

Teacher Preparedness Concerning Autism Spectrum Disorder (ASD) in Jazan Region, Saudi Arabia: A Cross-Sectional Study

Abstract

Background.

Autism Spectrum Disorder (ASD) is a multifaceted neurodevelopmental condition characterized by distinct behavioral patterns, impaired social interaction, and communication challenges. Recognizing ASD early and implementing appropriate interventions are pivotal for improving outcomes. This study aims to comprehensively evaluate the understanding, attitudes, and teaching methodologies of kindergarten and primary school teachers in the Jazan region, Kingdom of Saudi Arabia, regarding children with ASD.

Methodology.

Utilizing a multistage cluster random sample technique, this cross-sectional study employed an interview-based questionnaire among kindergarten and primary school teachers in the Jazan region, Kingdom of Saudi Arabia. The sample size was determined to include 800 teachers.

Results.

Of the 870 participating teachers, a significant 87.8% reported lacking prior training on effectively addressing the needs of ASD children. However, an encouraging 74.8% demonstrated a substantial understanding of the social communication difficulties (problems understanding what other people mean) faced by autistic children, while 76.2% were aware of the challenges ASD children encounter in maintaining attention. Furthermore, a noteworthy 77.7% of participants recognized the pivotal role of open communication between teachers and families in facilitating quality educational experiences and enhancing academic outcomes for students with ASD.

Conclusion.

The study highlights the critical need for targeted training programs tailored to equip teachers with essential skills for supporting students with ASD. These findings underscore the importance of policy interventions to ensure adequate resources and expertise for effectively accommodating the unique needs of students with ASD in mainstream schools.

Keyword.

Autism Spectrum Disorder; Teacher Preparedness; Early Signs of ASD; ASD Knowledge; Teachers' Attitudes; Jazan Region; Saudi Arabia.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that typically manifests by the age of two years, [profoundly affecting an individual's behavior](#) ~~leaving a life-lasting impact on affected individual's behavior~~, social interaction, communication skills, and learning abilities ((NIMH 2024; Saudi_MOH 2021). This intricate condition is believed to be influenced by a combination of genetic and environmental factors(WHO 2023). While significant advancements

41 have been made in improving the symptoms and functioning of individuals with ASD, achieving
42 positive outcomes necessitates early diagnosis and targeted interventions ((Helt et al. 2008; Posar
43 & Visconti 2019) .
44

45 In this context, kindergarten and primary school teachers emerge as pivotal figures. Their
46 familiarity with ASD not only aids in early identification but also supports parents in navigating
47 the diagnostic and intervention landscape ((Khan et al. 2020) . Globally, the World Health
48 Organization (WHO) estimated that one in every 100 children experiences ASD ((WHO 2023).
49 On the other hand, Centers of Disease control and prevention declared that ASD increased in the
50 US among 8-years-old children from 1/150 in 2000 to 1/36 in 2018 (CDC 2023). This prevalence
51 of ASD is escalating, with males being affected more frequently than females at a ratio of 4.5 to
52 1(Khan et al. 2020). Arab Gulf countries, including Saudi Arabia, witnessed an increase in ASD
53 incidence from 1.4 to 29 per 10,000 people in 2014 (Salhia et al. 2014). In Saudi Arabia, a study
54 in the western region reported an ASD prevalence of 2.81 per 1000 children, as estimated from
55 the numbers treated in the ASD centers. However, the actual prevalence is believed to be around
56 42,500, reflecting a challenge attributed to the limited number of ASD centers in the country
57 (Sabbagh et al. 2021).
58

59 Early identification of ASD ~~has proven to be instrumental in~~is crucial for facilitating timely
60 interventions, ~~thereby enhancing which can significantly improve~~ developmental outcomes for
61 ~~enhancing developmental outcomes for~~ children diagnosed with ASD (Gabbay-Dizdar et al.
62 2022; Okoye et al. 2023) . ~~Research underscored the significance of early diagnosis, with studies~~
63 ~~affirming that identifying and treating ASD early can lead in some instances to the resolution of~~
64 ~~developmental challenges by adulthood~~ ~~Research underscored the significance of early~~
65 ~~diagnosis, with studies affirming that identifying and treating ASD early can lead to the~~
66 ~~resolution of developmental challenges by adulthood~~((Anderson et al. 2014; Bajko & Bazgan
67 2017; Steinhausen et al. 2016).
68

