

The Challenges Affecting the In-Service Training of Teachers of Students with Autism Spectrum Disorder on Evidence-Based Practice

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ABSTRACT: The in-service training of teachers of students with autism spectrum disorder (ASD) based on evidence-based practice (EBP) is subject to many challenges. This study explores the challenges encountered when training teachers of ASD students on EBPs and identifies suggestions for improvement. Method. Grounded Theory (GT) was used to guide data collection and analysis and develop a theoretical explanation based on data reported by 10 teachers of ASD students who were intentionally selected according to specific criteria. Data was collected inductively during individual interviews, and documents pertaining to the 33 participants were also analysed. Results. The study employed Reality Change Theory (RCT), illustrating the reality of the challenges facing the in-service training of teachers of ASD students on EBPs and making suggestions to change that reality. Several categories of challenges emerged, including: (1) access obstacles; (2) a lack of effectiveness; (3) implementation barriers; and (4) desired quality, which is related to teachers' proposals to improve the training. Conclusions. The qualitative results produced provide an in-depth understanding derived from teachers' data and their experiences of the challenges facing in-service training on EBPs, in addition to suggestions to help change reality and improve the quality of future training.

Keywords: Evidence-Based Practice, In-Service Training, Autism Spectrum Disorder.

تحديات تدريب معلمي الطلبة ذوي اضطراب طيف التوحد على الممارسات المستندة إلى البراهين أثناء الخدمة
ومقترحات التحسين

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المستخلص: يواجه تدريب معلمي الطلبة ذوي اضطراب طيف التوحد على الممارسات المستندة إلى البراهين أثناء الخدمة العديد من التحديات. استكشفت هذه الدراسة التحديات التي واجهت تدريب هؤلاء المعلمين أثناء الخدمة ومقترحاتهم لتحسينها. المنهجية. وظفت الدراسة النظرية المجردة لجمع البيانات وتحليلها، وتطوير تفسير نظري يعتمد على بيانات 10 من المشاركين الذين تم اختيارهم بطريقة العينة القصدية وفقاً لمعايير محددة. وقد جُمعت البيانات بشكل استقرائي من خلال المقابلات الفردية، وتحليل 33 من وثائق المشاركين. النتائج. ظهرت الدراسة بنظرية تغيير الواقع، التي وضحت واقع التحديات التي تواجه تدريب معلمي الطلبة ذوي اضطراب طيف التوحد على الممارسات المستندة إلى البراهين أثناء الخدمة وتقديم اقتراحات التحسين. ظهرت التحديات في عدة فئات، بما في ذلك: (1) معوقات الوصول؛ (2) نقص الفعالية؛ (3) حواجز التنفيذ؛ و (4) الجودة المنشودة، والتي تتعلق بمقترحات المعلمين لتحسين التدريب. الخلاصة. توفر النتائج النوعية فهماً متعمقاً مستمداً من بيانات المعلمين وتجاربهم حول التحديات التي واجهت تدريبهم على الممارسات المستندة إلى البراهين أثناء الخدمة، بالإضافة إلى مقترحاتهم لتغيير الواقع وتحسين جودة التدريب المستقبلي. الكلمات المفتاحية: الممارسات المستندة إلى البراهين، التدريب أثناء الخدمة، اضطراب طيف التوحد.

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Introduction

ASD students are known to suffer from deficits in communication and social interaction, in addition to potentially exhibiting specific and repetitive behavioural patterns (American Psychiatric Association [APA], 2013). This makes it difficult for teachers to employ the effective practices used by their peers in the context of general education, or to assert the effectiveness of a single intervention or treatment programme to meet their students' varying needs (Alexander et al., 2015; Hsiao & Sorensen, 2019; Paynter et al., 2017; Stahmer et al., 2005). The challenges teachers encounter have been intensified by the recent increased prevalence of ASD, which affected one child out of every 36 children aged 8 years (Centres for Disease Control and Prevention [CDC], 2023). Therefore, it is vital that teachers can benefit from EBP illustrating techniques that have proven effective in improving outcomes for ASD students when developing their teaching strategies (Cook et al., 2015).

Moreover, there has been an increased demand for legislation stipulating that teachers have sufficient knowledge of EBPs to determine effective pedagogies (No Child Left Behind [NCLB], 20 U.S.C. § 6319 (2002); Individuals with Disabilities Education Improvement Act [IDEIA], 20 U.S.C. § 1400 (2004); Every Student Succeeds Act [ESSA], 2015). Several systematic reviews have been conducted and reported in the literature, to identify these practices for use by teachers (for example The National Autism Center, [NAC], 2009; NAC, 2015; Odom et al., 2010; Wong et al., 2014; Steinbrenner et al., 2020). More recently, the United States spent nearly \$500 million between 2008 and 2015 researching effective treatments and interventions for ASD individuals (McNeill, 2019). In Saudi Arabia, the Ministry of Education issued a comprehensive teachers' guide to developing autism programmes; one of which included a detailed description of EBPs in a manner designed to assist teachers to integrate proven methods into their classrooms (Ministry of

Education, 2020). Despite the attention these practices have attracted in modern professional literature and legislation, a gap between research evidence and classroom practice persists (Cook et al., 2015; Dynia et al., 2020). Studies have reported that EBPs are often not employed by teachers when providing educational services to ASD students (Odom, 2009; Suhrheinrich, 2011; Stahmer et al., 2015), or that they are not used consistently or effectively (Al-Yafei and Al-Zari, 2020; Cook et al., 2015). Instead, teachers continue to employ practices with no positive, or at most a limited, impact on their students (Zureikat, 2020; Al-Hussein, 2017), while EBPs account for fewer than 10% of the educational interventions that schools employ with ASD students (Silveira-Zaldivar & Curtis, 2019).

