 (34.7)	0.65 ± 0.48
12. If treatment is administered, which of the following is the most widely accepted?	128 (85.3)	22 (14.7)	0.85 ± 0.35
13. Is Bell's palsy permanent damage?	105 (70)	45 (30)	0.7 ± 0.46
Total knowledge score			**8.99 ± 1.95**

Furthermore, the knowledge score significantly differed across workplaces (Kruskal–Wallis test: $p = 0.014$), demonstrating that specialists who work in the university medical center had significantly higher knowledge scores compared with specialists in small private clinics (Mann–Whitney *U*-test: $Z = -2.861$, $p < 0.003$). Moreover, a significant difference between both genders was found (Spearman's rho $p < 0.05$), where the females have a higher score mean (9.23) compared to males (8.36). However, there were no significant differences in knowledge scores regarding regions in Saudi Arabia, age groups, years of experience, or experience in treating BP.

Assessment of Attitude

The results of the physiotherapist's attitudes toward BP rehabilitation and using mime therapy are demonstrated in Table 3. Overall, the total attitude score was 108.79 ± 24.71 SD, indicating that participants had a positive attitude toward BP rehabilitation and mime therapy. Most respondents showed a positive attitude toward including information about mime therapy, and approximately 88.7% of the respondents agreed with this statement. Exercise therapy was identified as the most important component of mime therapy by 93.3% of respondents. Additionally, 71.3% reported that speech and voice exercises are essential to mime therapy. 81.3% of the respondents thought mime therapy is useful for flaccid facial

Table 3 Assessment of Bell's Palsy Attitude

Questions	Frequency (%) of responders		Mean ± SD
	Positive	Negative	
Attitude Regarding Content of Bell's Palsy Therapy:			
1. Providing information about compensation techniques (eg, manual support of the lower lip while drinking or information about protection of the eye) is part of mime therapy.	133 (88.7%)	17 (11.3%)	7.43 ± 2.84
2. Exercise therapy is the most important element of mime (Bell's palsy treatment) therapy	140 (93.3%)	10 (6.7%)	8.60 ± 2.37
3. Speech and voice exercises are an important element of mime therapy.	107 (71.3%)	43 (28.7%)	6.15 ± 3.2
Attitude Regarding Indications:			
4. Mime therapy is indicated in flaccid facial paralysis.	122 (81.3%)	28 (18.7%)	6.77 ± 2.96
5. Mime therapy is indicated in paresis	131 (87.3%)	19 (12.7%)	7.46 ± 2.9
6. Mime therapy is indicated in patients with synkinesis	130 (86.7%)	20 (13.3%)	7.23 ± 2.73
7. Mime therapy is indicated in patients undergoing dynamic reconstruction of the smile.	131 (87.3%)	19 (12.7%)	7.21 ± 2.65
Attitude Regarding Factors Influencing Success:			
8. Mime therapy has a higher success rate in intelligent patients compared with less intelligent patients.	112 (74.7%)	38 (25.3%)	6.23 ± 3.23
9. If mime therapy is initiated early on, the final result is better.	136 (90.7%)	14 (9.3%)	8.09 ± 2.55
Attitude Regarding Emotional Support:			
10. I think emotional support is important in mime therapy	138 (92%)	12 (8%)	8.32 ± 2.42
11. How much time do you spend on the emotional support of your mime therapy patients?	117 (78%)	33 (22%)	6.47 ± 2.63
Attitude Regarding Cooperation with Colleagues:			
12. How important is cooperation with another mime therapist for you with regard to facial palsy?	131 (87.3%)	19 (12.7%)	7.05 ± 2.67
13. How important is cooperation with a physician for you with regard to facial palsy?	132 (88%)	18 (12%)	7.51 ± 2.61

(*Continued*)

Table 3 (Continued).