69 Despite the potential benefits of early intervention, research reveals a concerning gap in ASD
70 knowledge among teachers, impacting the chances of timely intervention (Al-Hendawi et al.
71 2023; Darling-Hammond & Berry 2006; Fleury et al. 2014). Furthermore, the academic
72 achievement of autistic children is intricately linked to communication, social, and behavioral
73 difficulties, presenting formidable obstacles in school settings ((Grimm et al. 2018).
74 In some areas of the world studies on teacher awareness of ASD have demonstrated varying
75 levels of knowledge. In India, 95.7% of teachers were aware of ASD, while awareness levels
76 were lower in Nigeria (66%) and Pakistan (71.2%), indicating a need for improvement in some
77 regions. These findings underscore a trend of inadequate awareness among teachers regarding
78 the needs of children with ASD and effective strategies for addressing those needs. (Ayub et al.
79 2017; Paul & Gabriel-Brisibe 2015; Shetty & Rai 2014) . (Paul and Gabriel-Brisibe 2015; Shetty
80 and Rai 2014).

81 ~~Teachers attitude towards the inclusion of autistic children in schools although mostly positive~~
82 ~~but more research is needed in this area as well as extensive training for them ((Russell et al.~~
83 ~~2023).~~

84
85 In Saudi Arabia, studies conducted in the Al-Qassim (central) and Jeddah (west) regions reported
86 ASD knowledge levels among teachers at 48.7% and 58%, respectively. These studies
87 emphasized the substantial influence of teachers' attitudes, education levels, and interactions with
88 children with autism on their understanding of ASD (Alharbi et al. 2019; Khalil et al. 2020).
89 However, the southern region, particularly Jazan, which is also a frontier region adjacent to
90 Yemen, remains unexplored in this context, rendering this study unique in its contribution.

91
92 Given the pivotal role teachers play in shaping a child's educational journey, understanding their
93 knowledge, attitude, and practices regarding ASD is paramount. ~~Even in the US a recently~~
94 ~~recent master thesis in the United states conducted a systematic review -published master degree~~
95 ~~thesis showed through a systematic review emphasized~~ -the need for better -teachers'
96 preparedness ~~to deal with~~in supporting the autistic children (Gallardo 2024). ~~While teachers~~
97 ~~generally have a positive attitude towards the inclusion of autistic children in regular schools;~~
98 ~~further research and extensive training are necessary to enhance their ability to effectively~~
99 ~~accommodate autistic students (Russell et al. 2023).~~

100
101 This study aimed to fill the existing gap by assessing teachers' knowledge of early ASD signs,
102 identifying common misconceptions, evaluating attitudes toward children with ASD, and
103 understanding the methods employed by teachers to address the needs of this population in the
104 Jazan region, Saudi Arabia. Through this exploration, the study aspired to shed light on the state
105 of teacher preparedness concerning ASD in a region where this aspect has not been
106 comprehensively studied, offering valuable insights for future educational strategies and
107 interventions.

108 109 **Materials & Methods**

110 **Study design, sitting, period, and sampling technique.**

111 ~~In Saudi Arabia, governmental schools are gender-segregated from the first grade, with boys and~~
112 ~~girls attending separate schools. Children diagnosed with ASD typically enroll in special~~
113 ~~education schools. However, our study focuses on mainstream governmental schools, where~~
114 ~~autistic children may remain undiagnosed and unidentified.~~

עיצוב:ססן

115 ~~The governmental schools in Saudi Arabia are separated into male and female schools from the~~
116 ~~first primary. The diagnosed autistic children are usually sent to specialized schools for studying.~~
117 ~~Our study is considering the governmental schools where undiagnosed autistic children are.~~

118
119 We conducted a cross-sectional study in the Jazan Region, situated in the far southwest of the
120 Kingdom of Saudi Arabia, spanning the period from January to April 2023. Jazan Region is one

of the 13 Regions of Saudi Arabia. Jazan Regions has a homogenous population structure. ~~Although of that~~ Nevertheless, our research design employed a meticulous multistage cluster random sampling technique we employed a rigorous multistage cluster random sampling to ensure a comprehensive and representative sample.-

