UNIVERSITI PUTRA MALAYSIA

DEVELOPMENT OF AUTISM SPECTRUM DISORDER EDUCATIONAL MODULE(ASD.EM) FOR PRE-SCHOOL TEACHERS' KNOWLEDGE, BELIEF, IDENTIFICATION SKILLS, AND SELF-EFFICACY TO IDENTIFY CHILDREN WITH ASD

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SAHAR MOHAMMED TARESH TALEB

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

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DEDICATION

This dissertation is dedicated to my beloved late parents (Mohammed Taresh and Gamila Thabit Nasher) whose love and blessings guided and accompanied me throughout my life. Also, to my husband (Muneef Abdulraqeeb Taresh) who support me all the time and help me a lot, and all my children (Shukry-Saad-Gaith).

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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Being a developing country, there are a few services centers in Yemen for children with ASD; access to services is further impeded by ignorance about this kind of disorder, negative beliefs, and stigmatizing attitudes towards affected children and their families. To increase access to services, care provision is decentralized through task-shifted care by pre-schools workers, such as pre-school teachers (PSTs). The purpose of this study is to evaluate the effect of ASD.EM on pre-school teacher's knowledge, belief, identification skill and self-efficacy to identify children with ASD in Taiz Yemen.

mixed method included questionnaires and open-ended questions was utilized to investigate the impact of ASD.EM on PSTs' Knowledge (K), Belief (B), Self-Efficacy (SE), and Identification Skills (IS) to identify children with ASD. Cluster randomized trial was used to select 120 PSTs to answer the K, B, SE questionnaires. Participants were randomized for experimental groups (EG=60) and control group (CG=60). Then, forty participants (EG=20, CG=20) were randomly selected from the total sample (120 PSTs) to answer IS open-ended questions. The educational module ASD.EM consists of four structure units divided into 10 sessions with the range of 20 hours. It was implemented to the experimental group while the control group received another educational program related to career development (playing learning strategy) for 20 hours. Data were first collected from the Pre-test and then from the post-test after immediately finishing the ASD.EM sessions. Then, after one month of giving the post-test, data were gathered for a follow-up test. General linear model (GLM) repeated measure was used to compare between group EG &CG in K,B,SE. While, Multivariate analysis of covariance (MANCOVA) was used to assess the effect of ASD.EM on PSTs' K,B,SE after controlled the covariate variable . Also, the researcher used theme analysis (TA) to explore the PSTs responses for open-ended questions. Data were analysed using SPSS version 25.0 with level of significance at 0.05. The result showed that the EG showed more significant improvement in PSTs K, B, SE than CG. That is, K mean did

not differ between EG and CG at pre-test; (mean=82.08 (6.179) vs 81.45 (4.986), F (.618) P=.538). However, in the post-test and follow up test, the EG had a greater increase in PSTs' K between the groups; for post-test (mean=102.82 (6.329) vs 80.85 (4.547), F (21.836) P=0.001) and for follow up test (mean=103.08 (5.334) vs 81.55 (3.899), F (25.246) P=0.001). B mean did not differ between EG and CG at pre-test (mean=56.67 (7.476) vs 57.20 (7.702), F (-.385) P=.701). However, in the post-test and follow up test, the EG had a greater increase in PSTs' B between the groups; for post-test (mean=65.13 (3.534) vs 56.40 (7.265), F (8.373) P=000) and for follow up test (mean=65.25 (3.690) vs 56.58 (6.953), F (8.528) P=000). SE mean did not differ between EG and CG at pre-test (mean=40.08 (4.256) vs 39.90 (3.948), F (.245) P=.807). However, in the post-test and follow up test, the EG had a greater increase in PSTs' SE between the groups; for post-test (mean=51.00 (3.086)) vs 40.22 (4.499), F (15.310) P=000), and for follow up test (mean=50.05 (2.752) vs 40.38 (4.614)), F (13.937) P=000). In contrast, MANCOVA results showed no statistically significant difference on PSTs' K, B, SE based on demographic variables (educational level, teaching experiences) after controlling the covariate variable. Besides, three themes have emerged from the thematic analysis: (I)Ability to identify and name children with ASD, (ii) Ability to describe a child's behavioural problem, and (iii)Decision- recommending for referral to the specialist. Therefore, the findings, confirmed that the ASD.EM effectively improved PSTs' knowledge, belief, self-efficacy, identification skills to identify children with ASD in Taiz, Yemen.

Keywords: Autism spectrum disorder; Pre-school teachers; Knowledge; Belief; Identification skills; Self-efficacy; Yemen.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
Sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PEMBANGUNAN MODUL PENDIDIKAN GANGGUAN SPEKTRUM AUTISME (ASD.EM) GURU PRA-SEKOLAH PENGETAHUAN, KEPERCAYAAN, KEMAHIRAN DAN EFIKASI KENDIRI UNTUK MENGENAL PASTI KANAK-KANAK AUTISME