As a result, the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) called for in-service training for teachers to help them introduce EBPs in their classrooms, to improve their students' academic performance (Al-Hussein, 2017; Morrier et al., 2011; Cook et al., 2015). However, the issue of training teachers of ASD students on how best to use these practices has not received sufficient attention. Pre-service teacher training programmes related to autism lack or fail to provide adequate training (Sanz-Cervera et al., 2017; Silveira-Zaldivar & Curtis, 2019), with fewer than 15% of teachers reporting having received training on EBPs in their academic preparation programmes at universities (Morrier et al., 2011). Moreover, when Alexander et al. (2015) reviewed the literature on training teachers of ASD students on EBPs, they observed a scarcity of effective in-service training once such teachers were in employment.

The two researchers have experienced, throughout their work experience, the challenges facing teachers of ASD students wishing to employ EBPs in their classrooms, the inadequacy of in-service training on these practices, and the scarcity of research investigating such training. This study sought

to develop a theoretical understanding to explore the challenges facing the in-service training of teachers of ASD students on these practices to identify their suggestions for improving them by answering the following questions:

- 1- What are the challenges facing in-service training of teachers of ASD students on EBPs?
- 2- What are the suggestions to overcome the challenges of in-service training on EBPs?

2. Methods

This study highlights the challenges encountered during such training and provides suggestions for improvement. The study utilizes Grounded Theory (GT) methodology to gather and analyze data from 10 teachers of ASD students, combining individual interviews and document analysis. The Grounded Theory approach was employed here as it provided the most optimal option for this study in terms of processing data and providing answers for its questions through direct interactions between the researcher and the participants. This approach provided the participants with the opportunity to talk openly about their experiences and suggestions. The researchers were aiming at reaching this level of detailed data and developing a better understanding grounded in the perspective of the participants who had direct experiences of the studied phenomena.

Table (1)

Availability of criteria for the sample participating in the study

Participant's Code	Job	Years of Experience	Academic Qualification	No. of practices trained
P (1)	Teacher of ASD students	6	Bachelor's degree in Autism and Developmental Disabilities	7
P (2)	Teacher of ASD students	7	Bachelor's degree in Autism and Developmental Disabilities	7
P (3)	Teacher of ASD students	6	Bachelor's degree in Autism and Developmental Disabilities	16
P (4)	Teacher of ASD students	7	Bachelor of Autism and Developmental Disabilities	9
P (5)	Teacher of ASD students	14	Bachelor's degree in Autism and Developmental Disabilities	19
P (6)	Teacher of ASD students	8	Bachelor's degree in Autism and Developmental Disabilities	12
P (7)	Teacher of ASD students	6	Bachelor's degree in Autism and Developmental Disabilities	12

According to Creswell and Poth (2018/2019), Grounded Theory is an ideal option when there is no theory to explain and understand reality, or when there is a requirement to explain the experiences of participants with the phenomenon studied.

2.1. Participants

Ten teachers of ASD students were selected using the Purposeful Sampling method, which is a non-random method used to recruit participants with sufficient understanding of the phenomenon studied (Robinson, 2014). Snowball sampling was used to select three of these teachers. The participant sample members were selected according to specific criteria, known as Criterion Sampling (Harley et al. 2009). The criteria were listed in the letter of request to participate in the study and sent to teachers at the Ministry of Education after obtaining the necessary consent. The criteria were as follows: (1) the participant holds a bachelor's degree specializing in autism; (2) the teacher has at least five years of experience teaching ASD students; and (3) the teacher has completed in-service training courses on at least five out of 28 EBPs (Table 1). After confirming the participants met the criteria, their written consent was secured to participate in the study.

			Disabilities	
P (8)	Teacher of ASD students	6	Bachelor's degree in Autism and Developmental Disabilities	20
P (9)	Teacher of ASD students	9	Bachelor's degree in Autism and Developmental Disabilities	5
P (10)	Teacher of ASD students	8	Bachelor's degree in Autism and Developmental Disabilities	11

Data collection

Data was collected through in-depth interviews and the analysis of relevant documents. The researchers used Reality Change Theory (RCT) to illustrate the challenges faced during in-service training and propose suggestions for improvement. The interview guide included the two main questions posed by the researcher to explore new topics, and a guide was developed in light of the data produced. For example, questions about emerging categories were added or

addressed in greater detail. The interviews were conducted via Zoom and recorded with the consent of the participants. At the beginning of each interview, the participants were informed of their rights and that the confidentiality of their data would be guaranteed. In addition, participants' documents were analysed, including their in-service training certificates. All but two participants submitted documents for review (see Table 2).

Table (2)

Description of participants' documents in the study

Number of participants who submitted their documents	Type of documents	Issuing authorities	Number of documents	Total number of documents
8	Training certificates	Ministry of Education	18	33
		Ministry of Health	10	
		Ministry of Resources and Human Development	5	

These documents provided additional data about the categories examined during the stages of data analysis. Charmaz (2014) suggests that a researcher following Grounded Theory collects and analyses data before returning to the field to collect more data as part of a reciprocal process to develop a theory. A theoretical sample, which is a sample selected during data collection and analysis (Robinson, 2014), was also taken. The theoretical selection was made by comparing participants who met the selection criteria and selecting those who had received

training on a larger number of practices in order to obtain more information. Questions were added and developed to be more focused, and interviews were conducted in other locations, such as the cities of Jeddah and Riyadh, to fill a gap in emerging categories, i.e., implementation and fairness. According to Draucker et al. (2007), theoretical sampling is used if interview questions are refocused to obtain specific information about emerging concepts. The main researcher collected and analysed the data in consultation with the other researcher. The data collection that

coincided with its analysis was discontinued after ensuring theoretical saturation and the absence of anything new. Strauss and Corbin (1990/1999) note that the final sample size in Grounded Theory is determined by the data saturation point.

