

**Nur-Sultan Mainstream School Teachers' Knowledge of and Attitudes towards
ADHD**

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Dear Aizhan Akatayeva

This letter now confirms that your research project entitled: School teachers' knowledge and attitudes toward ADHD in Northern Kazakhstan has been approved by the Graduate School of Education Ethics Committee of Nazarbayev University.

You may proceed with contacting your preferred research site and commencing your participant recruitment strategy.

Yours sincerely

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NUR-SULTAN MAINSTREAM SCHOOL TEACHERS' KNOWLEDGE AND ATTITUDES TOWARDS ADHD

Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders among school-aged children, with a prevalence of about 5%. ADHD-related behaviour is mostly observed in a school setting as children spend most of their time at school. Therefore, teachers' role is significant as they are the first to recognize the characteristics of children with ADHD and refer them for assessment. Moreover, their attitude and support are important in leading to successful student outcomes. Teachers' limited or lack of knowledge of ADHD can result in unfavorable attitudes towards students with ADHD, which can lead to negative academic and non-academic consequences for such students. This study aimed to explore mainstream school teachers' knowledge of and attitudes towards students with ADHD, and identified teacher-related background factors that affect their knowledge and attitudes. The data was collected through an online survey using ADHD-specific knowledge and attitudes of teachers (ASKAT), which consists of two scales: Scale for ADHD-specific knowledge (SASK) and Scale of ADHD-specific attitudes (SASA). Overall, 167 teachers from ten schools in Nur-Sultan participated in this study. The study findings revealed that teachers' knowledge about ADHD was low and that they held slightly negative attitudes towards ADHD. Moreover, it was found that additional training on ADHD and experience with students with ADHD did significantly predict the level of knowledge about ADHD, whilst the level of knowledge about ADHD, additional training on ADHD, and age were significant predictors of teachers' attitudes towards ADHD. It is also important to note that the results of the current study indicated a positive correlation between teachers' knowledge of and attitudes towards ADHD. Although teachers' disposition towards

ADHD was negative, they expressed more favorable attitudes in relation to the desire for more training on ADHD. These results suggest the need for in-service training and professional development regarding ADHD for Kazakhstani mainstream school teachers. In addition to this, it was suggested to conduct more research on ADHD in Kazakhstan to understand better to what extent teachers of different regions of Kazakhstan know about ADHD and how they perceive children with ADHD.

Keywords: ADHD, attitude, mainstream schools.

**НҰР-СҰЛТАН ҚАЛАСЫ ЖАЛПЫ БІЛІМ БЕРЕТІН МЕКТЕП
МҰҒАЛІМДЕРІНІҢ ГЗЖБ ТУРАЛЫ БІЛІМІ МЕН КӨЗҚАРАСЫ**

Аңдатпа

Гипербелсенділік және зейін жетіспеушілігінің белгісі (ГЗЖБ) мектеп жасындағы балалар арасында жүйке жүйесінің дамуының ең көп таралған бұзылыстарының бірі болып табылады, оның таралуы шамамен 5% құрайды. ГЗЖБ-мен байланысты мінез-құлық көбінесе мектеп ортасында байқалады, өйткені балалар уақытының көп бөлігін мектепте өткізеді. Осылайша, мұғалімдердің рөлі өте маңызды, өйткені олар ГЗЖБ бар балалардың ерекшеліктерін бірінші болып таниды және оларды бағалауға бағыттайды. Сонымен қатар, олардың көзқарасы мен қолдауы оқушылардың табысты нәтижелері үшін өте маңызды. Мұғалімдердің ГЗЖБ туралы білімінің шектеулі болуы немесе болмауы ГЗЖБ бар оқушылар үшін жағымсыз академиялық және академиялық емес салдармен ұласатын оларға деген жағымсыз көзқарасқа әкелуі мүмкін. Бұл зерттеу жалпы білім беретін мектеп мұғалімдерінің ГЗЖБ туралы білімі мен көзқарасын зерттеуге, сонымен қатар олардың білімі мен көзқарасына әсер ететін мұғалімдермен байланысты фондық факторларды анықтауға бағытталған. Деректер екі шкаладан тұратын, яғни ГЗЖБ туралы білім шкаласы (SASK) және ГЗЖБ-ға байланысты көзқарас шкаласы (SASA), ГЗЖБ туралы білім мен көзқарас шкаласын (ASKAT) қолдана отырып, онлайн-сауалнама арқылы жиналды. Зерттеуге Нұр-сұлтан қаласының он мектебінен барлығы 167 мұғалім қатысты. Зерттеу нәтижелері мұғалімдердің ГЗЖБ туралы білімі төмен екенін және олардың ГЗЖБ-ға теріс көзқараста екендігін көрсетті. Сонымен қатар, ГЗЖБ бойынша қосымша дайындық және ГЗЖБ бар оқушылармен жұмыс тәжірибесі ГЗЖБ туралы білім деңгейін айтарлықтай болжайтыны анықталды, ал ГЗЖБ туралы білім деңгейі, ГЗЖБ бойынша қосымша дайындық және

жас мұғалімдердің ГЗЖБ-ға көзқарасының маңызды болжамдары болды. Сонымен қатар, ағымдағы зерттеу нәтижелері мұғалімдердің ГЗЖБ туралы білімі мен көзқарасы арасындағы оң байланысты көрсетті. Мұғалімдердің ГЗЖБ-ға деген көзқарасы теріс болғанымен, олар ГЗЖБ бойынша көбірек кәсіби дамуды қалайтындарын білдірді. Бұл нәтижелер қазақстандық жалпы білім беретін мектеп мұғалімдері үшін ГЗЖБ бойынша біліктілікті арттыру және кәсіби даму қажеттілігін көрсетеді. Бұған қоса, Қазақстанның әртүрлі аймақтарындағы мұғалімдердің ГЗЖБ туралы қаншалықты білетінін және ГЗЖБ бар балаларды қалай қабылдайтынын жақсырақ түсіну үшін Қазақстанда осы тақырып бойынша көбірек зерттеулер жүргізу ұсынылды.

Түйінді сөздер: ГЗЖБ, көзқарас, жалпы білім беретін мектеп.

ЗНАНИЯ И ОТНОШЕНИЕ УЧИТЕЛЕЙ ОБЩЕОБРАЗОВАТЕЛЬНЫХ ШКОЛ ГОРОДА НУР-СУЛТАН К СДВГ

Абстракт

Синдром дефицита внимания и гиперактивности (СДВГ) является одним из наиболее распространенных нарушений развития нервной системы среди детей школьного возраста с распространенностью около 5%. Поведение, связанное с СДВГ, в основном наблюдается в школьной среде, поскольку дети проводят большую часть своего времени в школе. Таким образом, роль учителей важна, поскольку они первыми распознают особенности детей с СДВГ и направляют их для оценки. Более того, их отношение и поддержка важны для достижения успешных результатов учащихся. Ограниченность или отсутствие знаний учителей о СДВГ может привести к неблагоприятному отношению к учащимся с СДВГ, что может привести к негативным академическим и неакадемическим последствиям для таких учащихся. Это исследование было направлено на изучение знаний и отношения учителей общеобразовательных школ к учащимся с СДВГ, а также на выявление фоновых факторов, связанных с учителями, которые влияют на их знания и отношение. Данные были собраны с помощью онлайн-опроса с использованием шкалы знаний и отношения учителей к СДВГ (ASKAT), который состоит из двух шкал: шкала знаний о СДВГ (SASK) и шкала отношений к СДВГ (SASA). Всего в исследовании приняли участие 167 учителей из десяти школ города Нур-Султан. Результаты исследования показали, что знания учителей о СДВГ были низкими и что они немного негативно относились к СДВГ. Более того, было обнаружено, что дополнительная подготовка по СДВГ и опыт работы с учащимися с СДВГ значительно предсказывали уровень знаний о СДВГ, в то время как уровень знаний о СДВГ, дополнительная подготовка по СДВГ и возраст были значимыми

предикторами отношения учителей к СДВГ. Также важно отметить, что результаты текущего исследования показали положительную корреляцию между знаниями учителей и отношением к СДВГ. Хотя отношение учителей к СДВГ было негативным, они выражали более благоприятное отношение к желанию больше обучаться по СДВГ. Эти результаты свидетельствуют о необходимости обучения без отрыва от работы и повышения квалификации по вопросам СДВГ для казахстанских учителей общеобразовательных школ. В дополнение к этому было предложено провести больше исследований по СДВГ в Казахстане, чтобы лучше понять, насколько учителя разных регионов Казахстана знают о СДВГ и как они воспринимают детей с СДВГ.

Ключевые слова: СДВГ, отношение, общеобразовательная школа.

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Chapter 1: Introduction

1.1 Background of the Study

Nowadays, the system of inclusive education has been systematically improving worldwide, including in countries such as Kazakhstan. Inclusive education as a concept intends to provide an equitable education for all. According to UNESCO, inclusive education carries the idea that all children have equal learning opportunities despite their learning, social and cultural diversities (2009). As a process, it aimed at strengthening the capacity of the education system to meet the needs of learners with diverse needs.

Although the term inclusion has different interpretations, mostly it is about the inclusion of students with disabilities or special educational needs (SEN) in mainstream schools (UNESCO, 2009). Regarding Kazakhstan, the State Program of Education Development of the Republic of Kazakhstan for 2011 – 2020 has significantly contributed to the improvement of the inclusive education system in schools. As a result of this program, 70% of Kazakhstani schools have created favorable conditions for inclusive education (Shayakhmetova, 2021). Moreover, according to the State Program of Education Development of the Republic of Kazakhstan for 2020-2025, by 2025, the educational support services for children with disabilities are expected to be fully implemented in all Kazakhstani schools.

In recent years, particular attention has been given to teaching children with Attention Deficit Hyperactivity Disorder (ADHD). The main reason for this is that ADHD is one of the most common neurodevelopmental disorders in children, affecting almost 5% of school-aged children (APA, 2013). APA (2013) defines ADHD as “a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development” (p.61). Most of the children with ADHD have at least one disorder among learning disabilities, conduct disorder, mood disorder, anxiety, depression or poor relations

which may further impact their academic performance negatively (Rief, 2016).

Since the symptoms of ADHD are present in two or more settings (APA, 2013), ADHD-related behaviour is mostly observed in a school setting as children spend most of their time at schools (Greenway & Edwards, 2020). This means that the role of teachers who monitor children's behaviour and work closely with them on a daily basis is essential to recognize, refer to, support, and manage children with ADHD. Numerous international research indicates that teachers who have accurate knowledge of ADHD and favorable attitudes towards ADHD are more likely to support children with ADHD to achieve personal development and academic success (Anderson et al., 2012; Liang & Gao, 2016;).

Over the last decade, more attention has been given to ADHD in Kazakhstan. This is evidenced by the growing number of publications on this topic but their focus is mainly on the clinical features of ADHD and treatment for this disorder. However, these works are insufficient, firstly, to evaluate the prevalence of ADHD in Kazakhstan, secondly, to understand what Kazakhstani teachers know about ADHD, and thirdly, to identify how general education teachers perceive children with ADHD. Therefore, there is a need to explore teachers' knowledge of and attitudes towards ADHD in Kazakhstani schools and to determine teacher-related factors that influence their knowledge of and attitudes towards ADHD.