Oleh

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Sebagai sebuah negara membangun, Yaman mempunyai hanya beberapa pusat yang menawarkan perkhidmatan bagi kanak-kanak yang menghidap autisme. Selain itu, akses kepada perkhidmatan autisme ini turut dibatasi oleh kekurangan pengetahuan tentang gangguan spektrum ini, persepsi yang negatif dan stigma terhadap kanak-kanak autisme dan keluarga mereka. Untuk meningkatkan akses kepada perkhidmatan ini, penyediaan penjagaan telah disentralisasikan melalui pemindahan tugas penjagaan kepada pekerja prasekolah seperti guru-guru prasekolah. Kajian ini bertujuan untuk menilai keberkesanan modul pendidikan gangguan spektrum autisme terhadap pengetahuan, kepercayaan, kemahiran mengenal pasti dan efikasi kendiri dalam kalangan guru-guru prasekolah untuk mengenal pasti kanak-kanak autisme di Taiz, Yaman. Kajian ini merupakan kajian gabungan yang menggabungkan kaedah kuantitatif, menggunakan soal selidik, dan kualitatif, menggunakan soalan terbuka, untuk menyiasat kesan modul pendidikan terhadap pengetahuan (K), kepercayaan (B), kemahiran mengenal pasti (IS) dan efikasi kendiri (SE) untuk mengenal pasti kanak-kanak autisme. Sampel kajian ialah seramai 120 orang guru prasekolah yang telah dipilih secara rawak dan dibahagikan kepada dua kumpulan iaitu kumpulan eksperimen (EG= 60 orang) dan kumpulan kawalan (CG=60 orang). Seterusnya, seramai 40 orang guru prasekolah dipilih secara rawak daripada jumlah sampel tersebut untuk menjawab soalan terbuka terhadap kemahiran mengenal pasti (IS). Modul pendidikan gangguan spektrum autisme terdiri daripada empat struktur unit yang dibahagikan kepada sepuluh sesi dengan jangkamasa 20 jam. Modul ini dilaksanakan kepada kumpulan eksperimen sahaja manakala kumpulan kawalan menerima modul pendidikan lain yang berkaitan dengan pembangunan kerjaya untuk tempoh 20 jam. Data daripada ujian pra dan ujian pasca dikumpul sejurus selesai sesi intervensi menggunakan modul pendidikan. Selepas sebulan, data daripada ujian susulan pula dikumpul. Model linear umum (GLM) pengukuran berulang dan analsis kovarians multivariat (MANCOVA) digunakan untuk menilai keberkesanan intervensi.

Disamping itu, kajian ini juga menggunakan analisis tema (TA) untuk meneroka respons sampel kajian terhadap soalan terbuka. Data dianalisis menggunakan perisian SPSS versi 25.0 dengan tahap signifikan pada p< 0.05. Hasil kajian menunjukkan bahawa kumpulan eksperimen (EG) menunjukkan peningkatan yang signifikan untuk item K, B dan SE berbanding kumpulan kawalan (CG). Min item K tidak berbeza antara EG dan CG pada ujian pra (min EG=82.08 (6.179), min CG=81.45 (4.986), F (.618) P=.538). Walau bagaimanapun, dalam ujian pasca (min EG=102.82 (6.329), min CG=80.85 (4.547), F (21.836) P=0.001) dan ujian susulan (min EG=103.08 (5.334), min CG=81.55 (3.899), F (25.246) P=0.001), item K bagi EG mempunyai peningkatan yang paling besar.). Selari dengan K, min item B juga tidak berbeza antara EG dan CG pada ujian pra (min EG=56.67 (7.476), min CG=57.20 (7.702), F (-.385) P=.701). Walau bagaimanapun, dalam ujian pasca (min EG=65.13 (3.534), min CG=56.40 (7.265), F (8.373) P=0.001) dan ujian susulan (min EG=65.25 (3.690), min CG=56.58 (6.953), F (8.528) P=0.001), item B bagi EG mempunyai peningkatan yang paling besar. Dapatan kajian juga mendapati min item SE juga tidak berbeza antara EG dan CG pada ujian pra (min EG=40.08 (4.256), min CG= 39.90 (3.948), F (.245) P = .807). Walau bagaimanapun, dalam ujian pasca (min EG=51.00 (3.086), min CG=40.22 (4.499), F (15.310) P=0.001) dan ujian susulan (min EG=50.05 (2.752), min CG=40.38 (4.614), F (13.937) P=0.001), item SE bagi EG mempunyai peningkatan yang paling besar. Sebaliknya, keputusan MANCOVA tidak menunjukkan perbezaan yang signifikan bagi item K, B dan SE berdasarkan pemboleh ubah demografi (tahap pendidikan dan pengalaman mengajar) setelah pemboleh ubah kovariat dikawal. Selain itu, tiga tema telah muncul dari analisis tematik: (I) Keupayaan untuk mengenal pasti dan mengklasifikasikan kanak-kanak sebagai ASD, (ii) Keupayaan untuk menggambarkan masalah tingkah laku kanak-kanak, dan (iii) Keputusan- mengesyorkan supaya merujuk kepada pakar.Justeru, dapatan kajian mengesahkan bahawa modul pedidikan gangguan spektrum autisme adalah berkesan untuk meningkatkan pengetahuan, kepercayaan, efikasi kendiri dan kemahiran para guru prasekolah untuk mengenal pasti kanak-kanak autisme di Taiz, Yemen.

Kata kunci: Gangguan spektrum autisme; Guru prasekolah; Pengetahuan; Kepercayaan; Kemahiran mengenal pasti; Efikasi kendiri; Yaman.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

ASD	Autism Spectrum Disorder
PST	Pre-school Teacher
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
EG	Experimental Group
CG	Control Group
DV	Dependent Variables
IV	Independent Variables
ASD.EM	Autism Spectrum Disorder Educational Module
ADHD	Attention Deficit Hyperactivity Disorder
ADDIE	Analysis, Designs, Development, Implement, Evaluation.
SCT	Social Cognitive Theory
HBM	Health Belief Model
PSTs	Pre-school teachers

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter presents the background information on the Autism Spectrum Disorder (ASD), problem statement, significance of the study, research questions, objectives, and hypothesis of the study.