Data analysis

The process of data analysis commenced alongside its collection. The interview was conducted, and the participants' documentary evidence collected, scripted, reviewed, and analysed before the process of collecting data recommenced based on what the previous interviews had produced. The MAXQDA (2020) app was used to organize the qualitative data. Before starting the analysis process, written copies of the interview scripts were sent to each participant via e-mail to ensure that they reflected their statements during the interview, and each participant approved them. This study followed the procedures set out by Strauss and Corbin to analyse data according to Grounded Theory. The first step was open coding, in which the participants' statements were tracked, and coded line-by-line to reflect what they had said. Notes were also made. Charmaz (2014) indicates that coding and note-writing are activities carried out simultaneously during the analysis phase. The second procedure was axial coding, the focus of which was on determining the most frequent primary codes, which were directly related to the questions of the study. These were merged into one category based on their interrelationship and commonalities. Writing notes and making continuous comparisons helped to uncover the relationships between such codes and to integrate them into six main categories. Selective coding was the third of these procedures. At this stage, the previous categories were systematically combined into a central category which provided a theoretical explanation of the phenomenon being studied.

Trustworthiness credibility

Credibility and qualitative research aims at evaluating the accuracy of the results by the researcher, participants and the readers. To do so, the following measures were taken: (1)

several sources were used together data (triangulation), I employed, deep, individual interviews, in addition to analysing documents of participants. This contributed considerably to the credibility of the results of this study. (2) all views of participants, positive and negative, were included. Creswell & Poth (2018/2019) point out the importance of providing analysis of the negative views in order to provide realistic assessment of the phenomena being studied. (3) Getting feedback from the participants on credibility of the results. All participants were provided with the results of this study, and its analysis and interpretation. They all confirmed that the results represented their views, except one participant, who could not provide reply. For example M (2) said "I have no comment, it presents what I said and in its proper context." (4) The extended period of time taken together, and analyse data allowed for ample time to review and reflect on these processes and quality of their results. Fetterman (2010, in Creswell & Poth, 2018/2019) pointed out that "to insure credibility, we spend long time in the field to get to know the location on participants." Since the first researcher is from within the system, and in connection with some of the participants this allowed for (a) participant to gain confidence, and share knowledge openly, (b) the researcher to gain better understanding of the system and environment about which the participants were sharing their knowledge and experiences.

Dependability

Dependability in qualitative research corresponds to the concept of reliability in quantitative studies. To ensure this, the researchers undertook the following measures: (1) Provided a detailed description of all data collection and analysis procedures at various stages; (2) Described the tools employed in this study. Yin (2009, as cited in Creswell, 2019) recommends that researchers "present a detailed account of study instruments and data" (p. 349); (3) Recorded and transcribed the interviews, reviewed them, and then sent them to the participants to ensure there were no errors during data collection and transcription. Additionally, the

MAXQDA software was used for data coding and recoding in three stages. Creswell & Poth (2018/2019) noted that researchers enhance data reliability by obtaining detailed data through recording, transcription, and using computer programs for analysis.

Results

The “Changing Reality” theory arising from the participants’ data explains the challenges faced while training teachers of

ASD students on EBPs and their suggestions for improvement. The challenges were organized into four categories: (i) obstacles to accessing training on those practices; (ii) poor effectiveness of the training offered; (iii) barriers that hinder teachers’ implementation of the practices after training; and (iv) suggestions to improve the quality of training on those practices (Figure 1).

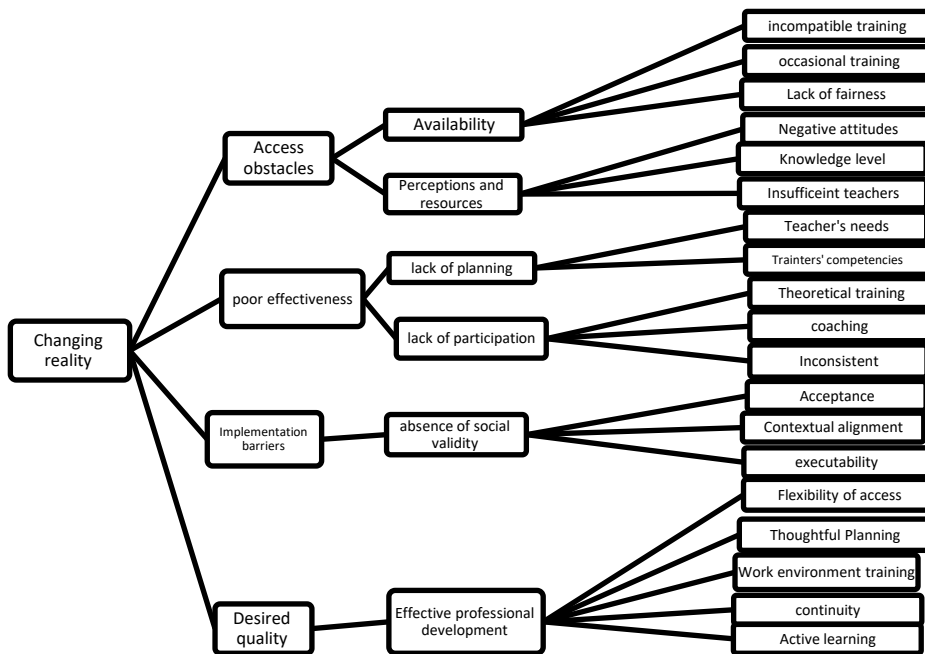


Figure (1). Changing reality theory.

