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CHANGING TEACHERS' CONCEPTIONS OF AUTISM SPECTRUM DISORDER: A TRAINING TO INCREASE KNOWLEDGE, IMPROVE SELF-EFFICACY, AND ASSESS ATTITUDES TOWARD INCLUSION

by
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Title: Changing Teachers Conceptions of Autism Spectrum Disorder: A Training to Increase Knowledge, Improve Self-Efficacy, and Assess Attitudes Toward Inclusion

The literature shows that training presentations and workshops increase knowledge of teachers about Autism Spectrum Disorder (ASD), make the process of inclusion more successful, lead to more favorable attitudes toward inclusion, decrease stigma toward ASD and consequently lead to greater feelings of self-efficacy. Self-efficacy of teachers pertains to the certainty they feel towards having an impact on student learning. The literature also shows that self-efficacy of teachers affects their performance when working with students with ASD. Some studies attended to the knowledge factor, specifying that increased knowledge about ASD enhanced self-efficacy of teachers. Other studies have focused on attitudes toward inclusion in mainstream settings, which impact self-efficacy as well.

The present study was divided into two parts. The primary aim of Study 1 was to assess the effects of a training presentation about autism on increasing knowledge about ASD, making attitudes toward inclusion more favorable, decreasing stigma toward ASD and improving self-efficacy of teachers. The secondary aim of Study 1 was to assess the maintenance of acquired knowledge about ASD, changes in attitudes toward inclusion, stigma toward ASD, and levels of self-efficacy four weeks following the training. The aim of Study 2 was to systematically replicate and expand upon the literature concerning factors that impact self-efficacy. Specifically, the aim was to examine the effects of these factors taken together, knowledge about ASD, attitudes toward inclusion, stigma toward ASD and demographic characteristics on the self-efficacy of teachers working with students on the spectrum.

A total of 92 general, special and shadow teachers were recruited from different schools in Lebanon. The main findings of Study 1 were that the training had a positive impact on knowledge and self-efficacy of teachers. The training, however, could not impact attitudes toward inclusion and stigma of teachers toward ASD, as the pretest results obtained prior to the training were already very low (floor effect) for stigma toward ASD and very high (ceiling effect) for favorable attitudes toward inclusion, that there was no room for change. The main findings of Study 2 were that knowledge was the only predictor of self-efficacy. Attitudes toward inclusion, stigma toward ASD and demographic characteristics were not significant predictors of self-efficacy. The study was the first of its kind to focus on characteristics, qualifications and knowledge of teachers concerned with students on the spectrum attending inclusive settings in Lebanon. The interpretations of the findings and the limitations of the study were discussed.

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CHAPTER I

Knowledge, Self-Efficacy and Attitudes Toward Inclusion of Teachers of Students with ASD

The Diagnostic and Statistical Manual of Mental Disorders (DSM) is commonly used to guide the diagnosis of autism (APA, 2013). According to DSM 5, Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that causes clinically significant impairments across social, occupational, or other important areas of current functioning. Autism is a developmental disability that significantly affects verbal and nonverbal communication along with social interactions and repetitive activities and stereotyped movements. Children with ASD often adhere to strict routines, resist change and administer unusual reactions to sensory experiences.

ASD is the most internationally growing developmental disability affecting 1 in 68 children (CDC, 2014; Elsabbagh et al., 2012). Recently, children with ASD are being included in general education classrooms based on the philosophy of inclusion, which states that all schools should adapt their practices to meet particular needs of students (Kinsella & Senior, 2008). The philosophy of inclusion is in line with the International and European legal frameworks including the United Nations Declaration on Human Rights (UDHR), the European Convention on Human Rights (ECHR) and the United Nations Educational, Scientific and Cultural Organization (UNESCO; Marshall & Goodall, 2015).

Successfully teaching children with ASD in inclusive classrooms depends on the self-efficacy of teachers (Atiles, Jones, & Kim, 2012), their knowledge about ASD and their attitudes toward inclusion (Rafferty & Griffin, 2005). The National Research Council (NRC, 2001) found

that one of the weakest factors of teaching children with ASD is the absence of qualified teachers, which calls for the importance of training teachers.

Training teachers increased their knowledge about ASD, made the process of inclusion more successful, led to more favorable attitudes and consequently higher feelings of self-efficacy of teachers (Atiles et al., 2012; Mulvihill, Shearer, & Van Horn, 2002). However, successful inclusion of students does not only depend on general education or special education teachers, it also requires the presence of paraprofessionals, which are also referred to as shadow teachers (Symes & Humphrey, 2011). Shadow teachers help mainstream teachers in the process of inclusion through working directly with the child with ASD during preschool and elementary classes (Symes & Humphrey, 2011). Shadow teachers offer children with ASD the opportunity to attend mainstream classrooms while offering them the extra attention they require (Symes & Humphrey, 2011). The role of paraprofessionals (or shadow teachers) was previously limited to being caregivers of students with ASD. Their current roles have become much more complex, however, with paraprofessionals/shadow-teachers now responsible for helping students achieve higher academic standards and facilitating friendships and social networks (Causton-Theoharis, 2009).

The present study offered participants a training about ASD and examined the extent to which it had an impact on their knowledge about ASD, attitudes toward inclusion, stigma toward ASD and, in turn, their self-efficacy. The present study also examined self-efficacy as a function of knowledge about ASD, attitudes toward inclusion and stigma toward ASD among shadow teachers, and general and special education teachers who work with students on the spectrum.

A. An Overview of Self-Efficacy

According to Bandura (1977, 1994), self-efficacy is related to beliefs, expectations and

confidence pertaining to capabilities of individuals, rather than their actual skills. Efficacy is defined as the judgment of individuals of their ability to deal with various environmental demands, ranging from regular daily events to difficulties and obstacles. Since self-efficacy determines the confidence a person feels at succeeding in certain tasks, individuals with low self-efficacy expected to fail at tasks, while those with higher self-efficacy believed they will achieve their goals (Klassen, Tze, Betts, & Gordon, 2011).

When faced with difficulties, individuals with higher self-efficacy attempted to resolve the situation and recover faster than those with lower self-efficacy (Schwarzer & Hallum, 2008). These findings supported the Social Cognitive Theory proposed by Bandura (1994, 1997), which states that individuals, who feel more able, persevere to achieve their goals, and cope better with difficulties or even failure.

Sources of Self-Efficacy. Bandura (1997) discussed four sources of self-efficacy: sense of mastery, vicarious experiences, social persuasions and physiological and affective states. Sense of mastery is based on interpretations of one's past experiences. Usher and Pajares (2008) confirmed the importance of sense of mastery when it comes to self-efficacy of teachers. Their findings showed that teachers with past successes had high levels of self-efficacy, while teachers with past failures had low levels of self-efficacy.

The second source, vicarious experiences involve gaining experience through observing others, benefiting from their success and learning from their mistakes (Bandura, 1997). Billingsley, Carlson and Klein (2004) demonstrated the importance of mentor teachers in developing efficacy for early special education teachers. In that study, mentor teachers served as role models who could be imitated, and novel teachers observed proper interaction and problem-solving methods.

The third source, social persuasion is related to the persuasive messages and feedback a person receives from others (Bandura, 1997). Tschannen-Moran and Woolfolk Hoy (2007) found that self-efficacy and attitudes of teachers depended mostly on their need for social support and the degree to which they received support, positive and constructive feedback from their administration and qualified colleagues.

The last source of self-efficacy, physiological and affective states, pertains to somatic and emotional responses to performance of individuals (Bandura, 1997). Teachers of children with Autism Spectrum Disorder (ASD) are typically subjected to more stress due to the impact of their characteristics and skills on all areas of learning and interactions (Ruble et al., 2011). Several studies (e.g., Klassen & Chiu, 2010; Ruble et al., 2011) found that teachers, who undergo high levels of stress and anxiety felt unable to perform well at work, hence reported lower levels of self-efficacy and greater job dissatisfaction.

Self-Efficacy of Teachers. Efficacy influences behaviors in various educational, health, sports and business settings (Bandura, 1997). In educational settings, self-efficacy of teachers is the certainty they feel towards having an impact on student learning (Klassen & Chiu, 2010). Examining efficacies of teachers is an excellent tool to measure strengths and weaknesses of education programs and services, in order to determine which areas are: targeted appropriately, missing or require different approaches (Atiles, Jones, & Kim, 2012).

Tschannen-Moran and Woofolk Hoy (2001) compared levels of self-efficacy of teachers, and found that higher self-efficacy led to better achievement and served to better motivate students. They also found that the higher the self-efficacy of teachers, the less difficulties they faced in the classroom, hence less stress and more job satisfaction experienced.

Atiles et al.'s (2012) study involving undergraduate students enrolled in primary teacher education classes examined efficacy of teachers in working with students with special needs. Results showed that self-efficacy did not merely depend on hours spent in inclusive settings, but rather on the classroom ratio of children with special needs in comparison to students of typical development. Therefore, the extent to which teachers felt well equipped to work with students with special needs was directly related to the quality of their experience, rather than time spent in inclusive classrooms.

Klassen and Chiu's (2010) study showed that self-efficacy in general, and self-efficacy particular to each of classroom management, instructional strategies, and student engagement, varied throughout years of experience. The study also found that teachers with higher self-efficacy in domains of classroom management and instructional strategies tended to be more satisfied with their job. Dicke et al. (2014) found that only low levels of self-efficacy in classroom management predicted emotional exhaustion of teachers. The importance of their findings laid in their revelation that only self-efficacy in classroom management, not self-efficacy in general affected beliefs of teachers in their competence to maintain classroom stability.

B. Overview of Knowledge about ASD

Kilanowski, Foote, and Rinaldo (2010) reviewed research studies conducted during the past 50 years and established that general education teachers do not perceive of themselves as fit to teach children with special needs in inclusive classrooms. Several studies (e.g., Barned, Knapp, & Pritchett, 2011; Hart & Whalon, 2013; Johnson, Porter, & McPherson, 2012) supported the problematic implication raised by Kilanowski et al. (2010). Pazey, Gevarter, Hamrek, and Rojeski (2014) found a direct relation between knowledge about ASD and

readiness of teachers to work in inclusive settings. Higher levels of knowledge of teachers and school administrations led to more feelings of preparedness, hence offering proper services and successful integration of students with ASD.

Segall and Campell (2014) predicted that knowledge of teachers about ASD would influence educational placement decisions of students with ASD. However, they found that only competence of teachers predicted placement, in which competent teachers recommended least restrictive settings. Rafferty and Griffin (2005) found that teachers who felt competent had high levels of knowledge about ASD, and those who lacked knowledge felt incompetent and held unfavorable attitudes toward inclusion. Haimour and Obaidat (2013) found that knowledge of general and special education teachers about ASD varied based on gender, position, level of education, teaching experiences and interactions with students with ASD. In general, levels of knowledge were between acceptable to weak. Special education teachers were more knowledgeable due to their higher education levels and positions, and richer teaching experiences and interactions with students with ASD.

C. Knowledge about ASD in General Education Teachers

Barned, Knapp, and Pritchett (2011) examined attitudes toward obtaining knowledge and levels of knowledge of pre-service teachers. Pre-service teachers were enrolled in teaching programs and expressed an interest in eventually working with children with ASD. All teachers agreed that knowledge of ASD was important, but they considered that advanced knowledge of ASD only concerned special educators. According to these future general education teachers, familiarity with effective teaching strategies to work with students with ASD was sufficient.

On the contrary, Loicono and Valenti (2010) found that a high percentage of general education teachers called for proper training and awareness of empirically validated strategies to

working with students with ASD. However, they found that the majority of general education teachers in inclusive classrooms had no awareness of ABA principles, and did not undergo any form of training related to students with ASD.

Hart and Whalon (2012) established that general education teachers lacked training and were not knowledgeable of teaching strategies in basic areas of: academics, social communication and behaviors of students with ASD. General education teachers also held misconceptions, such as ASD being the result of unhealthy parent-child relationships, ASD merely existing in childhood, that early intervention and Applied Behavior Analysis are not effective, and that all children with ASD display the same symptoms (Barned et al., 2011; Mavropoulou & Padeliadu, 2000).

D. Knowledge about ASD in Special Education Teachers

Several studies showed that special education teachers had more knowledge about ASD than general education teachers (Barned et al., 2011; Haimour & Obaidat, 2013; Mavropoulou & Padeliadu, 2000). According to Mavropoulou and Padeliadu (2000), special education teachers had adequate knowledge of symptoms of ASD and displayed awareness of strategies to handle inclusive classrooms. Yet, Hendricks (2011) conducted a study on a large sample of special education teachers, which led to different findings.

Teachers had low to intermediate levels of knowledge about ASD and lacked awareness of empirically validated intervention strategies to deal with students with ASD. Consequently, special education teachers were not using effective teaching strategies with students with ASD (Hendricks, 2011). Loiacono and Allen (2008) supported the lack of knowledge of special education teachers about ASD, and added the lack of training in ABA. In addition, Loiacono and Allen (2008) stated that even though special education teachers were certified to work with

children with ASD, this does not indicate their readiness or qualification to work with students with ASD.

E. Knowledge about ASD: Importance of Training

Johnson et al. (2012) found that past experiences of teachers were not related to the extent of knowledge about ASD. Teachers were more knowledgeable in repetitive behaviors, resistance toward change and lack of eye contact. However, teachers were not aware of the variations in IQ levels and the tendency to play with toys in a dysfunctional manner. These findings lead to the importance of trainings regardless of experience, teachers need to have adequate knowledge and skills to make accurate judgments about teaching tasks to benefit all students (Mulvihill et al., 2002). Trainings of teachers should focus on enhancing knowledge about ASD and developing skills in dealing with children with ASD appropriately in inclusive settings.

Leblanc et al. (2009) demonstrated that attending even just a few workshops had a significant impact on performance of teachers in inclusive classrooms. The study consisted of two workshops, which provided teachers with general knowledge of ASD, defined ABA and discussed empirically validated strategies to effectively teach and integrate students with ASD. Upon follow up, teachers retained information, reported more favorable attitudes towards inclusion and higher confidence in their role in integration. Teachers who sought professional help or reliable resources when needed led to more significant changes and more effective inclusion.

Ericzen et al. (2009) found strong relationships between educational experiences of teachers and quality of care provided to students with ASD. The higher the number of trainings attended, the better care provided. The trainings comprised of four two-hour sessions:

introduction to inclusion, respectful accommodations, positive behavioral support and partnering with families. Positive changes were significant only in teachers who attended three or more trainings, which indicates that one or two sessions would not be enough.

According to Ericzen et al. (2009), educational experiences of teachers included personal characteristics of teachers and number of trainings attended. Personal characteristics of teachers are defined as their motivation to attend trainings. This supports a finding by Mulvihill et al. (2002), which found that teachers who participated in trainings held more favorable attitudes toward inclusion compared to those who did not seek or participate in available trainings. Mulvihill et al. (2002) considered that favorable attitudes of teachers increased willingness to successfully include children with special needs in their classrooms.

Parsons and Reid (1999) developed a training program for teachers of students with ASD, which consisted of lectures, on-the-job monitoring and follow-up supervision. Trainers demonstrated accurate methods of teaching desirable skills, then observed the trainees perform and provided them with feedback accordingly. Trainers reinforced accurate demonstrations and corrected the inaccurate ones. Trainees were provided with follow-up supervisions for the long-term success of the training program to be ensured. The training was found to be successful in providing teachers with the necessary skills to teach students with disabilities and deal with their behavior. After fulfilling the complete training and supervision, teachers were able to familiarize paraprofessionals in inclusive settings of the basic teaching skills merely through observing them with students with ASD and providing them with feedback.

F. Impact of Online Training on Conceptions about ASD: The Case of College Students

This study was inspired by the work of Gillespie-Lynch et al. (2015), and it adapted the training used and examined changes in knowledge and stigma associated with ASD through pre-

training assessments and identical post-tests. The Gillespie-Lynch et al. study was the first to target knowledge and stigma associated with ASD among college students, with attempts to correct misconceptions. The training delivered only consisted of a single training that only lasted for 50 minutes, and it made a significant difference.

Even though college students had some knowledge about autism at baseline, many misconceptions were revealed in open-ended questions. College students were aware that individuals with ASD show affection and that intervention should be individualized. They were misinformed about some diagnostic features of ASD, however, such as restricted interests and repetitive behaviors. Other misconceptions that were revealed at baseline included confusing ASD with learning disabilities, believing ASD was a childhood disorder, and implicating vaccines as the cause for this disorder (Gillespie-Lynch et al., 2015).

The online training achieved its goal of being a cost-effective method that increased levels of knowledge, corrected misconceptions about ASD and decreased stigma of college students toward people with ASD. Stigma toward people with ASD was more difficult to change than knowledge, and the highest degree of stigma was exhibited towards having relationships with individuals with ASD. Findings showed that women and individuals with relatives on the spectrum had lower levels of stigma toward people with ASD (Gillespie-Lynch et al., 2015).

G. Philosophy of Inclusion

The philosophy of inclusion views all children as different in numerous ways, not limited to particular disabilities. Based on this philosophy, all learning needs of children must be met through changing school practices and adapting them based on students particular needs (Kinsella & Senior, 2008). According to Sharma, Loreman and Forlin (2012), inclusion should be approached as a context-specific construct, in which teachers focus on their teaching methods

and the classroom environment rather than the disabilities of students. They also believe that schools exist to equally meet the needs of all students, and if a student is struggling, the source of the problem lies in the school, not the student.

Consistent with Sharma et al.'s (2012) beliefs, Finkelstein (2001) argues against the medical conceptualization of disability, which has impeded the inclusion of children with special needs. The medical model states that if a child faces learning difficulties, he or she is at a disadvantage due physical disabilities. Therefore, the student is erroneously identified as the source of the problem and is separated to a special and non-inclusive environment.

