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A Retrospective Survey Of Joint Mobilization Utilization During Clinical Internship Of Silliman University Physical Therapy Alumni

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Abstract

Introduction. Physical therapy interns of Silliman University reported limited exposure to the application of joint mobilization techniques during their clinical internship training program. The study aimed to determine whether joint mobilization is utilized in physical therapy internships, including the barriers and challenges affecting its use. The study described (1) the interns' self-reported knowledge and awareness of the benefits, principles, type, and indications of joint mobilization, (2) the use of joint mobilization with regards to practice settings and locations, (3) the interns' self-assessment of competency to perform joint mobilization techniques after graduation, and (4) the barriers to increased utilization during clinical practice.

Methods. Data were collected from PT graduates of cohorts 2018, 2019, and 2020 to gather information relevant to the study's objectives, and 96 responded to the survey. Descriptive statistics, chi-square tests, and thematic methods were used to calculate and analyze the results.

Results. The study showed that most interns understood and reported knowledge of the principles, benefits, types, and indications of joint mobilization. It was found that most joint mobilization techniques were applied in the outpatient setting compared to inpatient and home health settings during the physical therapy internship. Additionally, its utilization was high in Manila, followed by Negros Oriental, Bacolod, and the lowest in Cebu. The results showed that self-reported competencies were under entry-level expectations upon graduation, with the greatest competency on the shoulder and the least on the spine. Lastly, barriers to application suggested limited exposure of interns to perform the techniques due to the lack of physician orders. Other reasons included lack of opportunity to apply techniques, lack of clinical instructor guidance, low self-confidence, lack of practice opportunities before internship, and the belief that certification is needed to perform joint mobilization.

Discussion. The data suggested that although interns understand the principles, benefits, types, and indications of joint mobilization, variation in internship experience, lack of self-reported competencies, and limitations in its utilization due to barriers exist.

Keywords: joint mobilization, physical therapy interns, internship program, Silliman University

Introduction

In 1953, Mennell stated that "beyond all doubt, the use of the human hand, as a method of reducing human suffering, is the oldest remedy known to man." The human hand is the primary tool of manual physical therapists (p. 843) as cited in Farrell & Jensen (1992). Orthopedic manual physical therapy may include soft tissue mobilization, massage, muscle training, joint manipulation or mobilization, and exercise, as per Haussler in 2009. The American Physical Therapy Association (APTA) considers manipulative techniques integral in evaluating and treating musculoskeletal conditions (as cited in Farrell & Jensen, 1992). These techniques can be in the form of thrust and non-thrust manipulation (Prakash & Patel, 2020). Manipulation and mobilization are interchangeably used, but this creates confusion during documentation and application (Mintken et al., 2008). Dr. Stanley Paris clarified that non-thrust manipulation is often associated with the term joint mobilization technique; a terminology more commonly used in physical therapy student textbooks. In contrast, high-velocity thrust is associated with manipulation (Boissonnault et al., 2004).

Non-thrust manipulation is often used to treat musculoskeletal conditions (Masaracchio et al., 2019; Coulter et al., 2018). It is defined as a low velocity, high amplitude, skilled passive movement to the joint and related soft tissues in a specific direction to improve the range of motion and reduce pain (APTA, 2013, p.2). The safety and effectiveness of the technique are well-studied and documented in the literature. Physical therapists (PTs) can perform manipulation in all its forms (Farrell & Jensen, 1992).