In the initial phase, five governorates—namely, Jazan, Abu Arish, Samta, Al-Ardah, and Al-Ahad—were randomly selected from the 16 governorates comprising the Region. Subsequently, a second stage involved the random selection of four male ~~schools~~ and four female schools from both kindergarten and primary schools within each chosen governorate. Finally, in the third stage, we invited all available teachers in each school to participate in the study. This comprehensive approach ensures a representative sample by strategically selecting clusters and then employing random sampling within those clusters. Moreover, the inclusion of both genders and various age groups from kindergarten and primary schools enhances the diversity of the sample.

Sample size calculation

We used the Raosoft sample size calculator to calculate our sample size (Raosoft 2004). With a total population of approximately 20,000 teachers in kindergarten and primary schools within the Jazan region, a 3% margin of error, and a 90% confidence level, the calculated sample size stood at 725. In anticipation of potential nonresponses, we increased the minimal required sample size to be 800. This proactive approach enhances the study's reliability and ensures that the findings are both statistically sound and resilient (Toepoel & Schonlau 2017).

Participants

We visited the randomly chosen schools, interviewed all teachers, and explained the purpose of the research. Those who ~~aecepted~~ agreed to participate in the study completed our anonymous interview questionnaire after verbally obtaining informed consent.

Study tools

We used an interview-based questionnaire crafted in Arabic in Google Forms. This comprehensive tool delved into various aspects, including teachers' knowledge of early ASD signs, their perceptions of common misconceptions, attitudes toward children with ASD, and the strategies they used to employ to meet the needs of this specific population. The initial set of questions was adapted from a prior study conducted in 2017 (Alyami et al. 2022) and underwent meticulous modifications to align with the characteristics of our target population.

We developed the questionnaire in four sections. The first section was ~~ecollecting-related to~~ the demographic data of the participant teachers, including their age, gender, marital status, having children, living in ~~a~~ city or urban area, highest degree, ~~and~~ getting scholarships or not. The second section was designed to collect general information about autism including their knowledge about it, where did they get their knowledge, having ~~an~~ autistic child or a relative with ASD, how they consider ASD and its relation to family history, vaccination, etc. The third

section was collecting data about the early signs that would appear ~~on~~in reference to the autistic children. ~~While the~~The fourth section was designed to find ~~out~~ what approaches the teachers used ~~d in dealing with the~~when teaching children with ASD.

We added four ~~confusing~~ questions that were intended to add ~~a commendable~~ layer of depth to the understanding of teachers' knowledge about ASD. By exploring aspects that are subject to ongoing discussions, the study not only assessed the current awareness of teachers but also acknowledged the dynamic and evolving nature of our understanding of ASD. This approach provided a nuanced perspective on the challenges in establishing consensus on certain aspects of ASD within the educational context, contributing to a more comprehensive evaluation of teachers' knowledge in this critical area.

In order to assess the practicality and efficiency of the interview-based approach, we conducted a pilot study involving 30 participants (results not included). The primary objectives of the pilot study were to evaluate the relevance of the questions and determine the time required for efficient data collection. Drawing insights from the pilot study, we made the necessary adjustments to refine the questionnaire, ensuring clarity and pertinence.

Statistical analysis

The collected data underwent rigorous analysis utilizing the Statistical Product and Service Solutions (SPSS) software version 27. Descriptive statistics, encompassing mean, standard deviation, frequencies, and percentages, were employed to provide a comprehensive overview of both quantitative and categorical variables. In order to discern variations among participants, the T-test was used to compare differences between two categories of independent variables. For independent variables with more than two categories, a one-way Analysis of Variance (ANOVA) was conducted to assess differences among the groups. Following a significant ANOVA result, post hoc pairwise comparisons were performed using the Bonferroni correction to control for multiple comparisons and minimize the risk of Type I errors. This approach ensures that the observed differences between groups are statistically rigorous and reliable. The predetermined significance level was set at $P < 0.05$, with results reported alongside a 95% confidence interval (CI) to underscore both statistical significance and precision.