Obstacles to access

The participants reported various obstacles to their access to in-service training based on EBP. These obstacles can be organized into two main categories: (i) availability; and (ii) perceptions and resources.

Availability

The lack of in-service training on EBP was one of the key obstacles the participants referred to. They also referred to the infrequency of training (if any) options available and the limited opportunities for equal access to training.

Unavailable training

The participants indicated that a lack or scarcity of EBP training was one of the key

challenges they faced. P (3) stated, “We have a problem with EBP training; it is not offered. I am very keen to attend training and I do not want to miss any opportunity to attend such training, but unfortunately, there isn’t any.” P (7) mentioned the same issue, “I implement many practices without receiving any training... For example, I received no training on Discrete Trial Training (DTT). Sometimes I try and I do not even know if the method is right or wrong.” Although teachers do receive in-service training free of charge from the Ministry of Education, P (2) stated that she had sought to access EBP training in other locations due to its lack of availability: “In fact, there is no training on EBPs. In other

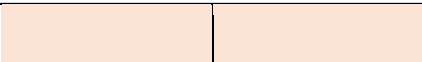
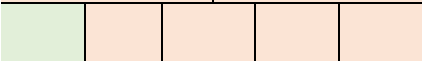

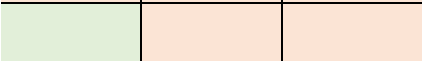
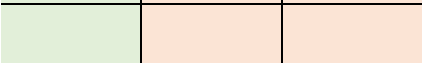
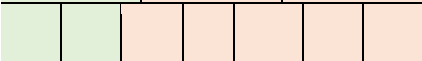
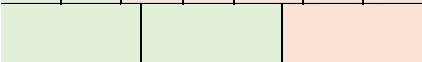
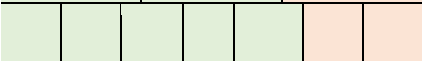
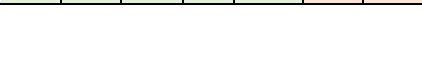

words, the courses conducted by the Ministry of Education did not address that topic, and therefore, I have to rely on my personal effort to attend training in other locations.”



Infrequent training

The participants explained that EBP training was conducted when engaging in training teachers on other topics, such as behaviour modification or applied behaviour analysis, with the exception of Sensory Integration (SI), which was the only topic the majority of participants received training on. P (8) stated; *I believe in-service training was rare and insufficient... Look at the list, I ticked many*

Table (3)

How to approach EBPs in in-service training

Participant code	No. of documents	Type of document	Method of addressing each EBP	
P (1)	2	Training certificates		
P (2)	5			
P (3)	3			
P (4)	3			
P (6)	3			
P (7)	7			
P (9)	3			
P (10)	7			
				
				

 Main focus of the training  Incidental training

topics as not trained. I may have come across these concepts in one of the lectures." Similarly, P (2) stated, "The material was insufficient. All the practices I mentioned to you were a part, a few points, or a small component of another training course; it was not the main focus of the course which addressed another topic."

The results of the analysis undertaken by the participants' in-service training documents on EBPs showed that the majority of the practices were occasionally and incidentally addressed, while the training mostly focused on sensory integration (Table 3).

Lack of equal opportunities

The participants in this study work in five different cities: Makkah, Madinah, Riyadh, Jeddah, and Taif. They reported that EBP training was accessible in major cities such as Riyadh or Jeddah, meaning opportunities for equal access to training were limited. P (4) said, "Courses and workshops are not held everywhere. For example, most of the workshops can be found in Riyadh and Jeddah, so it was difficult for us to attend them." P (3) added, "I have noticed, by virtue of my work, that there is defective provision of

training in small governorates and villages. Teachers here are not trained like their peers in major and big cities."

Perceptions and resources

The perceptions of the teachers of ASD students, including their negative attitudes, and lack of knowledge of EBPs, in addition to inadequacies in terms of human resources, are just some of the obstacles cited as barriers to teachers' desire to access training.

Negative attitudes

The participants described the negative attitudes of some teachers towards EBPs, as

contributory factors in their lack of motivation to access training. P (1) explained this, saying: *"Sometimes the teacher herself does not wish to develop herself but adheres to her old formal preparation programme. She does not have the motivation to read and keep abreast of the latest developments, and even the courses do not mean much to her. The challenges are not always related to the administration or training, but they are sometimes based on the teacher and her motivation."* P (4) added, *"I think the reason is specialists' negative attitudes toward these practices. Some see them as unimportant and unnecessary. We continue in the same traditional way."*

Knowledge level

Some participants revealed their ignorance of EBPs, highlighting this as potentially one of the obstacles impeding their pursuit of training in these practices. P (3) stated, *"One of the first challenges that we face as teachers is insufficient knowledge. I feel that my colleagues and I lack sufficient knowledge about the EBPs."* P (9) added, *"Let's consider the visual support, I don't know what visual support is (VS). As a specialist, I don't know the concepts of visual support, differential reinforcement, or other behaviour. If we go to the field and ask about the 28 practices, I wonder how many of the practices of the 28 EBPs we are familiar with."*