A study by Stephens (1970) concluded that only 17% of the school respondents teach manipulative therapy (as cited in Farrell & Jensen, 1992). In 1992, joint mobilization was included as one of the skills required of a physical therapy graduate as listed on the Evaluative Criteria for Accreditation of Education Programs for the Preparation of Physical Therapists. Six years later, another study by Ben-Sorek and Davis showed that 60% of the school respondents included joint mobilization in the curricula. Joint mobilization inclusion in physical therapy degree programs has evolved considerably from the 1970s to the present day. Bryan et al. and Stephens et al. noted that approximately 99% of the current programs in the United States offer instructions for spinal mobilization (as cited in Boissonnault et al., 2004). Also, about 99% integrate joint manipulation in the curriculum (Notebloom et al., 2015). The Philippine Physical Therapy and Occupational Therapy Law (Republic Act, RA 5680, 1969) supports the application of manipulation as within the scope of physical therapy practice, defining physical therapy as an "art and science of treatment utilizing therapeutic exercises, heat, cold, light, water, manual manipulation, electricity, and other physical agents." According to the World Confederation of Physical Therapy Guideline in 2011, the physical therapy graduate must possess minimum competencies in patient instructions,

therapeutic exercises, functional training, and manual therapy (as cited in Commission on Higher Education Memorandum Order, CMO, Number 55, series of 2017, Commission on Accreditation in Physical Therapy Education, CAPTE, 2017). Manual therapy includes acupressure, lymphatic drainage, massage, manual traction, passive range of motion, mobilization, and manipulation (Bearne & Hurley, 2010; CAPTE, 2017). A recent survey of Philippine PT schools teaching joint manipulation found that 88.5% included non-thrust techniques in their curriculum (Bautista et al., 2020). Ninety-four percent of the surveyed schools teach mobilization on the extremities, and 60% teach them on the spine. Therefore, there are expectations that physical therapy interns shall have background knowledge on the application of joint mobilization techniques. However, there is no current data on how physical therapy interns use these techniques as a therapeutic procedure during their clinical internship.

It has been reported that exposure and practice are valuable in improving technique performance (Wise et al., 2016). The learning of manual therapy starts with observation of the skill as performed by the instructor, followed by the student's attempt to mirror the activity as observed, and followed by practice with increasing levels of complexity (Funabashi et al., 2012). The principle of motor learning is helpful with acquiring and retaining the necessary psychomotor skills expected of a PT. The students must apply and practice the skill to improve competency (Corkery et al., 2020). Although it has been found that schools in the United States generally teach joint manipulation to students, it appears that techniques are underutilized during clinical education experiences, which were highly dependent on the clinical instructor's supervision (Struessel et al., 2012).

The Silliman University Institute of Rehabilitative Sciences (SU IRS) program curriculum includes basic instructions for joint mobilization of the spine and extremities (IRS, 2012, 2019). However, it was reported by faculty members of said program that spinal mobilization instruction was limited due to the faculty members' lack of knowledge and expertise in teaching the subject. The curriculum, however, has evolved to meet the advancing needs of physical therapy graduates.

The interns of SU IRS are typically assigned to various centers in Dumaguete City, Bacolod City, Cebu, and Metro Manila to ensure the interns are exposed to multiple settings and locations in the Philippines for ten months. They must participate in a minimum of 1500 hours of clinical internship, 1200 hours in the clinical setting, and 300 hours in the non-clinical setting (CMO 55, s2017). However, undocumented data reports that Silliman University physical therapy interns have limited exposure to applying joint mobilization procedures during their clinical internship training program. Information gathered suggests clinical instructors did not allow them to perform the joint mobilization or did not perform the skill at all. In addition, they reported that these techniques may not be in the physician's order, thus limiting the application of techniques. Despite these reports,

limited studies show if physical therapy interns utilize joint mobilization and, if underutilized, what the reasons are for the lack of use.

While previous data suggest that joint mobilization is included in the clinical preparation of physical therapy interns in the Bachelor of Science in Physical Therapy (BSPT) program, a descriptive study to investigate the clinical practice of physical therapy interns on the use of joint mobilization and to examine factors influencing the use of these techniques was needed. This study describes (1) the interns' self-reported knowledge of the benefits, principles, type, and indications of joint mobilization, (2) the usage of joint mobilization according to practice settings and geographic locations, (3) the interns' self-assessment of competency to perform joint mobilization techniques after graduation, and (4) the barriers to utilization during clinical practice.

