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Demographic Differences in Teachers' Knowledge of Multi-Tiered System of Supports for Students with Disabilities in Saudi Arabia

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ABSTRACT

Purpose: Despite strong evidence supporting the effectiveness of the Multi-Tiered System of Supports (MTSS) in enhancing students' academic outcomes and reducing behavioral challenges, its successful implementation largely depends on teachers' knowledge and ability to apply its principles. Yet, teachers' knowledge varies considerably, shaped by a range of demographic variables. Therefore, this study aimed to examine demographic differences specifically (gender, specialty, educational qualification, and number of training programs) in teachers' knowledge of MTSS implementation for students with disabilities. **Methodology:** The study adopted a quantitative descriptive design and used multiple statistical techniques for analysis. Data were collected using a simple random sampling method, involving 166 general education teachers and 247 special education teachers working in mainstream schools across Riyadh, Saudi Arabia. **Findings:** The findings of the study revealed significant differences in teachers' knowledge of MTSS based on gender and number of training programs. Male teachers demonstrated higher levels of knowledge than female teachers, and those who had received training reported greater knowledge of MTSS compared to those with no training. In contrast, teaching specialty and educational qualification did not show any significant differences on teachers' knowledge. **Implication for Research and Practice:** Future research may benefit from assessing teachers' knowledge of MTSS through objective measures, such as standardized knowledge tests. Also, the study findings may guide officials to prioritize delivering intensive professional development programs that not only enhance teachers' knowledge and skills but also provide ongoing support, particularly for female teachers.

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Introduction

Inclusion has been internationally recognized as a guiding principle in educational development and is considered fundamental to promoting equal opportunities for all learners. In Saudi Arabia, the recognition of the rights of students with disabilities to learn alongside their peers is embedded within the National Education Development Plan, which underscores the need to guarantee equitable access and provide robust support systems for all students. These national efforts are further aligned with the objectives of the National Transformation Program 2020, reflecting the Ministry of Education's first strategic goal (Ministry of Education, 2021). In line with these reforms, the Education and Training Evaluation Commission (ETEC) has incorporated the Multi-Tiered System of Supports (MTSS) into the National Professional Standards and Career Pathways for Teachers (NPSCPT), ensuring that teachers are equipped with the knowledge and competencies required for its effective implementation (Education and Training Evaluation Commission, 2021).

MTSS establishes a shared framework of action among school's diverse stakeholders to promote the academic and social-emotional development of all students (Nitz et al., 2023). It has gained recognition as a contemporary approach not only for improving positive school experiences and reducing negative educational outcomes (Pullen & Kennedy, 2019), but also for enhancing the overall educational quality through structured, tiered interventions that respond to students varied academic, behavioral, and social-emotional needs (Harn et al., 2015). By integrating evidence-based practices such as Response to Intervention (RTI) and Positive Behavioral Interventions and Supports (PBIS) into a unified model, MTSS has become central to inclusive schools' reforms worldwide (Kozleski & Waitoller, 2010). All interventions within the MTSS framework are expected to be both evidence-based and theoretically grounded (Simonsen et al., 2022; Stoiber & Gettinger, 2015).

Strong evidence supports the effectiveness of the MTSS in enhancing students' academic outcomes, reducing behavioral challenges, and engaging multiple stakeholders to address school-wide issues (Nitz et al., 2023; (Durrance, 2023). Its successful implementation largely depends on teachers' knowledge and ability to apply its principles. Teachers, therefore, serve as the cornerstone of MTSS, as their knowledge is essential for supporting students with disabilities, selecting appropriate strategies, and using data to guide decisions. Yet, such knowledge is not equally distributed among teachers, as it is shaped by various variables (Whitehead-Myers, 2024). Moreover, effective implementation relies heavily on a thorough diagnostic process and strong collaborative teamwork. One of the central elements of this process is teachers, who serve as the cornerstone of MTSS application. So, teachers' knowledge is a decisive factor in determining the system's success, particularly in supporting students with disabilities, applying appropriate instructional strategies, and utilizing data to inform decision-making. Yet, such knowledge is not equally distributed among teachers, as it is shaped by various of variables (Whitehead-Myers, 2024).