Teacher shortage

The participants indicated that having to participate in training during teaching hours, given the limited preparation of teachers of ASD students, is one of the challenges impeding access to training. P (3) said, *"There are many obstacles, including time, which represented a big problem. The training sessions are always in the morning while we are with our students. A deficiency is expected to occur, and the main reason is the teacher shortage in the autism field. Moreover, a few principals refuse to allow teachers to attend the training to prevent this deficiency from occurring."* P (2) argued, *"Although training is often not available on practices, some training courses are sometimes conducted, but it is difficult for teachers to attend as they do not know where their students should go."*

Lack of effectiveness

The participants further indicated that one of the challenges they faced was the lack of effectiveness of in-service training on EBPs when they were able to access it. This challenge is reflected in two main categories: (1) lack of planning; and (2) lack of participation.

Lack of planning

The majority of the participants indicated that in-service training does not meet their needs, or address EBP. Moreover, EBP training (if any) is characterized by poor-quality content and a shortage of professional trainers.

Teachers' needs

The participants explained that the in-service training programmes offered typically fail to meet their needs, and consequently they are not motivated to attend. P (10) said, *"I do not think the teachers will want these courses if they are offered. I am a teacher in the field, and they choose a title for the course, such as "Behaviour Modification". The title is not attractive or up-to-date, and there is no training on new practices."* P (1) added, *"Often teachers are interested in attending training on the most common five practices, modelling, extinguishing, sensory integration, reinforcement, and memorization.... The information of the training on EBPs (if any) can be simple and theoretical, you do not feel that you have learned anything new."* Although all the participants were trained on sensory integration, some did not consider it a priority or deem it of relevance to their teaching practice.

Trainers' competencies

Some of the participants spoke of the trainers' lack of practical experience and adult learning skills. For example, P (3) stated, *"Among the challenges is the absence of good trainers and insufficient cooperation between the Ministry of Education and other bodies such as universities or the Ministry of Health who may have someone to train teachers."* P (7) added, *"Sometimes I attend a course and feel that my experience in this field is higher than that of the trainer who provides it due to the fact that I work already in the field. The trainer may have received only theoretical training and does not have practical experience, and often*

they are faculty members and supervisors. When we describe our problems, they have difficulty finding solutions to them."

No participation

Many of the participants referred to the lack of opportunities available to them to contribute when they receive in-service training on EBPs, stating that training is often theory-based, and offered outside the work environment, being short in duration and often inconsistent.

Theoretical training

The absence of hands-on training, and the prevalence of the lecture method when receiving training on EBPs, was a further challenge mentioned by the majority of the participants. This negatively impacted their ability to apply these practices in their classrooms. For example, P (1) said, *"Mostly the method we used was the lecture; the trainer talks, and we just listen. As a teacher, I need hands-on training. The theoretical content is already understood."* P (2) added, *"The training available on practices focused on the theoretical side and was insufficient. We are unable to apply something we have learned to*

the field, and questions and problems start to arise."

Training outside work settings

As mentioned above, in-service training on EBP was typically offered outside the work environment, for example in conference rooms or training centres. The participants believed that this contributed to the difficulties they experienced applying the theoretical concepts acquired during training in practice. P (2) explained this stating, *"The training venue is separate from the work setting; it is difficult for us to put what we have learned into practice."* P (5) stated: *"There is no practical training such as going to integration schools, associations, or special education centres in order to apply what we have learned practically in the classroom."*

According to the participants' documents, the methods of training offered were limited to lectures and workshops, and none of the documents provided indicated that the teachers received any training in work settings. Rather, they were limited to closed training sessions in halls in various locations.

Table (4)
Methods of in-service training on EBPs

Participant code	No. of documents	Type of documents	Method of addressing each EBP
P (1)	2	Training certificates	Lecture
P (2)	5		Lecture, Workshop, Coaching
P (3)	3		Lecture, Coaching
P (4)	3		Lecture, Coaching
P (6)	3		Lecture, Coaching
P (7)	7		Lecture, Workshop, Coaching
P (9)	3		Lecture, Coaching
P (10)	7		Workshop, Coaching

Lecture ■ Workshop ■ Coaching ■

Intermittent training

The participants also reported a lack of ongoing training on EBPs and viewed the training they received as insufficient to gain experience and apply essential practices in their classrooms. P (2) said, *“The training is not really sufficient. I don’t think one day’s course of four or five hours is enough for the teacher to be able to use these practices ... In fact, for many practices, it takes a long time to get results from the training.”* P (8) added, *“Applying what I learn from a lecture is not enough because after a while I will forget a lot of information or practices, so I need to come back to remember it and then apply it. I do not feel that the courses are always sufficient.”*

Implementation barriers

Several barriers to teachers' implementation of EBPs in their classrooms emerged after they completed their training. These were represented in the single major category of absence of proof of social validity.

Lack of social validity

Certainly, the participants believed their implementation of EBPs post-training is hindered by the absence of key components of social validity, which include (1) acceptability; (2) contextual alignment; and (3) feasibility.