The results of this study can increase awareness towards the utilization of joint mobilization techniques in physical therapy centers. Although it has been shown that the techniques are taught in Philippine physical therapy schools (Bautista et al., 2020), the study identified possible reasons and contributing factors for reasons of non-utilization. This research may result in a positive initiative toward joint mobilization during direct patient care.

Methods

Research Design

This mixed, cross-sectional, and descriptive study used an electronic survey of Silliman University physical therapy alumni who completed their internship programs in 2018, 2019, or 2020.

Ethical Considerations

The research dissemination started after receiving approval and clearance from the Silliman University Ethics Board. Participants were oriented on the objectives and details of the study, and their signed informed consent was requested before participation. The participants had the option to withdraw from the study at any time. Any information that might identify the participants was kept in a secure place and only made available to those directly related to the completion of the research. The materials containing raw information will be disposed of 5 years following the completion of the project.

Respondents and Sampling Procedure

Purposive sampling was utilized. Using Slovin's formula, it was calculated that the target sample size was 92 out of 124 alumni, at a 95% confidence interval and a 5% margin of error. Inclusion criteria were as follows: the respondent must have (1) attended a one-year clinical internship training program between 2017 and 2020, (2) successfully graduated from a physical therapy

program, (3) been at least 18 years of age, and (4) been affiliated with Silliman University during the physical therapy internship. Ninety-seven alumni participated in the study, but one was excluded as she did not belong to the identified years of graduation.

Research Instrument

The authors created the survey instrument with extensive deliberation of its coverage. The authors' experiences, knowledge, and comments by the alumni and other physical therapy professionals were considered during the formulation of the questionnaire. The survey instrument was a 2-part online questionnaire. Part one focused on personal demographics, practice settings, and regional locations of the internship program. The second part focused on the clinical internship experiences. Questions asked were related to the PT intern's use of joint mobilization techniques, confidence in psychomotor skills and decision-making, and factors or barriers associated with joint mobilization usage. Some questions used a 5-point Likert scale, with five and one as strongly agree and disagree, respectively. The second part also contained questions about the application of joint mobilization and the average daily frequency of application during the clinical internship program, according to the type of setting and location of the affiliation centers. Lastly, it included a self-assessment test for joint mobilization application on various body areas following the internship program and self-reported competency levels. A Likert scale was also used for this section, with one as unable to apply the skill, requiring more than 90% supervision post-graduation, and five as above entry-level performance, requiring less than 25% supervision post-graduation to perform the skill.

Data Gathering Procedure and Timetable

The reliability of the survey instrument was calculated using Cronbach Alpha. The score derived was 0.94 (Mondal H. & Mondal S., 2017), deeming the questionnaire reliable. The reliability testing was followed by a pilot survey performed by five licensed PTs. The five PTs were then asked to provide feedback regarding the questionnaire to establish face validity. They were licensed to practice in the Philippines and have over 20 years of experience in the clinical setting, academe, or both. All PTs reported that the questionnaire could easily be understood and answered. One of the PTs made suggestions on how to ensure that the survey can answer all the research questions. All his proposals were considered, and necessary corrections were applied to the questionnaire.

It should be noted that construct validation was not performed, which could affect the validity of the questionnaire. The research instrument was distributed and answered through an online survey platform. It was promoted using posters, emails, and social media, and the link was shared through these various platforms. Furthermore, participants were encouraged to share the link with

other possible respondents. Responses were collected from July 2022 to August 2022.

Data Analysis Procedure

The responses and results were recorded, reviewed, and analyzed to determine the utilization of joint mobilization during the clinical internship training program, the intern's decision-making process, the barriers to using joint mobilization, and the self-assessed skills of the physical therapy alumni following graduation. Descriptive statistics were used to calculate the percentage and frequency of responses. Chi-square tests were used to establish the dependence of joint mobilization application frequency on internship practice settings and locations. The answers to the open-ended questions were analyzed using latent thematic analysis. Meanings were organized and grouped by their similarities. Themes and ideas were derived after such organization and transferred into texts that were relevant to the findings. They were reviewed at least thrice to ensure familiarity and understanding (Sundler et al., 2019).