1.2 Background

Professional concern towards children with behavioural difficulties is recently viewed as an integral part of the teacher's role (Neely-Barnes et al., 2011). Autism spectrum disorder (ASD) is one of the behavioural difficulties, which consists of a set of complex and lifelong repetitive, stereotyped behaviors, and a pervasive inability to communicate verbally and non-verbally. This disorder is a neurological status existing from birth and may persist during lifespan (Xie et al., 2016). It also affects the cognitive and emotional abilities and a child's behavioural (Neik et al., 2014) .

According to the American Psychiatric Association (APA, 2013), the ASD is characterised by two features, impairment in social interaction, communication, and limited behavioural patterns, interests, and activities. Notably, several from health officials on ASD emphasised the in the number of ASD cases in recent years. Autism and Developmental Disabilities Monitoring (ADDM) estimated based on the data from 2008 that the prevalence of ASD increased by 23% compared to the data from 2006 (11/1000 in 2008 versus 9/1000 in 2006). Meanwhile, the most recent prevalence of ASD, was observed from 1 out of 50 children (Centers for disease control and prevention CDC, 2020) , as shown in Figure 1.1.

The ADDM Network was composed of 11 sites for surveillance year 2016 (Arizona, Arkansas, Colorado, Georgia, Maryland, Minnesota, Missouri, New Jersey, North Carolina, Tennessee, and Wisconsin).

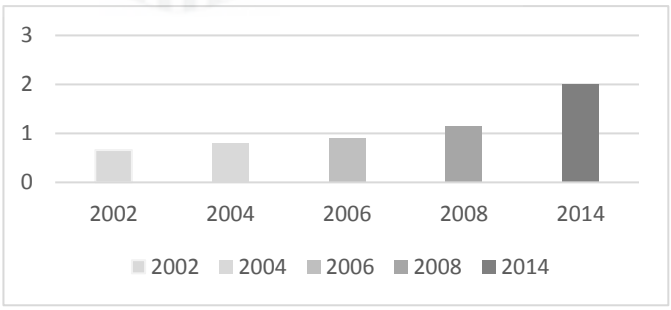

Figure 1.1: Prevalence of ASD
[Source Centre for Disease Control and Prevention (CDCP)]

Other study conducted during 2009-2017 mentioned that about 1 in 6 (17%) children aged 3–17 years were diagnosed with a developmental disability including autism spectrum disorder based on parents' reports in US (Zablotsky et al., 2019). The increase in this prevalence indicated that ASD is more common compared to other developmental disorders (Granader et al., 2014). The high rate of ASD cases makes the efficient diagnosis of this issue necessary (Paynter et al., 2015; Xie et al., 2016). Following the proper investigation of ASD in many developed countries, international organisation, and agencies released guidelines on methods to address this phenomenon. Meanwhile, despite several attempts made to investigate ASD in Arabic countries, the studies on this issue are highly scarce (Alallawi et al., 2020; Hussein & Taha, 2013).

However, some studies do mention that ASD is a prevalent disorder in Arab countries. For example, a field study using the Arabic version of the Gilliam Autism Rating Scale (GARS) conducted in both Egypt and Saudi Arabia found that 11,057 children under the age of 16 were diagnosed with autism. It was indicated that the ratio of prevalence from boys to girls was 2:1 (Al-Sharbati et al., 2015; Alsehemi et al., 2017). While study found that the ASD prevalence rate in Oman was 104 for every 10,000 children (Al-Farsi et al., 2011; Al-Sharbati et al., 2015), while 128 out of 50,838 kids at a pediatric hospital in Tripoli, Libya was recorded to be autistic. Moreover, cases of autism were recorded among 11.5% of children in Egypt and Tunisia. It is noteworthy that nearly two million children were reported by the Palestinian Central Bureau of Statistics to have disabilities or require special needs, including the 1,515 mentally disabled children (Al-Zaalah et al., 2015).

In a survey on mental health in the Middle East conducted for 25 years, underrepresentation of data was found in the publications on child psychiatry, particularly, on autism (Al-Sharbati et al., 2015; Hussein & Taha, 2013). Another study and survey conducted in the United Arab Emirates (UAE) were performed on a random sample of 694 children aged three years old. It was found that 58 out of 10,000 children were recorded ASD symptoms (Hussein et al., 2011). Meanwhile, the Kingdom of Saudi Arabia was recorded with 42,500 cased of autism with the possibility of many other cases not being diagnosed.

As examined in several countries, early identification and intervention are essential in increasing positive results among children, especially the pre-school children aged from three to five years (Dunlap et al., 2006; Fantuzzo et al., 1999; Smith-Donald et al., 2007). However, early diagnosis of ASD remained limited in Arab countries, such as Saudi Arabia, as highlighted by Al-Zaalah et al. (2015). Meanwhile, the first legislation decision was issued in 1991 for the care and rehabilitation of children with disabilities in the Republic of Yemen, which is considered one of the developing countries. Subsequently, the Higher Committee for the Care of Handicapped Rehabilitation was established in 1999, which launched the Handicapped Care and Rehabilitation Fund. However, this funding programme considered ASD one of the types of disability. In the programme strategy from 2004 - 2018, the first goal was to change society's view towards children with disabilities by raising the level of awareness of those children rights and capabilities.

Currently, a high percentage of ASD among children requires pre-school teachers to identify children's abnormal development at an early stage, followed by referral to specialists (Harris & Handleman, 2000; Sallows & Graupner, 2005). A pre-school teacher has a high chance of identifying this type of disorder among his or her students and refer it to perform an appropriate assessment to acquire early intervention services (Drusch, 2015). However, pre-school teachers might be faced with many obstacles in these processes (Biasotti, 2011), which involve their beliefs, attitudes, feelings, skills, and perceptions of children with ASD, knowledge in managing ASD. The lack of knowledge and incorrect beliefs toward ASD could lead to low self-efficacy of pre-school teachers in identifying ASD in children and less confidence in voicing their concern to the children's parents before referring them for early intervention to ASD (Biasotti, 2011).