Questions	Frequency (%) of responders		Mean ± SD
	Positive	Negative	
Attitude Regarding Measurement Instruments:			
14. Regularly performing a measurement of facial function (for example, Sunnybrook or House-Brackmann) is important for correctly performing mime therapy	129 (86%)	21 (14%)	7.21 ± 2.8
15. Regularly administering a quality-of-life questionnaire (For example, Facial Disability Index or Facial Clinimetric Evaluation scale) is important for correctly performing mime therapy	129 (86%)	21 (14%)	7.07 ± 2.78
Total attitude score			**108.79 ± 24.71**

paralysis, paresis, and synkinesis, while 12.7% believed mime therapy is not indicated in patients undergoing dynamic smile reconstruction. Only 25.3% of participants reported that mime therapy has no effect on patients' intelligence levels; on the other hand, 90.7% believed that the early initiation of mime therapy would result in better outcomes. During mime therapy, 92% of participants believed that emotional support was important, while only 22% reported not giving adequate emotional support during their sessions. 87.3% agreed on the importance of cooperation with colleagues, and 88% agreed on the importance of cooperation with physicians regarding facial palsy. 86% of the responses show a positive attitude towards measuring instruments.

While delving deeply into the questions, the attitude score was found to be significantly varied. In the comparison of different regions, there is a notable variation in the impact of high-intelligence level patients on the success of mime therapy compared to low-intelligent patients. Participants from the western region showed a more positive response compared to those from the central region (Mann–Whitney *U*-test: $Z = -2.31$, $p < 0.05$) according to post-hoc analysis. In addition, there are significant differences regarding the indication of mime therapy during the flaccid stage among the regions of Saudi Arabia (Kruskal–Wallis test: $p = 0.002$). According to the post-hoc analysis, there were significant differences. Western vs Central (Mann–Whitney *U*-test: $Z = -3.064$, $p < 0.002$), Western vs Eastern (Mann–Whitney *U*-test: $Z = -2.178$, $p = 0.029$), Eastern vs Southern (Mann–Whitney *U*-test: $Z = -2.246$, $p = 0.025$), and Eastern vs Central (Mann–Whitney *U*-test: $Z = -3.706$, $p < 0.001$). The attitude significantly differed between both genders (Spearman's rho $p < 0.05$) only with the importance of emotional support in mime therapy, whereas the females (mean = 0.84) were more positive than the males (mean = 0.66). Nevertheless, those who are not managed/treated patients with Bell's palsy showed a significant positive attitude toward the importance of cooperation with physicians regarding facial palsy and the regularity of performing facial measurements for correctly performing mime therapy (Spearman's rho $p < 0.05$).

Statistical investigation of other factors, such as gender, age groups, region, education, main working place, years of experience, and whether they managed/treated patients with BP were conducted. The results showed no significant differences between the participants' demographic characteristics (Kruskal–Wallis test: $p > 0.05$) in relation to the overall attitude score.

Discussion

This study utilized a self-administered survey to investigate the knowledge and attitudes regarding Bell's palsy rehabilitation in Saudi Arabia among 150 physical therapists. The survey results revealed that 68.7% of respondents were female, slightly higher than males, which is consistent with previous studies.[46,47,56] This could indicate that rehabilitation practice in Saudi Arabia is as independent as other medical and health specialties despite the gender distribution discrepancies across all medical fields.[46,47,56] Our respondents' mean age (and SD) was 33.13 (6.85), which is nearly similar to other studies.[46,47,57] The majority of participants held Bachelor's degrees (65.3%) and were employed in general hospitals (72.7%). A similar statistic was reported in previous studies, demonstrating relatively low numbers of

post-professional therapists (those with advanced degrees or specialized training) compared to the number of bachelor's physical therapy degrees and clinical Doctors of Physical Therapy; this is understandable due to the lack of post-professional physical therapy and residency programs in Saudi Arabia.[58–60] The majority of the participants (58.7%) stated that they work in the western region of Saudi Arabia, with the central region coming in second place (16%). The northern region had the lowest representation (3.3%). We found that most of our respondents in the western region majored in neurology compared to the other regions, indicating that physical therapists who specialized in neurology were more trained to handle patients with BP and had more education and training in that field.[60] However, our study did not target neurological physical therapists, which may explain the lack of subspeciality discrepancy found in our research. Thus, the decline in the knowledge scores could be due to the lack of neurological and BP subspecialties therapists in our sample.