Acceptability

A number of the participants spoke about some of their peers’ lack of interest in EBPs, and some of them commented that do not meet students’ goals or require twice as much effort as their current practices. P (2) said, *“Many teachers do not want to change, and many of them prefer the practices they use as they are faster and easier. Sometimes teachers wish to apply EBPs, but others don't want to work that way or make that effort.”* P (8) stated, *“I think that their application is useless or ineffective, or they think that I may not accept or care about this issue.”*

Contextual alignment

According to the participants, EBPs do not correspond to the demands of the school context. Those teachers who applied such practices did not receive motivation or support from administrators or educational institutions, which consequently limited their implementation of such practices in their classrooms after training. P (4) addressed this, saying, *“There are many things that limit the application of these practices. Do the administration, the supervisors, the teaching staff themselves, and the place you are in encourage you to implement them or not?”* Likewise, P (10) stated, *“No one appreciates*

my work ... I mean the Ministry of Education has not asked us, and there is no official body or enthusiasm on its part to implement the EBPs. Furthermore, the supervisor does not care about that."

Feasibility

The participants also indicated that a lack of time and resources limited their ability to implement EBPs even after they have received training. The challenges they mentioned included staff shortages, increasing student numbers, varying needs, and time constraints. P (2) said, *"We have a shortage of staff and sometimes a heavy workload for teachers. The number of students is large, and we know that practices require a great deal of time and effort from the teacher, especially the issue of data collection and analysis on an ongoing basis. The multidisciplinary team is not available and there is no assistant teacher even if there are heterogeneous students in the classroom. This is exhausting for us. It is impossible to focus on the practices and how we apply them. Teachers will often not be able to apply what they have learned, even if they receive training."*

Desired quality

The participants presented a set of proposals to help improve the in-service training process on EBPs, classifying them into a single main category, namely effective professional development.

Effective professional development

The participants proposed providing effective professional development on EBPs. Their suggestions were organized into five main categories: (1) flexible access; (2) thoughtful planning; (3) coaching; (4) consistency; and (5) active learning.

Flexible access

The participants also offered suggestions to ensure that teachers have access to EBP training, including summer training, online training, and itinerant trainers. P (4) *"I suggest holding a summer training course or as an alternative, a programme at the end of the semester to train teachers on most practices so that they can attend the programme."* P (5) explained his suggestion, saying, *"If there were a registered online training platform, you can enter and choose the practice you*

want to train on." P (7) added, *"The truth is that distance education is easy to attend even outside the country. I hope to pursue distance training."*

Thoughtful Planning

The participants further suggested that training based on EBP should be developed and delivered according to the actual needs of the teachers. For example, P (5) said, *"Training on practices must be done according to the teachers' priorities. The trainer should be familiar with the field or have a team of teachers to address training needs."* P (8) suggested that training should be planned and target the individual needs of teachers in light of their students' academic stages: *"I am interested in direct instruction or discrete trial training, and therefore there should be conclusive training on them. For instance, task analysis is used more for young people, and therefore it is an area of interest for teachers in the early intervention stage; consequently, they should receive training on it."*

In addition, the participants emphasized the importance of improving the quality of trainers. They pointed out the importance of the availability of specialists with practical experience, in addition to adult education skills. P (7) expressed this opinion, saying, *"The training should be provided by anyone who works directly with ASD children so that they can practise what they preach, and face the same challenges that we will face while working."* P (4) added, *"Trainers must be specialized in applied behaviour analysis and certified in training on practices. They should have specific personal characteristics, such as the ability to deliver, debate and manage the workshop."*

Coaching in Natural Settings

A high proportion of the participants suggested that training should take place on EBPs in the work environment and that the training should include modelling, practice, feedback, and follow-up, to ensure that they acquire the necessary skills to apply the targeted practices in their classrooms. P (4) explained this by saying, *"Coaching in the natural settings of your work is more effective. Ongoing training will take place with the*

trainer who will follow up with us and oversee what is happening, how we are applying the practice, and what the results we have reached are in addition to the challenges we faced during the implementation. He then gives us feedback.... that's what I aspire to." Moreover, the participants suggested building professional learning communities within schools, and peer coaching so that they could benefit from peers who are skilled at applying EBPs in their classrooms. P (1) said, "Teachers can conduct workshops themselves.... these workshops are held in schools. A qualified teacher implements the practice before us, and we observe her. It is similar to the idea of microteaching. Our number is fewer, but the quality is higher."

Consistency

The participants also spoke about the intensification and consistency of in-service training on EBPs as a suggestion to ensure the effectiveness and use of such practices by teachers in their classrooms. P (3) said, "As a teacher, I must undergo intensive training and not just one or two training sessions during the school year. Intensive training is a requirement ... It is assumed that teachers of ASD students should receive no less than 50 to 40 hours of training during the school year." P (4) added, "The training is ongoing and under supervision. The trainer who trained us on the practices should come back to follow up on the application, and how they are applied. He should provide us with feedback. This is the nature of continuous education and training."

active learning.

The participants expressed a desire to participate actively in training, and to diversify the techniques they used to include discussion, problem-solving, case studies, and role-playing so as to engage and activate the role of teachers during training. P (1) said, "It is important to have workshops which ensure your engagement and involvement in activities. They develop situations or problems about a specific case, and we discuss the best practice to use with the case, how to apply it, and what the steps are. In other words, teachers work, think and brainstorm." Similarly, P (5) stated, "It is necessary to

present examples and stories of autism cases and to show videos. We address a case of autism and start discussing it. I think that this is better than sitting for hours listening to a lecture. I would like the training to use different strategies and not to rely conclusively on the method of memorization."