Results

Demographics

Out of 96 respondents, 60 were female (62.5%), 31 were male (32.3%), and five (5.2%) preferred not to disclose their gender. Apart from the eight respondents who did not answer their age, participants were between 23 and 28. Most participants were 24, 25, and 26 years old, comprising 25%, 31.3%, and 17.7% of the total respondents, respectively. For their graduation year, respondents were somewhat distributed, with about a third (34.4%) having graduated in 2020, a greater percentage (39.6%) from 2019, and the least (26.0%) from cohort 2018. Regarding internship locations, all 96 participants interned in Visayas, and most interned in Luzon (92). Silliman University has no affiliation centers in Mindanao. All 96 participants interned in inpatient and outpatient clinics, and 94 were also assigned to the home health setting.

Awareness and Utilization of Joint Mobilization Techniques

Almost ninety-one percent (90.6%) of participants understood the concept of mobilization, and the same percentage reported knowing when and why mobilization was beneficial, as an intern.

In terms of application, the majority could suggest what kind of mobilization could be utilized (54.2%). Furthermore, the results showed that 81.3% of participants knew joint mobilization could be used for neurology, cardiology, and other conditions.

The results showed that the respondents could apply at least 1 type of mobilization technique per case (62.5%).

Setting

The outpatient setting showed the highest (89.6%, 86 respondents) utilization of joint mobilization (Figure 1). More specifically, 65.6% performed it 1-4 times daily, and the rest performed it five or more times daily (Figure 2). Contrastingly, only 38.5% (37 respondents) applied mobilization in the inpatient setting. A drop in daily frequency was also seen, as 69.8% reported negligible daily application, and only 27.1% used joint mobilization 1-4 times daily. Home health showed similar results to the inpatient setting, with 41.5% application (39 out of 94 participating in home health care). Overall, 63.8% reported negligible daily usage, and 30.9% reported 1-4 times everyday use.

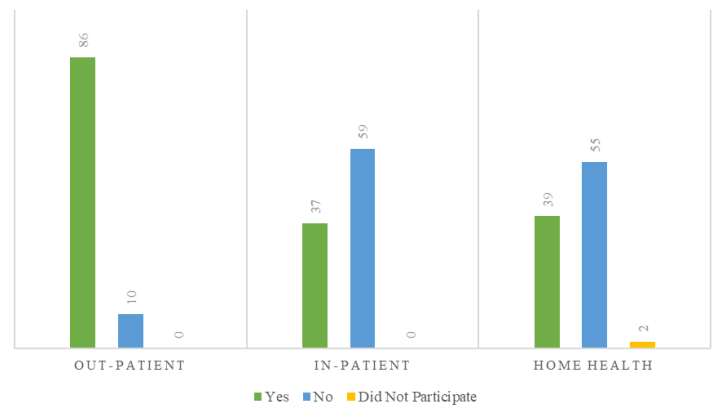


Figure 1. Application of Joint Mobilization According to Practice Setting

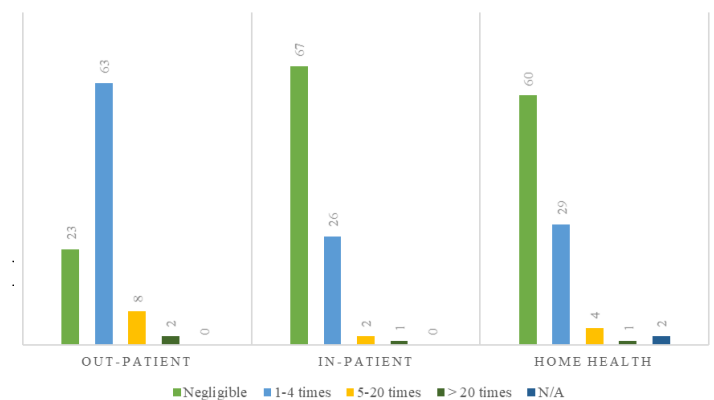


Figure 2. Daily Frequency of Joint Mobilization Utilization Per Setting

Based on the chi-square test results, the frequency of joint mobilization application varied based on the practice setting. However, given that the statistical value (47.91) was much higher than the critical value (9.49) based on the chi-distribution table at a 5% significance level, the frequencies recorded through the survey deviated from the expected and were highly dependent on the practice setting. Therefore, the application of joint mobilization was highly reliant on the type of practice setting.