Ethical Consideration

Prior to initiation, the study received thorough scrutiny and ethical approval from the Research Ethics Committee (REC) at Jazan University, denoted by reference number REC-44/06/460. This ethical endorsement ensured the study's alignment with ethical guidelines and principles. Informed consent forms, meticulously outlining the study's purpose and procedures, were provided to participants. Participants demonstrated their voluntary agreement by reading, comprehending, and verbally accepting the terms stipulated in the informed consent forms.

Participants were explicitly informed of their right to abstain from participation or withdraw from the study at any juncture, emphasizing the principle of voluntary participation. To

safeguard participant confidentiality and privacy, stringent measures were implemented. The collected data were anonymized, securely stored, and access was restricted to the research team, reinforcing the commitment to upholding the welfare and rights of study participants throughout the entire research endeavor. All data will be stored in a password secured file on the principal investigator computer for 5 at least 5 years as requested by the ethical committee.

Results

Table 1 provides a snapshot of the demographic characteristics of the 870 teachers who participated in this study. Their average age was 42.3 years (± 6.9 SD), and their collective teaching experience averaged 16 years (± 7.6 SD). A significant majority (78.6%) of teachers were familiar with the term "Autism." Regarding their sources of knowledge on Autism Spectrum Disorder (ASD), 27.9% mentioned television, 25.5% cited friends, and the highest percentage (41.7%) identified social media as their primary source of information on ASD.

Table 2 presents findings on teachers' general knowledge about ASD and recognition of its early signs in autistic children. More than half of the participants (51.5%) correctly acknowledged that autistic children are not mentally disabled. Regarding perceived risk factors, 71.7% associated electronic devices with ASD, while 14.4% linked early-age vaccination to ASD. Furthermore, 37.1% considered the way the family raise their children as a potential influencing factor, and 59.7% believed that autistic children can be cured. Exploring these additional points provide deeper insights into teachers' beliefs, enriching the overall findings of the study.

In the second part of Table 2, we presented a detailed examination of teachers' awareness regarding early signs of ASD. All indicators listed in this section were acknowledged by teachers as significant early signs of ASD. Notably, a substantial percentage of teachers demonstrated a high level of awareness, with 76.2% recognized attention deficit as a crucial early sign, and 74.8% acknowledged the importance of communication deficits. However, there were variations in awareness levels, with 49.3% recognized the challenges autistic children face in expressing their feelings, and 42.2% recognized the sensory issues.

Table 3 demonstrates some believes of the Jazan teachers regarding ASD. More than half of the teachers (65.2%) believed that autistic children have higher skills than their peers although most of them (64.8%) believed that those children have name response deficit as a sign of ASD. On the other hand, half of the teachers believed that regular school environment is not suitable ~~to~~ deal-withfor autistic children.

Regarding the teachers' abilities and methods they use ~~in-dealing-with~~when teaching autistic children, such as creating an educational plan and using suitable methods for their abilities. ~~We,~~

242 ~~we~~ discovered that 87.8% of the teachers did not receive any prior training on how to ~~deal~~
243 ~~with~~~~teach~~ autistic children. Moreover, 72.3% of the teachers believed that regular schools do not
244 provide activities ~~that~~ are in line with the abilities of children with ASD. In addition, more than
245 half of the participants (59.1%) indicated that regular schools in the region lack specialized
246 assistants to deal with ASD children (results not presented in tables).

247
248 We employed a one-way ANOVA analysis as well as the T-test to compare the effect of each of
249 the variables; gender, marital status, having a child with ASD, and having a relative with ASD,
250 and latest qualification of the teachers on three components; ~~the~~ Knowledge About ASD,
251 Knowledge about Early Signs of ASD, Ability and methods in dealing with autistic Children
252 (table 4).

253
254 The scores of each component were created as the sum of the items constructing that component.
255 Higher scores referred to more knowledge or more ability in dealing with autistic.
256 The result displayed in Table 4 revealed that single teachers ~~were having~~~~have~~ more knowledge
257 about ASD compared to other teachers, However the difference was statistically not significant
258 ($P = 0.222$). Moreover, the knowledge about ASD was higher among teachers with higher
259 educational ~~level~~~~levels~~ ($P < 0.001$). Exploring these additional points provide deeper insights
260 into teachers' beliefs, enriching the overall findings of the study.

