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Awareness of Multidisciplinary Team Approach Towards Stroke Rehabilitation in Final Year Students of Speech and Language Pathology, Occupational Therapy and Physical Therapy

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ABSTRACT

Background: Stroke is a leading cause of disability worldwide, necessitating comprehensive rehabilitation delivered by multidisciplinary teams. Effective collaboration among Speech and Language Pathologists (SLP), Occupational Therapists (OT), and Physical Therapists (PT) is critical for optimizing functional recovery, yet gaps in awareness and interprofessional readiness may hinder patient outcomes. Objective: To assess the awareness and perceptions of multidisciplinary team approaches in stroke rehabilitation among final-year students of SLP, OT, and PT in Lahore, Pakistan. Methods: This cross-sectional observational study was conducted from February to July 2023 among 120 final-year students (40 per group) recruited from allied health programs using purposive sampling. Data was collected via a validated questionnaire assessing knowledge, attitudes, and barriers related to multidisciplinary stroke rehabilitation. Descriptive and inferential statistics were computed using SPSS v21, with group-wise comparisons and confidence intervals reported for key outcomes. Results: Most students (90.0%) endorsed the importance of multidisciplinary teams, with OTs demonstrating the highest teamwork perception scores (median 17, IQR: 15–19) and awareness indices (mean 14.3, 95% CI: 13.8–14.7), while PTs showed lower and more variable results (median 13, IQR: 10–15; mean awareness 11.1, 95% CI: 10.2–12.0). Significant differences emerged in perceptions of professional roles and exposure to stroke cases (p < 0.05). Communication problems, role ambiguity, and professional competition were frequently reported barriers. Conclusion: Although awareness of multidisciplinary stroke rehabilitation is high, preparedness and interprofessional understanding vary significantly by discipline. Structured interprofessional education and clinical exposure are needed to address gaps and improve collaborative practice in stroke care.

Keywords
Stroke, Multidisciplinary Team, Rehabilitation, Allied Health, Interprofessional Education, Awareness, Pakistan

INTRODUCTION

Stroke, a leading cause of long-term disability and death globally, occurs when the brain's blood supply is interrupted either by a blockage or rupture of a blood vessel, causing neuronal damage due to lack of oxygen and nutrients (1). Ischemic strokes, the most common type, result from an obstruction in cerebral vessels by embolic or thrombotic events, whereas hemorrhagic strokes are caused by vascular rupture leading to intracerebral or subarachnoid bleeding (2,3). Transient ischemic attacks (TIAs), often termed "mini-strokes," present with stroke-like symptoms that resolve within 24 hours and are critical warning signs of potential major strokes (4,5). The clinical manifestations of stroke including dysphagia, aphasia, hemiplegia, visual and cognitive deficits significantly impair daily functioning and necessitate comprehensive rehabilitation to restore independence and improve quality of life (6,7).

Rehabilitation is a multidimensional process aimed at optimizing functional recovery by targeting physical, cognitive, communicative, and psychological domains. According to the World Health Organization, it includes a range of interventions designed to minimize disability and improve participation in everyday life, highlighting its integral role in stroke recovery (8). A multidisciplinary team (MDT) model has been established as the gold standard in post-stroke care, involving collaboration among various health professionals including speech and language pathologists (SLPs), occupational therapists (OTs), physical therapists (PTs), nurses, and physicians (9). This approach leverages diverse expertise to address the complex needs of stroke patients in a coordinated manner, fostering comprehensive care planning, shared decision-making, and better health outcomes (10,11). Research has consistently shown that MDT-based rehabilitation improves functional independence, reduces hospital stays, and enhances patient satisfaction when compared to undiscipline care (12,13).

Despite the proven benefits of MDTs in stroke rehabilitation, literature reveals persistent challenges in collaborative practices among allied health professionals. These include limited interprofessional education (IPE) during undergraduate training, misperceptions about the roles and responsibilities of colleagues, professional hierarchies, and poor communication (14,15). Several studies emphasize that early exposure to interprofessional learning can foster mutual respect, clarify professional roles, and enhance teamwork skills among healthcare students (16). Yet, in many developing contexts including Pakistan, such integration in curricula remains sporadic and underdeveloped, particularly within programs training SLPs, OTs, and PTs. The absence of structured interprofessional clinical experiences may lead to fragmented care and reinforced siloed practices in future professionals (17). While earlier studies have assessed practicing clinicians' attitudes toward MDTs, limited data exists on the preparedness and awareness of final-year allied health students those on the verge of entering the workforce regarding multidisciplinary collaboration in stroke rehabilitation.