Location

Based on the information given, the application of joint mobilization was highest in Manila, which showed 77.1% utilization (Figure 3), with 47.9% using it 1-4 times a day and 24.0% using it five or more times per day (Figure 4). Notably, Metro Manila was the only location where any participant reported using joint mobilization over 20 times daily (4.2%). In Negros Oriental, 68.8% used joint mobilization. 55.2% applied it 1-4 times, 6.3% applied it 5-20 times, and the rest reported negligible daily application. Fifty seven percent used mobilization techniques in Bacolod, but the daily usage was almost the same as non-usage at 51.6% and 48.4%, respectively. Cebu was the only location where the former interns had a higher report of non-application (52.8%). Only 43.1% used joint mobilization daily, with negligible daily usage for the majority (56.9%).

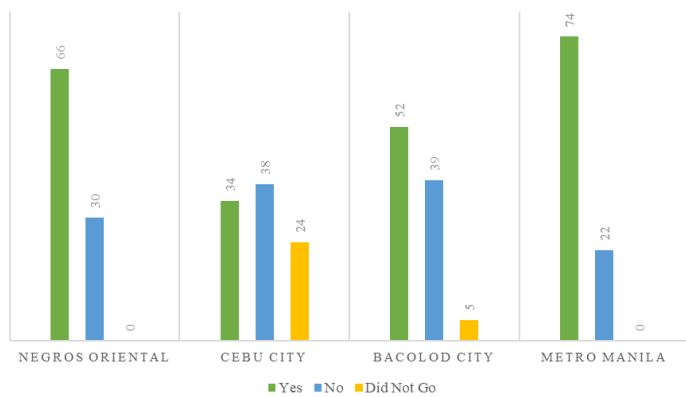


Figure 3. Daily Frequency of Joint Mobilization Utilization Per Setting

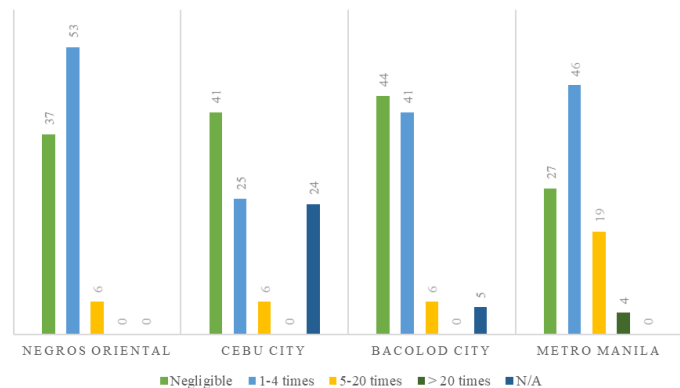


Figure 4. Daily Frequency of Joint Mobilization Utilization Per Setting

Metro Manila, Negros Oriental, and Bacolod had more respondents answer in the affirmative for the application of joint mobilization (as shown in Figure 3); Metro Manila and Negros Oriental, particularly, had large margins compared to the negative. For Figure 4, 1-4 times and negligible application daily were the highest across all locations.

The chi-square test for this section also showed the dependency of the frequency of joint mobilization application on the internship location. The calculated chi statistic value (30.89) was much higher than the critical value of 12.59, establishing

dependence of the variables. Though this relationship is significant, the larger difference between the calculated and critical values in the previous section suggested a greater dependence on practice setting than location for application frequency.