1.2 Statement of the Problem

The main element in the process of diagnosing and managing students with ADHD in schools is teachers. By closely interacting with their students daily, teachers are more likely to provide important information about the background and symptoms of their students with ADHD and contribute to meet their needs in a classroom (Al-Omari et al., 2015). Moldavsky et al. (2013) agreed with the idea that teachers have a key role in the recognition and referral of children who have ADHD. This is because they have more

opportunities to observe the child's behaviours by comparing with their peers who do not have this disorder, as the observation of the child in a medical setting may not show obvious symptoms of the disorder.

Sax and Kautz (2003) highlighted that teachers were usually the first to notice the symptoms and raise concerns about the child. Moreover, the teacher is frequently the first person with whom parents could consult when they notice some challenges with their child (Sayal et al., 2006). Topkin and Roman (2015) found that although the teacher and parent reports are important in the diagnosis process, mostly teachers become more responsible for evaluating children with ADHD as students with ADHD demonstrate behaviours in which the other children without this disorder and their teachers cannot cope. This idea was confirmed by Anderson et al. (2012). They highlighted that teachers are the main figures who report the symptoms, recommend parents seeking evaluation, and help students with ADHD to be socially and academically achieved in the school.

Recently, the number of children worldwide with ADHD has been reportedly increasing. ADHD is a very common disorder among school-aged children with the prevalence rate of about 5% (APA, 2013). According to the Centers for Disease Control (2010, as cited in Liang & Gao, 2016), nearly 3% to 10% of school-aged children internationally have been diagnosed with ADHD. In Kazakhstan, the prevalence of ADHD has not been extensively researched because of the lack of specific diagnostic methods and criteria (Alipbayeva & Bekbolatova, 2013). Nevertheless, Kazbekova (2010) found that 4% to 9.5% of children in Kazakhstan have been identified with this disorder (as cited in Shaimardanova & Pak, 2020). In addition to this, Evstifeeva (2009) reported that there are up to five or more children with ADHD-type behaviours in each classroom within secondary schools. Increasing number of learners with ADHD makes ADHD as one of the challenges for teachers in the teaching process.

Students' behaviours and problems with academic performance usually cause increased stress on educators and teachers as they feel unable to deal with these students and support them properly in the classroom. Teachers are an essential part of the process of developing academic performance and managing behaviours in the classroom for children with ADHD, their attitude and support are important in leading to successful student outcomes.

1.3 Purpose of the Study

The purpose of this research study was to explore general education teachers' knowledge of and attitudes towards ADHD in Nur-Sultan. Specifically, this study focused on three major aspects, which were used to understand teachers' knowledge of and attitudes towards ADHD. First, it aimed to investigate Kazakhstani secondary school teachers' knowledge of ADHD. Second, it determined their attitudes towards ADHD. Third, it identified the possible teacher-related background factors that could influence teachers' knowledge of and attitudes towards ADHD.

1.4 Research Questions

In order to determine teachers' knowledge of and attitudes towards ADHD and to identify how teacher-related factors influence their knowledge of and attitudes towards ADHD, this study addressed the following research questions:

1. To what extent are general education teachers knowledgeable about ADHD?
2. What are general education teachers' attitudes towards ADHD?
3. Do teachers' background factors affect their knowledge of and attitudes towards ADHD?

1.5 Significance of the Study

This study is relevant for university students, teachers, psychologists and scholars investigating the topics of teachers' knowledge of and attitudes towards ADHD. Moreover,

the knowledge gained from this study will be beneficial for researchers in education who are interested in contributing to promote inclusive education practices in Kazakhstani secondary schools.

1.6 Definition of Terms

The following definitions, which are drawn from the reviewed literature, are used throughout the thesis:

1. *Attention deficit hyperactivity disorder (ADHD)* is characterized by “a persistent pattern (at least 6 months) of inattention and/or hyperactivity-impulsivity, with onset during the developmental period, typically early to mid-childhood” (APA, 2013, p.59-60).
2. *Attitude* is a positive or a negative evaluation of ourselves or definite things such as ideas, people, or issues (Petty et al., 1997).
3. *Mainstream schools* are public schools for children aged 6-18 years free-of-charge (OECD, 2015).

1.7 Summary

This research is significant to reveal teachers' knowledge of and attitudes towards ADHD in Nur-Sultan, Kazakhstan. Teachers as an essential part of the teaching and learning process have a big role in supporting students diagnosed with ADHD because a limited or a lack of their knowledge of the features of ADHD could result in negative academic and non-academic consequences on such students. Moreover, this topic has not yet been broadly examined by the educational community in Kazakhstan as ADHD is not considered as a serious diagnosis in the Kazakhstani context (Firova, 2017). Identifying the symptoms and understanding the barriers that children diagnosed with ADHD face will contribute to the successful implementation of inclusive education in Kazakhstani secondary schools.

1.8 Outline of the Study

This study consists of six chapters. The introductory chapter states the research problem and identifies the purpose of the study with the research questions. The significance of the study and definitions of the central phenomena are also described. The next chapter of Literature review provides a critical review of literature and studies connected to the research problem. Methodology chapter presents the research design of the study, sampling and data collection procedures, and data analysis methods. The findings chapter presents the results of the online survey employed by teacher-participants. The fifth chapter is Discussions, which discusses the results of gathered data with relation to Literature review, and it is followed by the Conclusion, which summarizes the findings of the research and presents limitations of the research and recommendations for further research in this area.

Chapter 2: Literature Review

2.1 Introduction

This literature review overviews the relevant literature on a range of topics relating to ADHD. Some of the topics are connected to the concept of ADHD and issues around it, and others are related to teachers' knowledge of and attitudes towards ADHD. As there is a lack of relevant studies concerning teachers' knowledge of and attitudes towards ADHD within the Kazakhstani context, the overview focuses on western and some Asian countries which have conducted significant work in the field.

This chapter is organized into 8 sections: the first section describes the theoretical framework that guided the research process. The second section presents the definition and identification of ADHD. Challenges faced by students diagnosed with ADHD are discussed in the fourth section. The fifth and sixth sections discuss the literature on teachers' knowledge of and attitudes towards ADHD respectively as well as the factors affecting them. The seventh section examines Kazakhstani studies on the topic. The last sections summarize the chapter.

2.2 Theoretical Framework

The concept of "attitude" has been defined in different ways, but the main definition is related to the idea of assessment of specific objects such as a person, a thing or an idea (Petty et al., 1997). An attitude is a positive or a negative evaluation of ourselves or things such as ideas, people, or issues (Petty et al., 1997). Attitudes tend to be stable, and they are highly influenced by context (van Aalderen-Smeets et al., 2012). Moreover, attitude is a multidimensional concept with numerous subcomponents; and measuring the subcomponents of attitude toward a specific object leads to measuring individuals' overall attitude (van Aalderen-Smeets et al., 2012).

2.2.1 The Tripartite Model and Theory of Planned Behaviour

Attitudes are commonly examined through the “tripartite” model and are considered to have three bases which are affect, behaviour, and cognition (the ABCs of attitudes) (De Boer et al., 2011; Daffin & Lane, 2021). The latter cognitive component of attitudes consists of beliefs and thoughts that an individual has about the attitude object (Anderson et al., 2012; van Aalderen-Smeets et al., 2012). For example, teachers' knowledge and beliefs about teaching children with ADHD in an inclusive setting can be referred to as this component. An affective component refers to emotions that a person has in relation to the attitude object while a behavioral component includes actions of a person when faced with the attitude object (Anderson et al., 2012; van Aalderen-Smeets et al., 2012). For example, affect can include teachers' feelings about teaching students with ADHD, while behaviour may consist of teachers' views on how to behave with a student with ADHD in the classroom.

However, the theory of planned behaviour, one of the significant theories on the relationship between attitude and human behaviour, shows that behaviour which is the third construct of attitudes should be seen as the result of attitudes instead of being part of the construct of attitude (Ajzen & Fishbein, 1980, as cited in van Aalderen-Smeets et al., 2012). According to this theory, a person's behaviour is influenced by behavioral beliefs (beliefs about the consequences of the behaviour), control beliefs (beliefs about factors that may impact the behaviour) and normative beliefs (beliefs about the expectations of other people) (Ajzen, 2002). Consequently, these three components determine people's behavioral intentions about their control and willingness to perform the specific behaviour (van Aalderen-Smeets et al., 2012). On the basis of these two theories of attitude, van Aalderen-Smeets et al. (2012) developed a new theory by including perceived control rather than behaviour as the third component of attitude and viewing behaviour and behavioral intentions as an outcome of attitude.

2.2.2 Modified Tripartite Model

The current study is guided by this new theoretical framework developed by van Aalderen-Smeets et al. (2012). They developed this framework to confirm that attitude and behaviour should be seen as different concepts. The theory retained the affective and cognitive affects, excluded the behavioral component of the tripartite model as part of the basic construct of attitude, and added a new component referred to as perceived control which consists of self-efficacy and beliefs about contextual factors. The authors believe that perceived control refers to an individual's internal and external feelings and beliefs of being in control. Self-efficacy is focused on people's internal beliefs and feelings to perform particular behaviours whilst people's perceptions of being in control based on external factors refer to perceived dependency. For example, teachers' beliefs that they can teach students with ADHD only if their school provides enough preparation time and the proper materials can be referred to as perceived dependency of control, while teachers' confidence in being able to teach students with ADHD can be referred to as self-efficacy.

Van Aalderen-Smeets et al. (2012) suggested three categories of reflecting increasing levels of confidence or sense of being in control: "teachers could theoretically be (a) low on self-efficacy and highly dependent on context factors, (b) high on self-efficacy, but still highly dependent on context factors, or (c) high on self-efficacy and not dependent on context factors" (p.177). This indicates that two subattributes of perceived control are interrelated, although they are focused on the different domains.

The modified tripartite model of attitude, which forms the theoretical framework for the present study, provides an opportunity for the researcher to find out the relations between teachers' perceived control and teachers' attitudes. Moreover, the current study employed the Scale for ADHD-specific attitudes (SASA) by Mulholland (2016), which was developed to prove the modified tripartite model of attitude.

2.3 Definition and Identification of ADHD

2.3.1 Definition of ADHD

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders in children. The concept of ADHD was first defined by George Still in 1901 (Still, 1902 as cited in Kos & Richdale, 2004). He characterized the condition as a problem of overactivity, inattention and deficits in 'volitional inhibition'. Currently, there are several definitions of ADHD provided by different resources. According to Henderson (2004), ADHD combines core symptoms such as inattention, hyperactivity, and impulsivity. Similarly, Daley and Birchwood (2010) define ADHD as a combination of the symptoms mentioned above, adding that it is a neurobiological and developmental condition. In addition to this, ADHD is recognized as "a neurobehavioral disorder characterized by differences in brain structure and function that affect behaviour, thoughts, and emotions" (CHADD, 2001 as cited in Rief, 2012, p.24).