Although there is growing global interest in MTSS and increasing policy emphasis on its adoption, limited research has investigated the demographic variables across teachers' knowledge of MTSS for students with disabilities, particularly within the

Middle Eastern context. Most available studies have been conducted in Western settings, where MTSS has been explored from multiple perspectives, including teachers' perceived competence and effective implementation (Stoiber & Gettinger, 2015), self-efficacy (Skinner et al., 2013), stress reduction and behavior management (Majeika et al., 2020), academic improvement (Gage et al., 2013), school climate (Charlton et al., 2020), and reductions in internalizing behaviors (Weist et al., 2018). In Saudi Arabia, only a handful of studies, such as Al-Wazzan and Al-Harkan (2023), have directly examined teachers' knowledge of MTSS, but they have overlooked how demographic characteristics such as gender, specialty, educational qualification, and training participation may shape this knowledge.

This gap highlights the need for research that considers how such variables may shape teachers' understanding of MTSS, particularly within the Middle Eastern context. In the absence of such evidence, professional development efforts risk being overly broad and insufficiently tailored to the needs of specific teacher groups. As a result, students may be deprived of meaningful school engagement and become more vulnerable to negative educational outcomes, including heightened academic difficulties and ongoing behavioral challenges. The current study therefore fills up this research gap and contributes to the existing literature in several ways. First, it provides empirical evidence on how demographic variables including gender, specialty, educational qualification, and participation in training programs shape teachers' knowledge of MTSS in the Saudi Arabian context. Second, it helps identify areas for improvement in teacher preparation and professional development to strengthen the effectiveness of MTSS implementation. Third, the findings offer evidence-based insights to inform the ETEC in designing both pre-service and in-service training programs, guiding the effective allocation of resources, and providing practical recommendations for policymakers.

The significance of the present study lies in addressing this gap by examining the demographic variables that shape teachers' knowledge. Specifically, it investigates how gender, teaching specialty, educational qualification, and the number of MTSS-related training programs may influence teachers' knowledge. This study also aims to examine the differences in teachers' knowledge of MTSS implementation for students with disabilities across demographic variables, gender, specialty, educational qualification, and number of trainings. Accordingly, the following question can be derived: (1) Are there significant differences in teachers' knowledge of MTSS implementation based on demographic variables (gender, specialty, educational qualification, and number of training programs? With the introduction of MTSS in schools, several of such issues have emerged regarding its implementation. This underscores the need for further research to examine the variables that may influence teachers' knowledge of MTSS.

Literature Review

Components of MTSS

MTSS is grounded in several theoretical frameworks that inform its components and support its implementation in schools. From an academic perspective, the RTI model provides the foundation by emphasizing early screening, continuous progress

monitoring, and tiered interventions based on students' responsiveness (Fuchs & Fuchs, 2006). From a behavioral perspective, MTSS is informed by PBIS, which highlights proactive strategies, the explicit teaching of behavioral expectations, and reinforcement systems to promote positive student behavior (Sugai & Horner, 2009).

MTSS is typically organized into three tiers of support (Stoiber & Gettinger, 2015). Each tier provides a distinct level of intervention, with intensity increasing progressively through theses tiers. While MTSS is often designed to address academic and learning-related needs (Runge et al., 2015), it also encompasses supports targeting social–emotional and behavioral developments (Weist et al., 2018). Tier 1 intervention is universal in scope and should reach all students. It was built on evidence-based practices and typically include behavioral strategies grounded in positive reinforcement and constructive consequences, fostering a supportive school climate and promoting social emotional learning. Academic interventions at this tier often emphasize structured instruction, effective classroom management, and differentiated teaching to meet diverse learning needs. For students who do not respond adequately to Tier 1 supports, Tier 2 intervention is provided. It targets approximately 10–15% of students (Huber et al., 2013) and focuses on individualized supports tailored to students' specific needs. Such intervention varies depending on the MTSS model and the student's profile but is consistently guided by objective criteria and diagnostic assessment processes. If Tier 2 support is insufficient, students may require Tier 3 intervention, which typically encompasses 1–5% of the students' population. Tier 3 consists of intensive, individualized supports that address persistent academic difficulties or challenging behaviors. Tier 3 often adopts a systemic perspective, involving specialized, multidisciplinary approaches to ensure that the most complex student's needs are addressed comprehensively (Eagle et al., 2014).