Moreover, our study found that a significant proportion of participants (80.7%) have handled patients with Bell's palsy, indicating the importance of physiotherapy role in BP rehabilitation,[61–64] and 78.7% of the participants focused on restoring symmetry of the face as an important goal of physical therapy rehabilitation which is aligned with what was reported in the previous study among mime therapists in the Netherlands.[38] Most of our respondents (78.7%) reported preferring to see patients with BP within a week, which aligns with a previous study that showed that rehabilitation is most effective during the acute stage period using mime therapy.[65] Control coordination exercises in rehabilitation protocols were predominantly utilized by our participants, as recommended in a previous study.[38]

On the other hand, knowledge about Bell's palsy, including its etiology, clinical presentation, treatment modalities, and prognosis, is crucial.[46] Our study revealed that practitioners had a moderate level of knowledge regarding Bell's palsy, with an average score of 8.99 out of 13; these results were similar to the results found among dentists.[48] It is notable that 96.7% of participants correctly identified the involvement of the 7th cranial nerve in cases of Bell's palsy, which has been identified as a core cause for BF in the research and was aligned with what was reported in a previous study performed among dentistry.[48] Most of the participants correctly identified BP as peripheral facial palsy, indicating a better understanding among physiotherapists (82.7%) compared to dentists (57%) regarding types of nerve injuries.[48] 55.3% of the participants reported that BP could not affect both sides of the face, which is aligned with the previous two studies that assessed the knowledge among dentists and the general population in Saudi Arabia.[48,61] Most of the participants (85.3%) are aware that BP could be triggered by a virus infection; in other studies, 38% only of the dentists have awareness of the etiology.[48] Also, low temperature and high air pressure, known among physiotherapists in this study and the general population in a previous study performed in the Qurayyat region of Saudi Arabia, could lead to BP.[62] The majority of the participants (83.3%) correctly identified lagophthalmos, which is the inability to completely close the eye, as an early ocular complication of Bell's Palsy. This finding is consistent with previous research conducted among dentists in Saudi Arabia,[48] which also emphasized the importance of understanding the ocular manifestations of Bell's Palsy. It is crucial to address these issues in patients with Bell's Palsy as they can lead to complications such as corneal dryness, exposure keratitis, and even vision loss if not properly managed.[11]

Our study found that most participants lacked knowledge in grading Bell's palsy symptoms and were not familiar with the House-Brackmann grading system, an important tool used for evaluating the severity of Bell's Palsy, which is aligned with a previous study conducted among dentists in Saudi Arabia,[48] The dental research showed that only a small percentage of participants were familiar with this grading system, reflecting a widespread lack of knowledge across different healthcare professions in the assessment of BP. Additionally, the low percentage of correct answers (26.7%) regarding grading BP symptoms in our study aligned with the findings of a previous cross-sectional study in Saudi Arabia, which revealed that many physiotherapists lacked formal training in evidence-based practices.[66] These findings highlight the necessity for more comprehensive training in these diagnostic tools across various medical disciplines.

In addition, our study found that the overall knowledge score was higher for respondents with postgraduate degrees than bachelor's degree holders, demonstrating a significant relationship between BP knowledge and education levels, which aligned with previous studies.[46–48] In addition, the participants who worked in university medical centers also demonstrated higher levels of knowledge about BP compared to therapists working in private clinics, suggesting the potential benefits of specialized university training programs, which again reflect that education institutions can impact practice. These findings reinforce the importance of education in influencing clinical practice by providing advanced

learning opportunities and fostering institutional support for evidence-based treatments. As suggested in the previous research,[67] expanding specialized training programs beyond academic settings would help enhance knowledge and promote consistent practices across healthcare environments.

On the other hand, our study also investigated physiotherapists' attitudes toward BP rehabilitation and the use of mime therapy, indicating a generally positive disposition. Our results showed that the therapists generally had a positive attitude toward these approaches. This suggests that the therapists viewed the indications for and the importance and effectiveness of mime therapy more positively. This is similar to the findings of a previous study that applied to mime therapists, where similar positive attitudes were observed. In that study, therapists who had received structured education in mime therapy demonstrated a strong belief in its value and efficacy.[38]