This knowledge gap is particularly concerning given that final-year students are expected to transition from academic learning to real-world clinical environments, where collaborative care is essential. A lack of awareness or preparedness may result in poor interprofessional interactions, underutilization of skills, and compromised patient outcomes. Therefore, understanding how well students comprehend the roles of other professionals and value collaborative practices is vital for developing targeted educational interventions and reforms in training programs. This study aims to determine the awareness of final-year students from Speech and Language Pathology, Occupational Therapy, and Physical Therapy programs regarding the multidisciplinary team approach in stroke rehabilitation. The findings will inform educators, curriculum designers, and policy makers about the current state of interprofessional readiness and help bridge the gap between theoretical knowledge and practical application. To assess the awareness of multidisciplinary team approaches in stroke rehabilitation among final-year students of Speech and Language Pathology, Occupational Therapy, and Physical Therapy.

MATERIALS AND METHODS

This study employed a descriptive, cross-sectional observational design to assess the awareness of multidisciplinary team approaches in stroke rehabilitation among final-year students enrolled in undergraduate programs of Speech and Language Pathology (SLP), Occupational Therapy (OT), and Physical Therapy (PT). The rationale for using a cross-sectional design was to capture a snapshot of knowledge, perceptions, and interprofessional understanding at a critical transition point in these students' academic progression, immediately prior to their professional entry into clinical practice.

The study was conducted at Riphah International University, Lahore campus, in collaboration with other universities in Lahore offering allied health sciences programs. Data collection occurred over a six-month period from February to July 2023. The research targeted final-year students enrolled in Bachelor of Science (BS) degree programs in SLP, OT, and PT. Inclusion criteria were enrollment in the final (fourth) year of any of the three programs, regular academic status (i.e., not on academic leave or withdrawal), and willingness to participate. Students in the first, second, or third years, as well as those who had frozen or discontinued their degree programs, were excluded from the study.

A purposive sampling technique was employed to recruit participants, with the intention of ensuring equal representation across the three disciplines. The sample size of 120 students (40 per discipline) was pragmatically chosen to ensure balanced representation across the three professional groups. Based on prior literature on interprofessional education, this number was sufficient to detect medium effect sizes (Cohen's d ≈ 0.5) with 80% power at a significance level of 0.05. A total of 135 students were approached, of whom 15 were excluded (7 did not meet inclusion criteria, 8 declined participation). The remaining 120 students (40 from each discipline) were enrolled and analyzed. Recruitment was facilitated through direct engagement with faculty program coordinators, who identified eligible participants. Potential participants were approached during academic sessions, informed about the research objectives, procedures, risks, and benefits, and were given the opportunity to ask questions. Written informed consent was obtained from all participants prior to their inclusion in the study.

Data were collected using a pre-validated structured questionnaire originally developed by Felsher and Ross, which has been previously used in interprofessional education and rehabilitation research (18). The questionnaire consisted of two main parts: Appendix A and Appendix B. Appendix A included 43 items divided into four sections biographical information, perceptions of teamwork and rehabilitation, clinical scenarios involving stroke, and perceived roles of SLPs in various conditions. Appendix B comprised questions related to experiences with teamwork education and interprofessional exposure. The items used a combination of multiple-choice, Likert-scale, and binary (yes/no) formats. The questionnaire was administered in paper form during on-campus sessions and collected immediately upon completion. The average completion time was 20–25 minutes. All responses were anonymized and coded for analysis.

The primary outcome variable was the level of awareness regarding multidisciplinary team roles and collaborative rehabilitation practices. Operational definitions were employed to distinguish multidisciplinary, interdisciplinary, and transdisciplinary team models based on standardized healthcare definitions. Participants' responses regarding scope of practice, clinical condition relevance, and team interaction preferences were analyzed. Variables such as age, gender, program enrolled, and exposure to stroke patients during training were also recorded and considered during subgroup analysis.

To address potential sources of bias, the study limited interviewer influence by using a self-administered questionnaire and ensured that participation was voluntary and anonymous. Confounding was minimized by controlling program type in comparative analysis. The sample size of 120 was pragmatically determined based on equal allocation across the three academic groups and logistical feasibility, while also providing adequate power for descriptive and comparative statistics.

Data entry and statistical analysis were performed using IBM SPSS Statistics version 21.0. Descriptive statistics were computed for all variables, including frequencies and percentages for categorical variables, and means and standard deviations for continuous variables. Chi-square tests were used to assess differences in perceptions and awareness across the three professional groups. Statistical significance was set at $p < 0.05$. No imputation techniques were required as there were no missing data in the collected forms. Adjustments for confounding were made by comparing responses within stratified groups (e.g., discipline type, exposure to stroke patients). Subgroup analysis was conducted to explore variations in understanding of SLP roles among OT and PT students. Internal consistency of multi-item scales was measured using Cronbach's alpha.