Provided that knowledge is one of the barriers to early screening, the lack of knowledge of ASD among pre-school teachers leads to late diagnosis (Self et al., 2010). Several studies around the world emphasised the influence of low knowledge in early diagnosis service (Dillenburger et al., 2013; Imran et al., 2011; McGrath et al., 2009). Meanwhile, a survey study performed on providers health , including pre-school teachers, demonstrated the need to enhance the knowledge of early signs of ASD to aid early recognition and diagnosis (Dillenburger et al., 2013). It was found that the understanding of early signs was low among pre-school teachers (Al-Farsi et al., 2011; Anthony et al., 2005; Lian et al., 2008), which indicated a low level of overall knowledge of ASD among pre-school teachers (Liu et al., 2016; Qi et al., 2016). This low level of knowledge also influenced the teachers' ability to identify children with ASD at an early-stage (Drusch, 2015).

Beliefs could play an essential role in individuals' interpretation of disability or children's behavioural problem (Derguy et al., 2020 ; Harrington et al., 2006; Jegatheesan et al., 2010). The inaccurate beliefs of various aspects of the disorder are common among teachers and parents. Compared to medical specialists in the field, the study assessing teacher and parent's beliefs and knowledge on the aspects of the disorder found that the parents (n = 47) and teachers (n = 47) had misconceptions regarding the cognitive, developmental, and emotional features of autism (Stone & Rosenbaum, 1988). Accordingly, the health belief model (HBM) is a theoretical framework, which describes health behavior and medical decision-making. Perceived barriers are among the components of this theory. When a particular action is taken or the teachers' concerns about the child's parents are expressed, social stigma is considered one of the barriers identified in the teachers' discussion with the child's parents and pre-school teachers' effort of reducing these barriers through the theory (Barrie, 2010; Rosenstock, 1990).

Several studies identified pre-school teachers' lack of knowledge and skills as one of the factors in the management of behavioural problems in ASD (Dunlap et al., 2006; Fox & Smith, 2007). Pre-school teachers should improve their skills to observe the track growth of children and their behavior. This is followed by recording their observation instead of writing a report. These identification skills are essential for pre-school teachers in their discussion with parents or other diagnosis specialists and negotiation with appropriate referral systems (Drusch, 2015; Kingsley, May 2012; Liu et al., 2016). However, pre-school teachers' perceptions of the costs involved in seeking a diagnosis or referral (e.g.,

time, social stigma, unawareness on who to contact, and no confidence in their knowledge among others) become barriers for the teachers to express their concern to the child's parents. Therefore, the identification of children with ASD could not be made (Barrie, 2010; Kingsley, May 2012).

Lastly, one of the obstacle factors to identify children with ASD is self-efficacy, which is one of the teachers' characteristics affecting their teaching practices, classroom teaching, and communication with children (Woolfolk & Hoy, 1990). According to Bandura in social cognitive theory (SCT) (Bandura, 2002), self-efficacy could be defined as the pre-school teacher's ability to take action and manage children with challenging behavioural problems, such as ASD (Bandura, 1977). One study suggested that teachers who believe in their ability to handle behavioural issues would place an effort to create change in the affected children (Liljequist & Renk, 2007). To illustrate, pre-school teachers possess the most important role in identifying children with ASD and referring them for clinical intervention at an early stage (Drusch, 2015) .

Several studies suggested that pre-school teachers' beliefs, perceptions, knowledge, self-efficacy, and skills related to challenging behaviour in ASD among young children could influence their identification and referral decisions (Dunlap et al., 2006; Fantuzzo et al., 1999; Kauffman, 1999; Powell et al., 2007). This study was performed to explore how pre-school teachers could acquire the ability to identify children with autism and refer those suspected with ASD to specialists while working with the children's parents. The current research was performed on the impact of pre-school teachers' ASD knowledge and skills to identify children with ASD. It aims to improve the misconception within the society regarding ASD and increase the pre-school teachers' self-efficacy in identifying the symptoms of ASD. It also identified the factors boosting their confidence to express their concerns to parents and refer children for screenings and other services.

1.3 Problem Statement

According to The United Nations Human Development Report in 2014, Yemen was estimated as one of the poorest countries in the world, with a rank of 140 out of 182 (Neely-Barnes et al., 2011). Low admission to education was a crucial poverty-related issue in Yemen. However, Yemen was also rapidly improving towards urbanisation while suffering a deteriorating economy in this period. According to the World Bank, 87% of the poor in Yemen were illiterate or did not complete primary school. Furthermore, the ongoing war contributed to the lack of education and poor health (Neely-Barnes et al., 2011). Followed by insufficient ASD centres except for the main cities, including Sana'a, Taiz, and Aden. Severe scarcity of child mental health professionals also occurred in Yemen (Barrie, 2010). Overall, all these factors led to the loss of actual recordings of ASD cases, although several studies assumed that a large number of cases were not diagnosed (Bryson et al., 2004; Sacrey et al., 2015).

The increase in ASD cases in recent years led to the necessity for more research to identify children with these cases and assist them at a stage (Saggu, 2015). It was found that the gap between the first concerns and the final diagnosis was high, which could

bring negative effects on the child's development. Accordingly, previous literature highlighted the importance of early diagnosis and intervention (Rosenberg et al., 2011). The reference to early intervention for children with severe behavioural problems, such as ASD, was identified as a high priority by both teachers and specialist (Conroy et al., 2005; Severson et al., 2007). It was demonstrated that children who received early intervention for behaviour problems possessed higher social skills and success in school compared to the children who did not receive the intervention or receive late intervention (Conroy et al., 2005; Fantuzzo et al., 1999; Smith-Donald et al., 2007).