With more than 50% of children with ASD included in mainstream settings, according to a report by Keen and Ward (2004), inclusion benefits are noted for both typically developing children and children with special needs. Typically developing children benefit through developing awareness, understanding and holding favorable attitudes towards their peers with special needs (Bitterman, Daley, Misra, Carlson, & Markowitz, 2008). Upon interacting with typical peers, children with ASD benefit socially, emotionally, and cognitively (Bitterman et al., 2008). These benefits are due to exposure to typical models of social behavior, feelings of acceptance and being subjected to higher academic standards (Mesibov & Shea, 1996).

The effectiveness of mainstream inclusion, however, revealed mixed findings, which were clarified by a high-functioning adult with ASD, "when the person with ASD and the environment match, the problems go away and we thrive. When they do not match, we seem disabled" (Baron-Cohen 2003, p. 180). Also, Attwood (2004) found that 65% of adolescents with ASD suffer from anxiety and depression in inclusive settings, which is much higher than the rates of adolescent with ASD in non-inclusive settings. Symes and Humphrey (2012) also found

that adolescents with ASD do not interact with peers and are three times more likely to be bullied compared to typically developing students.

H. Attitudes toward Inclusion

Attitudes toward inclusion are defined as an internal state predisposing individuals to assess children with special needs based on a continuum of favorable to unfavorable mindsets toward inclusion in regular classrooms (Cross, Traub, Hutter-Pishgahi, & Shelton, 2004; Eagly & Chaiken, 1993). These attitudes result from the quality of working experiences in inclusive settings, and also depend on personal characteristics of teachers (Mulvihill et al., 2002).

Barned et al. (2011) revealed contradictions in attitudes of teachers toward inclusion. Even though the majority of teachers agreed that children with special needs in general and children with ASD in specific should be included in general education settings, half of them expressed hesitation to including all students with ASD. Barned et al. (2011) determined the factors that teachers consider prior to educational placement decisions. The most influential factor was the severity of the disability, followed by the child's personality, then academic ability. This implies that teachers were the least concerned about learning abilities of students, and mostly concerned with their behaviors and severity of their disability. Even though the majority of participants held favorable attitudes towards inclusion, they all agreed on the importance of severity of disability. Teachers found that most students with severe ASD were not suitable for inclusion.

The lack of concern of teachers on the academic performance of their students with ASD, and their mere focus on behaviors indicated their deficiencies and lack of skills in dealing with problematic behaviors of students with ASD (Barned et al., 2011). This implies that teachers need to be *more knowledgeable of strategies and techniques* to handle inclusive classrooms.

Winter (2006) stated that university teaching programs are now required to ensure that graduates feel ready and willing to successfully include all students in mainstream classrooms, despite individual differences. The ability of teachers to provide a beneficial learning environment for all students has to be assessed through examining the perceived self-efficacy of teachers to apply evidence-based inclusive practices (Sharma et al., 2012).

Several studies (e.g., Finke, McNaughton, & Drager, 2009; Sharma et al., 2012) highlighted that teaching efficacy was one of the strongest predictors of favorable attitudes and appropriate inclusive behaviors in teachers who had included students with ASD in their classrooms. These studies found that teachers considered the major components of their success were their enthusiasm and beliefs in their contribution to teach and benefit children with ASD. In addition, they cooperated with other professionals and were able to handle disruptive behaviors of children with special needs. As a result, teachers with high levels of self-efficacy created effective inclusive teaching environments. On the other hand, teachers who did not believe in themselves or their students with special needs, failed to apply any of the inclusive practices, which led to disruptive and unmanageable classroom environments. Nougaret et al. (2005) found that students with ASD learned more when included successfully, and were less likely to exhibit problematic behaviors upon feeling safe and accepted in their classrooms.

There are mixed findings in predictors of effective inclusion. Several studies (e.g. Ericzen, Mueggenborg, & Shea, 2009; Rafferty & Griffin, 2005) reported that there was no significant relationship between attitudes toward inclusion and years of experience. Segall (2008) found that effective inclusion depended on experience, not knowledge or attitudes. On the contrary, Lindsay and Dockrell (2002) emphasized the role of attitudes, and considered that skills, knowledge and competencies were not enough for successful inclusion.

I. Teachers of Children with ASD in Developing Countries

Several studies conducted in developing countries such as India (Shetty & Rai, 2014), Pakistan (Arif, Niazy, Hassan, & Ahmed, 2013) and Singapore (Lian et al., 2008), showed that teachers lacked knowledge of basic facts about ASD. The majority of teachers held a positive attitude towards inclusion, but reported low self-efficacy in working with students with ASD, and called for the need for formal training. Arif et al. found that the major source of information about ASD came from the media, which may include unreliable and misleading information.

ASD in Arab Countries. There has been a recent interest in ASD in the Arab world, specifically in Egypt and Saudi Arabia (Taha & Hussein, 2014). Prevalence of ASD is lower in Arab than Western countries (Mostafa, 2011). The lower prevalence does not necessarily indicate fewer occurrences, and might be due to lack of professionals who can accurately diagnose ASD, or to cultural factors playing a role in the way parents deal with their children's diagnoses or symptoms (Mostafa, 2011; Taha & Hussein, 2014). Mostafa (2011) claimed that mothers might underreport symptoms and difficulties of their children to avoid the stigma toward ASD and to keep their children in general-education schools.

Mendoza (2011) found that in rural areas of Egypt, children with ASD were homeschooled, since their parents did not believe they are able to go to school due to the delays and difficulties, which will result in isolation and bullying by peers. In Urban areas of Egypt, children with learning difficulties were enrolled in mainstream classrooms with a shadow teacher. General-education and shadow teachers were reportedly lacking sufficient training. Academic programs were not targeted at schools; students with ASD were taught on a one-on-one basis after school in specialized centers or at home with therapists (Mendoza, 2011).

Haimour and Obaidat (2013) found that knowledge of teachers in Saudi Arabia ranged from weak in general education teachers to acceptable in special education teachers. According to Haimour and Obaidat (2013), knowledge about ASD should not be limited to special educators; all teachers should receive training in educational practices and knowledge about ASD, and general education programs should include special education classes.

ASD in Lebanon. The status of ASD interventions is not very different in Lebanon. Applied Behavior Analysis (ABA), which is the most empirically supported and recommended treatment for ASD (Daou, 2014; Department of Health, 1999; Department of Health and Human Services, 1999; Gill, 2001; Jacobson, 2000; Keenan et al., 2015; Rosenwasser & Axelrod, 2001), is scarcely available in Lebanon (Daou, 2014). The scarcity is revealed through the lack of services, research or publications pertaining to the use of ABA in Lebanon (Daou, 2014). Obeid and Daou (2015) examined the effect of coping styles, social support and child's behavioral symptoms on the wellbeing of Lebanese mothers of children with ASD. The recruitment process was very difficult, since many schools refused to cooperate for various reasons. Some schools claimed that they did not want to overload mothers, others only allowed recruitment before the academic year as long as research did not take place on school grounds. Even some mothers of children with ASD refused to participate, claiming that they would not benefit, and ads on a Facebook page of an ASD group in Lebanon failed to recruit any participants. However, other schools did cooperate and their cooperation led to the significant findings of the study. The lack of cooperation and difficulties faced in recruitment reveal the lack of a research culture in Lebanon and explains difficulties that were faced in this study, as will be described later in the Method and Discussion.

Also facing recruitment challenges, Daou (2014) had initiated contact with a private school for students with ASD, to recruit students in a replication of the original study conducted by MacDuff et al. (1993). Daou faced many difficulties in recruitment, but was ultimately able to recruit three students for her single-case experimental design. The nature of the design used in that study required only a small number of participants; nonetheless, securing only those three students was laborious, given the context. Even though the children did not receive intensive behavioral intervention, there was significant improvement, which indicates that even minimal behavioral interventions can make a difference. The intervention also had a positive impact on the attitudes of teachers and caregivers, who expressed an interest in participating in further studies (Daou, 2014).

Fayyad, Farah, Cassir, Salamoun and Karam (2010) also found that the smallest interventions in Lebanon could make a difference. Fayyad et al. provided parenting skills training to social workers that lacked any background in mental health. As a cost effective way, the social workers trained parents of children with behavioral problems, who would not have received any training otherwise, and positive changes in parenting skills were reported (Fayyad et al., 2010).

Dirani and Salamoun (2014) found that age of assessment in Lebanon is higher than Western countries. Early assessment is of critical importance, since it leads to early interventions and better outcomes (Dirani & Salamoun, 2014). Even though autistic symptoms are apparent at 18-24 months, children with ASD in Lebanon are diagnosed on average at 4 years and 7 months. Dirani and Salamoun stressed the importance of developing comprehensive national strategies that will allow earlier diagnoses.

Hajjar and Richa (2008) also conducted a study in the Lebanese context, in which the symptoms and characteristics of children with ASD were compared to those of children with Down's syndrome. Results showed that children with ASD engaged in more repetitive behaviors, and had more thoughts of obsession and compulsion. One could argue that teachers of students with ASD may face more difficulties than teachers of children with other disabilities, and may require more training and support.

J. Comparison between Lebanon and United States College Students

Obeid et al. (2015) compared misconceptions and stigma related to ASD among highly educated college students from Lebanon and the United States, and took a closer look at the differences between those two cultures. The results showed that college students in the US had higher levels of knowledge about ASD and lower stigma toward students with ASD compared to Lebanese students at baseline. The online training about ASD increased knowledge of college students in the US and Lebanon, which showed that providing trainings increases knowledge across different cultures. However, the levels of stigma toward ASD remained higher in the Lebanese population compared to the US following the training, which indicates that such trainings are merely a first step in addressing the attitudes of the Lebanese population towards individuals with ASD.

Even though college students in the US had more knowledge and lower stigma toward ASD than Lebanese students, students in the US had more misconceptions in certain areas (Obeid et al., 2015). For instance, Lebanese students were more aware that there is one ASD in DSM-5, ASD tends to be under-diagnosed in lower classes, and were less likely to confuse ASD with other disorders or learning difficulties.

The differences in accuracies and misconceptions of college students may be related to the individualistic and collectivistic natures of the American and Lebanese societies, thus students focused more on the individual and social aspects of ASD, respectively. In the US, which is individualistic in nature, individuals tend to define themselves in terms of permanent individual characteristics, so they were more aware than the Lebanese population that ASD is lifelong, and emphasized cognitive difficulties which show individual differences not particular to ASD. Whereas Lebanon, which is more collectivistic (at least more so than typically individualistic countries, as Obeid et al. argued) in nature, individuals tend to define themselves in terms of dynamic social interactions, so they emphasized the social aspect of autism, which led to more common misconceptions than the US, that individuals with ASD are not interested in social interaction, and do not cooperate with others on purpose.

CHAPTER II

Aims and Hypotheses

The present study consisted of two parts that will be referred to as Study 1 and Study 2 hereafter. The aim of Study 1 was to assess the impact of a training presentation on the following variables: (a) knowledge about ASD, (b) stigma toward ASD, (c) attitudes toward inclusion, and (d) self-efficacy of teachers. The aim of Study 2 was to examine the effects of the predictors (knowledge and stigma about ASD, and attitudes toward inclusion) on the outcome (self-efficacy of teachers).

A. Aim and Hypotheses of Study 1

The aim of Study 1 was to assess the effects of a training presentation about ASD on increasing knowledge and decreasing stigma about ASD, changing attitudes toward inclusion, and improving self-efficacy of teachers.

Gillespie-Lynch and her team were the first to assess changes in knowledge about ASD as a function of an online training, and found that the training increased acquired knowledge about ASD and decreased stigma toward individuals with ASD (Gillespie-Lynch et al., 2015; Obeid et al., 2015). Consistent with that line of research, Study 1 examined changes in knowledge and stigma toward ASD as a function of a live – not online – presentation about ASD. Since knowledge of teachers about ASD had an impact on their readiness to work with students with ASD (Pazey et al., 2014), the study examined changes in teachers' self-efficacy as a function of the training. Therefore, the following hypotheses were tested.

Hypothesis 1a. At follow up, teachers' knowledge about ASD will be higher after the training lecture about ASD than at pretest.

Hypothesis 1b. At follow up, teachers will hold more favorable attitudes toward inclusion after the training lecture about ASD than at pretest.

Hypothesis 1c. At follow up, teachers' self-efficacy will be better after the training lecture about ASD than at pretest.

Hypothesis 1d. At follow up, teachers' stigma toward individuals with ASD will be lower after the training lecture about ASD than at pretest.

B. Aim and Hypotheses of Study 2

The aim of Study 2 was to examine the effects of knowledge and stigma about ASD, and attitudes towards inclusion on the self-efficacy of teachers working with students with ASD.

Higher levels of knowledge lead to higher levels of self-efficacy (Atiles, Jones, & Kim, 2012), and Study 2 aimed to examine the relation between knowledge about ASD and levels of self-efficacy. The literature demonstrated that favorable attitudes toward inclusion were best predicted by self-efficacy of teachers and their success at teaching children with ASD in inclusive classrooms (Sharma et al., 2008). In the present study, there was an interest in looking at self-efficacy of teachers in Lebanon as predicted by attitudes toward inclusion and stigma toward ASD. Therefore, Study 2 examined knowledge and stigma about ASD and attitudes toward inclusion as predictors of self-efficacy. Study 2 also aimed at examining influential factors when assessing self-efficacy of teachers. Influential factors were assessed as covariates and they included age, education level and background, specific occupation, and number of years working in an ASD-related domain.

Hypothesis 2a. High scores on knowledge about ASD will predict increased self-efficacy among teachers of children with ASD.

Hypothesis 2b. Low stigma toward students with ASD will predict increased self-efficacy among teachers of children with ASD.

Hypothesis 2c. Favorable attitudes toward inclusion will predict increased self-efficacy among teachers of children with ASD.

Hypothesis 2d. The relation between the predictors (knowledge pretest, stigma toward ASD pretest and attitude pretest) and the outcome variable (self-efficacy) will be explored after partialling out the effect of the covariates (age, education, major, occupation {general educators, special educators, others} and years of experience.

CHAPTER III

METHODOLOGY

A. Research Design and Introduction to the Methodology (Study 1 and Study 2)

Studies 1 and 2, taken together, used a within-participants quasi-experimental research design (Study 1) with a non-experimental component (Study 2).

In the beginning, the present study was *not* meant to be separated into two parts, but was rather planned as a single study addressing both aspects of the design (quasi-experimental and non-experimental). Participants were asked to attend two sessions, in which they were to be given identical pre- and posttests, separated by a training lecture. The sessions were to take place at two inclusive schools: School A (working with students with special needs for nearly 10 years, includes a department that implements special programs for inclusion) and School B (recently started welcoming students with special needs, and became inclusive only few months prior to data collection for the current study).

Because of high *rates of attrition and missing values* (both discussed in detail under Results below), the study had to be split into two parts, Study 1 and Study 2, each concerned with one aim – Study 1 addressed the first aim (examining the impact of the training, assessing possible differences between pre- and posttest measures) and Study 2 addressed the second aim (examining the effects of the predictors on teachers self-efficacy). In this section, the focus will be on the *instruments*, *procedures*, and *participants* involved in these two studies that emerged.

B. Instruments (Study 1 and Study 2)

1. Questionnaire of Demographic Information. The demographics questionnaire, presented to all participants in the first session, consisted of five items that measured demographic covariates (see Appendix A).

a- ***Demographic Covariates.*** Five items measured the demographic covariates; participant's age, education level and background, occupation, and years of experience. Gender was not considered as a covariate since the majority of participants were females.

b- ***Age.*** Age was measured through an item "What is your age in years?"

c- ***Education Level.*** Education levels of teachers were measured through an item "What is the highest degree you have obtained in school?" response options included "high school graduate, some college credit, Bachelor's degree, Master's degree, Doctorate and other." Responses were grouped into two categories, the first category included participants with Bachelors and Masters Degree, and the second category included participants whose highest level of education involved high school, some college credit, accounting certificates and teacher trainings. Participants who did not answer "Bachelor's Degree", but mentioned a Teaching Diploma in the "other" option belonged to the first category, since they need to hold a Bachelor's Degree in order to get a Teaching Diploma.

d- ***Education background.*** An open-ended question "What is or was your major" assessed the education background of participants. Responses were categorized into two groups, social sciences and not social sciences. Majors in the social sciences category consisted of early childhood education, teaching diplomas, English literature, psychology, special education, social work, law, secretary, and sports management. As for the majors in the non-social science category were Computer and Communication Engineering, Accounting, Economics, Science, medical laboratory, business management and administration.

e- Occupation. An item measured current job or occupation "What is your current job or occupation?", participants could pick more than one option that applies, and the responses included "university student, shadow teacher, general educator, special education" and an open-ended "other" option. Responses were grouped into three categories: general educator, special educator and others. The first category consists of general educators, responses on the "other" were recoded into general educator in cases where participants responded as "other" to mention their specific teaching position, such as homeroom teacher, classroom teacher, French teacher, Arabic teacher and leveled reading teacher. The second category included special educators, shadow teachers, ABA therapists and individuals who are both shadow teachers and special educators, whereas the third category included physical education teachers and university students. Three dummy variables were computed with the first dummy variable representing general educators, the second dummy variable representing special educators, and the third dummy variable representing others. For more details, check the coding table below.

Dummy Variable	General Educators	Special Educators	Others
1) General Educators	1	0	0
2) Special Educators	0	1	0
3) Others	0	0	1

f- Years of experience. Years of experience of teachers was measured using an item "How long have you been working with students with ASD?", participants had to pick an option from "1-6 months, 6-12 months, 1-2 years, 3 years and above, and none". Responses were grouped into two categories. The first category included

participants with no experience to one year of experience, whereas the second category included participants with more than one-year experience.