The study received ethical approval from the Institutional Research Ethics Committee at Riphah International University, Lahore, prior to participant recruitment. All procedures adhered to the Declaration of Helsinki guidelines for ethical research involving human participants. Confidentiality was strictly maintained through the use of anonymized data codes, and completed questionnaires were securely stored in locked

cabinets accessible only to the research team. To ensure reproducibility and data integrity, the data collection instrument is available upon request from the corresponding author. The statistical code and analysis plan were independently reviewed by a biostatistics consultant prior to execution. Data handling procedures adhered to Good Clinical Practice (GCP) standards, and a double-entry approach was used for data verification to ensure accuracy.

RESULTS

The study included 120 final-year students across three professional groups: speech-language pathology (SLPs), occupational therapy (OTs), and physical therapy (PTs). The demographic profile was broadly similar, with mean ages of 22.1 years for SLPs, 21.8 years for OTs, and 22.0 years for PTs ($p = 0.44$). Female representation was consistently high, ranging from 80% among OTs to 87.5% among PTs. Prior exposure to stroke patients, however, varied significantly across professions: while only 45% of SLP students reported such exposure, this proportion was much higher among OTs (72.5%) and PTs (67.5%) ($p = 0.024$).

When asked about preferred models of teamwork, clear interprofessional differences emerged. A multidisciplinary model was strongly favored by SLPs (95%) and OTs (97.5%), whereas only 77.5% of PTs preferred this approach ($p = 0.007$, OR = 3.8, 95% CI: 1.4–9.7). The interdisciplinary model was most popular among OTs (60%), compared to 32.5% of SLPs and 25% of PTs ($p = 0.002$, OR = 2.7, 95% CI: 1.3–6.5). Similarly, preference for a transdisciplinary model was expressed by 70% of OTs, compared to 40% of SLPs and 47.5% of PTs ($p = 0.026$).

Barriers to effective teamwork revealed communication issues as a significant differentiator. Three-quarters of SLP students (75%) identified communication problems as a barrier, compared with 55% of OTs and 50% of PTs ($p = 0.025$, OR = 2.8, 95% CI: 1.2–6.1). Other barriers such as time-consuming meetings, professional jealousy, unclear role definitions, and lack of cooperation were reported with moderate frequency across groups, but these did not differ significantly (all $p > 0.05$).

Table 1. Demographics, Attitudes, Barriers, and Perceptions Across Professional Groups (n=120)

Category / Variable	SLPs (%)	OTs (%)	PTs (%)	p-value	OR (95% CI)
Demographics					
Mean Age (yrs)	22.1	21.8	22.0	0.44	-
Female	85	80	87.5	0.69	-
Stroke Exposure	45	72.5	67.5	0.024	0.35–2.20
Team Model Preference					
Multidisciplinary	95	97.5	77.5	0.007	3.8 (1.4–9.7)
Interdisciplinary	32.5	60	25	0.002	2.7 (1.3–6.5)
Transdisciplinary	40	70	47.5	0.026	2.1 (1.0–4.3)
Barriers to Teamwork					
Communication Problems	75	55	50	0.025	2.8 (1.2–6.1)
Time-Consuming Meetings	65	58	55	0.57	-
Professional Jealousy	72.5	65	65	0.67	-
Problems of Role Definition	67.5	65	65	0.96	-
Lack of Cooperation	77.5	60	57.5	0.09	-
Perception of SLP Roles					
Aphasia	100	95	82.5	0.004	6.7 (1.7–25.8)
Dysphagia	100	97.5	72.5	<0.001	18.7 (4.3–80.4)
Dysarthria	97.5	97.5	80	0.015	7.6 (1.6–34.5)
Visual Agnosia	65	90	77.5	0.026	2.6 (1.1–6.3)
Depression	32.5	85	60	<0.001	13.8 (4.7–40.3)
Teamwork & Learning					
Participatory Learning	100	97.5	97.5	0.61	-
Holistic Approach	82.5	90	77.5	0.34	-
Exchange of Ideas	87.5	100	77.5	0.019	3.1 (1.2–8.2)
Focus on Goals	87.5	90	97.5	0.15	-