Nevertheless, the fourth edition of the Diagnostic Statistical Manual of Mental Disorders (DSM-IV) of the American Psychiatric Association (APA) (1994) has provided the official criteria for diagnosing ADHD. According to the DSM-IV, ADHD has three subtypes which are predominantly inattentive, predominantly hyperactive-impulsive, and a combination of both (APA, 1994). Moreover, this official document lists nine specific symptoms under each type, and to be identified with ADHD a child needs to display at least six out of nine symptoms of one or more categories (APA, 1994). As time goes on, the symptoms of ADHD become more accurate in terms of diagnosis and identification of the disorder. The fifth edition of the Diagnostic Statistical Manual of Mental Disorders (DSM-V) of the American Psychiatric Association characterizes ADHD as "a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by nine symptoms from either (or both) the inattention

group of criteria and the hyperactivity and impulsivity criteria. Six (or more) of the following symptoms have persisted for at least six months to the degree that is inconsistent with developmental level, and that negatively impacts directly on social and academic/occupational activities” (APA, 2013, p.59).

2.3.2 Identification of ADHD

Today, in many countries, most children who may have ADHD are undiagnosed or sometimes misdiagnosed (Sayal et al., 2006) because it is not enough to have the symptoms that indicate ADHD. In some cases, children may demonstrate some characteristics of ADHD, but some of these behaviours and signs may be normal for their age and stage of development (Henderson, 2003). However, the existence of symptoms is not the main criterion to indicate ADHD. It should be proven that six (or more) inattentive or hyperactive-impulsive symptoms have been evident before the age of 12 and have lasted for at least the last six months (APA, 2013). Moreover, it was indicated that the symptoms of ADHD (a) have a persistent pattern that obstructs a child's development and functioning; (b) are evident in two or more settings (for instance, at school, home or work; with relatives or friends; in other places); (c) negatively influence the quality of academic, social, or professional functioning (APA, 2013).

The DSM-V characterized a person with ADHD as having at least six symptoms representing either (or both) the characteristics of inattention group and/or the hyperactivity and impulsivity group:

“1. Inattention:

- a. Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).
- b. Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).
- c. Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).

- d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
 - e. Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).
 - f. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).
 - g. Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
 - h. Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).
 - i. Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).
2. Hyperactivity and impulsivity:
- a. Often fidgets with or taps hands or feet or squirms in seat.
 - b. Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).
 - c. Often runs about or climbs in situations where it is inappropriate. (*Note:* In adolescents or adults, may be limited to feeling restless.)
 - d. Often unable to play or engage in leisure activities quietly.
 - e. Is often "on the go," acting as if "driven by a motor" (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).
 - f. Often talks excessively.
 - g. Often blurts out an answer before a question has been completed (e.g., completes people's sentences; cannot wait for turn in conversation).
 - h. Often has difficulty waiting his or her turn (e.g., while waiting in line).
 - i. Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people's things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing)." (APA, 2013, p.59-60).

Several researchers have proven that a child with ADHD may have other co-

existing disorders or conditions. Therefore, it is important to know that there is a

"comorbidity" with ADHD, which means at least two associated conditions are present

within a person (Rief, 2012). According to the American Academy of Pediatrics, more

than 50% of children with ADHD experience sleep problems and show secondary

behavioral complications such as argumentativeness, lying, noncompliance, temper

outbursts, being easily angered, and blaming others (2000, as cited in Rief, 2012). There is

a high rate of having coexisting psychiatric disorders among children with ADHD, such as

oppositional defiant disorder (ODD), anxiety disorder, and conduct disorder (CD) (Rief, 2012).

Taking all the above mentioned into consideration, making a complete and accurate diagnosis of ADHD is vital when signs of any behavioral and/or learning problems are observed in the individual. This kind of process must be conducted by knowledgeable and skilled professionals who understand the characteristics and symptoms of ADHD and who can identify as well as deal with other disorders and conditions that may co-exist (Rief, 2012).

2.4 Challenges faced by Students with ADHD

Liviatan (2015) found three typical correlations of ADHD, which are underachievement, high rates of aggression and disobedience, and difficulties building relationships with peers. It was indicated that academic and social difficulties experienced by children with ADHD are not limited to the childhood period and might also have an effect on their social well-being and mental health condition in adulthood (Dessie et al., 2021).

The school experience can be challenging for students with ADHD. According to Liviatan (2015), there are several important factors that predict students' academic success. They include sitting in a place, listening, following the instructions, being organized, staying focused, cooperating, sharing, and forming relationships with peers. These abilities may contradict the characteristics of children with ADHD and make them academic underachievers. In this sense, Bekle (2004) highlighted that 95% of children with ADHD experience academic underachievement. He emphasized that students with ADHD experience difficulties in sustaining attention and regular work effort for long periods of time, including completing tasks and work, staying concentrated in the classroom, following instructions, or staying in their seats.

Moreover, studies show that students with ADHD, compared to typically developing students, often experience persistent academic difficulties that lead to poor academic performance, more failed grades, more expulsions from school, grade retention, and a lower rate of college undergraduate completion (Johnston, 2002; Ingersoll, 1988, as cited in Henderson, 2003). The study conducted by Barry et al. (2002) indicated that children with ADHD aged 8-14 years old performed significantly lower in reading, writing, and mathematics skills than typically developing children.

Many students with ADHD have serious problems related to antisocial and disruptive behaviours, such as easily losing emotional control, being vindictive, arguing, and showing defiance (Taylor & Larson, 1998 as cited in Bekle, 2004). Furthermore, it was reported that some cases such as fighting, lying, stealing and destruction of property happened with students diagnosed with ADHD (Bekle, 2004).

Children with ADHD may also face difficulties in having pleasant relations with their peers and maintaining eye contact (Lawrence et al., 2017). Selikowitz (2004) found that children with ADHD may have social challenges because of the characteristics of their condition such as impulsivity, low self-esteem, and hyperactivity. Moreover, “many children with ADHD have a limitation in the way in which their brain can understand and respond to social conventions, which is called “social cognition deficit” (Selikowitz, 2004, p.75).

2.5 Teachers' Knowledge of ADHD

In recent years, numerous research studies have been conducted on ADHD. These studies are mostly focused on evaluating teachers' awareness of ADHD and their attitudes towards it, as well as on exploring factors that might influence their knowledge and perceptions of ADHD. The results of previous research related to ADHD indicated that teachers' knowledge of ADHD was uneven across studies, and it may depend on the

context. For example, numerous studies that explored teachers' awareness of ADHD have found that teachers had significant knowledge of ADHD (<50-85% correct) (Cueli et al., 2020; Greenway & Edwards, 2020; Kos et al., 2004; Mulholland et al., 2015; Yarde-Leavett, 2018). It was found in the previous studies that the questions to which teachers responded most accurately were related to the symptoms or diagnosis of ADHD, with the least accurate answers related to aetiology (Greenway & Edwards, 2020; Mulholland et al., 2015; Yarde-Leavett, 2018).

Comparable results were presented by Cueli et al. (2020), who conducted a study with 587 Spanish participants (170 active teachers and 417 university students) to analyze teachers' knowledge of ADHD in four categories which are general information, aetiology or causes, symptoms, and treatment. The results indicated that the teachers had a moderate level of knowledge about ADHD having the highest scores related to treatment, followed by symptoms, general information and aetiology. The level of incorrect responses in relation to aetiology in both cases was higher than other knowledge dimensions. The authors pointed out that having the lowest score in this dimension might be because of teachers' mindsets and beliefs. Moreover, the research studies conducted by Greenway and Edwards (2020) and Mulholland et al. (2015) found that teachers also had difficulties in answering questions related to prevalence of ADHD. The authors of these studies highlighted that there is a high need for pre-service and in-service teacher training programmes to provide teachers with appropriate information about the extent and nature of ADHD.

However, some studies found that many teachers generally have poor knowledge about ADHD and feel unable or ill-equipped to deal with students with this disorder in the classroom (Al-Omari et al., 2015; Dessie et al., 2021; Guerra & Brown, 2012; Murtani et al., 2020). Teachers' low awareness points to teacher preparation programmes in higher

educational institutions as not preparing pre-service teachers with sufficient knowledge and skills to support students with different disorders, including ADHD. Even though teachers lack prior education about ADHD, they are often willing to receive additional professional development training on ADHD and preparation for working with children with additional needs (Al-Omari et al., 2015). Therefore, it is significant for the educational researchers to identify teacher-related factors that positively influence their knowledge of ADHD.

2.5.1 Predictors of Teacher Knowledge of ADHD

The previous literature has indicated that teachers' knowledge about ADHD varies across different factors. The level of teacher knowledge of ADHD is likely to increase with age and experience as a teacher. Teachers learn from their own and colleagues' practices. As a result, the practice teachers gain over the years may positively influence their knowledge about ADHD. For instance, Liviatan (2015) found that teachers with more years of teaching experience develop organized and rich knowledge based on previous experiences. According to the findings of the study, the positive correlation between the teachers' knowledge level of ADHD and their working years was found to be stronger than the one between the knowledge level and age of the respondents (Liviatan, 2015). However, no significant differences were found in the knowledge level of male and female teachers. Moreover, the study by Anderson et al. (2012) explored the differences in knowledge of and attitudes towards teaching children with ADHD across the years of teaching experience. The findings revealed that as teachers gain classroom experience through contact with students diagnosed with ADHD, they may increase their knowledge of ADHD and develop more favorable attitudes towards teaching children with ADHD.

The study by Guerra and Brown (2012), which measured the knowledge and perceptions of 107 teachers from three independent school districts in South Texas using

the Knowledge of Attention Deficit Disorders Scale (KADDS), revealed that teachers who have more than ten years of teaching experience and who have experience working with children with ADHD may have a higher level of knowledge of ADHD. Therefore, they scored significantly higher on the KADDS. In addition to the previous study in which they identified the level of Sri Lankan primary school teachers' knowledge about ADHD, Menikdiwela and Vojtova (2017) found that the teachers who had more than five years of experience working in a special class within a mainstream school could explain the core symptoms of ADHD and the nature of the disorder compared to other teachers who had not heard about this disorder.

However, not all studies have reported that teachers with more years of teaching experience are more knowledgeable about ADHD. The findings of the study conducted by Kos et al. (2004) indicated that more experienced teachers tended to consider themselves as having a better knowledge of ADHD compared to their less experienced colleagues. According to the authors, this perception was inaccurate, as teachers' teaching experience was not found to be positively correlated with their actual knowledge about ADHD. This idea was also supported by Shroff et al. (2017), who highlighted that younger teachers, as a result of changes in the curriculum on teacher education, may be more flexible to learn about the features of inclusive education and disabilities than older teachers.

The another significant factor that has been considered from the findings of the previous studies conducted by Kos et al. (2004) and Yarde-Leavett (2018) is receiving additional training regarding ADHD. These authors found that teachers who had received more in-service training on ADHD had a greater knowledge of ADHD and scored significantly higher on the knowledge scale.

Taking into account all above-mentioned factors, teacher-related variables such as age, general teaching experience, teaching experience with children with ADHD, and

additional training on ADHD were selected as predictors of knowledge about ADHD based on the findings of the previous studies.