2. Knowledge of ASD. The scale was administered by Gillespie et al. (2015), participants in both Studies 1 and 2 were asked a series of open-ended and closed-ended questions pertaining to their knowledge of ASD (see Appendix B). Open-ended questions required teachers to describe ASD in their own words, to verify if their description matches with DSM-5. Teachers were also asked to describe effective ways to teach students with ASD. Then, the survey battery included closed-ended questions that examined knowledge of ASD in areas of: prevalence, diagnosis, causes, and characteristics of individuals with ASD, types of interventions, and quality of outcomes. In total, the pretest/posttest consisted of 29 items. However, not all the 29 items were in included in the analysis, only 17 items were included. Items were rated on a 5-point Likert scale with "1" indicating "strongly disagree" and "5" indicating "strongly agree". Items that were correct (questions 8, 11, 13, 15, 19, 20, 21 and 22) were scored based on -2 for strongly disagree, -1 for somewhat disagree, 0 for neither agree nor disagree, +1 for somewhat agree and +2 for strongly agree. As for the items that were incorrect (questions 9, 10, 11, 14, 16, 17, 18, 25 and 29), the scores were based on +2 for strongly disagree, +1 for somewhat disagree, 0 for neither agree nor disagree, -1 for somewhat agree and -2 for strongly agree. The total score of knowledge, which ranged between -34 to 34, was calculated by summing the items of the scale. Higher scores on the knowledge scale indicated higher levels of knowledge.

3. Social Distance Scale. Social Distance Scale (see Appendix C), was administered by Gillespie et al. (2015), after adapting the Social Distance Scale measure of stigma toward ASD by Bogardus (1993). The Social Distance Scale consisted of 6 items that questioned the willingness of individuals to form various types of relationships with individuals with ASD (e.g.,

neighbors, project, friends and marriage) . For each item on the scale, responses ranged between 1 (least stigma) to 4 (most stigma). Total scores of the social distance scale were summed, scores ranged from 6 to 24, with higher scores indicating higher levels of stigma toward ASD. The Social Distance Scale had good internal consistency of α= .87, and these scales generally have good to excellent internal consistency and construct validity (Gillespie et al.). For Study 1, the reliability of the social distance scale was good for both the pretest and posttest with α = .75 and α = .71 respectively. For Study 2, the reliability of the scale for the pretest was moderate α = .80.

4. Teacher Attitudes toward Inclusion Scale. Teacher Attitudes toward Inclusion Scale (TATIS), which was created and validated by Cullen (2010), was used as a measure of attitudes toward inclusive teaching (see Appendix D). TATIS was designed to examine attitudes of teachers toward inclusion, and to discover ways to assist teachers in holding more favorable attitudes toward inclusion. It consisted of 14 items measuring perceptions of students with disabilities in inclusive settings (POS, items 1-6), beliefs about efficacy of inclusion (BEI, items 7-10), and perceptions of professional roles and functions (PRF, items 11-14). For each item on this scale, individuals were asked to indicate, how the statement presented applies to attitudes toward inclusion of students with ASD, on a 7-point Likert scale, ranging between 1=agree very strongly and 7= disagree very strongly (Cullen, 2010). For the purposes of the current study, the TATIS was modified slightly. The term "mild to moderate disabilities" throughout the TATIS was substituted with the term "autism", and the original 7-point scale was adapted to a 5-point Likert scale. Cullen (2010) found that TATIS is a reliable measure through Cronbach alpha's correlation procedure. The reliability of the instrument was evaluated and found to have an overall correlation coefficient of 0.821 (Cullen, 2010). The Cronbach alpha for each of the factors of perceptions of students with disabilities in inclusive settings (POS), beliefs about

efficacy of inclusion (BEI), and perceptions of professional roles and functions (PRF) were .803, .863 and .680, respectively. For example, sample items of the perceptions of students with disabilities in inclusive settings (POS) factor: “All students with autism should be educated in regular classrooms with non-handicapped peers to the fullest extent possible”, beliefs about efficacy of inclusion (BEI) factor: “Students with autism should not be taught in regular classes with non-disabled students because they will require too much of the teacher's time”, and perceptions of professional roles and functions (PRF) factor: “I would welcome the opportunity to team-teach as a model for meeting the needs of students with autism in regular classrooms.” Items 7, 8, 9 and 10 belonging to the (BEI) subscale were reverse coded. Scores of each subscale were summed, and a total score was also created through adding the sum of the 3 subscales. Higher scores indicated more favorable scores toward inclusion. The reliability of the attitude scale was acceptable for the pretest $\alpha = .67$, and moderate for the posttest $\alpha = .82$. For Study 2 the reliability of the scale for the pretest was acceptable $\alpha = .66$.

5. Teachers’ Self-Efficacy Scale. Teachers’ Self-Efficacy Scale (TSES), which was created and validated by Tschannen-Moran and Woolfolk Hoy (2001), was used as a measure of self-efficacy of teachers (see Appendix E). Participants were presented with 24 items measuring efficacy for instructional strategies (8 items), classroom management (8 items), and student engagement (8 items). For each item on this scale, individuals were asked to indicate, how the statement presented applies to feelings of self-efficacy while teaching students with ASD, on a 9-point Likert scale, ranging between 1=nothing, 3=very little, 5=some influence, 7= quite a bit, and 9 =a great deal. The original 9-point scale was adapted to a 5-point Likert scale consistent with Oh (2011). There are two forms of TSES, short (12 items) and long forms (24 items), and researchers found that both have adequate reliability and validity for the whole scales and their

three subscales. For example, sample items of self-efficacy for instructional strategies: “How much can you do to adjust your reading and writing lessons to the proper level for individual students?”; for classroom management: “How well can you establish routines to keep activities running smoothly in your reading and writing lessons?”; and for student engagement: “How much can you do to get through to the most difficult students in your reading and writing lessons?”. Researchers found reliabilities for the TSES full scale ranged from .92 to .95, and for the subscales from .86 to .90 (Tschannen-Moran & Woolfolk Hoy, 2007). Klassen et al. (2009) found reliabilities ranged from .71 to .94 for TSES short form in five settings: Canada, Cyprus, Korea, Singapore, and the United States. This indicates that TSES measures self-efficacy of teachers across different cultural settings. Mean scores were calculated for participants to indicate their self-efficacy, and higher scores indicated more self-efficacy of teachers. For Study 1, the reliability of the self-efficacy scale was high for both pretest and posttest with $\alpha = .92$, and $\alpha = .94$. For Study 2, the reliability of the scale for the pretest was high with $\alpha = .93$.

6. Handouts. After the first session, teachers were provided with take-home material consisting of booklets that would offer them more information about ASD, tips and strategies for providing better classroom environments, and help improve self-efficacy among teachers of children with ASD.

C. Intervention

The training lecture was adapted from Gillespie-Lynch et al.’s (2015) online training slideshow. The training was delivered in a slideshow that required between 40 to 60 minutes depending on the level of activity of participants. It covered basics of ASD (e.g., diagnostic criteria, differences between DSM-IV and DSM-5 criteria, differences between genders and cultures in terms of ASD manifestation, descriptions of characteristics of those on the spectrum,

etc.), and addressed issues that teachers face regularly when working with children on the spectrum (mainly concerning Applied Behavior Analysis, the do's and don'ts in autism intervention in the classroom setting, the correction of misconceptions teachers might hold, and offering teachers some tips and strategies that are effective when working with students with ASD). It also included two vignettes that required teachers' participation of how they would respond to various situations, and then the co-investigator shared appropriate methods of intervention. Following close to 20 hours of consultations and training delivered, the experimenter developed the level of proficiency needed to deliver the training workshop to participants, through trainings provided by the supervisor.

Fidelity measures were given to observers after each training session to confirm that the training was conducted well, and to make sure every part needed in the training was delivered to criterion. Observers were asked to rate the trainer's fidelity of delivery and the level of activity of participants. The observers were research assistants in the pilot study, and school psychologists in the trainings at School A and School B. The fidelity measures also included some background information of the study, such as the timeline and learning objectives that included basic information of the study, and outcomes assessment that specified the scales that were used to assess the studied variables. In the observation of the trainer's fidelity of delivery, results of five observations showed that when it comes to defining ASD, discussing causes of ASD, addressing misconceptions of ASD, defining what ABA entails, explaining the operant conditioning paradigm and explaining the consequence matrix, *thorough explanations* were provided across all settings (pilot study, School A and School B). As for the level of activity of participants, in the pilot study and School B, participants were observed to have *participated more actively* during the module than participants in School A and some of those in B.

D. Procedures (Study 1 and Study 2)

Recruitment. Data collection for the main study was supposed to start in April 2015, but instead it started on September 16th, 2015 and ended on November 4th, 2015. This delay was due to a number of difficulties faced in recruitment. The first attempt at recruitment started with distributing fliers at 5 schools and posting ads on several Facebook pages related to ASD, which were also shared by professionals in the field. These recruitment efforts continued for one month, yet only resulted in the recruitment of 1 participant. As a result, the co-investigator contacted schools and offered to carry out the research at their premises during the in-service month of June 2015. The alternative recruitment method was through convenience sampling based on the experimenter's connections in inclusive schools. Administrators from two schools agreed to participate in June, but later asked to postpone the training from June 2015 till September 2015. The recruitment process will also be discussed further under Limitations.

Procedures and Data Collection. For Studies 1 and 2, participants were recruited from schools using non-random convenience sampling. Data collection and the training lecture took place in each school. School principals were contacted and received the fliers of this research study (see Appendix F), which included some information about the purpose and potential benefits of the study. Teachers were presented with an informed consent form (see Appendix G), that informed the potential participants about the study, including its purpose, risks and benefits associated with it, and confidentiality of participant information, among other details that would help potential participants make an informed decision about whether or not to participate. The informed consent form also included the contact information of the principal investigator and the co-investigator; in case the participants had any questions regarding the study.

Find below a timeline of the sessions, followed by a description of Studies 1 and 2.

Study 1:

1. Participants were given a pretest that included: demographic information, knowledge and stigma about ASD, attitudes toward inclusion and self-efficacy.

2. The experimenter delivered the training lecture.

3. Teachers were given handouts to take home with them.

One month later:

4. Participants returned for a follow-up session.

5. Teachers were provided with an opportunity to ask questions.

Study 2:

1. Participants received the same pretest as those in Study 1 (#1 above). It was also followed by the training lecture (#2 above). Teachers were also given handouts to take home (#3 above). They did not, however, return for follow-up a month later.

For Study 1, which relies on the comparison of the pretest and the posttest, teachers attended both Sessions 1 and 2. In which they were asked to fill the pretest, attend the training session, and then attend a follow-up session took place one month later, at each of the schools where participants were asked to complete the identical posttest, and the variables under study were reassessed. The identical pre- and posttest comprised of the four scales mentioned above. An opportunity to ask questions was provided and lasted for one hour and thirty minutes at School B, and it only lasted 15 minutes at School A. The difference in time will be discussed under Limitations.

For Study 2, teachers only attended Session 1, in which they completed the pretest and attended the training lecture. The pretest contained the demographics form and the four scales described above.

E. Participants

A total of 92 teachers took part in this study. The majority of teachers in Studies 1 and 2 were females (96.7%) and the age of participants ranged between 19 and 64 with a mean age of 32.1 years (SD= 7.93). The number of participants retained was not the same in Studies 1 and 2. Study 1, which was based on the comparison of pre- and posttests, included 58 out of the 92 participants, due to high rates of attrition and missing values (described further under Results). Study 2, however, which only relied on the pretest, included 76 out of the 92 participants, due to high rates of missing values (also described further under Results).

F. Pilot Study

The study was pilot tested with 5 participants recruited following Institutional Review Board (IRB) approval. The average time needed to complete the questionnaires ranged between 30 to 35 minutes. The training presentation took an hour since many slides were discussed. The participants reported that the measures were clear. Therefore, no changes were necessary to any of the measures or procedures, and the data from those 5 participants were incorporated in the main study.

G. Analytic Plan

Reliability analyses were conducted to examine the psychometric properties of the scales prior to the main data analysis to examine this study's aims and hypotheses. Study 1 consisted of paired sample t-tests to investigate the differences on knowledge, attitude, stigma toward ASD and self-efficacy between pre- and posttests among all participants, then we took a closer look at each school and examined the differences between both schools. Study 2 consisted of a multiple regression analysis on the pretest only, which examined the predictors (knowledge about ASD, attitudes toward inclusion, demographic characteristics and stigma) of self-efficacy of teachers.

CHAPTER IV

RESULTS

A. Sample Characteristics and Demographics

A total of 92 teachers took part in the study. In Study 1, the data from 26 participants were excluded because they did not complete the posttest, and the data from 7 participants were excluded because they missed more than 35% of the questions. In addition, 1 case was deleted because it was found to be both univariate and multivariate outlier (see the section on "Univariate and Multivariate Outliers" below for more details). Therefore, $N = 58$ participants were retained in the final analysis of Study 1.

In Study 2, data from 15 participants were excluded because they missed more than 35% of the questions. In addition, 1 case was deleted because it was found to be both univariate and outlier in solution (see the section on "Univariate and Multivariate Outliers" below for more details). Therefore, $N = 76$ participants were retained in the final analysis Study 2.

The order of version A was the demographics questionnaire, knowledge scale, social distance scale, attitudes toward inclusion scale and self-efficacy scale. As for version B, the order of the scales was the demographics questionnaire, self-efficacy scale, attitudes toward inclusion scale, social distance scale and knowledge scale. The knowledge scale included 3 open-ended questions about ASD, but these questions were not included in the analysis since only 55% of participants answered in the pretest, and only 28.2% answered in the posttest.

In Study 1, N=58, for the pretest, 56.9% of participants completed version A of the questionnaires whereas 43.1% of participants completed version B of the questionnaires. For the posttest, 55.2% of participants completed version A of the questionnaires whereas 44.8% of participants completed version B of the questionnaires. Concerning the gender of participants,

most participants were females (96.6%) whereas very few participants were males (3.4%). The age of participants ranged between 21 and 54 with mean age *M* = 32.36, *SD* = 7.18 (See Table 1). Furthermore, more than three quarters of participants had a BA/MA (77.8%), however, 22.2% of participants completed high school or some college credits or certificates. In addition, 83% of participants had a social science background, whereas 17% of participants did not have a social science background. Concerning the occupation of participants, the majority of participants were general educators (56.9%) followed by special educators (36.2%) and others (1.7%). Finally, most participants had more than one year of experience (69.6%), whereas 30.4% of participants had no experience to one year of experience (see Table 2).

In Study 2, N=76, 52.6% of participants completed version A of the questionnaires whereas 47.4% of participants completed version B of the questionnaires. Concerning the gender of participants, most participants were females (96.1%) whereas very few participants were males (3.9%). The age of participants ranged between 21 and 54 with mean age *M*= 32.04, *SD* = 7.96 (see Table 3). Furthermore, more than three quarters of participants had a BA/MA (78.9%), however, 15.8% of participants completed high school or some college credits or certificates.

In addition, 78.9% of participants had a social science background, whereas 11.8% of participants did not have a social science background. Concerning the occupation of participants, the majority of participants were general educators (43.4%) followed by special educators (30.3%) and others (22.4%). Finally more than half of the participants had more than one year of experience (57.9%), whereas 28.9% of participants had no experience to one year of experience (see Table 4).

B. Counterbalancing for Pretest

Two counterbalanced versions of the questionnaire were generated to control for order and sequence effects in version A and version B.

1- Normality. Normality of the variables (knowledge pretest, stigma toward ASD pretest, attitudes pretest, and self-efficacy pretest) across participants, who completed version A and those who completed version B, was tested by examining the z-scores of skewness and kurtosis. The z-skewness was calculated by dividing skewness by the standard error of skewness and the z-kurtosis was calculated by dividing kurtosis by the standard error of kurtosis. Since the sample size in each group was ($N < 50$), then any score of z-skewness and z-kurtosis above ±1.96 is considered significant deviation from normality.

In Study 1, the z-scores of skewness and kurtosis revealed that the variables knowledge pretest, attitudes pretest, self-efficacy pretest across versions A and B, and the variable stigma toward ASD pretest across version A had z-skewness scores and z-kurtosis scores below the ±1.96 significance level, indicating that these variables were normally distributed. The variable stigma toward ASD across version B, however, had positive kurtosis with z-kurtosis scores above the ±1.96 significance level.

In Study 2, the z-scores of skewness and kurtosis revealed that the variables knowledge pretest across versions A and B, attitudes pretest across versions A and B, self-efficacy pretest and stigma toward ASD pretest across version A had z-skewness scores and z-kurtosis scores below the ±1.96 significance level, indicating that these variables were normally distributed.

However, the variable stigma toward ASD across version B, had positive kurtosis; z-kurtosis scores above the ±1.96 significance level. And the variable self-efficacy across version B, was negatively skewed with scores above the ±1.96 significance level.

2- Counterbalancing Main Analysis. In Study 1, since the normality of the variables knowledge pretest, attitudes pretest and self-efficacy pretest was met across version A and version B, thus 3 independent sample t-tests were carried out to investigate whether knowledge pretest, attitudes pretest and self-efficacy pretest were significantly different across versions A and B.

The results of the t-tests revealed that, on average, participants who filled version A had lower levels of knowledge on pretest (M = 8.53, SD = 4.87) compared to participants who completed version B (M = 6.16, SD = 6.59). However, this difference was not found significant as indicated by the t-test; t (42.80) = 1.51, p = .139, *ns*, r =.20. Furthermore, on average, participants who filled version A had lower levels of attitudes on pretest (M = 49.91, SD = 7.41) compared to participants who completed version B (M = 50.80, SD = 6.04). However, this difference was not found significant as indicated by the t-test; t (55) = -.49, p = .627, *ns*, r = -.06. Finally, on average, participants who filled version A had higher levels of self-efficacy on pretest (M = 4.06, SD = .48) compared to participants who completed version B (M = 4.05, SD = .50). However, this difference was not found significant as indicated by the t-test; t (56) = .08, p = .935, *ns*, r =.10 (See Table 5).