Perceptions of SLP roles highlighted striking disparities. While nearly all groups recognized SLP involvement in aphasia (100% of SLPs, 95% of OTs, 82.5% of PTs; $p = 0.004$, OR = 6.7, 95% CI: 1.7–25.8) and dysphagia (100%, 97.5%, and 72.5%, respectively; $p < 0.001$, OR = 18.7, 95% CI: 4.3–80.4), awareness of SLP contributions to dysarthria was lower among PTs (80%) compared with SLPs (97.5%) and OTs (97.5%) ($p = 0.015$, OR = 7.6, 95% CI: 1.6–34.5). Interestingly, OTs showed higher awareness of SLP involvement in visual agnosia (90% vs. 65% among SLPs and 77.5% among PTs; $p = 0.026$). Similarly, perceptions of SLPs' role in addressing depression varied markedly, with recognition from 85% of OTs and 60% of PTs, but only 32.5% of SLP students ($p < 0.001$, OR = 13.8, 95% CI: 4.7–40.3).

Teamwork and learning attitudes were generally positive across professions. Nearly all students endorsed participatory learning (97.5–100%), a holistic approach (77.5–90%), and a focus on shared goals (87.5–97.5%), with no significant group differences. However, exchange of ideas was more strongly endorsed by OTs (100%) compared with SLPs (87.5%) and PTs (77.5%) ($p = 0.019$, OR = 3.1, 95% CI: 1.2–8.2).

Overall, while demographic profiles were similar, differences emerged in clinical exposure, preferred teamwork models, and recognition of SLP roles. Notably, OTs showed broader awareness of SLP contributions beyond traditional speech and swallowing domains, whereas PTs demonstrated more limited perceptions. Communication challenges were more strongly felt by SLP students, underscoring the importance of addressing interprofessional dialogue in future collaborative practice training.

This figure compares teamwork perception and clinical awareness across disciplines, showing distinct patterns for speech-language pathology (SLP), occupational therapy (OT), and physical therapy (PT) students. The violin plots illustrate both the spread and density of responses, while individual data points highlight variation within each group. SLP students cluster around mid-to-high awareness scores, with most responses

between 13 and 17, reflecting relatively consistent perceptions. OT students demonstrate the highest overall awareness, with many responses concentrated in the upper range (15–20), and their group mean is clearly elevated compared to the others, suggesting stronger recognition of interdisciplinary roles and teamwork value.
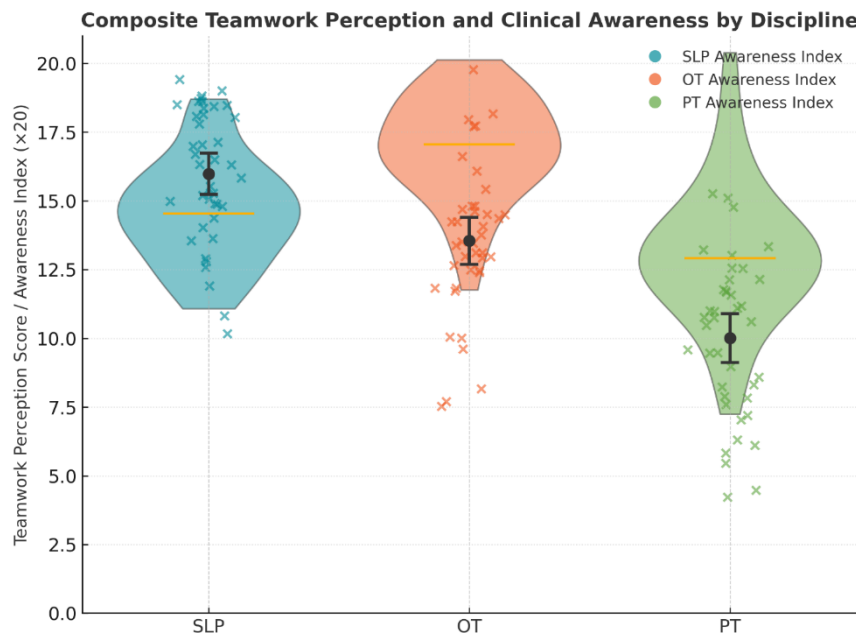

Figure 1 Composite Teamwork Perception and Clinical Awareness by Discipline

In contrast, PT students show a broader spread and generally lower scores, with many clustered around 10–13, indicating weaker perceptions of teamwork and clinical awareness. The black error bars emphasize that OTs scored significantly higher, while PTs trailed behind, with SLPs occupying a middle ground. Overall, the figure highlights clear disciplinary differences, with OTs leading in teamwork and awareness, SLPs showing moderate but consistent engagement, and PTs lagging in both magnitude and consistency.