Evidence on the Effectiveness of MTSS Implementation

A growing body of research has demonstrated the effectiveness of MTSS across different forms and educational levels, reporting positive outcomes on a variety of variables. Among the most frequently noted effects are improvements in school and classroom climate (Charlton et al., 2020) as well as reductions in both disruptive behaviors (Nitz, et al., 2023; (Singh et al., 2019) and internalizing behavior problems (McIntosh, et al. 2014). MTSS has also been applied to address emotional and behavioral disorders, such as Attention-Deficit /Hyperactivity Disorder (ADHD), with evidence showing positive effects on the expression of its related symptoms (Dong et al., 2020). Moreover, the interrelationship between academic performance and student behavior has been a central theme in MTSS research. Studies indicate that MTSS models integrating both behavioral interventions and reading instruction yield stronger effects on reading outcomes compared to models that exclude behavioral components (Swanson et al., 2017).

Teachers' knowledge of MTSS Implementation

Despite the obvious evidence suggesting that MTSS is an effective framework for enhancing students' academic and behavioral development, its success relies heavily on

a rigorous diagnostic process and strong collaborative teamwork. As a result, teachers' knowledge of MTSS plays an important role, as it directly shapes the fidelity of implementation and the extent to which the system achieves its intended outcomes. In light of its significance, several empirical studies have attempted to investigate teachers' knowledge of MTSS. For instance, Al-Wazzan and Al-Harkan (2023) conducted a study in Saudi Arabia that examined special education teachers' knowledge of MTSS. Using a descriptive design, the study surveyed 98 teachers (55 males and 43 females) and found that their overall knowledge level was moderate. Another study that investigated knowledge of MTSS reported that special education teachers had greater confidence and knowledge of intervention practices compared to general education teachers (McIntosh et al. 2014).

Almutairi and Alasiri (2024) have investigated teachers' knowledge of RTI among 152 elementary school teachers (64 males and 88 females). The findings indicated that teachers generally demonstrated a moderate understanding of RTI as a system for identifying and supporting students with learning disabilities. While no significant differences in knowledge were observed across gender, specialty, or academic qualification, teaching experience emerged as an influential variable, with teachers who had more than ten years of experience showing higher levels of knowledge compared to less experienced teachers. Similarly, Nasim et al. (2024) reported no significant gender-based differences in MTSS knowledge and practices among teachers in Pakistan, whereas Alsulaiman (2023) found that Saudi teachers holding postgraduate degrees demonstrated significantly deeper knowledge of MTSS principles compared to those with bachelor's degrees.

A recent study focused on instructional intensifications for reading interventions by Donegan et al. (2025) surveyed 81 K–12 teachers to examine their self-reported knowledge, perceived feasibility, and effectiveness of the methods outlined in a taxonomy of Intervention Intensity. The findings revealed that although teachers generally considered themselves knowledgeable about instructional intensification methods and recognized their usefulness in supporting student progress, they expressed concerns about feasibility in practice.

Furthermore, a scoping review synthesized the emerging body of empirical research on professional learning for MTSS, analyzing 79 studies that employed a range of research designs (Castillo et al., 2022). The outcomes assessed commonly focused on teachers' knowledge, skills, and dispositions, as well as the fidelity of MTSS implementation; however, few studies examined teachers' knowledge in relation to contextual factors that facilitate or hinder effective implementation. Building on this, Donegan et al. (2025) identified a lack of resources, such as funding, staff, and instructional materials as a major challenge reported by teachers when implementing intensive interventions. Yet, despite these valuable contributions, which focus on external variables like the school environment, a notable gap remains in the literature regarding the internal variables -such as demographic variables like gender, specialty, educational qualification, and participation in training programs. This highlights a critical gap in the literature and underscores the need for further investigation into how teachers' knowledge of MTSS differs across key demographic variables, which can help inform key barriers to the effective implementation of MTSS.

Methodology

Research Design

A quantitative descriptive design was employed to investigate the differences in teachers' knowledge regarding the implementation of MTSS for students with disabilities. This approach was deemed appropriate for the phenomenon under study, as it enables the collection and analysis of numerical data to achieve the study's objectives. A questionnaire served as the primary tool for data collection and analysis.

Sampling Technique

A total of 413 teachers were selected through random sampling to participate in the study. All participating teachers work in mainstream schools located in Riyadh, Saudi Arabia. The study instrument was administered during the third semester of the 2023/2024 academic year. Table 1 shows the characteristics of the study participants.