Self-Assessment of Competency

The results revealed that most respondents thought they were least competent when dealing with the spine, having average ratings lower than the beginner level. The sacroiliac and cervical areas were the lowest rated at 1.53 and 1.57 out of a score of 5, respectively (Figure 5). All lower extremities had average ratings between the beginner and intermediate levels. The knee had the highest rating, nearing the intermediate level, while the hip had the lowest rating for all non-spinal areas (2.38). The respondents reported a higher competency level for the upper extremities. With the intermediate level as a baseline, the shoulder and the wrist were rated as just above, and the hand, elbow/forearm were just below.

Figure 6 showed that 26.0% of participants reported lacking competency in joint mobilization for the areas listed. Thirty-three percent rated themselves as beginners and 22.9% were of intermediate skill level. Surprisingly, only 13.5% were at entry-level competency, which should be the goal after completing the internship program. Only 4.2% were confident in their ability to perform joint mobilization, rating themselves above entry level.

Barriers

The interns reported that their most significant barrier was the lack of doctor's orders to perform joint mobilization, shown in Figure 7 as contributing most to the leftmost bar. The second major barrier was the lack of opportunity to perform joint mobilization, which 40.6% (39 of the participants) felt was a significant barrier, and 34.4% (33 of the participants) thought it was a moderate barrier. The lack of clinical instructor's (CI) approval to perform joint mobilization (35 for significant barrier) was third, and lack of self-confidence was the least significant (31 for significant barrier). The respondents felt that their mobilization/manual therapy CI was equipped enough to teach, with 61.5% agreeing or strongly agreeing. The results for participants feeling they had enough training to mobilize a joint while supervised by a CI were divided, with 38.6% agreeing or strongly agreeing and 31.2% disagreeing or strongly disagreeing. Furthermore, when respondents were asked whether they were exposed enough to joint mobilization techniques during their internship, 37.5% disagreed, and only 34.4% agreed.

When asked about any other additional barriers, 76 respondents had no further comments. Five respondents reiterated barriers listed previously in the survey (4 – lack of opportunity to perform joint mobilization; 1 – lack of CI approval). Two respondents stated that there was a lack of cases in which they could apply joint mobilization, and one cited that they lacked the opportunity to make treatment plans involving the technique. One believed that certification was required before performing joint mobilization. A few participants highlighted barriers specifically

about the CIs, stating that they did not encourage or guide the students (2 responses); they performed the mobilization themselves instead of the students (1 response); there was no inclusion of joint mobilization in their treatment plans (2 responses); or that they were not specialized or experienced and were therefore unable to perform joint mobilization (1 response).

Three reported that they lacked teaching on the topic, practice before the internship, and feedback during the internship. The remaining respondents said there was a lack of initiative to apply joint mobilization (1 response) and that other treatment methods were more practical and beneficial (1 response).