Various studies supported the crucial need for early identification and intervention of teachers for young children with ASD (Fantuzzo et al., 1999; Fox & Smith, 2007; Kauffman, 1999; Powell et al., 2007). Effective evidence-based interventions are employed to reduce or eliminate challenging behaviours, such as ASD. Accordingly, provided that pre-school teachers have a high chance to manage children for a long term and compare a child with other regularly developing children, the pre-school phase is considered an ideal setting for identifying children with ASD at an early phase. Following the training and education in child development received by pre-school teachers (Branson et al., 2008), the teachers should be able to refer children with ASD at a young age (Drusch, 2015). Moreover, pre-school teachers' observation is a reliable source for providing information about children with ASD symptoms compared to children without these signs. Pre-school teachers are more capable of providing notices compared to parents due to their higher ability to compare between the children in the class in terms of development, as proven in many studies (Barrie, 2010; Dereu et al., 2012).

Although pre-school teachers could play the primary role in the diagnosis report for a child with ASD, the teachers were found to mistakenly identify signs of attention-deficit/hyperactivity disorder (ADHD), such as hyperactivity and excessive talking (Johnson et al., 2012). This mistake delays the identification of development among children, which leads to the requirement for more preparation among pre-school teachers to manage the challenging behaviours in the class. Several studies highlighted that pre-school teachers could be a trusted sources after receiving proper self-efficacy training in the identification of children with disabilities and special conditions for other specialists or child' parents (Dominick et al., 2007; Latouche & Gascoigne, 2019; Talib & Paulson, 2015).

However, Hawley and Williford (2015) recorded that teachers' ability to transfer children with ASD to intervention service is essential. Therefore, Rhodes (2016) highlighted that pre-school teachers should be trained for the improvement in their knowledge and ability to manage those kind of disorders among children (Rhodes-Coblentz, 2017). Meanwhile, Dillenburge (2013) stated that numerous discussions were made on the effectiveness of expanding diagnostic criteria and the level of reliability, case determination, awareness among relevant professionals and teachers, and an actual increase in the prevalence of diagnostic disorder (Dillenburger et al., 2013).

One of the suggestions for preparing the pre-school teachers for managing children with ASD is the involvement in the ASD team diagnosis (Drusch, 2015). Therefore, pre-school teachers could play the main role in diagnosis report after an appropriate preparation for ASD area has been made (Branson et al., 2008; Drusch, 2015). Following that, Drusch (2015) confirmed that professional or personal efforts are not adequate to enhance the teachers' knowledge, skills, and ability, suggesting that the knowledge and skills for identifying ASD could not be achieved through their field of work. Therefore, the teachers require exposure to more training in skills to identify the signs of ASD symptoms among children, including the addition of referral services. In the case of adding referral services, several qualities from pre-school teachers are required (Kingsley, May 2012). Therefore, the rehabilitation of pre-school teachers plays a vital role in providing education and health education relevant to developmental disorders in children such as ASD. According to the conceptual framework of the current study, a positive effect on knowledge, belief, and self-efficacy can be created to identify children with autism by providing education for pre-school teachers to identify children with autism at an early stage who can effectively share and transmit relevant information to children' parents and society.

Therefore, as educated and respectful figures of the Yemeni community, teachers have been selected as the study population as the agent of change in the transfer of ASD-related knowledge to child' parents and community members. It is common for Yemeni pre teachers to share and discuss common behavioural health issues with their caregivers by conducting behavioural modification sessions at school. And thus, help spread the knowledge gained in this domain to all community. As well as the role played by pre-school teachers in promoting healthy behavior with regard to psychological healthcare practices among caregivers, educational module intervention has therefore been identified as the best method in increasing the knowledge on ASD among the general population since it is more effective and less costly (Able, 2012) . Besides that, pre-school teachers can also play a role in offering psychological healthcare education since they are the role models, which enable them to reach a larger population by connecting with the caregivers and community members. In addition to that, since no study has been published on the ASD of Yemeni children with ASD, this study might therefore help in providing information for the undertaking of plans in increasing the number of ASD awareness educational module, as well as in defining preventive strategies within this group which could be one of the effective means in the development of educational module for other groups in the future. To the best of the researchers' knowledge, this study is the first of its kind, evaluating educational module intervention of ASD using the SCT and HBM among pre-school teachers in Yemen.

Moreover, in conjunction with global increase in the prevalence of ASD (Biasotti, 2013) occurs due to ignorance among pre-school teachers about ASD, especially in Yemen, suffering from ignorance in general and mental health (Desta et al., 2017; UNDP, 2009). Following that, pre-school teachers urgently require training and enhancement of their self-efficacy to identify this type of disability and assist parents in facing their challenge. Notably, ASD.EM is an essential initiative in Yemen. Moreover, a recent systematic review on the ASD area mentioned that; the best way to investigate educational module effectiveness is mixed methods approaches because they provide a detailed understanding of both intervention components and broader structural factors and still not addressed yet (Hussein & Taha, 2013). Thus, this study aims to educate pre-school

teachers through the educational module (ASD.EM) to increase knowledge, increase positive belief, and enhance the pre-school teachers' identification skills and self-efficacy to identify children with ASD in Taiz city in Yemen. Therefore, Figure 1.2 below summarises the problem statement based on the previous studies shown in Section 1.2,