2.6 Teachers' Attitudes towards ADHD

Recently, research on teachers' attitudes towards teaching students with ADHD has received noticeable attention among educational researchers. Research has shown that teachers' attitudes towards the inclusion of children with disabilities differ depending on the type of disability (De Boer et al., 2011). Numerous international research indicated that teachers mainly held negative attitudes towards teaching students with ADHD. For example, Al-Omari et al. (2015) indicated that Jordanian teachers' disposition towards ADHD was negative. Similarly, Yarde-Leavett (2018) found that South African teachers possessed unfavorable attitudes towards ADHD-affected learners even though they had more desire for better training regarding ADHD. On the other hand, this result points to the ambivalent attitudes in which individual possesses positive and negative attitudes at the same time (Anderson et al., 2012). However, it was found that teachers' dual attitudes towards ADHD can lead to their unfavorable behavior towards teaching students with ADHD. Teachers with negative perceptions may expect that children diagnosed with ADHD must behave in the same manner as students who do not have ADHD (Guerra et al., 2017). In addition to this, Glass (2001) found that teachers' negative attitudes towards children with ADHD may play a significant role in the quality of education the student will gain.

Mulholland et al. (2015) determined teachers attitudes dividing them into four domains which are feelings towards teaching students with ADHD, beliefs about ADHD and its associated behaviors, accommodations, knowledge, and training regarding ADHD, and desire for more training regarding ADHD. They also divided feelings and beliefs into negative and positive in order to get in-depth understanding of teachers' attitudes towards

ADHD. The findings of this study revealed that generally, Australian teachers held negative beliefs and feelings towards ADHD whilst they desired better training and professional development regarding ADHD.

2.6.1 Predictors of Attitudes towards ADHD

Teachers' attitudes towards children who have ADHD can differ depending on teacher-related background factors. Research has shown that even though teachers generally have favorable attitudes towards ADHD, they often believe that having a student with ADHD in their classroom can be a burden (Blotnicky-Gallant et al., 2015). Some research studies revealed that there was no significant relationship between teachers' attitudes towards ADHD and teacher-related background factors. For example, Liang and Gao (2016) found that teachers who had experience teaching students with ADHD had more negative thoughts about those students compared to those who did not. In addition to this, all of the interviewed teachers believed that having students with ADHD disrupts their teaching in the classroom (Liang & Gao, 2016). However, the analysis of the interviews showed that teachers' attitudes are closely related to their professional experience and training, which had a considerable impact on their self-efficacy thoughts and professional responsibility in supporting students with ADHD (Liang & Gao, 2016). It was also found by Mulholland et al. (2015) that teaching experience did significantly predict teachers' positive feelings towards teaching students with ADHD. In addition to this, the study conducted by Anderson et al. (2012) indicated that as teachers' teaching experience increased, they developed more favorable attitudes towards teaching students with ADHD.

Mostly negative attitudes towards children with ADHD were confirmed in the study by Al-Omari et al. (2015). The study found no statistically significant relationship between teachers' knowledge scores and attitudes towards teaching students with ADHD. Moreover, it became obvious from the findings that participants' age or teaching

experience did not influence their behaviour towards students with ADHD. Ninety-three percent of teacher-participants believed that children with ADHD need psychological support from health professionals.

On the contrary to the findings of the study by Al-Omari et al. (2015), the studies conducted by Greenway and Edwards (2020), Cueli et al. (2020) and Mulholland et al. (2015) found that the level of knowledge of ADHD was a stronger predictor of attitudes towards ADHD. This means that teachers who have greater knowledge of ADHD are more likely to have favorable attitudes towards teaching students with ADHD.

Taking into account above-mentioned teacher-related background factors, age, general teaching experience, teaching experience with children with ADHD, additional training on ADHD and the level of knowledge about ADHD were selected as predictor variables of attitudes towards ADHD based on the relevant studies.

2.7 Classroom Management of Students with ADHD

According to Henderson (2004), successful teachers should use a three-pronged strategy in teaching children with ADHD. This strategy begins by identifying the individual needs and strengths of the child. Then, the teacher should select various educational practices connected with academic instruction, behavioral interventions, and classroom accommodations that are suitable to meet that child's needs. Lastly, these practices are combined into an individualized educational program (IEP) or other individualized plans and then integrated with educational activities provided to other children in the class (Henderson, 2004).

Blotnicky-Gallant et al. (2015) found that teachers used behaviour management and instructional approaches but were much less likely to use intensive behaviour management strategies. In addition, they reported that they were also using nonverbal cues to refocus students' attention and were providing assistance during transitions frequently. Despite this

fact, it is obvious that there are a number of strategies that teachers did not use in the classroom. The main reason for this is that some strategies may require teachers to have specific training for effective implementations of those strategies. Moreover, some approaches may require additional time to effectively teach to their students with ADHD. Thus, the authors suggest providing teachers with the appropriate training and support necessary to implement successful strategies (Blotnicky-Gallant et al., 2015). Consequently, when teachers use these strategies in their classrooms, learners with ADHD will be provided with optimal interventions that may enhance both their learning and behavioural functioning at school.

In contrast to previous studies, the research results conducted by Kern et al. (2015) indicated that 52% of the respondents regarded medication as a primary intervention strategy. They even indicated that taking medication such as Ritalin helps children with ADHD to control their behaviours, stay focused and achieve academically in a classroom. Also, it is important to mention that there is a difference between state and private school teachers' preference for medication with 66% and 44%, respectively. However, 17% of the teachers in this study did not support the use of medication and were in favour of educational interventions.

Regarding the Asian context, South Korean teachers try to provide opportunities for children with ADHD to improve their responsibility and provide more support for the child with the help of individual tutorials for schoolwork (Moon, 2012). As the main responsibility, the teacher tries to support the child to achieve learning objectives after the lessons (Hong, 2008, as cited in Moon, 2012). As Shwerder (1998, as cited in Moon, 2012) demonstrated, Korean teachers mostly focused on emotional difficulties rather than behavioral problems compared to teachers of western countries.

2.8 ADHD in the Kazakhstani Context

ADHD has recently been recognized as one of the most significant challenges for mainstream schools around the world. Approximately 3% to 10% of school-aged children internationally have been diagnosed with ADHD (Centers for Disease Control cited in Liang & Gao, 2016). However, in Kazakhstan, the prevalence of ADHD has not been extensively researched because of the lack of specific diagnostic methods and criteria. (Alipbayeva & Bekbolatova, 2013). In addition to this, the studies related to ADHD conducted in Kazakhstan have mainly focused on the methods of diagnosis and evaluation of the effectiveness of medication (Alipbayeva, 2013).

In recent years, more attention has been given to ADHD in Kazakhstan. This is evidenced by the growing number of publications on this topic, but their focus is mainly informative. Moreover, interest in this topic has increased because 8-10 years ago there were only one or two children with ADHD in a classroom, but now there are up to five or more children with this disorder in each classroom (Evstifeeva, 2009). Moreover, it was found that nearly 4% to 9.5% of children in Kazakhstan have been identified with ADHD (Kazbekova, 2010 as cited in Shaimardanova & Pak, 2020).

According to the Ministry of Health Care and Social Development of the Republic of Kazakhstan, from May 21, 2015 No. 367, ADHD today is considered as a socially significant problem. This is because the condition is highly prevalent in the child population and has resulted in negative consequences such as behavioral disorders, school disadaptation, and early alcoholism.

2.9 Summary

Since there is a lack of relevant studies concerning teachers' knowledge of and attitudes towards ADHD within the Kazakhstani context, the overview has focused on western and some Asian countries which have conducted significant work in the field. During the process of reviewing the literature, important variables for the current study

were identified and employed to formulate research questions and construct the survey questionnaire. In order to examine teachers' knowledge of ADHD and their attitudes towards students with this disorder, teacher-related variables, including teachers' age, level of education, and the general number of years of teaching experience, were selected based on the relevant literature discussed above.

Chapter 3: Methodology

3.1 Introduction

The current study aimed at exploring general education teachers' knowledge of and attitudes towards ADHD, as well as the influence of teacher-related background factors on their knowledge of and attitudes towards ADHD in Nur-Sultan. The study focused on three research questions: 1. To what extent are general education teachers knowledgeable about ADHD? 2. What are general education teachers' attitudes towards ADHD? 3. Do teacher's background variables affect their knowledge of and attitudes towards students with ADHD? A non-experimental quantitative research method was employed to address these research questions.

This chapter explains the methodology employed in this study. It is organized according to the following sections: research design, sampling strategies, research sites and participants, data collection instruments, data collection procedures, data analysis methods, ethical concerns, and limitations of the study.

3.2 Research Design

A survey research design is a preferred type of data collection for the current study because of several reasons. According to Creswell (2012), such a method enables researchers to build quantitative descriptions of any number of people to describe the population's opinions, attitudes, characteristics, or behaviours of the population. In addition, the survey was selected as it allows the collection of large amounts of data by guaranteeing respondents' anonymity and generalizing the findings from a sample to a population (Cohen et al., 2007; Creswell, 2014; Muijs, 2004). Lastly, the online survey design has an advantage in terms of the economic data input costs and time (Creswell, 2014; Muijs, 2004).

The survey employed in the study is cross-sectional because the data was collected at one point in time (Cohen, et al., 2007; Creswell, 2014). The data was gathered through an online survey using ADHD-specific knowledge and attitudes of teachers (ASKAT), a new research instrument developed by Mulholland (2016). This research instrument has two scales: Scale for ADHD-specific knowledge (SASK), which was developed to assess teachers' knowledge of ADHD and Scale of ADHD-specific attitudes (SASA), designed to evaluate teachers' attitudes towards ADHD.

3.3 Research Site

The target population of the present study was mainstream school teachers of Nur-Sultan. Initially, this study was focused on comparing the teachers' knowledge of and attitudes towards ADHD in two selected schools, namely mainstream and gifted schools of Nur-Sultan in Northern Kazakhstan. However, one of the research sites, the school for the gifted, did not give their permission to conduct a survey. Therefore, there have been some changes in research sites.

As the population in Nur-Sultan is large, the researcher wanted to involve all the mainstream schools. However, the Department of Education of Nur-Sultan gave their permission to conduct a survey just in twelve schools. Therefore, the participants were selected by probability sampling. Cluster sampling enables the researcher to choose a specific number of schools and test all the teachers in those selected schools (Cohen et al., 2018). To avoid bias in this research, twelve schools from four administrative regions of Nur-Sultan were selected to conduct a survey: 3 schools from Almaty region, 3 schools from Esil region, 3 schools from Saryarka region and 3 schools from Baikonyr region. However, two of the schools refused to participate in the survey because teachers of those schools were busy at that time with preparing the students for PISA and attending

professional development courses. All those participating schools are state schools where there is no tuition fee.

3.4 Data Collection Instruments

An online survey was selected as a data collecting instrument for the current research. There are several advantages to using an online survey. Most importantly, it saves cost and time to distribute, collect and produce data; allows researchers to assess a wider and much larger population by protecting anonymity and confidentiality; and enables respondents to complete the questionnaire at any place and at a time to suit themselves (Cohen et al., 2007).

There are a limited number of developed instruments that explore teachers' knowledge of and attitudes towards ADHD. Most of the empirical studies have used the instruments such as the Knowledge of Attention Deficit Disorders Scale (KADDS) and Beliefs about Attention Deficit Hyperactivity Disorder (B-ADHD) which was developed by Kos (2004). However, the KAADS was developed to investigate teachers' knowledge of ADHD (Mulholland, 2016) whilst B-ADHD is focused on evaluating teachers' attitudes towards ADHD, behaviours and management practices used for students with ADHD. Thus, the proposed study employed a new research instrument called the ADHD-specific knowledge and attitudes of teachers (ASKAT) developed by Mulholland (2016). This instrument, consisting of two scales, the scale for ADHD-specific knowledge (SASK) and the scale for ADHD-specific attitudes (SASA), was designed to investigate teachers' knowledge of and attitudes towards ADHD.