261
262 Furthermore, the ~~result show that the level of knowledge about early signs of ASD for the male~~
263 ~~teacher had the average value 15.80 with SD= 3.5 higher than female average scores 15.2 with~~
264 ~~SD=3.7. Similarly, for the component “Teachers’ Ability in dealing with autistic children” the~~
265 ~~male teachers indicate results show that the male teachers' level of knowledge about early signs~~
266 ~~of ASD was 15.80 on average with SD=3.5. The female average scores were 15.2 with SD=3.7.~~
267 ~~Similarly, for the component “Teachers’ Ability in dealing with autistic children,” the male~~
268 ~~teachers indicated~~ increasing ability compared to the female teachers ($P = 0.006$, 95% CI [12.8,
269 13.2]).

270
271 ~~On the other hand, t~~The results in ~~table~~~~Table~~ 4 show that a single teacher is more likely to have
272 more knowledge about early signs of ASD compared to ~~a~~ divorced teacher ($P = 0.027$).

273
274 In addition, among those teachers who having a relative with ASD the result revealed that they
275 have significantly more knowledge about ASD, about early signs of ASD and better ability to
276 dealing with autistic children compared to teachers without having relatives with ASD ($P < 0.001$,
277 95% C.I [17.7,18.4], $P = 0.001$, 95% C.I. [15.8,16.7], $P < 0.001$, 95% C.I [13.0,13.5], respectively).

278
279 Moreover, it is found that, the higher the education levels of the teachers the more his/her
280 knowledge about ASD and more knowledge about early sign ASD and better ability in dealing
281 with autistic children ($P < 0.001$, $P < 0.001$, $P = 0.025$ respectively).

Discussion

Our study shed light on significant deficiencies in the general understanding of ASD among kindergarten and primary school teachers, particularly in the Jazan region in the far southwest of Saudi Arabia. Although the prevalence of ASD is alarming all over the world and increasing than expected in some areas in the world who have good statistics for the disease (CDC 2023), only a small fraction of the teachers in Jazan (14.7%) recognized ASD as an organic neurodevelopmental disease (Kim 2015), with a substantial percentage (38.6%) demonstrated unclear comprehension of the topic. Furthermore, a concerning misconception emerged, with nearly one-fifth (19.3%) of teachers linking autism with mental retardation, although it is not (Ghosh & Gorakshakar 2009; Melvin et al. 2022). These findings underscore a widespread lack of accurate knowledge and misconceptions surrounding ASD among educators in Jazan (table 2).

This pattern of insufficient awareness among teachers mirrors similar studies conducted across the Kingdom of Saudi Arabia. For instance, a 2019 study in the Al-Qassim region highlighted comparable deficits in teacher understanding of ASD, suggesting a systemic issue transcending regional boundaries which did not change between 2013 and 2022 (Alharbi et al. 2019; Alobaid & Almogbel 2022). Recognizing these knowledge gaps, we sought to enhance the robustness of our study by increasing the sample size, motivated by the imperative to address these pervasive misconceptions.

In our investigation into teachers' perceptions of ASD risk factors, a significant majority (71.7%) identified electronic devices as potential contributors to ASD development (table 2). This finding resonates with a study conducted in Saudi Arabia, where more than half of the participants (55.4%) supported the idea that limiting electronic device usage among children could aid in treating or preventing ASD (Khalifa et al. 2023). This alignment underscores the widespread concern regarding electronic device usage as a perceived risk factor for ASD among educators in Saudi Arabia (Alrahili et al. 2021).