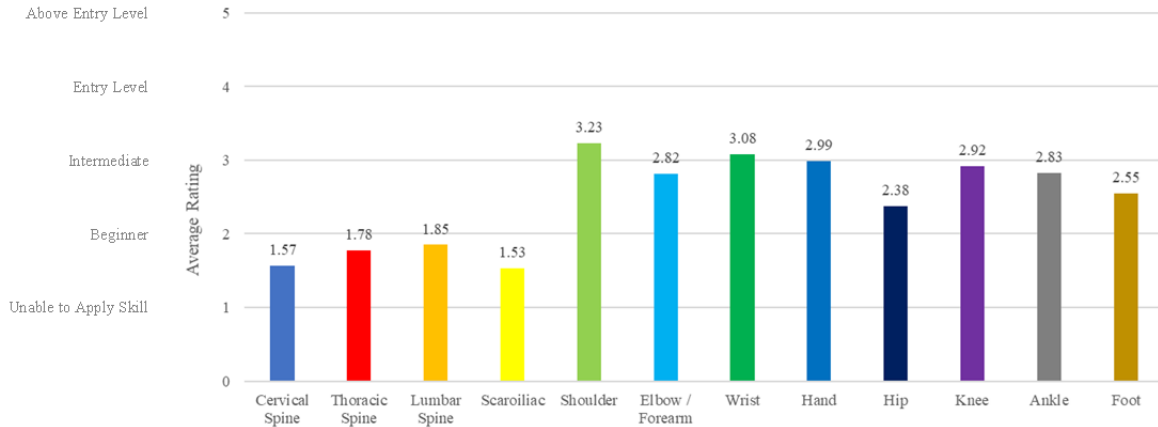


Figure 5. Average Ratings for Level of Joint Mobilization Competency

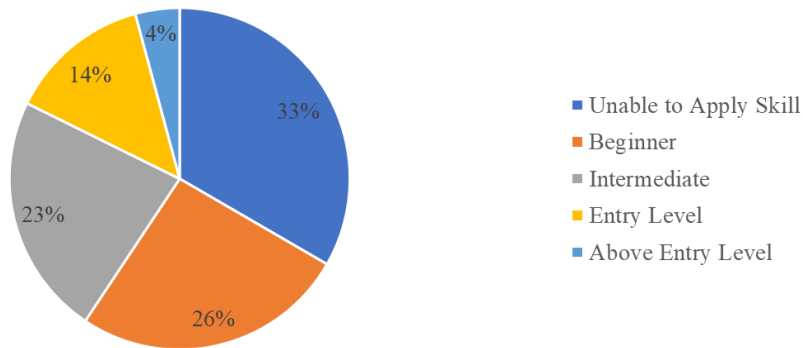


Figure 6. Joint Mobilization Competency Level of Respondents

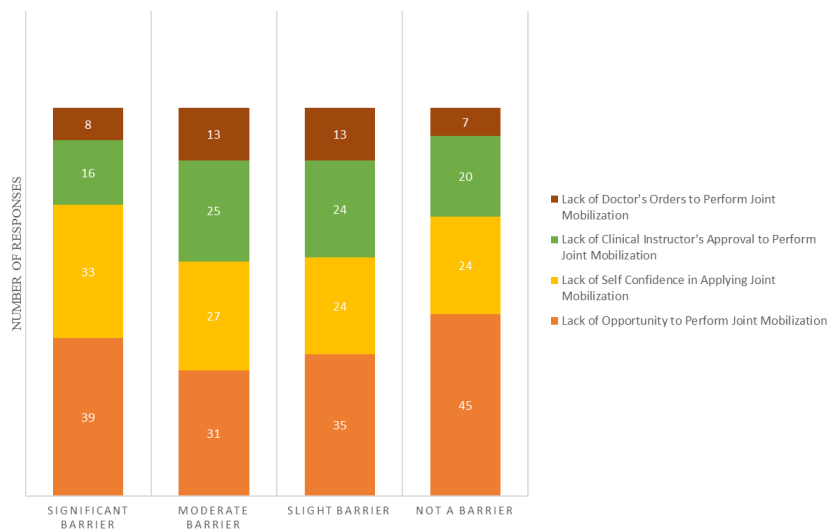


Figure 7. Stacked Bar Chart for Barrier Responses

Discussion

This is the first study to investigate the utilization or non-utilization of joint mobilization in the clinical setting during physical therapy internship experiences. Due to the limited sample population investigating Silliman University physical therapy interns, the results of the study can be generalized to the Silliman University Physical Therapy program only. The authors used purposive sampling to choose the set of respondents who completed the internship program from 2017 to 2020. Interns from academic years 20-21 and 21-22 were excluded due to internship restrictions from COVID-19. Interns were required to submit a written log and summary of their physical therapy interventions at each center, improving their ability to recall their internship experiences accurately. The interns completed a monthly treatment log consisting of the interventions they utilized for each patient per session. A secondary purpose of the study looked into self-perception and self-assessment of capabilities and skills related to joint mobilization; however, the authors did not consider specific rubrics to capture the true abilities of respondents.