The original questionnaire is in English, and it was translated into two state languages, Kazakh and Russian. Prior to the scale survey, the translated scales were read and commented on by a school psychologist and two teachers. Consequently, demographic questions were changed from open-ended to multiple-choice questions to indicate the

responses as variables. The demographic questions that are not relevant for the Kazakhstani context were excluded from the survey. In addition to this, the school counsellor on SASA was replaced by the school psychologist since in Kazakhstani schools, psychologists are the people who assess students' well-being and counsel them (Hernández-Torrano et al., 2021).

The final version of the survey (Appendix C) consists of three sections. The questions defining the participants' demographic data of the participants (Section 1) were designed by the researcher of the study. They included questions about respondents' age, gender, the years of teaching experience, educational qualifications, teaching specialization, and experience with students with hyperactive or inattentive behaviours. Section 2 is comprised of questions that evaluate teachers' knowledge of ADHD, whilst the questions in section 3 assess teachers' attitudes towards ADHD. This questionnaire used different types of questions, including a six-point Likert-type rating scale, True/False/I don't know, and multiple-choice questions. As the scale is publicly accessible, there is no need to receive additional consent from the designers of the instrument in the scope of this research.

3.5 Data Collection Procedures

The process of quantitative data collection consists of several interrelated steps (Creswell, 2014). After receiving the ethical approval from the NUGSE Ethical Review Committee, the letter with a copy of their approval (Appendix A) was sent to the head of the Department of Education in Nur-Sultan to get permission to conduct a survey in all mainstream schools in Nur-Sultan. As they gave their permission to conduct a survey in twelve schools, the letter of invitation was sent to the principals of those twelve schools to provide information about the purpose, potential benefits, and risks of the study. The survey link was disseminated to teachers by the school administration. Respondents were

treated with respect adhering to some important principles (Appendix B). First, teachers were requested to participate in the study and informed about the nature and the purpose of the research. Teachers who expressed interest in participating in the survey were informed that their participation in the research is voluntary and that anonymity and confidentiality are assured. No personally identifiable information was requested on the questionnaire. The survey was accessible for two weeks to ensure enough time for teachers to complete the survey at their convenience. Lastly, participants did not receive any payment for their participation. The survey was available in two state languages: Kazakh and Russian to avoid language barriers.

3.6 Data Analysis Methods

The data were collected through Qualtrics Survey Platform and analyzed using Statistical Package for the Social Sciences (SPSS) which is user-friendly and the most commonly used statistical data analysis software (Muijs, 2004).

This research study employed univariate and multivariate types of analysis to answer the research questions. As a descriptive type of analysis, univariate analysis can give the researcher important information on individual variables and research questions (Muijs, 2004). Thus, it provided useful descriptive information about teacher-related background variables. Next, frequency analysis was performed to determine teachers' knowledge about ADHD (SASK) and to assess their attitudes towards ADHD (SASA). Total scores for knowledge and attitudes were calculated by employing multiple regression analysis. Finally, multiple regression analyses were carried out to explore whether teacher-related background variables predicted teachers' knowledge of and attitudes towards ADHD.

3.7 Ethical Concerns and Risks of Research

The research was conducted according to ethical standards of the guidelines of the NUGSE Ethics Committee. According to Louw and Edwards, ethical consideration is a set of rules created to ensure that participants behave competently (cited in Topkin, 2013). Therefore, the researcher carried out the necessary precautions to protect the research participants' privacy. Before the study, the administrations of ten schools were provided with an e-mail that included the purpose and nature of the study and that anonymity and confidentiality were assured. In addition, this e-mail contained the consent letter and the link to the survey so the school administration could share them with their teachers. Participants took part in the study on the basis of informed consent, and on a voluntary basis, and they had the right to withdraw from the survey at any time without any penalty or loss of benefits (Cohen et al., 2007). No questions relating to personal information were requested in the survey. Teacher-participants were given two weeks to complete the online survey. All data gathered from the online questionnaire will be stored on the researcher's own laptop and protected with a password. The researcher may not use the data in any way which identifies the schools. In addition, the data will be deleted in 3 years in accordance with the requirement of NUGSE.

One potential risk associated with the participation in this study was that the school teachers might spend their working hours answering the survey's questions. To avoid this issue, they were recommended to complete the survey in their free time.

3.8 Summary

The methodology chapter provides information about the research methods and research procedures employed in this study. This quantitative research relying on the online survey as a data collection instrument investigated teachers' knowledge of and attitudes towards ADHD and teacher-related background factors that affect the knowledge

and attitudes teachers possess towards ADHD. The findings are presented in the next chapter.

Chapter 4: Findings

4.1 Introduction

This chapter presents the findings of the study which aimed to explore teachers' knowledge of and attitudes towards ADHD in mainstream schools of Nur-Sultan. The chapter consists of four main sections: demographic characteristics of the sample, the results of the Scale for ADHD-specific knowledge (SASK), the results obtained from the Scale of ADHD-specific attitudes (SASA), and multiple regression analysis between teachers' background variables and teachers' knowledge and attitudes towards ADHD.

Specifically, this study focused on three major aspects, which were used to understand teachers' knowledge of ADHD and their attitudes towards students with this disorder. First, it aimed to investigate general education teachers' knowledge of ADHD. Second, it determined the attitudes that teachers possess towards ADHD. Third, it identified the possible teacher-related background factors that influence knowledge and attitudes towards students with ADHD. To address these questions, a non-experimental quantitative research method was employed in this study. Data was collected through an online survey. The anonymous survey link was sent to teachers of ten mainstream schools in Nur-Sultan. Overall, 223 teachers participated in the survey. Those teachers who answered only demographic questions and the questions about ADHD ($n=56$) were removed from the sample. About 75% of teacher-participants ($n=167$) completed all sections of the survey: demographic questions, questions about ADHD, and questions related to teachers' attitudes towards ADHD.

4.2 Demographic Characteristics of the Sample

According to OECD (2019), just over half of teachers in Kazakhstan (55%) are between 30 and 49 years old. The results of the present study were similar to the official statistics. As shown in Table 1, the sample consisted mostly of teachers aged between 26-

35 (35.3%, $n=59$) and over 46 years (31.7%, $n=53$) (Table 1), with higher numbers of females (82.6%, $n=138$) over males (17.4%, $n=29$). In general, there are more female teachers (76%) than male teachers in Kazakhstani schools (OECD, 2019).

Almost half of the respondents (49.1%, $n=82$) indicated that their highest level of education was a bachelor's degree whilst only one teacher held a doctor's degree (0.6%). 25.1% ($n=42$) of teachers indicated they had master's degrees, and the remaining 25.1% ($n=42$) of respondents reported they had specialist degrees.

The respondents' teaching experience varied from 1 to over 21 years, with just under half of them (46.8%, $n=78$) having less than 10 years of teaching experience. Nearly a third of the sample (31.7%, $n=53$) indicated their teaching experience as more than 21 years. The remaining 21.6% ($n=36$) of respondents reported their teaching experience was between 11 and 20 years. As Table 1 shows, 60.5% ($n=101$) of the surveyed teachers indicated they had experience teaching a student with hyperactive or inattentive behaviours.

It is apparent from Table 1 that nearly two-thirds of those surveyed (63.5%, $n=106$) reported they did not study ADHD during their initial teacher training programme whilst one-fourth of the sample (25.1%, $n=42$) responded that they did not fully study ADHD. Only 7.2% of respondents ($n=12$) reported that they covered ADHD at a high level in their initial teacher training programme. Of the 167 teachers who completed the questionnaire, a minority of participants (21%, $n=35$) indicated that they had additional courses on ADHD.

Table 1. Demographic Characteristics of the Sample

Background Variables		n (%)	Total
Age	25 years or below	19 (11.4%)	167
	26-35 years	59 (35.3%)	
	36-45 years	36 (21.6%)	
	46 years or above	53 (31.7%)	
Gender	Male	29 (17.4%)	167
	Female	138 (82.6%)	

Background Variables		n (%)	Total
Level of Education	Bachelor's Degree	82 (49.1%)	167
	Master's Degree	42 (25.1%)	
	Specialist Degree	42 (25.1%)	
	Ph.D.	1 (0.6%)	
Teaching Years	0-2 years	16 (9.6%)	167
	3-5 years	24 (14.4%)	
	6-10 years	38 (22.8%)	
	11-15 years	21 (12.6%)	
	16-20 years	15 (9%)	
	21+ years	53 (31.7%)	
Experience teaching a student with hyperactive or inattentive behaviours	Yes	101 (60.5%)	167
	No	65 (38.9%)	
	Missing Data	1 (0.6%)	
The Coverage of ADHD during Initial Teacher Training Programme	None	106 (63.5%)	167
	Some	42 (25.1%)	
	High	12 (7.2%)	
	Missing Data	7 (4.2%)	
Additional Training/Courses on ADHD	Yes, I have had	35 (21%)	167
	No, I haven't had	125 (74.9%)	
	Missing Data	7 (4.2%)	

4.3 The results of the Scale for ADHD-specific Knowledge (SASK)

The Scale for ADHD-specific knowledge (SASK) was employed to explore teachers' knowledge of ADHD. The scale contains 20 statements in four dimensions of ADHD: Aetiology, Symptoms, Prevalence or assessment, and Treatment with three response options: 'True', 'False', and 'I don't know'. The responses were coded accordingly (1 = correct answer, 2 = incorrect answer, 0 = gap). Overall, 167 teachers responded to the knowledge questions. As the respondents had the right to refuse to answer specific questions, only a valid percentage of responses was used in the analysis.

The questions of this section were analyzed using Correct Response Analysis (CRA) and Frequency Analysis (FA) to determine the level of teachers' knowledge of ADHD. In general, the average score of teachers' correct answers was 42.3% ($M=8.45$, $SD=5.27$), which indicated that their knowledge of ADHD was poor (Table 2). Only one teacher (0.6%) had an excellent knowledge (>85% correct), half of the teachers (50.9%,

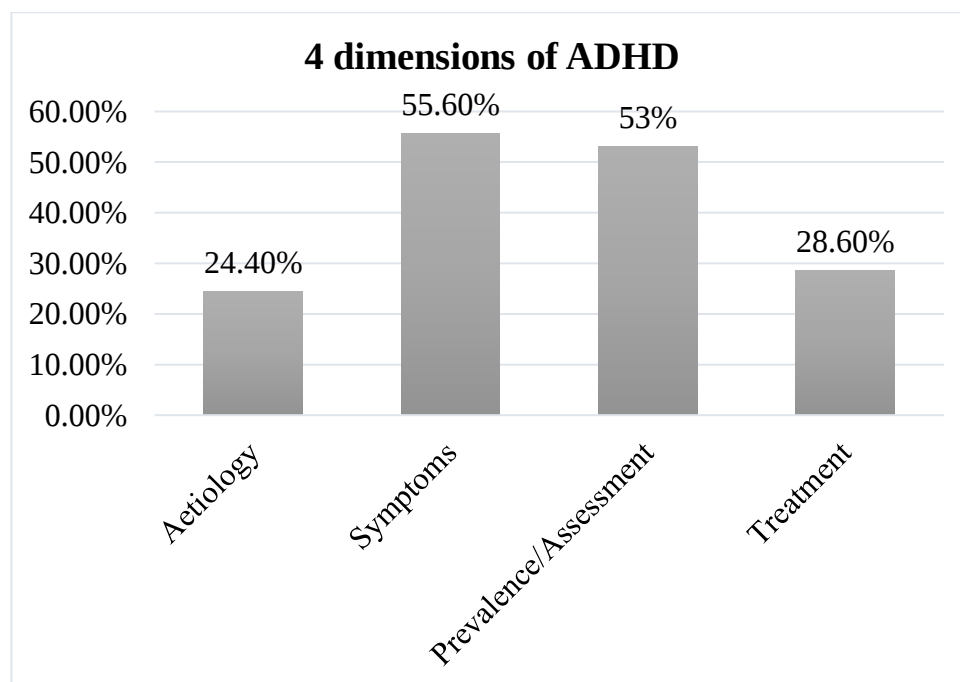
$n=85$) had an adequate knowledge (50-85% correct), and just under half of the surveyed teachers (48.5.9%, $n=81$) had poor knowledge of ADHD (<50% correct).