Discussion

The study identified several categories of challenges encountered in the in-service training of teachers of ASD students on Evidence-Based Practices (EBPs). These challenges include:

a. Access obstacles: Teachers reported difficulties in accessing appropriate training programs, resources, and support systems. Limited availability of training opportunities and geographical constraints were significant barriers. The results confirm the findings reported by Suhrheinrich (2011) and Stahmer et al. (2015), that teachers of ASD students lack EBP training. Several previous studies have discussed the paucity of in-service training on these practices (Alexander et al., 2015; DeMonte, 2013; Hsiao & Sorensen, 2019; Al Hussein, 2017). However, the study by Al-Ghamdi and Al-Otaibi (2022) found that 60% of ASD teachers have received in-service training on EBPs in professional development programmes, although approximately 34% have never received any. To explain this variance, Al-Ghamdi and Al-Otaibi (2022) asked the participating teachers to state whether or not they had received training on any EBPs, and whether or not EBPs were the main focus or included with other topics. Teachers may choose to receive training on any of the practices mentioned alongside other topics. Moreover, the majority of the participants reported the concentration of training in major cities such as Riyadh and Jeddah, and the scarcity of training in small governorates and villages. One possible explanation for this result is the presence in larger cities of Autism and Disability Research Centres, which provide specialized training on EBPs, in addition to the availability of behavioural analysts and trainers specializing in the field of autism in these regions. The current finding is similar to that reported in previous research (Olsen et al.,

2012; Paynter & Keen, 2015) concerning the limited use of EBPs in regional or rural areas, due to the lack of resources and in-service training opportunities in those locations.

On the other hand, teachers' lack of knowledge and negative attitudes towards EBPs also limited their willingness to access in-service training. This result may serve as evidence of the lack of teacher pre-service training on EBPs in university teacher preparation programmes (Morrier et al., 2011; Hsiao & Sorensen, 2019; Silveira-Zaldivar & Curtis, 2019). This leaves teachers without sufficient knowledge of such practices, and they then feel no desire to access training. Thus, negative attitudes may be created given the lack of related Arab knowledge sources.

b. Lack of effectiveness: Teachers expressed concerns about the effectiveness of the training programs they attended. Many felt that the content was not adequately tailored to the specific needs of ASD students, resulting in a lack of practical applicability. The results showed that in-service training did not meet the needs of teachers, as the training addressed topics or practices that were not a priority. One possible explanation for this result is the failure to analyse the actual needs of teachers when planning training, which leads to ineffective training and reduces teachers' motivation to attend. This finding is in line with that of Huhtala and Vesalainen (2017), who noted that most of the in-service training provided to teachers did not match their needs. DeMonte (2013) states that one of the problems associated with professional development is that it is disconnected from the daily practices of teaching, as it is generic and unrelated to the real-life problems faced by teachers. Although trainers' competencies and capabilities can increase the effectiveness of in-service training, according to Cimer et al. (2010) and the results of the current study, trainers lack the necessary competencies, such as specialization, work experience, and adult education skills. This result may be explained by the lack of specialized trainers available to teach those responsible for teaching ASD students, as found by Alexander et al. (2015). The results of the current study align with the findings of Al-Safi (2015), who found that one

of the obstacles that prevents effective in-service training is the lack of professional trainers. Similarly, Ayvaz-Tuncel and Çobanoğlu (2018) reported negative perceptions among teachers about the quality of trainers and their professional experience.

Furthermore, the results showed that teachers chose not to participate in EBP training as it was theoretical and based exclusively on lectures, in addition to taking place outside the work environment. This conclusion was also reached by Al-Ghamdi and Al-Otaibi (2022), who found that the lecture method is more common during in-service training on EBPs compared to workshops and hands-on training. Similarly, Hogan et al. (2015) indicated that most of the training provided to those who work with ASD students takes the form of lectures and presentations, requiring teachers to attend training halls and lectures instead of receiving coaching in natural settings where they can receive feedback. According to Ayvaz-Tuncel and Çobanoğlu (2018), in traditional in-service training, teachers sit passively without engaging, despite the fact that teachers, like their students, need a learning setting in which they can actively participate and work collaboratively with their peers. The participants also stated that the duration of EBP training was short, which means they complete their training without sufficient understanding or the ability to employ these practices in the classroom after training. This indicates teachers' need for continuous and effective training that enables them to *transfer* theory into practice. Stahmer et al. (2015) stressed that the limited education teachers receive about EBPs, such as lecturing workshops or short training sessions outside the classroom with no feedback, understandably hinders their application of it when teaching their own students. Restricted or strict training conditions undoubtedly differ from coaching in natural settings (Hogan et al., 2015).

c. Implementation barriers: Teachers encountered challenges when attempting to implement EBPs in their classrooms. Factors such as limited time, lack of support from administration and colleagues, and

insufficient resources hindered successful implementation. A further concern raised was that, even with the availability of knowledge and training, the absence of social validity components, such as teacher acceptance, administration support, and the lack of resources and time, limit teachers' ability to implement those practices. This result is similar to that reported by Suhrheinrich et al. (2013), who found that the complexity of practices and their need for resources, that may not be available in most school environments, are an obstacle to their implementation. This finding may be explained in the context of the established gap between research environments and practices in schools (Dyonia et al., 2020). Cook and Odom (2013) have stated that when defining EBPs in education, insufficient attention has been given to how they are implemented in schools. Most of these practices are difficult to implement in classrooms, as they are not designed for school settings, and may not receive administrative support, in addition to students' behavioural problems and varying needs (Stahmer et al., 2015).