Since the normality of stigma toward ASD across version B was not met; a Mann-Whitney test was conducted to investigate the difference on stigma toward ASD across versions A and B. A Mann-Whitney test indicated that social distance was not significantly different between participants who filled version A (*Mdn* = 12.00) and those who filled version B (*Mdn* = 13.00), U = 360.50, p = .653, *ns*, r = .06 (see Table 6).

In Study 2, since the normality of the variables knowledge pretest and attitudes pretest was met across version A and version B, thus 2 independent sample t-tests were carried out to

investigate whether knowledge pretest and attitude pretest were significantly different across versions A and B.

The results of the t-tests revealed that, on average, participants who filled version A had higher levels of knowledge on pretest (*M* = 8.93, *SD* = 5.75) compared to participants who completed version B (*M* = 6.72, *SD* = 7.57). However, this difference was not found significant, as indicated by the t-test; *t* (65.04) = 1.42, *p* = .161, *ns, r* = .16. On average, participants who filled version A had lower levels of attitude on pretest (*M* = 48.43, *SD* = 7.68) compared to participants who completed version B (*M* = 49.78, *SD* = 6.35). This difference was found significant, as indicated by the t-test; *t* (74) = -.83, *p* = .409, *ns*, *r* = .09 (See Table 7).

Since the normality of stigma toward ASD pretest across version B and self-efficacy pretest across version B was not met; hence a Mann-Whitney test was conducted to investigate the difference on stigma toward ASD and self-efficacy across versions A and B.

A Mann-Whitney test indicated that stigma toward ASD pretest was not significantly different between participants who filled version A (*Mdn* = 14.00) and those who filled version B (*Mdn* = 10.00), *U* = 614.00, *p* = .267, *ns*, *r* =.13. A Mann-Whitney test also indicated that self-efficacy pretest was not significantly different between participants who filled version A (*Mdn* = 12.00) and those who filled version B (*Mdn* = 12.00), *U* = 682.00; *p* = .832, *ns*, *r* = .02 (See Table 8).

In conclusion, participants who filled version A did not significantly differ from those who filled version B on the 3 scales on the pretest: knowledge, stigma and self-efficacy. Participants who filled version A, however, had significantly lower levels of attitudes toward inclusion than participants who filled version B.

C. Counterbalancing for Posttest

Two counterbalanced versions of the questionnaire were generated to control for order and sequence effects in versions A and versions B of the posttest that was only included in the analysis of Study 1.

1-Normality. Normality of the variables (knowledge posttest, stigma toward ASD posttest, attitudes posttest, and self-efficacy posttest) across participants who completed version A and those who completed version B, was tested by examining the z-scores of skewness and kurtosis, as explained above.

The z-scores of skewness and kurtosis revealed that the variables knowledge posttest across version A, stigma toward ASD posttest across version B, attitudes posttest across versions A and B, self-efficacy posttest across versions A and B had z-skewness scores and z-kurtosis scores below the ±1.96 significance level, indicating that these variables were normally distributed. The variable knowledge posttest across version B and the variable stigma toward ASD posttest across version A, however, were positively skewed with z-skewness scores above the ±1.96 significance level.

2-Counterbalancing Main Analysis. Since the normality of the variables attitudes posttest and self-efficacy posttest was met across version A and version B, thus 2 independent sample t-tests were carried out to investigate whether attitudes posttest and self-efficacy posttest were significantly different across versions A and B.

The results of the t-tests revealed that, on average, participants who filled version A had higher levels of attitude on posttest (M = 51.69, SD = 7.98) compared to participants who completed version B (M = 50.69, SD = 7.76). However, this difference was not found significant, as indicated by the t-test; t (56) = .48, p = .634, *ns*, r = .06. On average, participants who filled

version A had higher levels of self-efficacy on posttest (M = 4.38, SD = .39) compared to participants who completed version B (M = 4.04, SD = .44). This difference was found significant, as indicated by the t-test; t (56) = 3.13, p = .003, r = .38 (see Table 9).

Since the normality of knowledge posttest across version A and stigma toward ASD posttest across version B was not met; thus, a Mann-Whitney test was conducted to investigate the difference on knowledge posttest and stigma toward ASD posttest across versions A and B.

A Mann-Whitney test indicated that knowledge posttest was not significantly different between participants who filled version A (*Mdn* = 14.00) and those who filled version B (*Mdn* = 10.00), U = 324.50, p = .152, *ns*, r = .19. A Mann-Whitney test also indicated that stigma toward ASD posttest was not significantly different between participants who filled version A (*Mdn* = 12.00) and those who filled version B (*Mdn* = 12.00), U = 327.00, p = .442, *ns*, r = .10 (see Table 10).

In conclusion, participants who filled version A did not significantly differ from those who filled version B across the 3 scales in the post-test; knowledge, attitudes and stigma toward ASD. Participants who filled version A, however, had significantly higher levels of self-efficacy compared to those who filled version B in the posttest.

D. Preliminary Analysis

The preliminary analyses involved missing values analysis, analysis of univariate and multivariate outliers, and normality analysis.

1. Missing value analysis. The only inclusion criterion was being a teacher. A total of 92 participants completed the questionnaire. In Study 1, of those, the data from 26 participants were excluded because they did not complete the posttest, and the data from 7 participants were excluded because they skipped more than 35% of the questions. In addition, 1 case was deleted

because it was found to be both a univariate and a multivariate outlier (see the section on "Univariate and Multivariate Outliers" below for more details). Therefore, $N = 58$ participants were retained in the final analysis. The missing value analysis revealed that all the variables had less than 5% missing values except for the Education of Participants (6.9%), Experience with children with Autism (20.7%), major of participants (8.6%), occupation of participants (8.6%), knowledge pretest items 8, 12, 13, 17, 19 (5.2% each), knowledge pretest items 11, 14, 16, 29 (6.9% each), knowledge pretest item 20 (8.6%), knowledge pretest item 21 (15.5%), knowledge pretest item 25 (8.6%), stigma toward ASD pretest items 2, 5 (5.2% each), stigma toward ASD pretest item 6 (6.9%) Attitudes item 3, 6 (5.2% each), Self-efficacy pretest item 1 (5.2%), self-efficacy pretest items 2, 20, 21, 23, 24 (6.9% each), self-efficacy pretest items 3, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, (10.3% each), self-efficacy pretest items 4, 17, 18, 19, 22 (8.6% each), self-efficacy pretest items 5, 10 (12.1% each). Knowledge posttest item 14 (6.9%), knowledge posttest item 21 (5.2%), stigma toward ASD posttest items 1 and 2 (5.2% each), stigma toward ASD posttest items 3, 4, 5 (6.9% each), stigma toward ASD posttest item 6 (12.1%), self-efficacy items 16, 22 (5.2% each), self-efficacy items 18, 21 (6.9% each). To test whether the data were missing completely at random Little's MCAR test was run. The statistically non-significant result of the Little's MCAR test; X^2 (3867) = 300.17, $p = 1.000$, *ns*, indicated that MCAR (missing completely at random) can be inferred.

In Study 2, data from 15 participants were excluded because they missed more than 35% of the questions. In addition, 1 case was deleted because it was found to be both univariate outlier and outlier in solution (see the section on "Univariate and Multivariate Outliers" below for more details). Therefore, $N = 76$ participants were retained in the final analysis. The missing value analysis revealed that all the variables had less than 5% missing values except for the

Education of Participants (5.2%), Experience with Children with Autism (13.0%), Perceived Causes of Autism (10.4%), Age of Participants (5.2%), Knowledge item 14 (5.2%), Knowledge item 21, 22, 23 (10.4% each), Knowledge items 24, 25, 26, 28, 29 (5.2% each), Attitudes item 6 (5.2%), Self-efficacy item 2 (5.2%), Self-efficacy items 3, 6, 7 (7.8% each), Self-efficacy items 4, 5, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 (9.1% each), Self-efficacy items 10, 21, 22, 23, 24 (10.4% each). To test whether the data were missing completely at random Little's MCAR test was run. The statistically non-significant result of the Little's MCAR test; X^2 (2261) = 2011.53, p = 1.000, indicated that MCAR (missing completely at random) can be inferred.

2. Univariate and Multivariate Outliers. In Study 1, univariate outliers were inspected through Z-scores and 3 common univariate outliers were found with Z-scores above ±2.58[1] standard deviations with case numbers 14, 21 and 44. One univariate outlier was found on the variable attitude pretest with case number 21, and one univariate outlier was found on the variable knowledge posttest with case number 14. One univariate outlier was found on the predictor variable (stigma toward ASD pretest) with case number 21, and one univariate outlier was found on stigma toward ASD posttest with case number 44, and one univariate outlier was found on the outcome variable (self-efficacy pretest) with case number 21. Multivariate outliers were inspected through Mahalanobis distance using SPSS syntax on Pretest. One case was found to be a multivariate outlier, $\chi 2$ (3) = 14.88, $p < .01$ with case number 21. Multivariate outliers were inspected through Mahalanobis distance using SPSS syntax on posttest. One case was found to be a multivariate outlier, $\chi 2$ (3) = 10.30, $p < .01$ was case number 21. The outlier case number 21 was excluded since it was found to be both univariate and multivariate outlier.

[1] The z-score of 2.58 was used because the sample size was $N < 100$.

In Study 2, univariate outliers were inspected through Z-scores and 4 common univariate outliers were found with Z-scores above ±2.58 standard deviations with case numbers 25, 28, 29, 46. Two univariate outliers were found on the variable age with case numbers 25, 46. One univariate outlier was found on the knowledge scale with case number 28, one univariate outlier was found on the predictor variable (stigma toward ASD) with case number 28, and one univariate outlier was found on the outcome variable (self-efficacy) with case number 29. Multivariate outliers were inspected through Mahalanobis distance using SPSS syntax. No cases were found to be multivariate outliers, $\chi 2\ (9) = 21.21$, $p < .01$.

3. Outliers in the Solution. Outliers in the solution are cases that are not well predicted by the regression model and that exert undue bias on the parameters of the regression model. The presence of outliers in the solution was assessed through standardized residuals (Field, 2013). Cases with standardized residuals above the ±3.29 significance level are considered outliers in the solution. An examination of the standardized residuals in the current analysis of Study 2 revealed that the standardized residuals ranged between -4.41 and 1.35 with one case above ±3.29 (case number 29). Since case number 29 appeared to be both univariate outlier and outlier in the solution, it was excluded from the final analysis of Study 2. The other three univariate outliers, with case numbers 25, 28 and 46 were retained in the final dataset, because none of them appeared to be multivariate outliers or outliers in the solution.

4. Normality. In Study 1, normality of the difference between pre-test and post-test scores on the four variables (knowledge, stigma toward ASD, attitudes toward inclusion and self-efficacy) was tested by examining the z-scores of skewness and kurtosis. The z-skewness was obtained by dividing skewness by the standard error of skewness and the z-kurtosis was calculated by dividing kurtosis by the standard error of kurtosis. Since the sample size is $N = 58$

($N < 100$), then any score of z-skewness and z-kurtosis above ±1.96 is considered significant deviation from normality.

The z-scores of skewness and kurtosis revealed that the variables Knowledge difference, attitude difference, self-efficacy difference had z-skewness scores and z-kurtosis scores below the ±1.96 significance level, indicating that these variables were normally distributed. The variable stigma toward ASD difference, however, was both negatively skewed and positively kurtosis with z-skewness and z-kurtosis scores above the ±1.96 significance level.

In Study 2, normality of the variables was tested by examining the z-scores of skewness and kurtosis. The z-skewness was obtained by dividing skewness by the standard error of skewness and the z-kurtosis was calculated by dividing kurtosis by the standard error of kurtosis. Since the sample size is $N = 76$ ($N < 100$), then any score of z-skewness and z-kurtosis above ±1.96 is considered significant deviation from normality.

The z-scores of skewness and kurtosis revealed that the variables Self-efficacy, Attitudes, Social-distance, and Knowledge had z-skewness scores and z-kurtosis scores below the ±1.96 significance level, indicating that these variables were normally distributed. The variable age, however, was both positively skewed and positively kurtosis with z-skewness and z-kurtosis scores above the ±1.96 significance level.

The variable age was transformed using a reciprocal transformation (1/X). The z-skewness and z-kurtosis of the transformed variable were less than the ±3.29 significance level, indicating that this variable was normally distributed.

E. Main Analysis of Study 1

The main findings of the study were that the training had a positive impact on knowledge and self-efficacy of teachers. The training, however, could not impact attitudes toward inclusion

and stigma toward ASD of teachers, as the pretest results obtained prior to the training were already at ceiling and there was no room for improvement. Details of all findings are presented next.

Since the normality of knowledge difference, attitude difference, and self-efficacy difference were met. Three paired sample t-tests were conducted to investigate the differences on knowledge, attitude, and self-efficacy between pre- and posttests.

On average, participants had lower levels of knowledge on the pretest (M = 7.49, SD = 5.75) compared to the posttest (M = 13.07, SD = 7.09). This difference was found significant, as indicated by the paired sample t-test; t (56) = -6.66, $p < .001$ (*one-tailed*), d= .71, r = .40. As such, hypothesis 1a was supported.

On average, participants had lower levels of attitude on the pretest (M = 50.30, SD = 6.80) compared to posttest (M = 51.04, SD = 7.73). This difference, however, was not found significant, as indicated by the paired sample t-test; t (56) = -.57, p = .285 (*one-tailed*), *ns*, r = .05. As such, hypothesis 1b was not supported

On average, participants had lower levels of self-efficacy (M = 4.06, SD = .49) compared to posttest (M = 4.23, SD = .44). This difference was found significant, as indicated by the paired sample t-test; t (57) = -2.55, p = .007(*one-tailed*), r = .18. Therefore, hypothesis 1c was supported (see Table 11).

Since the normality of stigma toward ASD difference was not met, the Wilcoxon Signed-ranks test was conducted to investigate the difference on stigma toward ASD between pre-posttests. A Wilcoxon Signed-ranks test indicated that there were no significant differences on stigma toward ASD between pretest (Mdn = 13.00) and posttest (Mdn = 12.00), Z = -.71, p = .239, *ns*, r = .09. Therefore, hypothesis 1d was not supported (See Table 12).

F. Additional Analyses of Study 1: Comparison between Schools

The participants were somehow equally drawn from School A (50.9%) and School B (49.1%). After taking a closer look at the difference between School B and School A, it was found that teachers at School A had more favorable attitudes toward inclusion at pretest than teachers at School B. At School A, there was significant improvement in knowledge due to the training. As for School B, there was significant improvement in knowledge and self-efficacy due to the training.

1- Normality. Normality of the variables (knowledge pretest, stigma toward ASD pretest, attitudes pretest, self-efficacy pretest, knowledge posttest, stigma toward ASD posttest, attitudes posttest, and self-efficacy posttest) across participants from School A and those from School B, was tested by examining the z-scores of skewness and kurtosis. The z-skewness was obtained by dividing skewness by the standard error of skewness and the z-kurtosis was calculated by dividing kurtosis by the standard error of kurtosis. Since the sample size in each group was ($N <$ 50), then any score of z-skewness and z-kurtosis above ±1.96 is considered significant deviation from normality.

The z-scores of skewness and kurtosis revealed that the variables (knowledge pretest, stigma toward ASD pretest, attitudes pretest, self-efficacy pretest, stigma toward ASD posttest, attitudes posttest, and self-efficacy posttest) across participants from School A and those from School B had z-skewness scores and z-kurtosis scores below the ±1.96 significance level, indicating that these variables were normally distributed. The variable knowledge posttest across School B, however, had positive skewness and positive kurtosis with z-skewness and z-kurtosis scores above the ±1.96 significance level. The variable knowledge posttest across School A had positive kurtosis with z-kurtosis scores above the ±1.96 significance level.

Since the normality of the variables knowledge pretest, stigma toward ASD pretest, attitude pretest, self-efficacy pretest, stigma toward ASD posttest, attitude posttest, self-efficacy posttest across School A and School B participants was met, thus 7 independent sample t-tests were carried out to investigate differences in these variables across the schools.

The results of the t-tests revealed that, on average, participants from School A had lower levels of knowledge on pretest (M = 5.58, SD = 5.22) compared to participants from School A (M = 8.23, SD = 5.79). However, this difference was not found significant as indicated by the t-test; t (50) = -1.74, p = .089, *ns*, r =.24.

On average, participants from School A had higher levels of stigma toward ASD on pretest (M = 12.60, SD = 1.98) compared to participants from School A (M = 11.15, SD = 3.60). However, this difference was not found significant as indicated by the t-test; t (39.18) = 1.79, p = .082, *ns*, r = .27.

On average, participants from School A had lower levels of stigma toward ASD on posttest (M = 12.20, SD = 3.34) compared to participants from School B (M = 13.08, SD = 4.39). However, this difference was not found significant as indicated by the t-test; t (48) = -.80, p = .429, *ns*, r = .11.

On average, participants from School A had higher levels of attitude on pretest (M = 51.96, SD = 7.93) compared to participants from School B (M = 47.77, SD = 5.13). This difference was found significant as indicated by the t-test; t (42.81) = 2.26, p = .029, r = .33.

On average, participants from School A had lower levels of attitude on posttest (M = 50.33, SD = 6.58) compared to participants from School B (M = 50.92, SD = 8.96). However, this difference was not found significant as indicated by the t-test; t (45.84) = -.27, p = .787, *ns*, r = .04.