Some beliefs are even dangerous like the fake belief linking child vaccination with the development of ~~the~~ ASD (Baird et al. 2008; Gabis et al. 2022; Taresh et al. 2020). On comparing our results to an Australian study, our own showed a concerning disparity in beliefs regarding child vaccination and its association with ASD. While the Australian study showed a 3% agreement with the notion of vaccines as a risk factor for ASD, our study revealed a significantly higher percentage (14.4%) of participants attributing ASD development to vaccination, with an additional 38% expressing uncertainty on this matter (table 2). This discrepancy underscores the urgent need for comprehensive education and awareness initiatives, particularly targeting teachers who play a pivotal role in shaping community perceptions and understanding of ASD risk factors (Jones et al. 2021).

322

323 On the other hand, although diet can play a role in managing ASD (Alam et al. 2023; Hartman
324 and Patel 2020), Most of our teachers (51.5) did not know that. This goes in agreement with
325 another study conducted in KSA in 2023, where [a](#) high percentage of participants (47.3) didn't
326 know anything about using diet for managing ASD (Alam et al. 2022). Furthermore, our
327 findings indicated a troubling misconception among a notable portion (37.1%) of teachers who
328 erroneously believe that family interactions may predispose [them](#) to ASD (table 2). While family
329 dynamics undoubtedly influence child development, it is crucial to clarify that ASD is a
330 multifaceted condition with genetic, environmental, and neurological components. Educating
331 stakeholders about the complex nature of ASD and dispelling misconceptions about its etiology
332 is imperative for fostering a more informed and supportive environment for individuals and
333 families affected by ASD (Jones et al. 2021). In addition, around 60% of the surveyed teachers
334 expressed a belief in the possibility of curing ASD (table 2). However, it's crucial to understand
335 that ASD is typically a lifelong condition, although symptoms can be effectively managed and
336 improved with early appropriate interventions. While recovery from ASD is not impossible, it's
337 essential to clarify that it doesn't guarantee [a](#) complete cure of the condition as researchers
338 indicated that up to 25% of individuals with ASD may no longer meet the diagnostic criteria
339 after a certain period. Nevertheless, even if they no longer meet the criteria, they may still exhibit
340 some autistic traits, albeit to a lesser degree (Helt et al. 2008; Posar & Visconti 2019; Whiteley et
341 al. 2019). It's important to emphasize that recovery from ASD doesn't equate to attaining perfect
342 mental and social health similar to neurotypical individuals. Regarding the genetic predisposition
343 as a risk factor for ASD, nearly half (47%) of our teachers believed that it is a risk factor for
344 developing ASD. Likewise, an Australian study showed that 45.8% of those who have no
345 relation to ASD believed that the condition is inherited with even increase in the percentage of
346 those who agreed for that among the parents of the autistics (65.5%) and those who had a closed
347 autistic relatives (56.7%) (Jones et al. 2021).

348

349 In the second part of our study, we delved into the knowledge of kindergarten and primary
350 school teachers concerning the primary early signs of ASD, recognizing the pivotal role their
351 understanding plays in facilitating timely referral and intervention management (Zwaigenbaum
352 et al. 2015). Our analysis uncovered significant gaps in teachers' awareness within this domain.
353 Of particular concern was the notably low level of knowledge reported regarding sensory
354 problems experienced by autistic children (42.2%). Despite numerous studies underscoring that a
355 majority of autistic children grapple with sensory difficulties, this aspect remained largely
356 overlooked among the surveyed teachers (Fabbri-Destro et al. 2022; McCormick et al. 2016;
357 Parmeggiani et al. 2019). Similarly, only 43.7% demonstrated awareness of eating disorders in
358 autistic children, despite research indicating a prevalence of approximately 60% in this
359 population (Parmeggiani et al. 2019; Parsons 2023). Another notable finding was the lack of
360 awareness (49.3%) among teachers regarding the struggles autistic children face in expressing
361 their emotions, despite evidence suggesting that around one-third of ASD children exhibit