Table 2. Means and Standard Deviations for scores of SASK (correct answers)

Dimensions of SASK	Maximum	Mean	Std.Deviation
Aetiology	5	1.24	1.16
Symptoms	9	5.01	3.22
Prevalence / Assessment	2	1.06	0.81
Treatment	3	1.14	1.04
Total Knowledge about ADHD	19	8.45	5.27

As shown in Figure 1, surveyed teachers had more knowledge about Symptoms of ADHD (55.6%), followed by Prevalence (53%), then about Treatment and Aetiology, 28.6% and 24.4% respectively.

Figure 1. Teachers' Knowledge of ADHD in 4 Dimensions



As shown in Table 3, over half of the surveyed teachers responded more accurately to the questions related to symptoms and prevalence. The majority of teachers responded correctly to Items 3, 5, 7, 8, 11, 14, 16, and 17, which refer to symptom questions (Table 3). More than three-quarters of the respondents (76.4%, $n=107$) reported that children with ADHD are easily distracted (Item 8), although only 38% ($n=54$) understood that children

with ADHD can choose to be better behaved (Item 13). Regarding the prevalence questions, more than half of the surveyed teachers thought that there is approximately 1 child in every class that exhibits ADHD type behaviours (58.6%, $n=85$) and teachers are often the first to recognize ADHD type behaviours and refer children for assessment (65.7%, $n=92$).

One of the interesting findings within the treatment questions is that nearly half of the teachers (47.3%, $n=69$) responded incorrectly to Item 9, children with ADHD benefit from stricter parenting and schooling. Of the 146 respondents, only 22.6% ($n=33$) knew that this statement is False, while 30.1% ($n=44$) of the surveyed teachers indicated that they did not know whether the statement is True or False. Moreover, more than half of the respondents answered correctly to Item 20 (Children who present with ADHD behaviours, regardless of ADHD diagnosis, can benefit from individualized behaviour management strategies), which is a better result than other treatment questions.

As Table 3 illustrates, teachers knew the least about Aetiology of ADHD (24.4%). One more significant finding is that although 46.5% of teachers ($n=72$) indicated that ADHD is a neurobiological, developmental disorder (Item 1), only 12.3% ($n=18$) considered the statement that ADHD is caused by too much sugar in the diet (Item 10) as False. Moreover, it is important to highlight that 61% of the surveyed teachers ($n=89$) did not know whether Item 10 was True or False.

Overall, these findings indicated that although teachers' understanding of ADHD is mainly focused on the prevalence of ADHD and on behaviours children with ADHD exhibit, a majority of the surveyed teachers do not know about the causes of ADHD and effective treatment for ADHD. Therefore, the results suggest that it is necessary for teachers of Nur-Sultan to receive professional development on ADHD to effectively manage and teach students with ADHD-type behaviours.

Table 3. Number and Percentage of responses to Knowledge Survey Items

Survey Item	True n %	False n %	I don't know n %	Total
Aetiology				
1. ADHD is a neurobiological, developmental disorder.	72 ^a 46.5%	36 23.2%	47 30.3%	155
6. ADHD can be inherited.	56 ^a 38.3%	28 19.2%	62 42.5%	146
10. ADHD is caused by too much sugar in the diet.	39 26.7%	18 ^a 12.3%	89 61%	146
12. ADHD is caused by poor parenting.	68 47.5%	21 ^a 14.7%	54 37.8%	143
19. The cause of ADHD is unknown.	41 ^a 29.1%	32 22.7%	68 48.2%	141
Symptoms				
3. Children with ADHD tend to have poor concentration.	102 ^a 68%	16 10.7%	32 21.3%	150
5. There are different subtypes of ADHD which can present with different behaviours.	96 ^a 65.7%	13 9%	37 25.3%	146
7. Children with ADHD can present with hyperactive behaviours, inattentive behaviours, or a combination of both.	95 ^a 66%	9 6.2%	40 27.8%	144
8. Children with ADHD are easily distracted.	107 ^a 76.4%	8 5.7%	25 17.9%	140
11. Children who have the hyperactive type of ADHD often talk excessively, and have difficulty staying in their seat.	98 ^a 68%	13 9%	33 23%	144
13. Children with ADHD can choose to be better behaved.	38 26.8%	54 ^a 38%	50 35.2%	142
14. Some children can present with inattentive or hyperactive behaviours, yet not meet the criteria for an ADHD diagnosis.	84 ^a 58%	15 10.3%	46 31.7%	145
16. Children with ADHD often have problems concentrating on table-top work.	101 ^a 70.1%	14 9.7%	29 20.1%	144
17. Children with ADHD often fail to give close attention to their work and make careless mistakes.	99 ^a 68.7%	12 8.3%	33 23%	144
Prevalence / Assessment				
15. There is approximately 1 child in every class that exhibits ADHD type behaviours.	85 ^a 58.6%	22 15.2%	38 26.2%	145

Survey Item	True n %	False n %	I don't know n %	Total
18. Teachers are often the first to recognize ADHD type behaviours and refer children for assessment.	92 ^a 65.7%	18 12.9%	30 21.4%	140
Treatment				
2. Special diets (e.g. reduced sugar, wheat free, lactose free, additive free) are an effective treatment for ADHD.	54 35.8%	31 ^a 20.5%	66 43.7%	151
4. A combination of stimulant medication and behaviour management is an effective treatment for ADHD.	43 ^a 29.2%	35 23.8%	69 47%	147
9. Children with ADHD benefit from stricter parenting and schooling.	69 47.3%	33 ^a 22.6%	44 30.1%	146
20. Children who present with ADHD behaviours, regardless of ADHD diagnosis, can benefit from individualised behaviour management strategies.	84 ^a 58.3%	10 7%	50 34.7%	144

^a indicates the correct answer to the statement

4.4 The results of the Scale for ADHD-specific Attitudes (SASA)

To examine teachers' attitudes towards ADHD, The Scale for ADHD-specific attitudes (SASA) was employed. It consists of 30 survey items in 4 constructs using a six-point Likert-type rating scale (1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Somewhat Agree, 5 = Agree, 6 = Strongly Agree). For statistical analysis, the responses of negative items were reversed. Frequency Analysis was performed to analyze the responses to determine teachers' attitudes towards ADHD. The findings of this research revealed that although Nur-Sultan mainstream school teachers held both positive and negative attitudes towards ADHD simultaneously, generally, their disposition towards ADHD was negative ($M=3.02$, $SD=1.30$).

Table 4 provides the number and percentage of teachers who responded to the survey items related to the attitudes towards ADHD. On average, half of the surveyed teachers agreed to some extent with the statements relating to Positive Feelings towards

teaching ADHD-affected students, with 81% of respondents ($n=115$) indicating it is rewarding to see the accomplishments of students who display ADHD-type behaviours (Item 19). The majority of teachers agreed to some extent with the statements about Negative Feelings towards teaching students with ADHD. For example, less than two-thirds of teachers reported that students who exhibit behaviours associated with ADHD interfere with my ability to effectively teach my class (Item 2) and that it is challenging for me to teach students who exhibit behaviours associated with ADHD (Item 18), 59.4% ($n=88$) and 60.3% ($n=85$) respectively. Moreover, 72.8% ($n=110$) disagreed with the positive statement that it is rewarding to work with students who exhibit behaviours associated with ADHD (Item 1).

Also, it is important to note that teachers agreed with more than half of the statements about Negative Beliefs about ADHD and its associated behaviours. As shown in Table 4, 70.8% of respondents ($n=102$) indicated their agreement that children who exhibit ADHD-type behaviours need to try harder to focus on their schoolwork (Item 8). Moreover, 56.3% ($n=81$) agreed with Item 6, students who exhibit ADHD-type behaviours need more structure and discipline, not assistance with their academic work. Despite the fact that teachers agreed with most statements relating to Negative Beliefs about ADHD and its associated behaviours, two-thirds of the respondents disagreed with the negative statements that they believe ADHD is an excuse for poor parenting (Item 11) and children who exhibit ADHD type behaviours are deliberately misbehaving (Item 12), holding 64.1% ($n=91$) and 69% ($n=96$) respectively. One of the interesting findings is that although 61.5% of respondents ($n=86$) believed that ADHD is a valid diagnosis (Item 10), half of those surveyed (50.3%, $n=73$) indicated ADHD as overdiagnosed (Item 9).

In the case of Accommodations, of the 144 respondents, 78.4% ($n=113$) indicated that they would refer a student who exhibited ADHD-type behaviours in their classroom to

the school psychologists for a possible ADHD assessment (Item 13). Interestingly, over half of the teachers (54%, $n=74$) indicated that they don't have the lesson time to differentiate curricula and create activities that are engaging for students who exhibit ADHD behaviours (Item 22) yet more than two-thirds of participants (68.7%, $n=97$) felt they change their teaching styles for students who exhibit ADHD-type behaviours (Item 23). In the case of Knowledge and Training, the majority of teachers felt that they were not knowledgeable about ADHD-type behaviours (51.4%, $n=71$), classroom interventions to manage misbehaviour (56.6%, $n=77$), and managing ADHD-type behaviours (64.4%, $n=89$) although half of those surveyed (50.4%, $n=70$) reported that they can effectively teach students who exhibit behaviours associated with ADHD (Item 28). It is apparent from Table 4 that nearly 90% of the surveyed teachers desired more training about ADHD-type behaviours (Item 14) and classroom interventions to teach students who display ADHD-type behaviours (Item 15), 85.7% ($n=121$) and 89.2% ($n=124$) respectively. Moreover, almost 80% ($n=107$) reported that they want to be more effective teaching students who display ADHD-type behaviours (Item 29).