On average, participants from School B had lower levels of self-efficacy on pretest (M = 3.94, SD = .52) compared to participants from School A (M = 4.17, SD = .46). However, this difference was not found significant as indicated by the t-test; t (51) = -1.71, p = .094, *ns*, r = .23.

On average, participants from School B had lower levels of self-efficacy on posttest (M = 3.96, SD = .33) compared to participants from School A (M = 4.45, SD = .37). However, this difference was found significant as indicated by the t-test; t (51) = -5.11, $p < .001$, r = .58 (see Table 13).

Since the normality of knowledge posttest across School B and School A students was not met; a Mann-Whitney test was conducted to investigate the difference on knowledge posttest across School B and School A students. A Mann-Whitney test indicated that participants from School B had significantly lower levels of knowledge posttest (Mdn = 9.00) compared to participants from School A (Mdn = 14.00), U = 190.50, p = .004, *ns*, r = .38 (see Table 14).

G. Additional Analysis of Study 1: Comparison between Pretest and Posttest at School A.

1- Normality. Normality of the difference between pre-test and post-test scores on the four variables (knowledge, stigma toward ASD, attitudes toward inclusion and self-efficacy) was tested by examining the z-scores of skewness and kurtosis. The z-skewness was obtained by dividing skewness by the standard error of skewness and the z-kurtosis was calculated by dividing kurtosis by the standard error of kurtosis. Since the sample size is N = 27 ($N < 100$), then any score of z-skewness and z-kurtosis above ±1.96 is considered significant deviation from normality.

The z-scores of skewness and kurtosis revealed that the variables knowledge difference, stigma toward ASD, attitude difference, and self-efficacy difference had z-skewness scores and

z-kurtosis scores below the ±1.96 significance level, indicating that these variables were normally distributed.

2- Main Analysis. Since the normality of knowledge difference, attitude difference, stigma toward ASD difference and self-efficacy difference were met. Four paired sample t-tests were conducted to investigate the differences on knowledge, stigma toward ASD, attitude, and self-efficacy between pre- and posttests.

On average, participants had lower levels of knowledge on the pretest (M = 5.58, SD = 5.22) compared to the posttest (M = 10.00, SD = 7.12). This difference was found significant, as indicated by the paired sample t-test; t (25) = -3.73, p = .001, r = .60

On average, participants had higher levels of stigma toward ASD on the pretest (M = 12.57, SD = 2.04) compared to the posttest (M = 12.43, SD = 3.38). However, this difference was not found significant, as indicated by the paired sample t-test; t (22) = .20, p = .847, *ns*, r = .04

On average, participants had higher levels of attitude on the pretest (M = 51.96, SD = 7.93) compared to the posttest (M = 49.85, SD = 6.19). However, this difference was not found significant, as indicated by the paired sample t-test; t (25) = 1.09, p = .288, *ns*, r = .21.

On average, participants had lower levels of self-efficacy on the pretest (M = 3.94, SD = .52) compared to the posttest (M = 3.96, SD = .33). However, this difference was not found significant, as indicated by the paired sample t-test; t (26) = -.17, p = .870, r = .03 (see Table 15).

H. Additional Analysis of Study 1: Comparison between Pretest and Posttest at School B.

1- Normality. Normality of the difference between pre-test and post-test scores on the four variables (knowledge, stigma toward ASD, attitudes toward inclusion and self-efficacy) was tested by examining the z-scores of skewness and kurtosis. The z-skewness was obtained by dividing skewness by the standard error of skewness and the z-kurtosis was calculated by

dividing kurtosis by the standard error of kurtosis. Since the sample size is $N = 58$ ($N < 100$), then any score of z-skewness and z-kurtosis above ±1.96 is considered significant deviation from normality.

The z-scores of skewness and kurtosis revealed that the variables knowledge difference, attitude difference, self-efficacy difference had z-skewness scores and z-kurtosis scores below the ±1.96 significance level, indicating that these variables were normally distributed. The variable stigma toward ASD difference, however, had positive kurtosis with z-kurtosis scores above the ±1.96 significance level.

2- Main Analysis. Since the normality of knowledge difference, attitude difference, and self-efficacy difference were met. Three paired sample t-tests were conducted to investigate the differences on knowledge, attitude, and self-efficacy between pre- and posttests.

On average, participants had lower levels of knowledge on the pretest ($M = 8.23$, $SD = 5.79$) compared to the posttest ($M = 14.65$, $SD = 5.64$). This difference was found significant, as indicated by the paired sample t-test; $t\ (25) = -5.06$, $p < .001$, $r = .71$.

On average, participants had lower levels of attitude on the pretest ($M = 47.77$, $SD = 5.13$) compared to posttest ($M = 50.92$, $SD = 8.96$). This difference, however, was not found significant, as indicated by the paired sample t-test; $t\ (25) = -1.66$, $p = .109$, *ns*, $r = .32$.

On average, participants had lower levels of attitude on the self-efficacy ($M = 4.17$, $SD = .46$) compared to posttest ($M = 4.45$, $SD = .37$). This difference was found significant, as indicated by the paired sample t-test; $t\ (25) = -4.07$, $p < .001$, $r = .63$ (see Table 16).

Since the normality of stigma toward ASD difference was not met, the Wilcoxon Signed-ranks test was conducted to investigate the difference on stigma toward ASD between pre and posttests.

A Wilcoxon Signed-ranks test indicated that there were no significant differences on stigma toward ASD between pretest (*Mdn* = 13.00) and posttest (*Mdn* = 12.00), *Z* = -1.54, *p* = .123, *ns*, *r* = .30 (see Table 17).

I. Scales Descriptives in Study 2

The means and standard deviations of the scales are provided in Table 18. Concerning the outcome variable (Self-efficacy), it seems that on average participants had high levels of self-efficacy (*M* = 4.11, *SD* = .47). Concerning the Knowledge Scale, it seems that on average participants had high levels of Knowledge (*M* = 7.88, *SD* = 6.72). Concerning the Social Distance scale, on average participants had low levels of stigma toward ASD (*M* = 11.53, *SD* = 3.32). Finally, concerning Attitudes Scale, it seems that on average participants had positive attitudes (*M* = 49.07, *SD* = 7.07).

J. Correlation between Predictor Variables and Self-efficacy in Study 2

1. Assumptions of the Pearson Correlation Test.

a. Variable type. The outcome variable (self-efficacy) and the predictor variables (age, knowledge, attitudes, and stigma toward ASD were entered as scale variables. The predictor variables (educational background, major, occupation {general educators, special educators, others}, experience) were entered as nominal variables.

b. Normality of predictors and outcome variable. The predictor variables knowledge scale, social distance scale, attitudes scale and the outcome variable self-efficacy were normally distributed. In addition, the variable age was transformed to be normally distributed.

2. Main Analysis. The Pearson's correlations between the predictor variables (age, educational background, major, occupation, experience, knowledge, social distance, attitudes*)*

and the outcome variable (self-efficacy) were conducted using one-tailed test, testing hypotheses 1a and 1b. The correlation matrix is presented in Table 19.

The Pearson correlation test revealed that there were non-significant correlations between the predictor variables (age, educational background, major, occupation (general educators, special educators, others}, experience, social-distance, attitudes) and the outcome variable (self-efficacy); r = .03, p = .408, *ns* (*one-tailed*), r = .06, p = .316, *ns* (*one-tailed*), r = -.13, p = .140, *ns* (*one-tailed*), r = .05, p = .343, *ns* (*one-tailed*), r = -.08, p = .248, *ns* (*one-tailed*), r = .04, p = .375, *ns* (*one-tailed*), r = .01, p = .475, *ns* (*one-tailed*), r = -.01, p = .476, *ns* (*one-tailed*), r = -.15, p = .108, *ns* (*one-tailed*).

The Pearson Correlation test also revealed that there was a significant positive and small to medium correlation between knowledge and self-efficacy; r = .20, p = .044 (*one-tailed*); indicating that participants who had higher levels of knowledge tended to have higher levels of self-efficacy (see Table 19).

K. Regression Analysis: Predictors of Self-Efficacy

To test for hypotheses 2a through 2d; the predictors of self-efficacy, a multiple regression analysis using forced entry method was conducted. The forced entry method was used because the predictor variables entitled confirmatory hypotheses. The outcome variable was self-efficacy and the predictor variables were *knowledge, social-distance and attitudes.*

1. Influential cases. Influential cases are cases that exert large and undue influence on the parameters of the regression model. The presence of influential cases was assessed through Cook's Distances. Cook's distance is the difference between a parameter estimated using all cases and estimated when one case is excluded (Field, 2013). Cases with Cook's distance above 1 are considered influential cases. An examination of the Cook's distance in the current analysis

revealed that the Cook's distances ranged between .00 and .23 with no cases above 1. This indicates that there were no influential cases in the data.

2. Outliers in the Solution. Outliers in the solution are cases that are not well predicted by the regression model and that exert undue bias on the parameters of the regression model. The presence of outliers in the solution was assessed through standardized residuals (Field, 2013). Cases with standardized residuals above the ±3.29 significance level are considered outliers in the solution. An examination of the standardized residuals in the current analysis revealed that the standardized residuals ranged between -2.60 and 1.72 with no cases above ±3.29. This indicates that there were no outliers in the solution in the data.

3. Assumptions of regression. Prior to performing the main regression analysis the assumptions of regression were assessed.

a. Variable type. All the variables were scale variables.

b. Ratio of cases to IV's. One of the important assumptions of regression is the sample size. A "rule of thumb" proposed by Tabachnick and Fidell (2013) states that: for a medium size relationship between IVs (predictors) and the DV (outcome): the sample size *N* must be larger than (50+8m) if we are interested in multiple correlation and regression, where m is the number of IVs (predictors). On the other hand, the sample size must be larger than (104+m), if we are testing for individual predictors, where m is the number of IVs (predictors).

The current data analysis had a sample size of $N = 76$ and 3 independent predictors, thus the sample size was adequate for studying multiple correlation and regression ($50+8\times3 = 74$); however, the sample size for testing individual predictors was not adequate ($104+3= 107$).

c. Normality of predictors and outcome variable. The variables were normally distributed (see section on Normality).

d. Assumption of no Multicollinearity. The problem of Multicollinearity indicates that there is a high correlation between two or more predictors that affect the regression analyses (Field, 2013). There are two ways to check for multicolinearity; correlation matrix between predictors and Variance Inflation Factor (VIF) scores. Any correlation between two predictors above .8 would indicate a potential problem of multicollinearity. By inspecting the correlation matrix between predictors, there were no predictors that were highly correlated with each other (no significant correlation between two predictors with $r > |.80|$). This indicates that there is no potential problem of multicolinearity. In addition, Variance Inflation Factor (VIF) coefficients were examined in the final model of regression. VIF values above 10 would indicate that there is a problem of multicollinearity. In the current analysis, VIF values were below 10 indicating that the assumption of no multicollinearity is met.

e. Normality of residuals. The assumption of normality of the residuals of the outcome variable self-efficacy was assessed through the histogram. The histogram revealed that the distribution of residuals is not significantly different from that of a normal distribution (the distribution displayed a bell shaped curve). Hence, the normality of residuals was met (see Figure 1).

f. Independence of errors. The independence of errors assumption states that the errors of prediction are independent of one another. The assumption of independence of errors is tested using the Durbin Watson statistic, which varies usually between 0 and 4 (Field, 2013). A good value for this statistic is 2, however values between 1 and 3 are considered acceptable. In this analysis, the Durbin Watson value was 1.65, which is close to 2, and thus the assumption of independent errors was met.

g. Homoscedasticity of regression slopes. The assumption of homoscedasticity was tested by examining the following residuals scatter plot (ZRESID vs ZPRED). ZPRED is the standardized predicted values of the dependent variable based on the model while ZRESID is the standardized residuals or errors (Field, 2013). In this study, the plot revealed that the residuals scatter plot does show an even scatter around all scores, the points are therefore not funneling out. Therefore, the assumption of homoscedasticity was met (see Figure 2).

4. Multiple Regression Main Analysis. The F-test revealed that the regression model which contained the predictors (knowledge, stigma and attitudes toward ASD), which was forced into the regression equation, was not significantly better than the mean in explaining the variance in the outcome variable (self-efficacy), F (3, 71) = 2.01, p = .111, *ns*.

Although this regression model was not significant, it explained 8.1% (R^2= .081) of the variance of the outcome variable (self-efficacy). At the population level, this regression model explained 4.2% ($R^2adjusted$ = .042) of the variance of the outcome variable (self-efficacy). In addition, when moving from the sample to the population, the shrinkage ΔR^2 = 3.9%; indicating that the regression model would generalize well to the population (see Table 20).

By inspecting the table of coefficients; although the regression model was not significant, the t-tests revealed that among the 3 predictors, only the predictor variable (knowledge) was found to be a significant predictor of the outcome variable (self-efficacy; see Table 21).

The t-test revealed that the predictor variable (knowledge) was a significant, positive and small to medium predictor of self-efficacy; b = .02, β = .25, t (71) = 2.14, p = .036. This indicates that participants who had higher levels of knowledge tended to have higher levels of self-efficacy. As such hypothesis 2a was supported.

The t-tests revealed, however, that the predictor variables (stigma and attitudes toward ASD) were not significant predictors of the outcome variable (self-efficacy) with b = .01, B = .04, t (71) = .31, p = .759, *ns; b* = -.01, B = -.22, t (71) = -1.78, p = .079, *ns;* respectively. Therefore, hypothesis 2b and 2c were not supported.

L. Regression Analysis: Predictors of Self-Efficacy while Controlling for the Effect of Covariates.

To test for hypotheses 2d through 2f; the predictors of self-efficacy after controlling for the effect of the covariates (age, education, major, occupation {General Educators, Special Educators, and others, and experience), a hierarchical multiple regression analysis with two steps was carried out. The outcome variable was self-efficacy and the predictor variables were age, education, major, occupation (General Educators, Special Educators, and others), experience, knowledge, stigma toward ASD and attitudes. The predictor variables (age, education, major, occupation {General Educators, Special Educators, and others}, and experience) were entered through the forced entry method, because they were covariates. The predictor variables knowledge, stigma toward ASD, and attitudes were entered through the forced entry method, because they entitled confirmatory hypotheses. Refer to the previous section for a detailed explanation of the assumptions.

1. Influential cases. An examination of the Cook's distance in the current analysis revealed that the Cook's distances ranged between .00 and .20 with no cases above 1. This indicates that there were no influential cases in the data.

2. Outliers in the Solution. An examination of the standardized residuals in the current analysis revealed that the standardized residuals ranged between -2.29 and 1.64 with no cases above ±3.29. This indicates that there were no outliers in the solution in the data.

3. Assumptions of regression. Prior to performing the main regression analysis the assumptions of regression was assessed.

a. Variable type. The outcome variable (self-efficacy) and the predictor variables (age, knowledge, attitudes, and stigma toward ASD) were entered as scale variables. The predictor variables (educational background, major, occupation {general educators, special educators, others}, experience) were entered as nominal variables.

b. Ratio of cases to IV's. As was mentioned above, the sample size was adequate for studying multiple correlation regression, but not adequate for testing individual predictors.

c. Normality of predictors and outcome variable. The variables were normally distributed (see section on Normality).

d. Assumption of no Multicollinearity. In the current analysis, VIF values were below 10 indicating that the assumption of no multicollinearity is met (as mentioned above).

e. Normality of residuals. The histogram revealed that the distribution of residuals is not significantly different from that of a normal distribution (the distribution displayed a bell shaped curve). Hence, the normality of residuals was met (see Figure 3).

f. Independence of errors In this analysis, the Durbin Watson value was 2.06 which is close to 2 and thus the assumption of independent errors was met (same as above).

g. Homoscedasticity of regression slopes. In this study, the plot revealed that the residuals scatter plot does show an even scatter around all scores, the points are therefore not funneling out. Therefore, the assumption of homoscedasticity was met (see Figure 4).

4. Multiple Regression Main Analysis.

The F-test revealed that the first regression model which contained the predictors (age, education, major, occupation {general educators, special educators, and others} and experience),

and which was forced into the regression equation, was not significantly better than the mean in explaining the variance in the outcome variable (self-efficacy), F (6, 47) = 1.12, p = .367, *ns*.

Although this regression model was not significant, it explained 12.5% (R^2= .125) of the variance of the outcome variable (self-efficacy). At the population level, this regression model explained 1.3% ($R^2adjusted$ = .013) of the variance of the outcome variable (self-efficacy). In addition, when moving from the sample to the population, the shrinkage ΔR^2 = 11.2%; indicating that this regression model would not generalize well to the population (see Table 22).

The F-test revealed that the second regression model which contained the predictors (age, education, major, occupation {general educators, special educators, and others}, experience, knowledge, stigma toward ASD and attitudes), and which was forced into the regression equation, was not significantly better than the mean in explaining the variance in the outcome variable (self-efficacy), F (3, 44) = 1.27, p = .293, *ns*.

Although this regression model was not significant, it explained 19.5% (R^2= .195) of the variance of the outcome variable (self-efficacy). At the population level, this regression model explained 3% ($R^2adjusted$ = .030) of the variance of the outcome variable (self efficacy). In addition, when moving from the sample to the population, the shrinkage ΔR^2 = 16.5%; indicating that this regression model would not generalize well to the population (see Table 22). Finally, $R^2change$ = 7% indicates that the predictor variables (knowledge, stigma and attitudes toward ASD) explained a unique variance of 7% of the variance of the outcome variable (self-efficacy).

By inspecting the table of coefficients; the second regression model was not significant, and the t-tests revealed that none of the predictors was found to be a significant predictor of the outcome variable (self-efficacy; see Table 23).