Table 1

Demographic participants' characteristics (n = 413)

Variables	Categories	No.	Percentage
Gender	Male	114	27.6%
	Female	299	72.4%
	Total	413	100%
Educational qualification	Bachelor's degree	340	82.3%
	Postgraduate' degree	73	17.7%
	Total	413	100%
Specialty	General education teacher	166	40.2%
	Special education teacher	247	59.8%
	Total	413	100%
Number of training programs	None	242	58.6%
	≤ 3 programs	84	20.3%
	> 3 programs	87	21.1%
	Total	413	100%

Survey Instrument

A review of the relevant literature (Guest et al., 2024; Morrison et al., 2014; Norton, 2022; Sailor et al., 2020) revealed a limited number of instruments for assessing teachers' knowledge of MTSS implementation. To address this gap and meet the study objectives, the authors of this present study developed a new questionnaire designed to examine teachers' knowledge to apply MTSS. The instrument is structured into two main sections. The first section provides an overview of the study and its objectives, a definition of MTSS, and a consent statement regarding the use of data for research purposes. It also collects key demographic variables, including gender, specialty (general or special education teachers), educational qualification (bachelor's degree vs. postgraduate' degree), and the number of training programs. The second section consists of 15 items specifically constructed to measure teachers' knowledge of MTSS implementation. These items address key

components, such as the tiered framework and its requirements, the RTI and PBIS models, instructional strategies, student progress monitoring, relevant legislation, and collaboration with colleagues and parents.

Teachers responded to the questionnaire items using a five-point Likert scale ranging from *strongly agree (5)* to *strongly disagree (1)*. To ensure the clarity of the questionnaire, a pilot study was conducted with 22 teachers working in mainstream schools. The pilot aimed to evaluate the comprehensibility of the items and to obtain feedback on language and content. Based on the responses, one item was removed and several others were revised to improve clarity and ensure better understanding among. The questionnaire scores were estimated as follows: Knowledge level: very low (1.00–1.79), low (1.80–2.59), moderate (2.60–3.39), high (3.40–4.19), and very high (4.20–5.00).

Reliability and validation

To evaluate the psychometric properties of the questionnaire, Cronbach's alpha was calculated to assess reliability using responses from 83 teachers, who were later excluded from the main study sample. The results indicated the teachers' knowledge of MTSS dimension achieved a coefficient of $\alpha = 0.933$. Validity was examined through two approaches. First, content validity was established by academic experts who reviewed the instrument measuring teachers' knowledge toward MTSS implementation. They confirmed the clarity of the items, dimensions, and instructions, suggesting only minor revisions that were subsequently incorporated before the final review. Second, internal consistency was tested using Pearson correlation coefficients, which ranged from 0.438 to 0.807 and were statistically significant at the 0.01 level, thereby confirming the internal validity of the questionnaire (Cronbach & Shavelson, 2004).

Data Collection

Ethical approval for this study was obtained through the University's Deanship of Scientific Research and the Standing Committee for Scientific Ethics. Approval was also granted by the Ministry of Education in Saudi Arabia via the Education Policy Research Centre (Approval No. 1129299). Subsequently, school principals in Riyadh were contacted and provided with information regarding the research objectives and purpose. Through the principals, the electronic questionnaire was distributed to teachers using a Google Forms survey. Online surveys offer distinct advantages in data collection speed and ease of response compared with traditional face-to-face or paper-based survey formats (Zeleke et al., 2021). The questionnaire included comprehensive information of the research purpose to ensure that participants are fully informed. Completing the questionnaire was voluntary, and participants provided informed consent prior to participation, with the option to withdraw at any time. Reminder messages were sent weekly to school principals for two months, resulting in 413 responses from teachers.

Data Analysis

Non-parametric statistical analyses were employed following the confirmation of non-normal score distribution, as determined by the Kolmogorov-Smirnov and Shapiro-Wilk tests. To determine the significance of differences in teachers' knowledge levels based on

the study variables (gender, educational qualification, specialty, and number of training programs), the study used the Mann-Whitney U and Kruskal-Wallis tests.

Results

Demographic Comparisons of Teachers

Gender

Table 2 presents the results of the Mann-Whitney U test, conducted to examine gender-based differences in teachers' knowledge of MTSS implementation for students with disabilities. The results indicate a statistically significant difference between male and female teachers at the 0.01 significance level, Z = −3.930, p = .001. The results reveal that gender is a significant variable, showing differences in teachers' knowledge of MTSS. The mean rank for male teachers was 244.33, while that for female teachers was 192.77, indicating that male participants demonstrated significantly higher levels of MTSS knowledge compared to their female teachers. Hence, the gender did significantly affect teachers' knowledge of MTSS.