impaired emotional expression (Molnar-Szakacs et al. 2009; Parmeggiani et al. 2019). Conversely, our study found that teachers demonstrated the highest levels of awareness regarding attention deficit (76.2%) and lack of communication (74.8%) as early signs of ASD. These findings indicate a relatively stronger understanding in these particular areas among the surveyed teachers. However, it's noteworthy that all other aspects of knowledge concerning the early signs of ASD fell below the 70% mark, indicating significant room for improvement across the board. However, these findings were also demonstrated in a study conducted in Pakistan that reported a considerable proportion of teachers, were aware of poor communication (53% - 75.3%) and attention deficit (68%-69%) as early signs of ASD (Arif et al. 2013). Other studies in Yemen and Oman. In Yemen, the most teachers were unfamiliar with a range of early signs of ASD, including difficulties in social communication and engagement, limited and repetitive activities, and sensory sensitivity (Tareh et al. 2020). The results of Oman also showed even higher a lack of knowledge (Al-Sharbati et al. 2015). Same results with different levels were reported in 25 articles around the world (Gómez-Marí et al. 2021). This lack of knowledge would be the main reason that 63.4% of our teachers considered regular schools are not suitable for autistic children. Most of them also reported (59.1%) of the schools lack specialized assistants. However, another study thought that regular schools would be beneficial for the development of autistic children (Fleury et al. 2014). On the other hand, a recent Saudi study considered that the inadequate knowledge of the Saudi teachers and their lack of training in this area would hinder this in Saudi schools (Khalil et al. 2020). This was clearer to us when we found that more than two thirds (72.3%) of our teachers received no training to deal effectively with autistic children. Several studies in different countries have shown similar results. A study about the needs of students with ASD, their findings showed that the teachers often weren't educated enough on how to deal effectively with ASD students (Boujut et al. 2016). A qualitative research study was conducted to address teacher's challenges and preparation needs when dealing with ASD students and the outcomes of this study suggest that existing teacher education programs often do not adequately prepare educators to resolve challenges associated with teaching ASD students (Boujut et al. 2016). Our results confirm and extend those findings and suggest that the pre-training of primary and kindergarten teachers is of great importance in dealing with ASD children, as there is no training program concerned with this category, and most of the teachers who obtained this training were from attending training workshops outside the scope of preparing teachers (Busby et al. 2018). Finally, we tried to determine the teachers' demographic characteristics that affected the three main components of the study, namely knowledge about ASD and its early signs and the ability to dealing with autistic children. Not surprisingly, the education level of the teachers was affecting the three components (table 4). The higher the education levels the higher the scores in all components. This was also the case in different published studies (Al Jaffal 2022; Alharbi et al. 2019; Gómez-Marí et al. 2021).

Limitations and strengths

402 While our study provides valuable insights into teachers' understanding, perceptions, and
403 practices regarding ASD in the Jazan Region, it's important to recognize certain limitations.
404 Firstly, the cross-sectional design hinders our ability to establish causality and track changes over
405 time. Longitudinal research would offer more robust evidence. Secondly, the study's sample was
406 limited to the Jazan Region, potentially affecting the generalizability of findings to regions with
407 different cultural, educational, and healthcare contexts. Nonetheless, our findings contribute
408 significantly to understanding ASD in the Jazan Regions and may have implications for similar
409 Saudi regions as for the southern region of Saudi Arabia and other frontier areas in the Gulf and
410 Arab countries.

411

412 **Conclusions**

413

414 Our study identified significant gaps in teachers' understanding of early signs of ASD,
415 highlighting familiarity but lacking comprehensive comprehension. Notably, most teachers
416 lacked specialized training in identifying and supporting autistic students, indicating a critical
417 deficiency in their professional development. This emphasizes the urgent need to address
418 teachers' readiness in this regard, as it affects their ability to effectively support these students.
419 Investing in tailored training initiatives to enhance teachers' understanding of ASD is crucial for
420 creating inclusive learning environments. These findings emphasize the necessity for nationwide
421 educational initiatives and professional development programs aimed at improving teacher
422 awareness and understanding of ASD, like ASD-specific strategies, early signs recognition, and
423 tailored support. Our findings will be helpful for the decision makers to plan with our team
424 ~~developing-to develop~~ a training program for primary school teachers to be prepared for autistic
425 children.

426

427 **Acknowledgements**

428

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430 primary schools in the Jazan Region for their unwavering cooperation and enthusiastic
431 participation in our study. Their invaluable contributions have been indispensable to the
432 successful completion of this research endeavor. We firmly believe that their substantial input
433 will not only enhance the findings of this study but also lay a solid foundation for future research
434 in this critical field.

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439

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