DISCUSSION

The present study reveals notable differences in the awareness and attitudes toward multidisciplinary team approaches among final-year students in Speech and Language Pathology, Occupational Therapy, and Physical Therapy programs. Although the majority of students endorsed the value of multidisciplinary models in stroke rehabilitation, Occupational Therapy students consistently demonstrated the highest teamwork perception scores and awareness indices, while Physical Therapy students showed both lower central tendency and greater variability. This aligns with existing literature, which indicates that professional education emphasizing interprofessional collaboration, as commonly found in occupational therapy curricula, fosters not only technical skills but also the interpersonal competencies essential for collaborative practice in complex clinical environments (19). In contrast, physical therapy students' lower scores may reflect limited curricular integration of interprofessional education or fewer structured opportunities for clinical collaboration during their undergraduate training (20).

The moderate positive correlation between teamwork perception and clinical awareness found in this study is clinically significant. It suggests that students who better understand their professional roles within the rehabilitation team are also more likely to value and effectively engage in teamwork, a relationship previously highlighted in international research on interprofessional education outcomes (21). Occupational Therapy students, who had the highest correlation, appear to benefit from more consistent exposure to collaborative models, leading to both higher confidence and knowledge in multidisciplinary care. This finding echo reports by Thistlethwaite et al., who emphasized that repeated interprofessional experiences during training not only increase factual knowledge but also reinforce attitudes and behaviors necessary for team-based rehabilitation (22).

An important gap identified is the limited clinical exposure to stroke rehabilitation among Speech and Language Pathology students, with less than half having direct experience managing stroke patients during their training. This deficit may contribute to the more restricted perceptions of SLPs' roles in conditions such as depression or complex cognitive deficits, where broader understanding and clinical confidence are crucial for patient-centered care. Previous research has noted that without direct interprofessional clinical experiences, students often retain siloed conceptions of professional boundaries, leading to missed opportunities for collaborative intervention and potential gaps in patient care (23).

Barriers such as communication problems, lack of cooperation, and ambiguity in role definition were reported at high rates, especially among SLP students. These findings are consistent with prior studies identifying poor interprofessional communication and lack of mutual understanding as leading contributors to suboptimal outcomes in stroke rehabilitation teams (24). The recognition of professional jealousy and time-consuming meetings as significant issues further underscores the need for structured team leadership and clear delineation of responsibilities within multidisciplinary environments. Evidence from studies in high-functioning stroke units suggests that addressing these barriers through targeted interprofessional training and participatory team-building activities can improve not only collaboration but also clinical outcomes (25).

The pattern of higher awareness and teamwork perception among students exposed to interprofessional education workshops or direct clinical collaboration supports international recommendations for integrating such experiences throughout allied health curricula (26). The World Health Organization and leading accreditation bodies have consistently advocated for early and repeated IPE exposures as a core strategy for enhancing workforce readiness and patient safety (27). The results of this study suggest that targeted reforms in undergraduate training such as joint case

studies, simulation-based team exercises, and mandatory clinical rotations involving all three disciplines may be particularly beneficial for Physical Therapy and Speech and Language Pathology students, helping to address both knowledge and attitudinal gaps.

Purposive sampling and recruitment from a limited number of institutions in Lahore may reduce generalizability. Small sample size, reliance on self-reported data raises the possibility of recall and social desirability bias. Finally, the cross-sectional design precludes causal inference regarding how awareness influences future collaborative behavior. The findings are most applicable to final-year allied health students. Caution should be exercised in extrapolating results to practicing clinicians, students from other regions, or healthcare systems with greater integration of interprofessional education.

CONCLUSION

This study demonstrates that while final-year students in Speech and Language Pathology, Occupational Therapy, and Physical Therapy programs recognize the importance of multidisciplinary team approaches in stroke rehabilitation, there are significant differences in both their preparedness and practical understanding. Occupational Therapy students exhibit the highest levels of teamwork perception and clinical awareness, likely reflecting greater curricular and clinical emphasis on interprofessional collaboration. In contrast, students in Physical Therapy and Speech and Language Pathology programs display more variability and lower overall readiness, with notable gaps in direct clinical exposure and understanding of broader team roles. Persistent barriers including communication challenges, ambiguity in role definitions, and professional competition underscore the ongoing need for structured interprofessional education, joint clinical experiences, and targeted team-building interventions within allied health curricula. Addressing these issues is essential to prepare graduates for effective, patient-centered multidisciplinary rehabilitation, ultimately improving outcomes for individuals recovering from stroke.

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