The majority of respondents (88.7%) supported the importance of mime therapy, indicating a strong consensus on its educational value, aligned with a recent study conducted in 2023, which examined the perceptions of physiotherapists regarding patient education, revealed that exercise and diagnostic information were the most frequently and highly rated in terms of importance,[68] it is possible that therapists are aware of the lack of information provided to patients by their medical specialists. Therefore, patients will benefit greatly from practical advices.[38] In a previous study, therapists indicated that they would adapt their therapies to the patient's intelligence level and noted that sometimes this meant simplifying the exercises.[38] Our participants also mentioned that mime therapy is thought to be more successful in more educated patients compared to less educated ones, which showed that a certain level of patients' health education and motor skills was identified as beneficial to treatment outcomes.[38] 87.3% of participants believed that mime therapy is effective for patients undergoing dynamic smile reconstruction, similar to the therapists' beliefs in a previous study,[38] which is supported by research showing that the mouth region holds a more significant effect than the forehead and thus carries more weight in grading systems.[69] Notably, 90.7% of respondents believed that early initiation of mime therapy leads to better outcomes, emphasizing the significance of early intervention. This aligns with previous research, indicating that early rehabilitation during the acute phase of Bell's Palsy enhances recovery.[65] Other studies, such as those on facial exercise therapy, have similarly discovered that early treatment leads to better outcomes.[33] These findings emphasize the importance of early intervention in clinical practice to ensure timely and effective patient care and minimize long-term complications.

Interestingly, our study found that 86% of participants who were not familiar with the grading system for BP symptoms recognized the importance of regularly using measurement instruments such as the Sunnybrook or House-Brackmann scales and quality-of-life questionnaires. Although, these participants lacked knowledge of evidence-based methods, they still have a positive attitude, which is similar to the results of a previous study in Saudi Arabia,[70] thus reflecting their willingness to adopt these practices. These findings imply that improving access to formal education and training in standardized assessment tools could improve the implementation of evidence-based practices. In specific, our results demonstrated the impact of clinical practice and professional development in treating BP. Educating physiotherapy practitioners on outcome measures and grading systems can improve their clinical decision-making abilities and improve patient care outcomes.

Our study highlights the gaps in knowledge and positive attitudes among physical therapists toward BP rehabilitation. Emphasizing the significance of professional education and collaboration in improving rehabilitation practices can elevate clinical standards in the physical therapy field. Based on our findings, we recommend advancing knowledge of BP among rehabilitation specialists; by incorporating BP topics in educational programs, especially in the courses that address neuroplasticity concepts in rehabilitation, to better understand the mechanism and rationale for examining and treating BP in Saudi Arabia.

Our study has limitations as the questionnaire was implemented with Google Forms, implying that the responding practitioners used computer support. The study used convenient sampling to collect our participants, which may induce bias. However, the large sample (150 subjects) with the appropriately used statistical sample size determination and data analysis can improve sampling representation and reduce bias. It was reported that increasing sample size lessens biases and improves the generalizability of the findings when using convenience sampling.[71] Most of our participants were from the western region of Saudi Arabia, which could limit the generalizability of the results in other regions. Our study did not focus on the sub-specialty of physical therapy, which could limit the specificity of our findings. Future research could

use a sample of neurological rehabilitation specialists or BP specialists to examine their knowledge and attitudes toward Bell's palsy rehabilitation and mime therapy. Moreover, the survey mostly targeted physical therapists and did not include all rehabilitation specialists or other individuals who might potentially work with patients in this area. Further validation of our findings with other populations of rehabilitation practitioners is needed to assess their knowledge and attitude toward BP rehabilitation.

Conclusion

The study provides valuable insights into the knowledge and attitudes of physiotherapists in Saudi Arabia regarding Bell's palsy. Our study found that physiotherapists in Saudi Arabia generally have a moderate level of knowledge and an overall positive attitude toward Bell's palsy rehabilitation. We also observed that education level and workplace type significantly influenced knowledge and practice scores. It is important to address knowledge gaps, promote positive attitudes, and encourage ongoing professional development to ensure high-quality, evidence-based care for patients with Bell's palsy. Collaboration among healthcare professionals, educational institutions, and professional organizations is essential to improve clinical practice standards and enhance patient outcomes in Bell's palsy rehabilitation.

Data Sharing Statement

The datasets analysed during the current study are available from the corresponding author upon reasonable request.

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No potential conflict of interest was reported by the author(s).

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