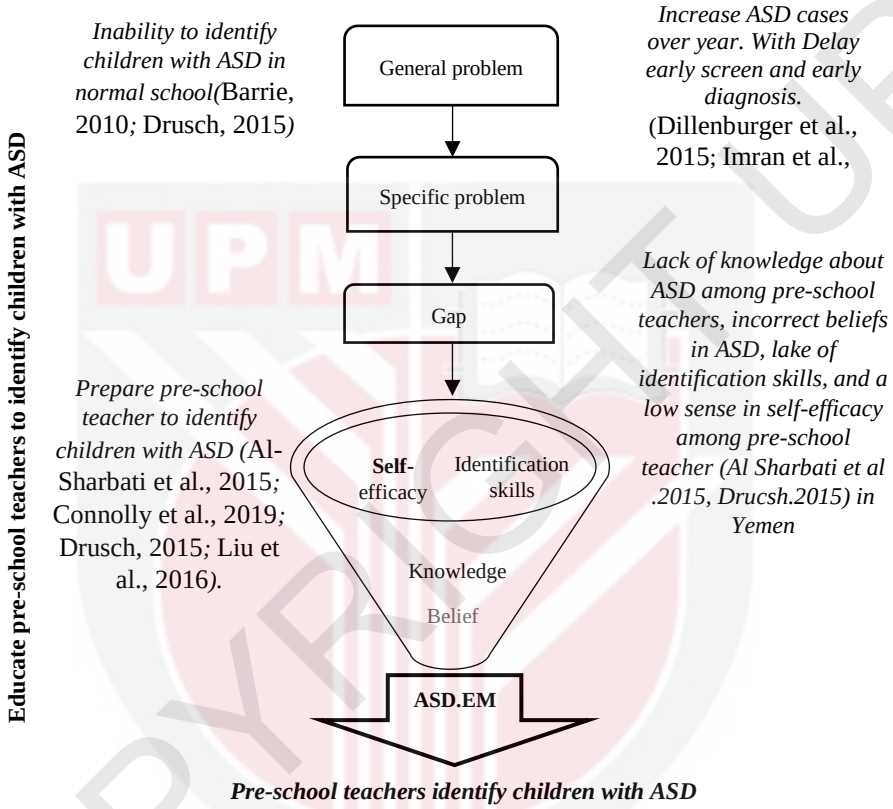

Figure 1.2: Present a problem statement

1.4 Research Objectives

This section includes the study objectives, the study's general objective, followed by five specifics objectives.

1.4.1 General objective

To develop and implement autism spectrum disorder educational module (ASD.EM) and evaluate its effectiveness on knowledge, belief, identification skills, and self-efficacy for pre-school teachers in Taiz, Yemen.

1.4.2 Specific objectives

The specific objectives of this study are:

1) To develop autism spectrum disorder educational module (ASD.EM) on pre-school teachers' knowledge, belief, identification skills, and self-efficacy to identify children with ASD in Taiz, Yemen.

2) To implement autism spectrum disorder educational module (ASD.EM) on PSTs' knowledge, belief, identification skills, and self-efficacy to identify children with ASD.

3) To compare the differences of PSTs' knowledge, belief, and self-efficacy to identify children with ASD between the experimental and control groups according to timing (pre-test, post-test, follow up test).

4) To compare the differences of PSTs' knowledge, belief, and self-efficacy based on demographic variables (Educational level- Teaching experience) after controlling the covariate variable.

5) To explore the PST' identification skills to identify children with ASD in Taiz Yemen

1.5 Research' Hypothesis & Questions

To achieve the objectives of the study, the researcher tested the hypothesis and answered the research questions. Table (1.1) presents both the research hypothesis and questions.

Table 1.1: Research objectives to the hypothesis and questions

No	Research Objectives	Research hypotheses \ Questions	General problem
1	To develop autism spectrum disorder educational module (ASD.EM) on PSTs' knowledge, belief, identification skills, and self-efficacy to identify children with ASD in Taiz, Yemen,	----------	Evaluate the effect of ASD.EM on PST to identify children with ASD
2	To implement autism spectrum disorder educational module (ASD.EM) on PSTs' knowledge, belief, identification skills, and self-efficacy to identify children with ASD	----------	
3	To compare the differences of PSTs' knowledge, belief, and self-efficacy to identify children with ASD between the experimental and control groups according to timing (pre-test, post-test, follow up test).	**H1:** There are no significant differences in PSTs' knowledge between the experimental and control groups at pre, post, and follow-up tests. **H2**: There are no significant differences in PSTs' belief between the experimental and control groups at pre, post, and follow-up tests. **H3:** There are no significant differences in PSTs' self-efficacy between the experimental and control groups at pre, post, and follow-up tests.	
4	To compare the differences of PSTs' knowledge, belief, and self-efficacy based on demographic variables (Education level - Teaching experience) after controlling the covariate variable.	**H4:** There is no significant differences of PSTs' knowledge based on demographic variables **H5**: There is no significant differences of PSTs' belief based on demographic variables **H6:** There is no significant differences of PSTs' self-efficacy based on demographic variables	
5	To explore the PST' identification skills to identify children with ASD in Taiz Yemen.	Q1: How were the PSTs' identification skills responses before and after implementing the ASD.EM within and between groups?	

Table 1.1 Presents five objectives investigated based on six hypotheses and one question. The general issue highlighted in this research, which was the preparation of pre-school teacher' knowledge, beliefs, identification skills, and self-efficacy to identify children with ASD.