The t-tests revealed, that all of the predictor variables (age, education, major, occupation {special educators, others}, experience, knowledge, social distance and attitudes) were not significant predictors of the outcome variable (self-efficacy) with b = 4.16, B = .06, t (48) = .42, p = .675, *ns (age); b* = .27, B = .19, t (48) = 1.37, p = .177, *ns (education); b* = -.35, B = -.28, t (48) = -1.98, p = .054, *ns (major); b* = -.12, B = -.13, t (48) = -.81, p = .420, *ns (occupation)*; b = .07, B = .07, t (48) = .40, p = .692, *ns (experience)*; b = -.13, B = -.14, t (48) = -.95, p = .350, *ns (knowledge)*; b = .01, B = .01, t (48) = .64, p = .525, *ns (social distance)*; b = .02, B = .16, t (48) = 1.11, p = .272, *ns*; b = -.02, B = -.25, t (48) = -1.70, p = .096, *ns (attitudes)*. Therefore, hypothesis 2d was not supported. It is important to note that the predictor variable general educator was excluded by SPSS from the second model (was not a significant predictor).

CHAPTER V

DISCUSSION

The aim of Study 1 was to assess the impact of a training presentation on knowledge and stigma associated with ASD, attitudes toward inclusion, and self-efficacy of teachers. The aim of Study 2 was to examine the effects of the predictors (knowledge and stigma associated with ASD, and attitudes toward inclusion) on the outcome (self-efficacy of teachers). These aims were viewed as important because ASD is the most internationally growing developmental disorder affecting 1 in 68 children (CDC, 2014; Elsabbagh et al., 2012). Also, children with ASD have recently been included in general education classrooms based on the philosophy of inclusion. The study in its two parts taken together is the first of its kind to focus on characteristics, qualifications, and knowledge of general and special education teachers concerned with students on the spectrum attending inclusive settings in Lebanon.

A. Interpretation of the Findings

The main findings of Study 1 were that the training had an impact on knowledge about ASD and self-efficacy of teachers, and the main finding of Study 2 was that knowledge was a predictor of increased self-efficacy of teachers of children with ASD.

The results of Study 1 revealed that knowledge about ASD increased after the training lecture about ASD. This finding is consistent with several studies which also found that attending a single to few trainings increased knowledge of teachers about ASD and corrected misconceptions (Gillespie-Lynch et al., 2015; Leblanc et al., 2009; Obeid et al., 2015).

The results of Study 1 also revealed that the training had an impact on self-efficacy of teachers working with students with ASD. In educational settings, self-efficacy of teachers is the certainty they feel towards having an impact on student learning (Klassen & Chiu, 2010). This

finding is consistent with Leblanc et al. (2009), in which confidence in teachers' roles in integration increased as a result of a training that increased knowledge about ASD. Several studies supported these findings that higher levels of knowledge about ASD lead to more confidence and readiness in inclusion (Hamrek & Rojeski, 2014; Pazey et al., 2014).

It is conceivable that the study had an impact on teachers' knowledge and self-efficacy, since the training included information about ASD, addressed issues teachers face regularly through examples and case studies, provided them with practical tips and strategies that are effective when working with students with ASD, and an opportunity to ask questions was provided per group and on a one-to-one basis. The training provided the teachers with an opportunity to reflect on their work (e.g., two vignettes were given in the training about different situations of students with ASD, and teachers shared how they usually deal with them), and develop a clearer understanding of their students competencies and difficulties (e.g., the training included the definition of ASD as described in the DSM-5, and common traits that are exhibited in individuals with ASD). The training was also designed to help teachers acquire more beneficial strategies of dealing with unwanted behaviors and reinforcing appropriate behaviors (e.g., the training covered the basics of Applied Behavior Analysis through going in-depth in explaining antecedents preceding behaviors, behaviors themselves and consequences following the behavior which either increase, decrease or maintain the behavior. The training also included examples of consequences teachers should avoid and provided them with better strategies of dealing with students with ASD in various situations).

The findings of Study 1 are in congruence with the findings of Study 2, in which knowledge was found to be a predictor of self-efficacy (at baseline; i.e., before the training was delivered). This finding is consistent with several studies, which found that teachers who have

higher levels of knowledge also have higher levels of self-efficacy (e.g., Atiles et al., 2012; Rafferty & Griffin, 2005). This finding is also in congruence with Atiles et al., who found that successfully teaching children with ASD depends on the self-efficacy of teachers. One could argue that teachers who are more knowledgeable about ASD are more successful in teaching students on the spectrum, thus have higher levels of self-efficacy.

In Study 1, stigma toward ASD did not decrease since the pretest results obtained were already very low and there was no room for change (floor effect). Floor effect is defined as using only the low end of the scale, which limits the variability of the scores (McBee, 2010). This finding is different from Gillespie-Lynch et al. (2015), who found that stigma of college students toward people with ASD was more difficult to change than knowledge, and the highest degree of stigma was exhibited towards having relationships with individuals with ASD. This finding is also different from Obeid et al. (2015), in which levels of stigma toward ASD of the Lebanese population were found to be higher than the US population before and after the training. The difference of this finding with the literature is due to the floor effect.

In Study 1, the training could not impact attitudes toward inclusion either, as the pretest results obtained prior to the training were already at ceiling. The ceiling effect is defined as using only the high end of the scale, which limits the variability of the scores (McBee, 2010). This finding is consistent with Mulvihill et al. (2002) who considered that favorable attitudes of teachers increased willingness to successfully include children with special needs in their classrooms. Therefore, given that teachers who participated in the current study work at inclusive schools, it is possible that they already have positive attitudes toward inclusion. This finding is different from Leblanc et al. (2009), however, who found that trainings had an impact on attitudes toward inclusion; and Barned et al. (2011) who revealed contradictions in attitudes of

teachers toward inclusion. Even though the majority of teachers had favorable attitudes toward inclusion, most of them expressed hesitation to including all students with ASD and they all agreed that inclusion should depend on the level of severity of ASD. Barned et al. found that the severity of the disability was the most influential factor in educational placement decisions, and teachers considered the severity of the disability more important than the child's personality and academic ability. This implies that teachers need to be more knowledgeable of strategies and techniques to handle inclusive classrooms, in order for students who would benefit from inclusion to be included. Bitterman et al. (2008) found that children with ASD benefit socially, emotionally, and cognitively upon interacting with typical peers. These benefits are the result of children with ASD being offered the opportunity to observe typical models of social behavior, feeling accepted and getting exposed to higher academic standards (Mesibov & Shea, 1996).

Even though anonymity and confidentiality were ensured before the teachers filled out the questionnaires, teachers might have engaged in social desirability while filling the attitudes toward inclusion and social distance scales. Social desirability is a response bias when participants fill out questionnaires, in which they select answers that will show them in more favorable light, rather than answers that reflect their true beliefs (Christensen, Johnson, & Turner, 2011; Lorenzo-Seva & Fernanando, 2012). Participants in the study were aware that the recruitment was done through the school principals, which might have affected their responses and made them more prone to engage in social desirability. Both schools belong to a Christian background, Chamiec-Case (2007) found that Christian beliefs and values affect the way social workers understand and practice their work with individuals with special needs, they also believe that stigma is harmful and all people should have equal rights, regardless of their difficulties or disabilities. Therefore it is conceivable that exhibiting negative attitudes toward inclusion or

stigma toward ASD would go against the religious values and beliefs of teachers in the present study. In addition, it should be taken into consideration that inclusion is present and emphasized at their schools, irrespective of their attitudes or beliefs about inclusion, which might have contributed to the teachers' interest in aligning their views with the system their schools support.

Favorable attitudes toward inclusion did not predict self-efficacy in Study 2. This finding is inconsistent with the literature, which shows the inverse, that teaching efficacy was one of the strongest predictors of favorable attitudes and appropriate inclusive behaviors in teachers who had included students with ASD in their classrooms (e.g., Finke et al., 2009; Sharma et al., 2012). It could be argued that the high rates of missing values, which will be discussed in-depth under Limitations in the following section, resulted in having to delete a sizable number of participants from an already small sample, and retaining participants with high rates of missing values affected the significance of the results.

None of the covariates were significant when the relation between the predictors (knowledge, stigma, and attitude all at pretest) and the outcome variable (self-efficacy at pretest) was explored after partialling out the effect of age, education, major, occupation (general educators, special educators, others) and years of experience. These findings were inconsistent with the literature, since age and years of experience had an effect on the self-efficacy of teachers (Klassen & Chiu, 2010; Tschannen-Moran & Woolfolk Hoy, 2007). Klassen and Chiu (2010) found that the first years of teaching were considered the most challenging; self-efficacy was the most malleable then, and self-efficacy ratings increased and became more stable as teachers gained experience. Teachers in this study, however, did not get the chance to gain enough experience yet due to the novelty of inclusion in Lebanon. In addition, given the documented poverty of ASD resources in this country (e.g., Daou, 2014; Dirani & Salamoun,

2014; Fayyad et al., 2010; Obeid et al., 2015), teachers in this study may not have been offered sufficient training and guidance to help them to accommodate students with ASD academically, socially and behaviorally in inclusive settings.

Major was not a significant covariate, which indicates that teachers who had a social science background (e.g., Early childhood education, special education and psychology) were not different from teachers who did not have a social science background (e.g., Accounting, business management and administration, and computer and communication engineering). The finding that major is not a significant covariate is different from Barned et al. (2011) who conducted studies on pre-service teachers and stressed the importance of their educational background on their future work with students. Pre-service teachers are enrolled in teaching programs and have expressed an interest in eventually working with children with ASD (Barned et al.) The fact that none of the covariates made a difference might indicate that all teachers lacked motivation and interest in seeking additional information about ASD.

As for the comparison between general and special educators there are mixed findings in the literature. The finding that is inconsistent with the study is that special educators had higher levels of self-efficacy than general education teachers (Barned et al., 2011). However, in congruence with the results of this study, some studies found that general education teachers do not perceive of themselves as fit to teach children with special needs in inclusive classrooms (Kilanowski et al., 2010), and even though special education teachers were certified to work with children with ASD, this does not indicate their readiness or qualification to work with students with ASD (Loiacono & Allen, 2008). These findings might provide a possible explanation of the lack of difference in the levels of self-efficacy between general and special educators.

In conclusion to this section, the possible adverse effects of lack of motivation of teachers, regardless of their major or occupation, due to lack of support in the form of education/training, and the lack of resources (whether curriculum and office supplies, or funding for the teachers, and salaries), makes it difficult to tease out any differences among the covariates.

B. Limitations, Implications and Future Directions

The main limitation of this study was the high rates of missing values on the questionnaires (missing more than 35% of the questionnaire), which resulted in two drawbacks. The first drawback was removing a large number of participants from the originally small sample size, and the second drawback was retaining participants with high rates of missing values in the study (less than 35% missing of the questionnaire), which affected the significance of the results. Another serious limitation related to sample size was the high rates of attrition, when the first study relied on comparisons between pre- and posttests to investigate the differences on knowledge, attitude, stigma toward ASD and self-efficacy within each participant.

The high rates of missing values and attrition could be the result of lack of motivation for many reasons, for instance, during the training teachers said that “all their efforts with students are not appreciated”, and teachers also said that “we believe we are underpaid, especially that our job is among the most tiring jobs.” It is also conceivable that at School B there were high rates of missing values due to the teachers’ difficulties in English since they were French-educated. The teachers at School B were mostly trilingual, but the technical terms in the survey may have made it more difficult to understand. Based on the high levels of attrition and missing values, a recommendation for future researchers would be including monetary incentives so teachers will

feel more motivated to participate in the study, and will take their time to fill the questionnaires thoroughly and completely.

It could also be argued that the lesser time allocated to the training session at School B, due to the thirty-minute delay as a result of the location being occupied might have affected the teachers while filling out the pretest. As for School A, the school principal rescheduled the training sessions twice, so the teachers might have lost interest in the study. One month later, the follow-up session at School B took place after school hours, which might have impacted the teachers' motivation while filling out the posttest, and teachers might have been in a rush to complete the questionnaire. Whereas at School A, the school principal only agreed to carry out the follow-up session during breaks, which may also have affected performance in filling out the survey. Teachers might have also been in a rush to complete the questionnaires to make use of their break. Therefore, it was very clear that the school administrators did not give the experimenter the kind of control and leeway necessary to carry out a complex study of this sort under optimal conditions. This was contrary to what the administrators had promised during recruitment. Future studies should insist on being in complete control of experimental conditions, and for studies of this nature to be carried out where experimenters are affiliated, because one cannot be in control of an environment at which he or she is a visitor.

Other limitations included the quasi-experimental nature of this study's design and the lengthy battery of tests that participants had to answer. The quasi-experiment permitted an assessment of the impact of training on the knowledge and stigma about ASD, attitudes toward inclusion and self-efficacy through administering identical pre- and posttests. A stronger design would have included random assignment of teachers into groups, with comparisons drawn between the control and experimental groups.

Concerning the length of the questionnaire battery, through counterbalancing of the posttest, it was found that teachers who filled version A had higher levels of self-efficacy than those who filled version B. Self-efficacy which was higher in version A came last in version A, and came second in version B, it could be argued that participants were not motivated to fill the questionnaires accurately or might have experienced fatigue toward the end.

The majority of teachers at both schools were general education teachers, and only few teachers were special educators. Barned et al. (2011) found that general education teachers considered advanced knowledge of ASD only concerned special educators. This might reveal lack of genuine interest of teachers in the study, which would also explain the disinterest in filling out the questionnaires accurately and entirely. A recommendation for future research would be to conduct comparisons between general- and special education teachers to assess potential differences at baseline, and then compare each of those groups to teachers who did not receive the training. It would also be interesting to look at the difference in knowledge about ASD and attitudes toward inclusion at schools that do not accept inclusion, and set high academic and conduct standards for their students.

Another limitation is that participants were recruited through convenience sampling and the findings of the study cannot be generalized to all teachers in Lebanon. The sample was recruited from School A and School B, both of which are private and Christian schools; therefore teachers at these institutions might have different characteristics compared to other teachers in different areas in Lebanon. Therefore, a recommendation for future researchers studying this topic would be to recruit a larger and more diverse sample of teachers to better explore the impact of training on the following variables; knowledge about ASD, stigma toward ASD, attitudes toward inclusion and self-efficacy on a larger scale.

On average, participants reported positive attitudes toward inclusion and low levels of stigma toward individuals with ASD. This might be explained by the fact that the teachers work at inclusive schools, and thus it is socially desirable to have positive attitudes toward individuals with ASD. For example, during the pilot study, one of the participants filled that she would be "definitely willing" to marry someone with ASD, however, she indicated to the researcher later on that she actually would *not* be willing to marry someone with ASD, but thought that it would be a good answer to report otherwise. Findings such as this suggest that it would have been informative to include a measure of social desirability. Another recommendation for future research on studying this topic would be to include a social desirability scale to measure social response bias. Moreover, researchers could also share some of their personal feelings or experiences to make teachers feel comfortable. It is also recommended that researchers provide teachers with breaks during the training to avoid fatigue, and include reminders throughout the survey for participants to take their time and respond truthfully. It would also be a good idea to offer follow-up and booster training sessions over a period of time to make sure the knowledge and skills disseminated in the training are maintained over time. If the training has an impact on increasing knowledge about ASD, making attitudes toward inclusion more favorable, decreasing stigma toward ASD and increasing self-efficacy of teachers, the process of inclusion at schools would become more successful (Cross et al., 2004). The success of inclusion at particular schools might eventually lead to inclusion at all schools, where all students will have equal rights of education (Marshall & Goodall, 2015). As a result, raising awareness of teachers about ASD would not only help in the process of inclusion at schools, it would be merely a first step in raising awareness and promoting inclusion and acceptance of individuals with ASD in society.