From the perspective of the researchers, this does not mean that adopting and understanding these practices is impossible, but real challenge is implementing and incorporating them within the real curriculum inside the classrooms. Cook & Odom (2013) have concluded that there are seven mechanisms for implementing these practices, whenever these mechanisms are available and effective, then real improvement in the behavior of practitioners related to these practices is achieved, and these are: "selecting teachers, training before and during service, continuous consultation, training through practice in the natural teaching environment, teacher and program evaluations, administrative support and integration of systems. For example, adopting strategies to work with external systems to ensure availability of financial, organisational and human resources to support the work of practitioners. In addition to that the factors of change, who are the experts in defining and dealing with challenges along the way do also play critical role in employing these

mechanisms and achieving sustainable implementation of these EBPs." (P.140).

d. Desired quality: Teachers proposed suggestions to improve the quality of future training programs. These suggestions included the need for more hands-on and practical training, ongoing support and mentoring, collaboration opportunities, and access to up-to-date research and resources.

The results identified the participants' suggestions as to how to improve the quality of in-service training on EBPs. Summer training, distance training, online training, and openness to technological innovations in this field were among the proposals raised by the participants to offer greater flexibility and access to training. This affirms several other studies suggesting the effectiveness of distance professional development and its contribution to teachers' use of the strategies learned in their classrooms (Machalicek et al., 2010; Dagher et al., 2017). The Autism-Focused Intervention Resources and Modules [AFIRM] project, which involves interpreting EBPs into online learning modules, could be instrumental in increasing teachers' access to such information about these practices.

The proposed results also showed a need for thoughtful planning designed to analyse the training needs of teachers, and the quality of trainers. The participants' ideas were consistent with the conclusion reached by Darling-Hammond et al. (2017), that effective professional development requires responsiveness to the needs of teachers and learners and takes place in the contexts in which they will be taught. Teachers often prefer training that targets their actual needs and has an impact on their daily practice in the classroom. Qualified trainers should possess experience, specialization, and adult education skills.

Recently, the National Centre for Professional and Educational Development (NCEPD) has recruited behaviour analysts from the Autism Research Center in Riyadh to provide training on EBPs for teachers. Similar steps and continuous cooperation with these bodies may play an important role in responding to the proposals of participants in this regard. Interestingly, most of the

participants emphasized the importance of having hands-on experience for trainers and considered that teachers and specialists are the most qualified to provide EBP training in natural settings by allowing teachers to observe them as skilled peers. This finding is consistent with the characteristics of effective professional development that support participation and cooperation among teachers to improve their practices. According to DeMonte (2013), most of the professional learning styles that showed improvement in learning involved some form of regular collaboration between teachers in schools. Furthermore, the findings included the participants' suggestions to enhance coaching opportunities, including modelling, practice, feedback, follow-up, and consistency, to help them implement the practices in their classrooms. It was noted elsewhere (Joyce & Showers, 2002; Meadan et al., 2017) that coaching contributed to teachers' transfer of acquired skills to their classrooms. Methods and practices that actively engage learners in acquiring and using new knowledge are one of the key characteristics of adult learning that have shown positive results (Trivette et al. 2009). Ayvaz-Tuncel and Çobanoğlu (2018) indicated that ensuring continuity of training leads to a change in teacher behaviour (more than 50 hours), and is one of the conditions for ensuring that in-service training is effective. In a survey of 1,300 studies of professional learning, the only study with a positive impact on increasing student achievement involved teachers participating in ongoing training activities for approximately 60 hours over a period of six months (DeMonte, 2013).

Conclusion

This study highlights the challenges faced by teachers of ASD students during in-service training on EBPs and provides suggestions for improving the quality and effectiveness of future training programs. By addressing issues related to accessibility, content relevance, implementation support, collaboration, and evidence-based practices, educational institutions and stakeholders can work together to enhance the training experiences of teachers and improve outcomes for students with ASD. This Type of study is needed to

identify vital solutions to improve the experience of in-service training on EBPs would help bridge the gap between university preparation and the requirements of practice in schools, in addition to raising the quality of the educational services provided to ASD students by ensuring they have qualified teachers who can employ effective practices to improve their outcomes.

Limitations of the study

The participants in this study were those who met the eligibility criteria, which included training in at least five evidence-based practices. However, the study faced difficulties in reaching teachers who had received training in these practices, and participants who mentioned they had received such training as part of another training program were recruited. There was also a challenge in accessing teachers who had received training in these practices within a single educational district, so the study included multiple cities. Another limitation was that the interviews were conducted during the COVID-19 pandemic, which prevented face-to-face meetings with participants, and Zoom was used instead for the interviews. Although it was an ideal option for reaching participants in distant cities, in-person meetings and reading participants' reactions could have provided additional insights. Finally, two participants did not provide documents of their in-service training on evidence-based practices. Teachers might have concerns about sharing these documents despite assurances of data confidentiality. One participant claimed the documents were in his school office and he could not retrieve them, while another mentioned she had lost the documents.

Recommendations for future research

Studies on evidence-based practices remain scarce, and those investigating the training of teachers in these practices are virtually non-existent. The results of this study explored the challenges of training teachers in all evidence-based practices for educating students with Autism Spectrum Disorder (ASD). Recommendations for future research, stemming from the current study's findings,

include focusing on challenges related to training in practices used for specific age groups or those that serve to develop particular fields and skills. The results indicated that these challenges varied according to the environments in which the participants in this study worked or had previously worked. There is a need to expand the scope of this study to include teachers in villages and small districts, as well as psychologists and speech therapists working with students with ASD. The study's results provided a set of suggestions for improving training on evidence-based practices; however, further research is needed to identify the best training practices to impact teachers' behavior and skills.

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