Table 4. Number and Percentage of responses to Attitude Survey Items

Item	Strongly Disagree n %	Disagree n %	Some-what disagree n %	Some-what agree n %	Agree n %	Strongly agree n %	Total
Positive Feelings towards teaching students with ADHD							
1. Students who exhibit behaviours associated with ADHD are rewarding to work with.	18 11.9%	44 29.1%	48 31.8%	34 22.5%	6 4%	1 0.7%	151
7. Students with ADHD-type behaviours bring new perspectives to the topics I am teaching.	11 7.7%	27 18.9%	31 21.7%	54 37.8%	18 12.6%	2 1.4%	143

[illegible]

Item	Strongly Disagree n %	Dis-agree n %	Some-what disagree n %	Some-what agree n %	Agree n %	Strongly agree n %	Total
3. Children who exhibit behaviours associated with ADHD can perform well in some subjects and not in others.	12 8.2%	31 21.2%	32 21.9%	40 27.4%	27 18.5%	4 2.7%	146
10. I believe ADHD is a valid diagnosis	10 7.1%	26 18.6%	18 12.9%	40 28.6%	35 25%	11 7.9%	140
Negative Beliefs about ADHD and its associated behaviours							
4. Students who exhibit ADHD-type behaviours have no excuse for their poor behaviour if they do not have a formal diagnosis.	13 9%	37 25.5%	28 19.3%	26 17.9%	34 23.4%	7 4.8%	145
5. Students who exhibit ADHD-type behaviours misbehave because they don't want to follow the set rules	16 11.3%	25 17.6%	24 16.9%	33 23.2%	39 27.5%	5 3.5%	142
6. Students who exhibit ADHD-type behaviours need more structure and discipline, not assistance with their academic work	13 9%	25 17.4%	25 17.4%	38 26.4%	38 26.4%	5 3.5%	144
8. Children who exhibit ADHD-type behaviours need to try harder to focus on their schoolwork.	7 4.9%	14 9.7%	21 14.6%	29 20.1%	61 42.4%	12 8.3%	144
9. I believe ADHD is over diagnosed	16 11%	35 24.1%	21 14.5%	32 22.1%	34 23.4%	7 4.8%	145
11. I believe ADHD is an excuse for poor parenting.	18 12.7%	53 37.3%	20 14.1%	36 25.4%	10 7.0%	5 3.5%	142

Item	Strongly Disagree n %	Dis-agree n %	Some-what disagree n %	Some-what agree n %	Agree n %	Strongly agree n %	Total
12. I believe children who exhibit ADHD-type behaviours are deliberately misbehaving.	22 15.8%	46 33.1%	28 20.1%	27 19.4%	13 9.4%	3 2.2%	139
Accommodations							
13. I would refer a student who exhibited ADHD-type behaviours in my classroom to the school psychologists for a possible ADHD assessment	11 7.6%	9 6.3%	11 7.6%	33 22.9%	66 45.8%	14 9.7%	144
22. I don't have the lesson time to differentiate curricula and create activities that are engaging for students who exhibit ADHD behaviours	6 4.4%	29 21.2%	28 20.4%	36 26.3%	31 22.6%	7 5.1%	137
23. I change my teaching styles and differentiate my lessons for students who exhibit ADHD-type behaviours.	7 5%	12 8.5%	25 17.7%	47 33.3%	45 31.9%	5 3.5%	141
24. The accommodations suggested to me for working with students who exhibit behaviours associated with ADHD are easy to implement in a general education classroom.	13 9.5%	23 16.8%	37 27%	35 25.5%	27 19.7%	2 1.5%	137
Knowledge and Training							
25. I feel I am knowledgeable about ADHD-type behaviours	17 12.3%	26 18.8%	28 20.3%	43 31.2%	18 13%	6 4.3%	138
	13	32	32	42	11	6	136

Item	Strongly Disagree n %	Dis-agree n %	Some-what disagree n %	Some-what agree n %	Agree n %	Strongly agree n %	Total
26. I feel I am knowledgeable about classroom interventions to manage misbehaviour	9.6%	23.5%	23.5%	30.9%	8.1%	4.4%	
27. I have received adequate professional development about managing ADHD-type behaviours	25 18.1%	42 30.4%	22 15.9%	31 22.5%	13 9.4%	5 3.6%	138
28. I can effectively teach students who exhibit behaviours associated with ADHD	16 11.5%	25 18.0%	28 20.1%	45 32.4%	22 15.8%	3 2.2%	139
Desire for more training							
14. I would like to know more about ADHD and its associated behaviours	6 4.3%	6 4.3%	8 5.7%	26 18.4%	70 49.6%	25 17.7%	141
15. I would like to have more information about classroom interventions to assist me with educating students who display ADHD-type behaviours	4 2.9%	3 2.2%	8 5.8%	27 19.4%	75 54%	22 15.8%	139
29. I want to be more effective teaching students who display ADHD-type behaviours	10 7.5%	9 6.7%	8 6.0%	33 24.6%	56 41.8%	18 13.4%	134

Overall, the mean score for teachers' attitude was 3.02, ranging between 1 (extremely negative) and 6 (extremely positive) (Table 5). This means that Nur-Sultan mainstream school teachers possessed unfavorable attitudes towards ADHD. It might be suggested that the majority of teachers believe that children with ADHD-type behaviours are misbehaving and that they find it challenging to teach students with ADHD. This might

be due to teachers' insufficient knowledge and training on ADHD. This is evidenced by the lowest mean scores for beliefs about ADHD and its associated behaviours and accommodations, knowledge and training, scoring 2.91 and 2.87 respectively. Despite the fact that teachers had negative attitudes towards ADHD, the mean score for desire for more training was 3.72, being close to positive score on a scale 1 to 6 (Table 5).

Table 5. Means and Standard Deviations for scores of SASA

Constructs of SASA	Mean	Std.Deviation
Feelings towards teaching students with ADHD	3.03	1.32
Beliefs about ADHD and its associated behaviours	2.91	1.35
Accommodations, Knowledge and Training	2.87	1.35
Desire for more training	3.72	1.83
Total Attitudes towards ADHD	3.02	1.30

4.5 Multiple Regression Analysis

To explore the relations between teachers' background variables and teachers' knowledge and attitudes towards ADHD, a multiple linear regression was performed. To do this, scores of responses were combined to get overall mean scores for each variable.

1. The first model of multiple regression was run to determine how teachers' age, level of education, teaching experience, experience with students with hyperactive or inattentive behaviours, and additional training on ADHD predict teachers' level of knowledge about ADHD. Five predictors were a modest fit model and explained 16% of the variance in level of knowledge about ADHD ($F(5,161) = 7.18, p < .001, R^2 = .18$, adjusted $R^2 = .16$). As shown in Table 6, receiving additional training on ADHD did significantly predict level of knowledge about ADHD ($\beta = .16, p = .02$) and experience with students with hyperactive or inattentive behaviours also predicted significantly level of knowledge about ADHD ($\beta = .35, p < .001$). Standardized β -coefficients showed that experience with students with hyperactive or inattentive behaviours was a stronger predictor of level of knowledge about ADHD than additional training on ADHD (Table 6).

Results indicated that as teachers get more experience working with students with hyperactive or inattentive behaviours and receive more additional training on ADHD, their level of knowledge about ADHD increases.

Table 6. Predictors of Teachers' Level of Knowledge about ADHD

Model 1	B	Beta	p	R ²	Adjusted R ²
Teacher knowledge about ADHD	9.202		<.001	.182	.157
age	-.044	-.009	.956		
level of education	-.067	-.016	.838		
teaching experience	.500	.165	.272		
experience with students with hyperactive or inattentive behaviours	3.733	.354	<.001		
additional training on ADHD	1.588	.163	.024		

2. For the second model of multiple regression, teachers' level of knowledge about ADHD was included as a predictor variable. In this model, teachers' feelings towards ADHD was the dependent variable with predictor variables being teachers' age, level of education, teaching experience, experience with students with hyperactive or inattentive behaviours, pre-service teacher education programmes, additional training on ADHD and level of knowledge about ADHD. Seven predictors were a modest fit model and explained 26% of the variance in feelings about ADHD ($F(8,166) = 8.37, p < .001, R^2 = .30$, adjusted $R^2 = .26$). It was found that teachers' level of knowledge about ADHD did significantly predict teachers' feelings about ADHD ($\beta = .47, p < .001$) and additional training on ADHD also predicted significantly teachers' feelings about ADHD ($\beta = .17, p = .01$) (Table 7). Standardized β -coefficients showed that level of knowledge was a stronger predictor of feelings towards ADHD than additional training on ADHD (Table 7). Results

indicated that teachers who had a good level of knowledge about ADHD and who received additional training on ADHD tended to have positive feelings towards ADHD.

Table 7. Predictors of Teachers' Feelings towards ADHD

Model 2	B	Beta	p	R ²	Adjusted R ²
Feelings towards ADHD	18.729		.008	.298	.262
age	-2.989	-.234	.113		
level of education	.796	.074	.304		
teaching experience	-.121	-.016	.912		
experience with students with hyperactive or inattentive behaviours	.074	.003	.969		
pre-service teacher education programmes	-1.957	1.352	.15		
additional training on ADHD	4.193	.172	.014		
level of knowledge about ADHD	1.182	.473	<.001		

3. The third model of multiple regression was performed to test whether teachers' age, level of education, teaching experience, experience with students with hyperactive or inattentive behaviours, pre-service teacher education programmes, additional training on ADHD and level of knowledge about ADHD predicted teachers' beliefs about ADHD. Seven predictors were a modest fit model and explained 15% of the variance in beliefs about ADHD ($F(8,166) = 4.80, p < .001, R^2 = .19, \text{adjusted } R^2 = .15$). As shown in Table 8, only teachers' level of knowledge about ADHD did significantly predict teachers' beliefs about ADHD ($\beta = .41, p < .001$). Results indicated that teachers with a greater level of knowledge about ADHD are more likely to have positive beliefs about ADHD.

Table 8. Predictors of Teachers' Beliefs about ADHD

Model 3	B	Beta	p	R ²	Adjusted R ²
Beliefs about ADHD	12.730		.065	.195	.155
age	-2.099	-.179	.257		
level of education	1.018	.103	.182		
teaching experience	-.340	-.049	.753		
experience with students with hyperactive or inattentive behaviours	2.876	.119	.126		
pre-service teacher education programmes	-1.046	1.33	.432		
additional training on ADHD	2.424	.108	.145		
level of knowledge about ADHD	.933	.406	<.001		

4. The fourth model of multiple regression was conducted to see if teachers' age, level of education, teaching experience, experience with students with hyperactive or inattentive behaviours, additional training on ADHD and level of knowledge about ADHD predicted training regarding ADHD. Six predictors were a modest fit model and explained 15% of the variance in training regarding ADHD ($F(6,166) = 5.79, p < .001, R^2 = .18$, adjusted $R^2 = .15$). It was found that teachers' level of knowledge about ADHD was the only significant predictor at the $< .001$ level (Table 9).

Table 9. Predictors of Teachers' Training regarding ADHD

Model 4	B	Beta	p	R ²	Adjusted R ²
Training regarding ADHD	12.548		<.001	.178	.148
age	-1.175	-.207	.184		
level of education	-.145	-.030	.691		
teaching experience	.254	.076	.618		
experience with students with hyperactive or inattentive behaviours	-1.008	-.086	.269		

Model 4	B	Beta	p	R ²	Adjusted R ²
additional training on ADHD	-1.061	-.098	.183		
level of knowledge about ADHD	.421	.378	<.001		

5. The fifth model of multiple regression was run to determine how teachers' age, level of education, teaching experience, experience with students with hyperactive or inattentive behaviours, additional training on ADHD and level of knowledge about ADHD predict desire for more training regarding ADHD. The predictors were modest fit level and explained 18% of the variance in the desire for more training regarding ADHD ($F(6,166) = 7.04, p < .001, R^2 = .21, \text{adjusted } R^2 = .18$). It was found that teachers' level of knowledge about ADHD ($\beta = .38, p < .001$) and age ($\beta = -.30, p = .05$) did significantly predict desire for more training regarding ADHD. As shown in Table 10, Standardized β -coefficients revealed that teachers' level of knowledge about ADHD was a stronger predictor of desire for more training. Moreover, the result indicated that the desire for more training tended to decrease as the teachers became older.