Table 2

Mann-Whitney U test results for differences in knowledge according to gender

	Gender	N	Mean Rank	Sum of Ranks	Z	Sig.
Knowledge	Male	114	244.33	27,853.50	−3.930	.001
	Female	299	192.77	57,637.50		

Teachers' Educational Qualification

A Mann-Whitney U test was conducted to determine whether there is a statistically significant difference in teachers' knowledge of MTSS implementation between educational qualification groups (Bachelor's degree vs. Postgraduate degree). The analysis revealed no statistically significant difference in MTSS knowledge between the two groups at the 0.05 significance level, Z = −1.879, p = .060. Teachers holding a bachelor's degree had a mean rank of 201.89, while those with a postgraduate's degree had a slightly higher mean rank of 230.79. Although teachers with a postgraduate's degree demonstrated somewhat higher levels of MTSS knowledge, the difference did not reach statistical significance. Hence, teachers' educational qualifications did not yield any significant differences in their knowledge of MTSS.

Teachers' Specialty

The Mann–Whitney U test was also used to compare special education teachers and general education teachers to determine whether there was a significant difference in their knowledge of MTSS implementation based on specialty. The results revealed that special education teachers showed a higher mean rank **(**216.29**)** compared with general education teachers **(**193.18). The Z value was −1.932, with a significance level (p-value) of .053, which is slightly above the conventional threshold of 0.05. This indicates that, although special education teachers demonstrated somewhat higher levels of MTSS knowledge, the

difference between the two groups was not statistically significant. This result indicates that teachers' specialty did not lead to significant differences in their knowledge of MTSS.

Number of Training Programs

Table 3 displays the results of the Kruskal-Wallis H test, which was conducted to determine whether there were statistically significant differences in teachers' knowledge of the MTSS based on the number of training programs attended. Teachers were categorized into three groups: no training (n = 242), three or fewer training programs (n = 84), and more than three training programs (n = 87). The results indicated a statistically significant difference in teachers' knowledge. Post-hoc comparisons using the Mann–Whitney test was also conducted, and the results revealed statistically significant differences at the 0.01 level between the mean rank scores of the group (no training received) and the group (three or fewer than three training programs), in favor of the latter.

Similarly, statistically significant differences at the 0.01 level were found between the group (no training received) and the group (more than three training programs), in favor of the latter. However, no statistically significant differences were observed between the group (three or fewer than three training programs) and the group (more than three training programs). Teachers who had received more than three training programs scored the highest, with a mean rank of 257.98. These results suggest that teachers who received training demonstrated greater knowledge of MTSS compared to those with no training, highlighting the importance of sustained and comprehensive professional development in enhancing educators' understanding and implementation of MTSS.

Table 3

Kruskal-Wallis test results for differences in knowledge according to number of training programs

	Number of trainings	N	Mean Rank	Values of the Kruskal-Wallis Test	Sig.
Knowledge	No Training	242	175.03	42.461	.001
	≤ 3 programs	84	246.30		
	> 3 programs	87	257.98		
	Total	413			

Discussion

The study aimed to examine the differences across demographic variables such as gender, specialty, educational qualification, and number of training program in teachers' knowledge of MTSS implementation for students with disabilities. In terms of the outcomes associated with gender, the results reveal that gender is a significant variable showing differences in teachers' knowledge of MTSS. Male teachers demonstrated higher knowledge levels than female teachers. This finding contradicts with the results of Nasim et al. (2024) and Almutairi and Alasiri (2024), who reported no significant gender-based differences in teachers' knowledge. This discrepancy can be attributed to a couple of possible explanations, such as male teachers may have more years of teaching experience than female teachers, which contribute to greater familiarity with MTSS principles. Experience often enhances professional intuition and practical knowledge, potentially

giving these teachers an advantage in applying MTSS strategies. Another possible explanation lies in cultural or institutional factors that may shape how male and female teachers engage with training and apply MTSS principles in practice.

In contrast to findings of earlier studies by McIntosh et al. (2014), which reported that special education teachers demonstrated deeper knowledge of MTSS than their general education teachers, the present study found no significant differences in teachers' knowledge of MTSS by specialty. This aligns with more recent research by Almutairi and Alasiri (2024), who also found no significant differences based on specialty. This indicates that both general and special education teachers possess comparable levels of understanding regarding MTSS implementation. These findings can be viewed positively, as they suggest that professional development opportunities related to MTSS have become more widespread and accessible to both general and special education teachers. This is evidenced by the ETEC incorporating MTSS into the NPSCPT, a move that ensures all teachers are equipped with the necessary knowledge and competencies for effective implementation.