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Table 1

Descriptive of the Sample Characteristics

Demographics	N	Minimum	Maximum	Mean	Standard Deviation
Age	58	21.00	54.00	32.36	7.18
Valid N (listwise)	58				

Table 2

Descriptive of the Sample Characteristics

		N	%
Pretest Version	Version A	33	56.9%
	Version B	25	43.1%
Posttest Version	Version A	32	55.2%
	Version B	26	44.8%
Gender	Female	56	96.6%
	Male	2	3.4%
Education Background	BA/MA	42	77.8%
	High school/college credits/ certificates	12	22.2%
Major of Participant	Social Science	44	83.0%
	Non-social Science	9	17.0%
Occupation	General Educator	33	60.0%
	Special Educator	21	38.2%
	Other	1	1.8%
Experience	No experience to one year of experience	14	30.4%
	More than one year of experience	32	64.6%

Table 3

Descriptive of the Sample Characteristics

Demographics	N	Minimum	Maximum	Mean	Standard Deviation
Age	72	21.00	64.00	32.04	7.96
Valid N (listwise)	72				

Table 4

Descriptive of the Sample Characteristics

		N	%
Pretest Version	Version A	40	52.6%
	Version B	36	47.4%
Gender	Female	73	96.1%
	Male	3	3.9%
Education Background	BA/MA	60	83.3%
	High school/college credits/ certificates	12	16.7%
Major of Participant	Social Science	60	87.0%
	Non-social Science	9	13.0%
Occupation	General Educator	33	45.2%
	Special Educator	23	31.5%
	Other	17	23.3%
Experience	No experience to one year of experience	22	33.3%
	More than one year of experience	44	66.7%

Table 5
Independent Sample t-test

	Version A		Version B		
	M	SD	M	SD	*t-test*
Knowledge Pretest	8.53	4.87	6.16	6.59	1.51
Attitude Pretest	49.91	7.41	50.80	6.04	-.49
Self-Efficacy Pretest	4.06	.48	4.05	.50	.08

ns $p > .05$

Table 6
Mann-Whitney U test

	Social Distance Pretest
Mann-Whitney U	360.50
Wilcoxon W	856.50
Z	-.45

ns $p > .05$

Table 7
Independent Sample t-test

	Version A		Version B		
	M	SD	M	SD	*t-test*
Knowledge Pretest	8.93	5.75	6.72	7.57	1.42
Attitude Pretest	48.43	7.68	49.78	6.35	-.83

ns $p > .05$

Table 8
Mann-Whitney U test

	Social Distance Pretest	Self-Efficacy Pretest
Mann-Whitney U	614.00	682.00
Wilcoxon W	1434.00	1348.00
Z	-1.11	-.21

ns $p > .05$

Table 9
Independent Sample t-test

	Version A		Version B		
	M	SD	M	SD	*t-test*
Attitude Posttest	51.69	7.98	50.69	7.76	.48
Self-Efficacy Posttest	4.38	.39	4.04	.44	3.13*

* $p < .01$

Table 10
Mann-Whitney U test

	Knowledge Posttest	Social Posttest
Mann-Whitney U	324.50	327.00
Wilcoxon W	675.50	627.00
Z	-1.43	-.77

ns $p > .05$

Table 11
Paired Sample t-test

	Pretest		Posttest		
	M	SD	M	SD	*t-test*
Knowledge	7.49	5.75	13.07	7.09	-6.66**
Attitude	50.30	6.80	51.04	7.73	-.57
Self-Efficacy	4.06	.49	4.23	.44	-2.55*

** $p < .001$ * $p < .01$

Table 12
Wilcoxon Signed Ranged Test

	Knowledge Pretest – Knowledge Posttest
Z	.71

ns $p > .05$

Table 13
Independent Sample t-test

	School A		School B		
	M	SD	M	SD	*t-test*
Knowledge Pretest	5.58	5.22	8.23	5.79	-1.74
Social Distance Pretest	12.60	1.98	11.15	3.60	1.79
Social Distance Posttest	12.20	3.34	13.80	4.39	-.80
Attitude Pretest	51.96	7.93	47.77	5.13	2.26*
Attitude Posttest	50.33	6.58	50.92	8.96	-.27
Self-Efficacy Pretest	3.94	.52	4.17	.46	-1.71
Self-Efficacy Posttest	4.45	.37	3.96	.33	-5.11**

** $p < .001$ * $p < .01$

Table 14
Mann-Whitney U test

	Knowledge Posttest
Mann-Whitney U	190.50*
Wilcoxon W	568.50
Z	-2.86

* $p < .01$

Table 15
Paired Sample t-test

	Pretest		Posttest		
	M	SD	M	SD	*t-test*
Knowledge	5.58	5.22	10.00	7.12	-3.73*
Social Distance	12.57	2.04	12.43	3.38	.20
Attitude	51.96	7.93	49.85	6.19	1.09
Self-Efficacy	3.94	.52	3.96	.33	-.17

* $p < .001$

Table 16
Paired Sample t-test

	Pretest		Posttest		
	M	SD	M	SD	*t-test*
Knowledge	8.23	5.79	14.65	5.64	-5.06*
Attitude	47.77	5.13	50.92	8.96	-1.66
Self-Efficacy	4.17	.46	4.45	.37	-4.07*

* $p < .001$

Table 17
Wilcoxon Signed Ranged Test

	Social Distance Pretest – Social Distance Posttest
Z	-1.54

ns $p > .05$

Table 18
Scale Descriptives

	N	Minimum	Maximum	Mean	Std. Deviation
knowledge scale	76	-6.00	27.00	7.88	6.72
Attitudes scale	76	33.00	62.00	49.07	7.07
Social Distance	76	6.00	23.00	11.53	3.32
Self-Efficacy	75	2.87	5.00	4.11	.47
Valid N (listwise)	75				

Table 19

Zero Order Correlation Matrix

	Self-Efficacy
Age	.03
Educational Background	.06
Major	-.13
General Educators	.05
Special Educators	-.08
Other	.04
Experience	.01
Social Distance	-.01
Attitude	-.15
Knowledge	.20*

*. Correlation is significant at the 0.05 level (one-tailed).

Table 20

R, R Square, Adjusted R Square

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.28	.08	.04	.46	.08	2.08	3	71	.11	1.65

Table 21
Regression Parameters

Model		***B***	***SE B***	***β***
1	(Constant)	4.62	.39	
	knowledge scale	.02	.01	.25*
	Social Distance	.01	.02	.04
	Attitudes scale	-.01	.01	-.22

Note: For model 1; R^2 = .08, ΔR^2 = .03, * p < .05

Table 22

R, R Square, Adjusted R Square

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.35	.13	.01	.44	.13	1.12	6	47	.37	
2	.44	.20	.03	.44	.07	1.28	3	44	.29	2.02

Table 23
Regression Parameters

Model		***B***	***SE B***	***β***
1	(Constant)	4.38	.73	
	Age	2.12	9.73	.03
	Educational Background	.28	.20	.20
	Major	-.34	.17	-.28
	Special Educators	-.09	.14	-.10
	Others	.06	.17	.06
	Experience	-.10	.14	-.11
2	(Constant)	5.00	.97	
	Age	4.16	9.86	.06
	Education Background	.27	.20	.19
	Major	-.35	.18	-.28
	Special Educators	-.12	.15	-.13
	others	.07	.17	.07
	Experience	-.13	.14	-.14
	knowledge scale	.01	.01	.10
	Social Distance	.02	.02	.16
	Attitudes scale	-.02	.01	-.25

Note: For model 1; R^2 = .125, ΔR^2 = .112,
For model 2; R^2 = .195, ΔR^2 = .165

Figure 1: Normality of Residuals

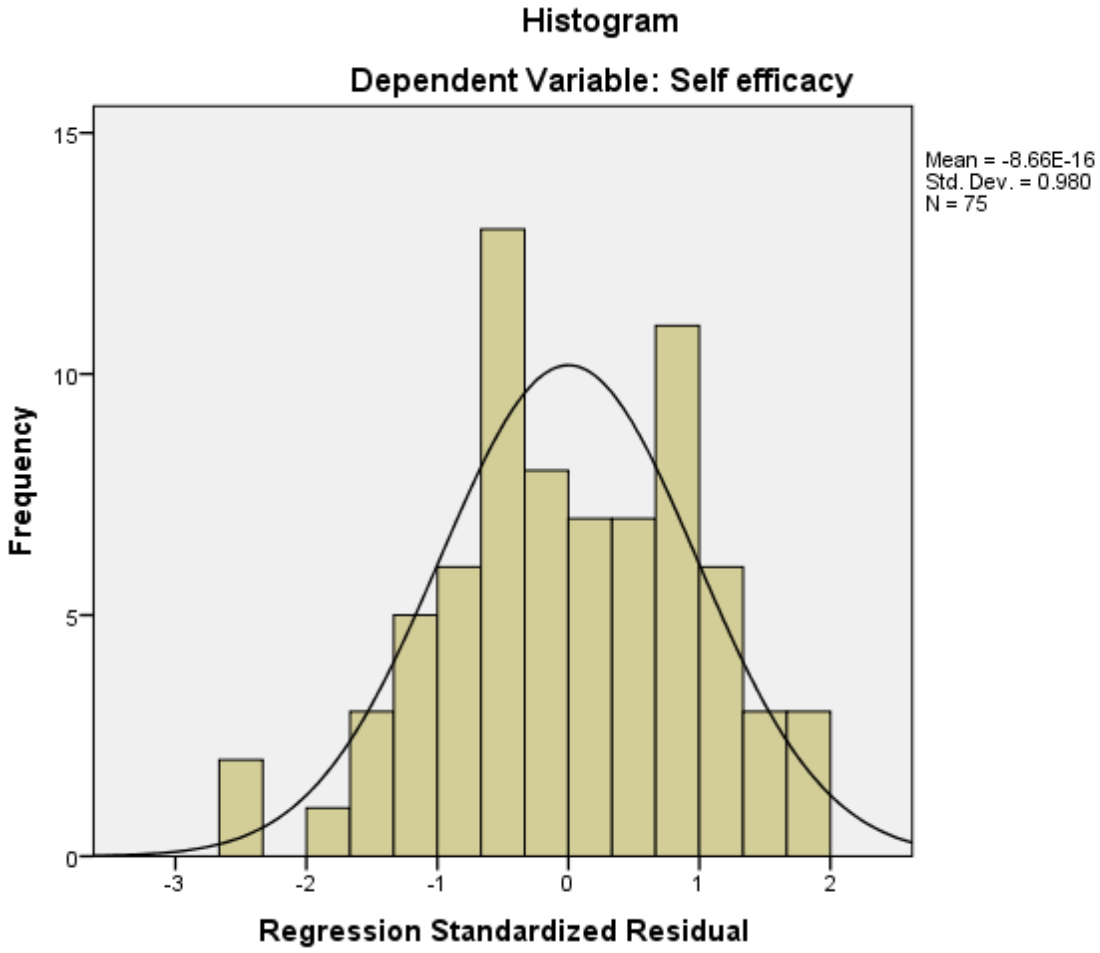


Figure 2: Homoscedasticity Assumption

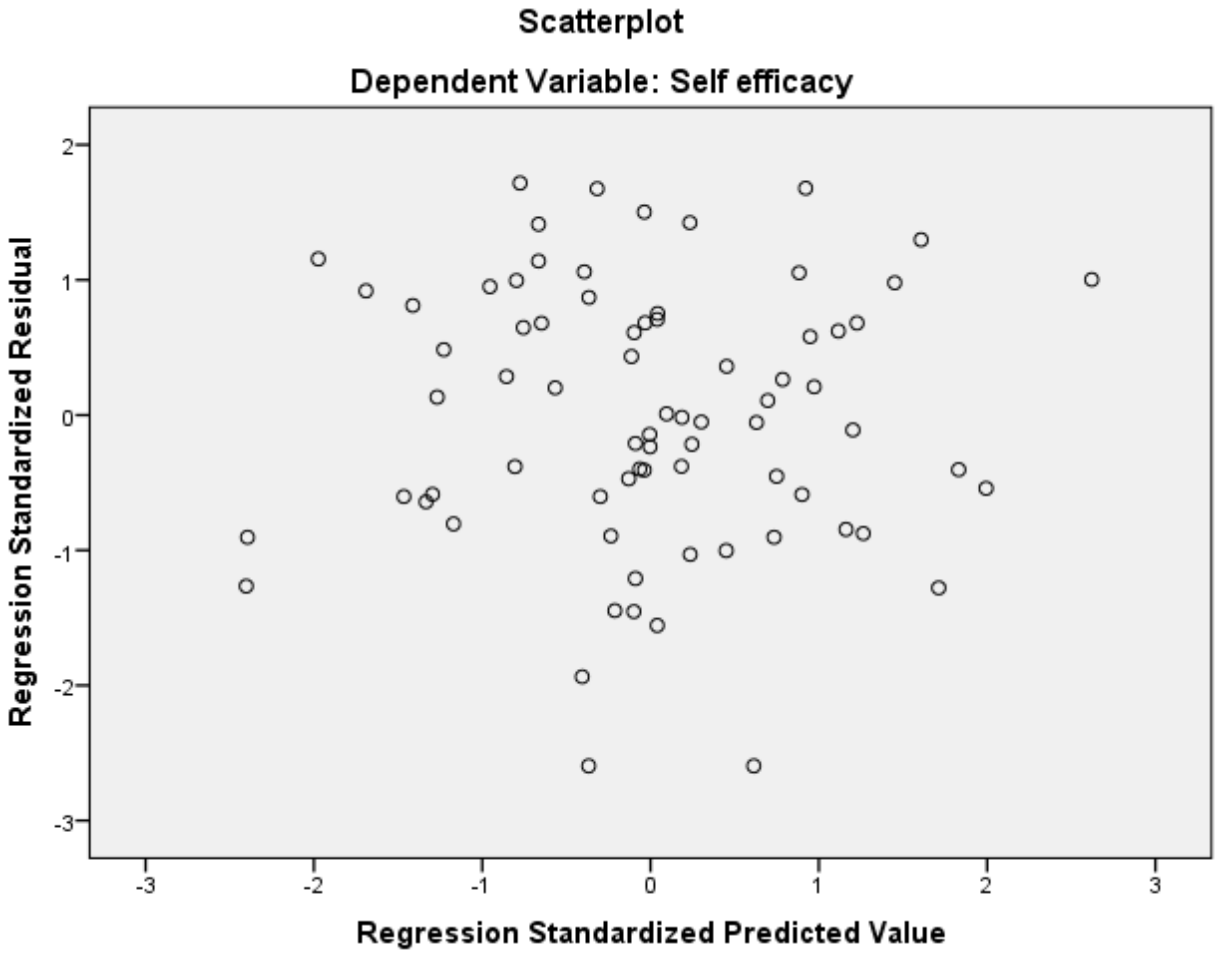


Figure 3: Normality of Residuals

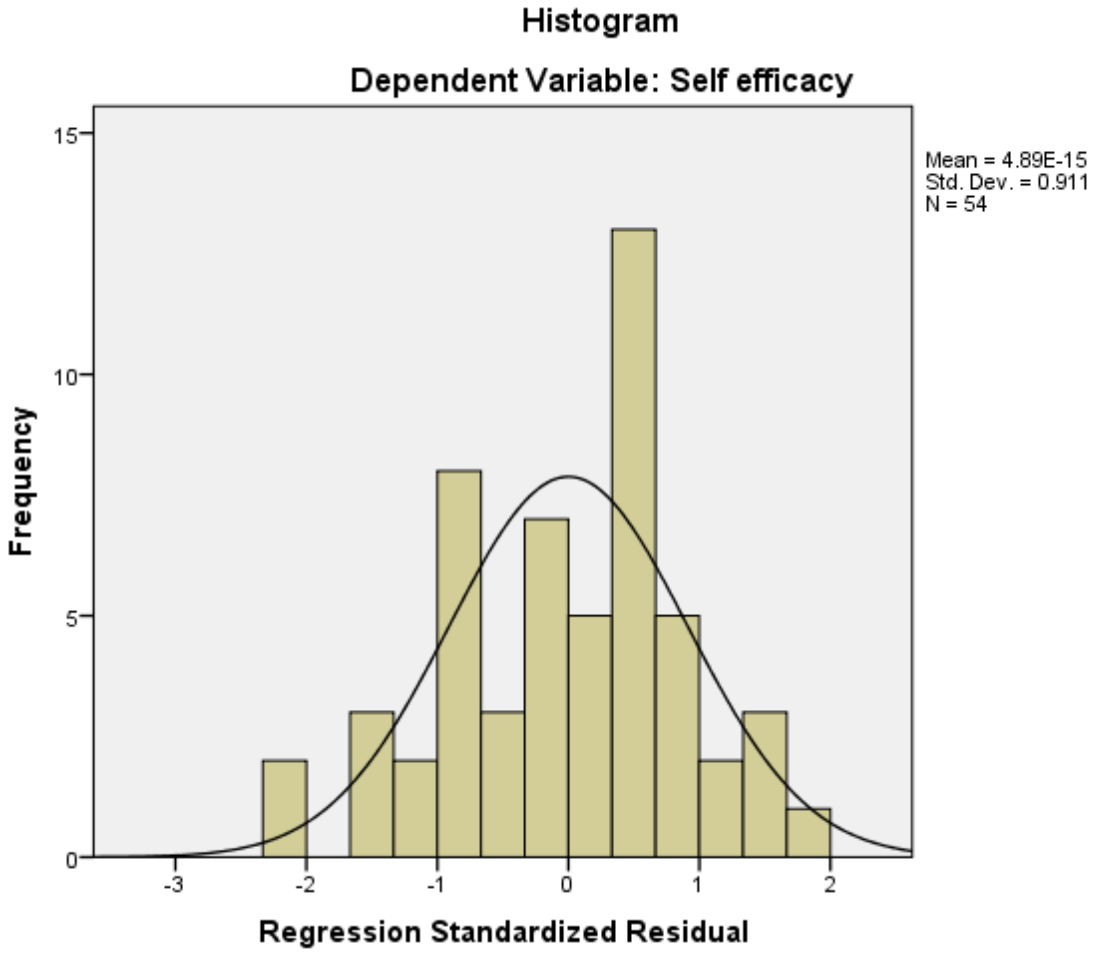
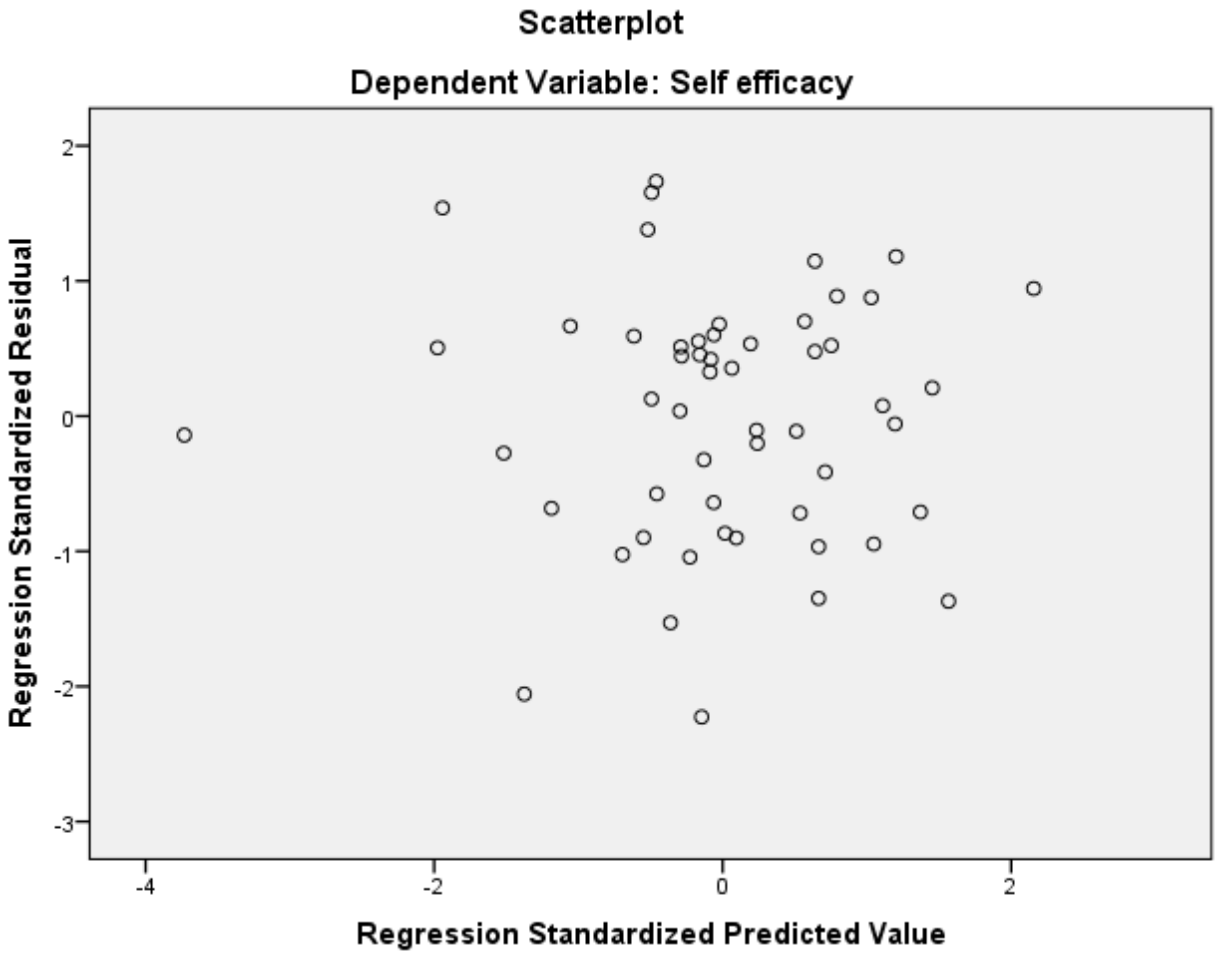