The results of the study described the practice patterns in the use of joint mobilization techniques during the clinical internship training program. Most respondents reported understanding the principles, indications, and benefits of the technique. The data gathered from this study suggest a lack of opportunity and exposure to the skill application.

The frequency of joint mobilization application depended on the practice setting and location, with the practice setting having a stronger relationship. Joint mobilization techniques were applied primarily in the outpatient setting, with 65.6% of respondents performing it 1-4 times daily. Joint mobilization techniques were commonly utilized in the outpatient setting for musculoskeletal conditions. Although its clinical use and benefits have been shown to improve joint mobility and range of motion, its application in neurology is limited. Joint mobilization utilization was also lacking in inpatient and home health settings, where the primary goals focused on function rather than increasing joint mobility. There is limited information explaining why its application is limited in these settings.

Regarding location, the application of joint mobilization was highest in Manila, followed by Negros Oriental, Bacolod, then Cebu. In addition, there was greater utilization of the technique per day in Manila than in other locations. Rural areas show inadequate health facilities, services, and medical technology. Mamot also reported that the quality and education of health professionals and workers are often higher in urban areas concerning probable salary (as cited in Collado, 2019). Results from this study both proved and showed disparities with this concept, as the most urban area in the Philippines, Metro Manila, showed the highest usage and training of joint mobilization.

On the other hand, interns who trained in Cebu City, the second most metropolitan location considered, reported the lowest utilization. No current data is available to explain why there is a lack of utilization of joint mobilization techniques in Cebu City.

However, some Silliman University interns noted that the interventions in this city were mainly focused on passive electrotherapeutic modalities.

About 18% of the respondents reported competency at entry-level or above entry-level upon graduation. They had the lowest competency on the spine, especially in the cervical and sacroiliac areas, and reported the highest competencies on the joint mobilization of the shoulder joint. As stated in the introduction, instruction on spinal mobilization for the SU IRS interns was also limited by the expertise of the course instructors. Further research is required to examine if and how greatly the lack of prior instruction affected competency through internship and after graduation.

The lack of a physician's order was noted to be the most significant barrier to mobilization application. Practice in the Philippine setting dictates that PTs follow a doctor's orders, meaning that the lack of prescription may lead to non-utilization of joint mobilization, even if warranted. Joint mobilization is a passive technique under the passive range of motion (PROM) skill set that can restore movement and provide a neurophysiologic effect that improves pain and muscle spasms (Hooks, 2012). Some physicians may lack knowledge of the indications of joint mobilization, including its operational definition, which may be the reason for not prescribing it in treatment plans. More studies are needed to investigate this.

The second most significant barrier was the lack of opportunity to perform joint mobilization. Findings substantiated this through the level of agreement, where participants reported a lack of exposure to the technique. Other reported barriers were related to the lack of clinical instructor's approval, limiting the prescription of the technique in cases where it could be applied. It is also possible that clinical instructors perform the procedures on select patients while others do not due to lack of skill.

Low self-confidence was the least significant barrier. Lack of adequate training, instruction, practice, and appropriate feedback from the clinical instructors or designated mentors may decrease the mentee's confidence. Future research is warranted to investigate this further.

Conclusion

The study revealed that interns understand the principles, benefits, and indications of joint mobilization despite the variation of its use in different practice settings and locations. Self-reported competencies regarding entry-level skills and other barriers resulted in decreased utilization of joint mobilization.

Post-professional training of faculty members and clinical instructors is highly recommended to teach students the proper application of joint mobilization techniques in the educational curriculum. In the same essence, physicians referring patients to physical therapy should know that joint mobilization can be prescribed for various conditions, including but not limited to neurology, orthopedics, sports, geriatric, and pediatric patients, to facilitate physical therapy outcomes.

Competing Interests

The authors declare that they have no conflict of interest with any organization or body that may affect the outcome of this research.

Declaration of Originality

The authors declare that this manuscript is their original work, and all the references were given due credit. There is no known violation of any existing copyright or infringement of third-party rights. The manuscript has not been submitted or published elsewhere.

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