1.6 Significance of the Study

Currently, a high percentage of ASD among children requires pre-school teachers to identify children's abnormal development at an early stage, followed by referral to specialists (Harris & Handleman, 2000; Sallows & Graupner, 2005). The increase in ASD cases in recent years led to the necessity for more research to identify children with these cases and assist them at a stage (Saggu, 2015). Therefore, The significance of the current study stems from its focus on developing an educational module to qualify preschool teachers in identifying autistic children in regular schools at an early stage. Such a focus would hopefully benefit Yemen as a developing country, children with ASD , preschool teachers, and parents. Therefore, the current study is of significance in theoretically and practically aspects;

Theoretically, the current study aims to develop an autism spectrum disorder educational module (ASD.EM) for preschool teachers. Therefore, the development of the educational module is done through organized and robust steps to ensure the validity and strength of the module structure. To design such a module, the researcher uses two theories: social cognitive theory (SCT) and the health belief model (HBM. Since the SCT focuses on shaping and modifying the individuals' behavior, the current study focuses on the effectiveness of the theory in the professional rehabilitation of preschool teachers to identify children with ASD. On top of that, SCT concentrates only on the individuals' cognitive and behavioural aspects, neglecting the emotional aspect. Therefore, the researcher will compel to add another theory, the HBM, to cover the emotional side of preschool teachers. On the other hand, the module will be built and evaluated through the ADDIE structure system, which is considered a closed system in developing the educational module to achieve the effectiveness requirement. Therefore, the significance of the study stems from its novel theoretical contributions to the body of teachers' habitation and child's developmental disorders detection literature, especially to those previous studies which have ignored implementing interventions. This is because the current study investigation focuses on several independent variables in relation to early detection for child disorders and preschool teachers' habitation.

Furthermore, the current study has of significance in practically aspect as follow: First, Yemen is considered one of the most impoverished countries, as reported by the World Bank in 2016. Although there is a consensus in the prevalence of ASD among children at a ratio of 1:50 children globally, the cases reported in the Arab countries are still very few. In addition, Yemen has a few studies conducted on children with developmental disorders, as confirmed by a review study by (Hussein & Taha, 2013), and most of these studies have not been published yet. Therefore, the study's findings will hopefully establish not only baseline data that may benefit other researchers interested in examining children's disorders but also primary data concerning Yemeni preschool teachers' knowledge, beliefs, and self-efficacy.

Second, addressing the issue of ASD among children presents the childhood situation in Yemen globally. In other words, the findings are hoping to shed light on how children with ASD disorder are mistakenly identified as other behavioural disorders. This would

hope to diagnose the current situation and suggest practical solutions to improve it. That is because those children need special care and highly trained teachers to help educate them properly.

Third, since teachers are one of the fundamental pillars of the learning process, preschool teachers have an essential role in the early detection of children with autism and educating parents at the same time. The study's findings hope to increase awareness of the preschool schools by giving them suitable training on detecting childhood with ASD and how to deal with them. Raising the preschool teachers' awareness is believed to shape their knowledge, ideas, and beliefs about children with ASD and improve their skills in identifying them early.

Fourth, the study's results are hoped to spread awareness among members of society, including parents who experience great stress and misunderstanding of their children with ASD. Those parents need not only the support of the public organizations but also the training on how to recognize such a disorder with their children. Such training will increase the parents' awareness of the proper way to deal with their children and ensure better treatment of their unexpected behaviors. Moreover, considering that pre-school teachers play a vital role in educating and motivating others and future society, it is thus very important for them to be provided with better health education especially in the childhood field. This research will directly benefit pre-school teachers, their preschoolers, families, and friends, as well as to provide information to the researchers, policymakers (educators), and health care and education qualification workers who strive to produce beneficial interventions for preschool teachers and their children in school.

In order to, ASD is considered the most common type of childhood disorder, which warrants the attention of education and health policymakers. The understanding of ASD can provide useful information for planning and developing an ASD detection policy at the educational and health organizational level. Thus, an evaluation of the ASD module, including the ideal age to commence detection is urgently needed, and effort should be made to reduce the proportion of late of unknown grades and stages.

1.7 Definition of Terms

In this section, the research terms, such as ASD, knowledge in ASD, belief in ASD, identification skills in ASD, ASD.EM, and self-efficacy to identify children with ASD will be defined.

1.7.1 Autism Spectrum Disorder (ASD)

Autism is a developmental disability caused by a neurological disorder, which negatively affects brain function. Normally taking place in the first three years of life, it is associated with severe deficits in mental, social, and communicative functioning. Two criteria involved in ASD diagnosis are the lack of social communication and social interaction,

which also include the difficulties in behavioural patterns, and repetitive and limited interests (Allinder, 1994). In this study, children with ASD means that all children who has any type of the autism spectrum disorders such as autistic disorder, Asperger's syndrome, pervasive developmental disorder not otherwise specified (PDD-NOS). Whether the disorders is mild, severe, or somewhere in between.

1.7.2 Pre-school teachers' knowledge in ASD

It is defined as the facts and information that people hold about a particular concept autism spectrum disorder (Rakab, 2018). In this study refers to facts and information that pre-school teachers hold (Causes, symptoms, treatment etc.) about autism spectrum disorder.

1.7.3 Pre-school teachers' Belief in ASD

According to M. F. Pajares (1992), belief is related to pre-school teachers' diagnosis of ASD causes and symptoms, or general information reflecting their attitude or thinking in different aspects (religious, societal, personal).in this study the pre-school teachers' belief refers to their belief (religious, societal, personal) towards children with ASD.

1.7.4 Autism Spectrum Disorder Educational Module (ASD.EM)

ASD.EM is education module for pre-school teachers to educate them on autism spectrum disorder. The ASD.EM helps PSTs to identify suspicious child who might have ASD. Therefore, the educational sessions are designed based on two theories and the ADDIE model. Specifically, it is based on the social cognitive theory in triadic reciprocal determination (behavioural, personal, and environmental factors) and the health belief module (HBM) to change the pre-school teachers' belief towards ASD. The descriptive theory indicates the methods of reducing the barriers beliefs toward ASD. Furthermore, ASD.EM is developed based on ADDIE (analysis-design-development-implement-evaluation) model. Dick et al. (2004) emphasised that any instructional design requires the use of a system to analyse problems and identify learning objectives to establish a strategic plan to solve teaching problems, test solutions, evaluate the results, and revise the programme. Although the literature offered several systematic instructional design models, the ADDIE model is possibly the commonly used model.