Figure 4: Homoscedasticity Assumption



Appendix A

Demographic Information

1. We would like to know about your personal experience with people with autism. Please select as many of the following types of relationships as you've had with people with autism:
   a. Yourself
   b. Your friend
   c. Your child
   d. Your parent
   e. Your sibling
   f. A member of your extended family
   g. Your coworker
   h. Your peer/classmate
   i. Your student
   j. Your spouse (I suggest placing this earlier)
   k. Your acquaintance
   l. None
   m. Other:

2. How have you gotten most of your information about autism? Please rank the following sources with **1** indicating the source you have gotten most of your information from:
   a. Family
   b. Friend/neighbor/acquaintance
   c. Doctor or Specialist
   d. School
   e. Your job
   f. Internet
   g. Magazines/brochures/books/ newspaper
   h. Radio
   i. TV
   j. Other:
   k. You have received no information about autism

3. Specify the town, city, and country in which you live. .

4. What is your age in years? (Please provide a numerical answer)

5. What is your gender?
   a. Female
   b. Male
   c. Other (Please Specify): _____

6. What is the highest degree you have obtained in school?
   a. High school graduate
   b. Some college credit, no degree
   c. Bachelor's degree
   d. Master's degree
   e. Doctorate/MD/JD
   f. Other (Please specify)
7. Are you currently a student (Yes/No)?
8. What is or was your major?
9. If you are affiliated with a college, which one is it (provide full name)?

10. What language(s) do you speak?

11. At what age were you first exposed to English?

12. What is your current job or occupation? (you can pick more than one)

a. University student
b. Shadow teacher
c. General educator
d. Special educator
e. Other:

13. What types of autism services are available where you live? If you don't know, please say so.

14. How long have you been working with students with ASD?

a. 1-6 months
b. 6-12months
c. 1-2 years
d. 3 years and above

Appendix B

Pre-test and post-test survey questions

1. What is autism in your own words?
2. What are effective ways for teachers to support their students with autism?
3. What are effective ways for students to support their peers with autism?

4. What causes autism? (Select as many choices as needed)
   a) Genes passed down from parents to children
   b) New changes (mutations) in the genes of affected children
   c) Environmental factors
   d) Vaccines
   e) Negative parenting
   f) Other (please write in your answer)

Instructions: We are interested in how you think about the following statements. Read each statement carefully. Indicate how you think about each statement by circling the respective number.

		Not important at all	Somewhat unimportant	I have no opinion on this issue	Somewhat important	Very important
5.	How important do you think it is to find a cure for autism?	1	2	3	4	5
6.	How important do you think it is to find the cause of autism?	1	2	3	4	5
7.	How important do you think it is to help people with autism appear more normal?	1	2	3	4	5

Knowledge Scale

Choose the degree to which you agree or disagree with the following statements

		Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
8	Autism is more frequently diagnosed in males than in females.	1	2	3	4	5
9	Children with autism do not show attachments, even to parents/caregivers.	1	2	3	4	5
10	People with autism are deliberately uncooperative.	1	2	3	4	5
11	Children with autism can grow up to go to college and marry.	1	2	3	4	5
12	There is one intervention that works for all people with autism.	1	2	3	4	5
13	Autism can be diagnosed as early as 15 months of age.	1	2	3	4	5
14	With the proper treatment, most children diagnosed with autism eventually outgrow the disorder.	1	2	3	4	5
15	People with autism show affection.	1	2	3	4	5
16	Most people with autism have low intelligence.	1	2	3	4	5
17	People with autism tend to be violent.	1	2	3	4	5
18	People with autism are generally disinterested in making friends.	1	2	3	4	5
19	People with autism care about and feel the pain of those who are suffering.	1	2	3	4	5
20	Autism is a lifelong disability.	1	2	3	4	5
21	There is one autism spectrum disorder in the DSM-5.	1	2	3	4	5
22	Between 1 in 38 and 1 in 110 people have autism.	1	2	3	4	5

		Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
23	Autism is diagnosed using blood tests and/or brain scans.	1	2	3	4	5
24	Married couples are more likely to divorce after having a child with autism.	1	2	3	4	5
25	Vaccines cause autism	1	2	3	4	5
26	Autism is only diagnosed more often among wealthier families in countries where richer people have better access to healthcare	1	2	3	4	5
27	Unusual sensory experiences are part of the diagnostic criteria for autism	1	2	3	4	5
28	We all have some autistic traits	1	2	3	4	5
29	Cold parenting causes autism	1	2	3	4	5

Appendix C

Social Distance Scale

Choose the degree to which you agree or disagree with the following statements

		Definitely willing	Somewhat willing	Somewhat unwilling	Definitely unwilling
1	How willing would you be to move next door to someone with autism?	1	2	3	4
2	How willing would you be to spend an evening socializing with someone with autism?	1	2	3	4
3	How willing would you be to start a collaborative project with someone with autism?	1	2	3	4
4	How willing would you be to make friends with a person with autism?	1	2	3	4
5	How willing would you be to have a person with autism marry into the family?	1	2	3	4
6	How willing would you be to marry or date a person with autism?	1	2	3	4

Appendix D

Attitudes Toward Inclusion Scale

		Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
1	All students with autism should be educated in regular classrooms with non-handicapped peers to the fullest extent possible.	1	2	3	4	5
2	It is seldom necessary to remove students with autism from regular classrooms in order to meet their educational needs.	1	2	3	4	5
3	Most or all separate classrooms that exclusively serve students with autism should be eliminated.	1	2	3	4	5
4	Most or all regular classrooms can be modified to meet the needs of students with autism.	1	2	3	4	5
5	Students with autism can be more effectively educated in regular classrooms as opposed to special education classrooms.	1	2	3	4	5
6	Inclusion is a more efficient model for educating students with autism because it reduces transition time (i.e. the time required to move from one setting to another).	1	2	3	4	5
7	Students with autism should not be taught in regular classes with non-disabled students because they will require too much of the teacher's time.	1	2	3	4	5
8	I have doubts about the effectiveness of including students with autism in regular classrooms because they often lack the academic skills necessary for success.	1	2	3	4	5
9	I have doubts about the effectiveness of including students with autism in regular classrooms because they often lack the social skills necessary for success.	1	2	3	4	5
10	I find that general education teachers often do not succeed with students with autism, even when they try their best.	1	2	3	4	5
11	I would welcome the opportunity to team-teach as a model for meeting the needs of students with autism in regular classrooms.	1	2	3	4	5
12	All students benefit from team teaching; that is, the pairing of a general and a special education teacher in the same classroom.	1	2	3	4	5
13	The responsibility for educating students with autism in regular classrooms should be shared between general and special education teachers.	1	2	3	4	5
14	I would welcome the opportunity to participate in a consultant teacher model (i.e. regular collaborative meetings between special and general education teachers to share ideas, methods and materials) as a means of addressing the needs of students with autism in regular classrooms.	1	2	3	4	5

Appendix E

Self-efficacy of Teachers

		Nothing	Very little	Some influence	Quite a bit	A great deal
1	To what extent can you use a variety of assessment strategies in your reading and writing lessons?	1	2	3	4	5
2	To what extent can you provide an alternative explanation or example when students are confused about your reading and writing lessons?	1	2	3	4	5
3	To what extent can you craft good questions about teaching reading and writing for your students?	1	2	3	4	5
4	How well can you implement alternative strategies for your reading and writing lessons?	1	2	3	4	5
5	How well can you respond to difficult questions about your reading and writing lessons from your students?	1	2	3	4	5
6	How much can you do to adjust your reading and writing lessons to the proper level for individual students?	1	2	3	4	5
7	To what extent can you gauge student comprehension of what you have taught about reading and writing?	1	2	3	4	5
8	How well can you provide appropriate challenges for very capable students in reading and writing lessons?	1	2	3	4	5
9	How much can you do to control disruptive behavior in the classroom during your reading and writing lessons?	1	2	3	4	5
10	How much can you do to get children to follow classroom rules during your reading and writing lessons?	1	2	3	4	5
11	How much can you do to calm a student who is disruptive or noisy during your reading and writing lessons?	1	2	3	4	5
12	How well can you establish a classroom management system with each group of students for your reading and writing lessons?	1	2	3	4	5
13	How well can you keep a few problem students from ruining an entire reading and writing lesson?	1	2	3	4	5
14	How well can you respond to defiant students in reading and writing lessons?	1	2	3	4	5
15	To what extent can you make your expectation clear about student behavior during your reading and writing lessons?	1	2	3	4	5
16	How well can you establish routines to keep activities running smoothly in your reading and writing lessons?	1	2	3	4	5
17	How much can you do to get students to believe they can do well in their reading and writing schoolwork?	1	2	3	4	5
18	How much can you do to help your students value learning about reading and writing?	1	2	3	4	5
19	How much can you do to motivate students who show low interest in their reading and writing schoolwork?	1	2	3	4	5
20	How much can you assist families in helping their children do well in reading and writing?	1	2	3	4	5
21	How much can you do to improve the understanding of reading and writing of a student who is failing?	1	2	3	4	5
22	How much can you do to help your students think critically about reading and writing?	1	2	3	4	5
23	How much can you do to foster student creativity in reading and writing?	1	2	3	4	5
24	How much can you do to get through to the most difficult students in your reading and writing lessons?	1	2	3	4	5

Appendix F

Are you a TEACHER of a child with AUTISM?

INTERESTED IN BEING PART OF A RESEARCH PROJECT?

You are invited to participate in a research study which will examine the efficacy of a training about autism spectrum disorders. The results of this study may help in the development of effective trainings for teachers of children with autism spectrum disorders.

You will be asked to participate in a pre-test, a training about autism spectrum disorders and a follow-up session 2-4 weeks later. The first session is expected to last 120 minutes, the second session is expected to last 30-45 minutes.

Risks: There are no foreseeable physical or psychological risks involved with participating in this study that exceed minimal risks ordinarily encountered in daily life or during performance of routine physical or psychological evaluation, although the possibility of some unforeseeable risks exists.

Benefits: By taking part in this study you may develop a new understanding about autism spectrum disorders. By participating in this study, you may feel more competent in working with children with ASD. You will also receive a certificate of attendance for attending the training lecture and follow-up refresher.

Alternatives: Your participation in this study is **voluntary**, and you may decide not to participate without prejudice, penalty, or loss of benefits to which you are otherwise entitled.

If you have any questions about participation, please contact:

Primary Contact Persons:
Jennifer Chebli
Graduate Student
American University of Beirut (AUB)
Email: jnc02@mail.aub.edu or
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American University of Beirut
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Appendix G

American University of Beirut
Department of Psychology

CONSENT TO PARTICPATE IN A RESEARCH PROJECT

Project Title: Community Conceptions of Autism Spectrum Disorders

Principal Investigator:
Nidal Daou, Ph.D.
Assistant Professor of Psychology
American University of Beirut
Email: nn07@aub.edu.lb
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Co-Investigators:
Jennifer Chebli
Graduate Student
American University of Beirut (AUB)
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Site where study is to be conducted: Online, at AUB and at schools.

School principals will not be present in order not to cause any undue influence, they will inform their teachers of the training, and teachers are free to attend.

Teachers will be given the training at their schools during the in-service month of September. As for the teachers recruited through snowballing methods from different schools, they will come to AUB at their own cost.

The same training will be given to all teachers, and fidelity measures will be filled out by research assistants to make sure that the trainer provided the same training to all participants in all settings.

Introduction/Purpose: You are invited to participate in a research study. The study is conducted under the direction of Nidal Daou, PhD, Assistant Professor, American University of Beirut (AUB). The co-Investigator taking part in this study is a graduate student from AUB. The purpose of this research study is to examine the efficacy of a training about autism spectrum disorders. The results of this study may help in the development of effective teacher trainings about autism spectrum disorders and increase autism awareness. This training has been previously used at AUB and at the City University of New York.

Recruitment and Procedures: This study is being advertised on the Facebook pages of autism institutes in Lebanon and related fields (e.g., Facebook page of the AUB Psychology Student Society). It will also be advertised through flyers distributed to different schools, clinics, and hospitals across the greater Beirut region.

Approximately 150 teachers are expected to take part in this training. Each participant will take part in a pre-test, a training about autism spectrum disorders, and a questionnaire battery inquiring about your perceptions about and experience in teaching a child with autism, a post-test and a follow-up session 2-4 weeks later. The time commitment of each participant is expected to last 60-90 minutes during the first session, and 30-45 minutes during the second session.

Possible Discomforts and Risks: There are no foreseeable physical or psychological risks involved with participating in this study that exceed minimal risks ordinarily encountered in daily life or during performance of routine physical or psychological evaluation, although the possibility of some unforeseeable risks exists. To minimize the risk of breach of anonymity we will not ask you to provide your name or birth date. To minimize the risk that the training material will be upsetting, the training was prepared by an autism specialist, Dr. Gillespie-Lynch, who has been studying autism for nearly 10 years. Research citations supporting the evidence put forth in the training are available on the CSI-ASD website: http://www.autism-collegeeducation.com/

Potential Benefits: A potential benefit of participating in this study is that you may develop a new understanding about autism spectrum disorders. You will also receive a certificate of attendance in exchange for attending the training and follow-up refresher. By participating in this study, you may help in the development of new trainings to help teachers understand autism spectrum disorders better that can be used in schools. Another potential benefit is that you will be provided with the opportunity to address certain concerns that are troubling you, related to teaching children with autism.

Alternatives:

Participation in this study is completely voluntary and there are no alternatives to participation.

Voluntary Participation and Withdrawal from the Project: Your participation in this study is voluntary, and you may decide not to participate without prejudice, penalty, or loss of benefits to which you are otherwise entitled. In addition, you may withdraw your consent to participate in this research at any point without any explanation and without any penalty. You are also free to stop answering this survey at any point in time without any explanation,

Financial Considerations: Participation in this study will involve no cost to the participant.

Confidentiality: The data obtained from you will be collected through a password-protected account online or through hard copies accessible only to the principal investigator and collaborators. The researchers will protect your anonymity by not collecting personally identifying information, such as your name, ID number (e.g., university or national identity card number), or date of birth. Instead, your responses will be stored with a special ID number assigned when you begin the survey. The data will be stored in an anonymous form on a computer server. Hard copies will be stored in a cabinet in the office of the investigator for a period of seven years following the

termination and/or publication of the study. Information not associated with the personal information will be presented by the investigator or used in reports and published manuscripts.

Records might be monitored or audited by the AUB IRB, or another legal body, without violating your privacy as your data will never be associated with your personal identifying information.

Contact Questions/Persons: This project has been reviewed and approved by the AUB IRB Office for the Protection of Human Participants in Research and Research Related Activities.

If you have any questions about your rights as a research participant, or to report a research-related concern/problem, you may call the IRB at: 01-350000 Ext. 5444/5.

You may also contact the investigators: Jennifer Chebli, jnc02@mail.aub.edu or Nidal Daou, nn07@aub.edu.lb, 01-350000 Ext. 4376/4360.

Debriefing: If you are interested in learning about the outcome of the study, you may contact Jennifer Chebli or Nidal Daou (contact information above), who, upon request, could email/explain to you a summary of the results after data analysis would have concluded.

Statement of Consent:

"I am 18 years of age or older. I have read the above description of this research and I understand it. I have been informed of the risks and benefits involved, and all my questions have been answered to my satisfaction. Furthermore, I have been assured that any future questions that I may have will also be answered by the principal investigator of the research study."

☐ By checking this box I indicate that I voluntarily agree to participate in this study. I have not waived any of my legal rights to which I would otherwise be entitled.
☐ By checking this box, I indicate that I am not interested in participating in this study.