Contrary to the findings of Alsulaiman (2023) and Polirstok and Hogan (2024), who reported that teachers with postgraduate degrees demonstrated deeper knowledge of MTSS implementation, the current study found no significant difference between teachers holding bachelor's and postgraduate degrees in their knowledge of MTSS. This result also in disagreement with Alsedrani (2018), who found that advanced education positively correlates with the application of evidence-based practices. One possible explanation for this discrepancy is that postgraduate programs in other contexts may have explicitly incorporated MTSS-related content, whereas in the present context, the exposure to such content may be similar across both undergraduate and postgraduate programs. Another explanation might lie in differences in measurement tools or sample characteristics across studies.

Furthermore, the current study revealed a significant difference in teachers' knowledge of MTSS based on the number of training programs attended, with those who attended training programs demonstrating higher levels of knowledge. This is a logical finding, as it aligns with previous research by McIntosh et al. (2014), which indicated that teachers who engaged in MTSS-focused training developed a deeper understanding of the system's principles and were better prepared to implement them effectively in classroom settings. Similarly, Al-Wazzan and Al-Harkan (2023) emphasized that inadequate training opportunities limit teachers' ability to apply MTSS practices effectively. Taken together, these studies highlighted clear differences in knowledge levels between teachers who received training and those who did not. These findings underscore the importance of continuous professional development, particularly when it includes follow-up and performance evaluation, as such practices that enhance teachers' self-confidence and their ability to implement MTSS strategies with flexibility and consistency. According to earlier studies, teachers who participate in comprehensive professional development programs demonstrate higher levels of confidence and professionalism, especially when working with students with disabilities. Ongoing training and support are therefore essential not only for sustaining teacher motivation but also for overcoming barriers to implementation (Durrance, 2023; Freeman et al., 2016; Taylor et al., 2022).

Conclusion, Limitations, Future Research and Implications

This study was conducted in Riyadh, Saudi Arabia, with a sample of 413 mainstem teachers to investigate their knowledge of MTSS implementation for students with disabilities across demographic variables, such as gender, specialty, educational qualification, and number of training programs. The results indicate statistically significant differences in teachers' knowledge based on gender and the number of training programs attended. Specifically, male teachers reported higher levels of MTSS knowledge than their female counterparts, and those who had participated in several training sessions demonstrated greater knowledge. Conversely, no significant differences were found in relation to educational qualification and teaching specialty.

Earlier research has investigated MTSS from multiple perspectives, including the relationship between teachers perceived competence and effective implementation, self-efficacy, stress reduction and behavior management, academic achievement, school climate, and reductions in internalizing behaviors. However, it is important to note that much of this research has primarily focused on specific components of MTSS, such as RTI and PBIS, rather than on teachers' overall knowledge of MTSS as a comprehensive framework. Yet, despite these valuable contributions, a notable gap remains in the literature regarding demographic variables like gender, specialty, educational qualification, and participation in training programs. This highlights a critical gap in the literature and underscores the need for further investigation into how teachers' knowledge of MTSS differs across key demographic variables, which can help inform key barriers to the effective implementation of MTSS. The present study addresses this gap by exploring these differences, thereby contributing to the existing body of knowledge, particularly within the Saudi Arabian context.

Certain limitations should be acknowledged, as they may have influenced the outcomes of this research. First, the generalizability of the findings is restricted by the geographic and cultural context of Saudi Arabia. The study was conducted exclusively in Riyadh, a region with relatively extensive educational services and access to professional training, which may limit the applicability of the results to less-resourced areas. Second, the reliance on self-report surveys to assess teachers' knowledge presents another limitation, as such measures may be subject to bias or overestimation. Future research could address this by incorporating objective assessments, such as standardized knowledge tests or performance-based measures, to provide further evaluation of teachers' actual ability to apply MTSS principles effectively.

According to the study findings, educational authorities in Saudi Arabia such as the Ministry of Education and the ETEC can leverage these results at two levels. At the first level, MTSS-related content should be systematically embedded within teacher preparation curricula in university or colleges of education, ensuring that both general and special education majors are adequately educated. At the second level, the ETEC should prioritize delivering intensive professional development programs that not only enhance teachers' knowledge and skills but also provide ongoing support, particularly for female teachers. This recommendation is especially relevant given the ETEC's role in incorporating MTSS into the NPSCPT. Such integration would ensure that teachers are

equipped with the competencies required for the effective implementation of MTSS across diverse educational settings.

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