The ASD.EM consists of 10 sessions, which cover several topics units; the knowledge (cognitive aspect) consists of: (the definition of ASD based on DSM5, the symptom of ASD, type of ASD, causes of ASD, the prevalence of ASD, the difference between ASD symptoms and other disorders. Furthermore), Beliefs (emotional aspect) consist of: (the social misbelief, religion belief, and the correction of the belief about ASD), while identification skills (motor-behaviour aspect) consist of: (report writing, including observation and record skills). Following that, self-efficacy (emotional aspect) consists of: (the identification of ASD, which is the pre-school teachers' responsibility for

children with ASD. In this case, pre-school teachers discuss with parents regarding the referral decision).

1.7.5 Pre-school teachers' Self-Efficacy to identify children with ASD

Self-efficacy conceptualises the belief that one could manage or cope with a challenging task (Gibson & Dembo, 1984) and has the necessary skills to achieve desired outcomes (APA, 2013). Specifically, confidence is a behaviour contributing to results, while the ability to perform the behaviour determines one's actions(Skaalvik & Skaalvik, 2017). Bandura (1997) asserts that self-efficacy beliefs in the individual judgments of one's competence in completing a task are the strongest predictors of human motivation and future behaviours (Bandura, 1977).

In this study, self-efficacy refers to Bandura's (1997) definition regarding the pre-school teacher's beliefs in the judgments of their ability to discuss with the child's parents regarding their concerns of child's developmental delay and ability to suggest a referral for the child.

1.7.6 Pre-school teachers' Identification Skills in ASD

Skills are known as the "ability to do something well". In other words, it is an ability to use one's knowledge effectively and readily in execution or performance (Soodak & Podell, 1996). In this study, these skills referred to the pre-school teacher's skills to identify children with ASD by implementing their knowledge about the risk symptoms of ASD by employing some skills for the observation of behaviour, behaviour record, and report writing.

1.8 Chapter Summary

Preparation pre-school teachers have become the essential steps in early diagnosis, which has been confirmed in several studies to have value and importance for a child with a disability, such as ASD. Provided that early detection reflects to early intervention and adaptation to communication, the preparation of pre-school teachers to identify children with ASD in the class is one of their responsibilities. Based on the literature review of pre-school teachers' preparation to identify children with challenging behaviour, several studies highlighted the importance of educating pre-school teachers about child developmental delay. Besides, pre-school teachers should understand the differences between the behavioural problem and symptoms of delay developmental. Therefore, this study focuses on the development of an educational module to prepare pre-school teachers in identifying this type of disability in the class.

The ASD.EM is built based on two theories Social Cognitive Theory (SCT) and Health Belief Model (HBM). Moreover, it built by the ADDIE model, and several topics to cover the pre-school teachers' needs for the ASD area. This chapter presents the background of the study, which is followed by the problem statement, research objectives, and significance early identification of ASD in several aspects. Furthermore, the definition of the research terms is highlighted. This chapter is considered the foundation of the study to understand the field of pre-school teachers' preparation with ASD disorder. The next chapter demonstrates the variables of this study, namely the pre-school teachers' knowledge in ASD, belief in ASD, identification skills in ASD, and self-efficacy to identify children with ASD. It also elaborates on SCT and HBM theories, including the previous research and theories to support the current study.

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BIODATA OF STUDENT

Sahar M. Taresh, was born in Taiz city, Yemen, on the 4th December 1986. She gained a bachelor's degree in kindergarten department, faculty of educational studies from Taiz University in 2008. After her graduation, she has worked as a lecturer at kindergarten department, Taiz University. She continued to pursue education in the level of master's degree in Taiz University in the kindergarten department. Upon completing the master's degree, she has got a scholarship to Malaysia to complete a doctor of philosophy (PhD) at Universiti Putra Malaysia. Her research interest is an autism spectrum disorder.

LIST OF PUBLICATIONS

Taresh, S. M., Ahmad, N. A., Roslan, S., & Ma'rof, A. M. (2019, July). Knowledge in Autism Spectrum Disorder (ASD) among Pre-School Teachers in Yemen. In Proceedings of the 3rd International Conference on Special Education (ICSE 2019), Surabaya, Indonesia (pp. 13-15). SCOPUS.

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AWARDS

21-28 Oct 2021

Silver medal at Putra InnoCreative Carnival in Teaching and Learning (PicTL) , **(PicTL 2021) for the poster** Preschool Teachers Educational Module on Identifying Children with Autism Spectrum Disorder (EMiASD),UPM, Malaysia

18th March 2021

Bronze medal at International Invention, Innovation and Articulation (i-IDeA**); 2021** for the project titled (*Autism Spectrum Disorder Education Module ASD.EM*), UiTM, Malaysia.

22-27th Oct 2020

Gold medal at International Putra InnoCreative Poster Competition (PicTL 2020**).** For the project titled (*Autism Spectrum Disorder Education Module ASD.EM***)**, UPM, Malaysia.

28th August 2020

Bronze medal at Education Innovation Challenge held in conjunction with the Malaysian International Convention on Education Research & Management 2020, IIUM, Malaysia.

12th December 2019

Gold medal at the innovation poster competition, Faculty of Educational Studies, for the project titled (*Autism Spectrum Disorder Education Module ASD.EM***)**, UPM, Malaysia.

2nd June 2008

Honour Award from former president of Yemen for achieving highest at the undergraduate level.

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