Table 10. Predictors of Teachers' Desire for More Training regarding ADHD

Model 4	B	Beta	p	R ²	Adjusted R ²
Desire for more training regarding ADHD	8.022		.001	.209	.179
age	-1.607	-.301	.049		
level of education	-.259	-.058	.441		
teaching experience	.526	.166	.263		
experience with students with hyperactive or inattentive behaviours	-.414	-.038	.619		
additional training on ADHD	.859	.084	.237		

Model 4	B	Beta	p	R ²	Adjusted R ²
level of knowledge about ADHD	3.328	.385	<.001		

Overall, the analysis indicated that all of the regression models were significant at < .05 level. This means that the dependent variables are caused at least by one of the predictor variables in the regression model.

4.6 Summary

This chapter has reported the results obtained via the online survey on the Qualtrics platform. The gathered data was analyzed using Statistical Package for the Social Sciences (SPSS). Regarding the first question of the present study 'To what extent are general education teachers knowledgeable about ADHD?', teachers have poor knowledge about ADHD. Although half of the teachers are aware of symptoms and prevalence of ADHD, almost three-quarters of teachers are not aware of aetiology and treatment. It was also found that the level of teacher knowledge of ADHD is likely to increase with in-service training on ADHD and professional experience with students with ADHD. Turning to the second question of this study 'What are general education teachers' attitudes towards ADHD?', teachers' overall attitudes towards ADHD in Nur-Sultan are negative. Although the vast majority of teachers have a strong desire for more training about ADHD and its associated behaviours.

The results of the study indicated that there are a number of teacher-related factors that affect teachers' overall knowledge of and attitudes towards ADHD. It was found that the level of teacher knowledge of ADHD is likely to increase with additional training on ADHD and professional experience with students with ADHD. Moreover, factors such as level of knowledge, additional training on ADHD and age are statistically significant in

predicting teachers' attitudes towards ADHD. The discussion of these findings is presented in the following chapter.

Chapter 5: Discussion

5.1 Introduction

The purpose of this study was to explore Nur-Sultan mainstream school teachers' knowledge of and their attitudes towards ADHD, as well as to analyze which teacher-related background factors affect their knowledge and attitudes. This study was based on the following research questions: 1. To what extent are general education teachers knowledgeable about ADHD? 2. What are general education teachers' attitudes towards ADHD? 3. Do teachers' background variables affect their knowledge of and attitudes towards ADHD?

The present research used a survey research design to collect data using ASKAT consisting of two scales: SASK to assess teachers' knowledge of ADHD and SASA to assess teachers' attitudes towards ADHD. Overall, 167 teachers from ten mainstream schools of Nur-Sultan participated in the survey. The gathered data were analyzed using Statistical Package for the Social Sciences (SPSS) software. Specifically, univariate and multivariate types of analysis were performed to answer the research questions.

In general, the findings of this study suggest that teachers' knowledge about ADHD is low and that they possess slightly negative attitudes towards ADHD. In addition, it determined teacher-related background factors which affected teachers' knowledge of and attitudes towards ADHD. For example, additional training on ADHD and experience with students with hyperactive or inattentive behaviours did significantly predict the level of knowledge about ADHD, whilst the level of knowledge about ADHD, additional training on ADHD and age were significant predictors of teachers' favorable attitudes towards ADHD.

These findings are discussed in this chapter in alignment with the research questions and their relevance and meaning in light of the literature review. The chapter is

organized according to the following sections: mainstream school teachers' knowledge about ADHD, mainstream school teachers' attitudes towards ADHD and factors affecting teachers' knowledge of and attitudes towards ADHD.

5.2 Mainstream School Teachers' Knowledge about ADHD

The results of the present study showed that Nur-Sultan mainstream school teachers had poor knowledge about ADHD, scoring an average of 42.3% of the correct answers on the knowledge scale (SASK). These results reflect those of Dessie et al. (2021), Guerra and Brown (2012), and Murtani et al. (2020) who also found that teachers' level of knowledge about ADHD is low. Although these studies were conducted in Ethiopia, the United States and Indonesia, the results of the present study were similar. However, there are numerous studies in which the proportion of teachers who know about ADHD is significantly higher. For example, the research conducted in Spain, the United Kingdom and Australia indicated that teachers have adequate knowledge about ADHD, scoring approximately 62% correct responses (Cueli et al., 2020; Greenway & Edwards, 2020; Kos et al., 2004; Mulholland et al., 2015). In addition to this, the study conducted in South Africa also showed that teachers responded to 78% of the questions of the knowledge scale (SASK) correctly which was employed in the present study (Yarde-Leavett, 2018). These different results can be explained by the fact that those countries have different cultures, societies and educational systems. Another possible explanation for different levels of knowledge of ADHD is related to receiving additional training and professional development regarding ADHD. Greenway and Edwards (2020) highlighted that teachers who received up-to-date and adequate training regarding ADHD are more likely to have significant knowledge about ADHD. The low level of Nur-Sultan mainstream school teachers' knowledge of ADHD might be due to the fact that almost 75% of surveyed teachers did not have additional courses on ADHD.

For Nur-Sultan mainstream school teachers, the most accurate knowledge about ADHD focused on symptoms (55.6%) and prevalence (53%) and the poorest knowledge related to treatment (28.6%) and aetiology (24.4%). These findings confirm the previous studies (Greenway & Edwards, 2020; Mulholland et al., 2015; Yarde-Leavett, 2018) which also found that teachers were the most knowledgeable about the symptoms of ADHD and the least knowledgeable about the aetiology of ADHD. In addition, studies conducted by Cueli et al. (2020) and Mulholland et al. (2015) indicated that approximately 72% of teachers in their research scored significantly in symptom questions. Consistent with the literature, the current research also found that more than half of the surveyed teachers responded correctly to the large majority of symptom questions. For example, almost three-quarters of participants in this study knew that children with ADHD are easily distracted and often have problems concentrating on table-top work. However, 62% of teachers had difficulties in responding to the only statement concerning symptoms that children with ADHD can choose to be better behaved. Only 38% knew that this statement was false. Teachers' adequate knowledge of symptoms is not surprising since 60.5% of surveyed teachers had experience teaching students with ADHD-type behaviours. This means that teachers who deal with students with ADHD-type behaviours on a regular basis seem to be aware of the characteristics of children with ADHD (Greenway & Edwards, 2020).

Teachers who have adequate knowledge of symptoms of ADHD understand the condition of ADHD, therefore they can refer children for further assessment. In terms of assessment, 65.7% of teachers in this study indicated that they would make referrals for assessment if they recognized ADHD-type behaviours. Studies conducted in Australia and South Africa reported comparable results. For example, 90% of South African teachers indicated that they would refer children for assessment (Yarde-Leavett, 2018), whilst only

about 40% of Australian teachers reported their agreement to refer children for assessment if they recognize ADHD-type behaviours (Mulholland et al., 2015). Even though teachers' adequate knowledge of symptoms affect their decision to refer ADHD-affected students for assessment (Yarde-Leavett, 2018), surveyed teachers in above-mentioned studies answered this statement relying on their personal beliefs and professional experience.

One of the prominent findings of the current study was that nearly half of the teachers believed that children with ADHD benefit from stricter parenting and schooling. Only 22.6% knew that this statement was false, while the remaining 30.1% of the surveyed teachers indicated that they did not know whether the statement was true or false. In addition to this, only 20.5% knew that the statement that special diets are an effective treatment for ADHD was not true. These results might suggest that Nur-Sultan mainstream school teachers are not well aware of the treatment for ADHD. This finding is contrary to the previous study, which has suggested that Spanish in-service and pre-service teachers know more about treatment for ADHD (83.4%) (Cueli et al., 2020). This means that Spanish teachers demonstrated an adequate level of knowledge of treatment for ADHD rather than Kazakhstani teachers due to the fact that teachers in Spain have teacher training programmes that provide them with important information about the characteristics of neurodevelopmental disorders including ADHD (e.g., symptoms, prevalence, comorbidity, and treatment). A possible explanation for the result of this study may be the lack of teacher training programmes about ADHD in Kazakhstan. It is evidenced by the argument that almost 64% of surveyed teachers in this study indicated that they did not cover ADHD whilst 25% reported that ADHD was not covered well during their initial teacher training programmes.

The overall score for aetiology was found to be 24.4%, lower than that of previously reported scores on knowledge dimensions. This finding broadly supports the

work of other studies in this area that revealed the high levels of mistakes related to aetiology (Al-Omari et al., 2015; Cueli et al., 2020; Greenway & Edwards, 2020). Specifically, nearly half of the respondents in this study wrongly believed that ADHD is caused by poor parenting whilst 37.8% did not know whether the statement was true or false. This finding is consistent with previous research conducted in Jordan and China (Al-Omari et al., 2015; Liang & Gao, 2016), which found that more Jordanian and Chinese teachers mistakenly believed that ADHD can be caused by poor parenting practices. One plausible explanation for blaming parents for their children's behaviours in this study can be the cultural differences. These results suggest that cultural beliefs might be relatively common in Asian countries. For example, Chinese parents, especially fathers, are responsible for their child's behaviour (Liang & Gao, 2016). Similarly, in Kazakhstan, parents are believed to be responsible for their children's behaviour (Shaimardanova & Pak, 2020). Thus, participants in this study might have responded to this statement based on their cultural beliefs. Comparable results have been indicated in the study conducted in Australia (Mulholland et al., 2015), where 77% of teachers correctly answered the statement, ADHD can be caused by poor parenting, was false. These differences can be explained by the fact that teachers from countries where there are many advanced educational practices and interventions relevant to children with ADHD are more likely to have significant knowledge about ADHD. Additionally, only 12.3% of teachers in the current study knew the statement that ADHD is caused by too much sugar in the diet as false whilst 61% did not know whether this statement was true or false. These findings confirm that Nur-Sultan mainstream school teachers are not well aware of the nature of ADHD. Teachers' low level of aetiology could be explained by the fact that the cause of ADHD is unknown. Therefore, teachers may have responded to treatment questions based on their personal beliefs because they did not know the aetiology of ADHD.

Overall, the findings of the present study suggested that Nur-Sultan mainstream school teachers have poor knowledge about ADHD. Specifically, they are more knowledgeable about symptoms and prevalence and less knowledgeable about treatment and aetiology. The previous literature shows that a poor level of knowledge about ADHD may result in negative attitudes towards ADHD (Anderson et al. 2012; Barnett et al., 2012 as cited in Murtani et al., 2020). Therefore, the findings of the present study have significant implications for professionals in the education system of Kazakhstan as they need to increase the level of pre-service and in-service teacher training on ADHD in order to provide appropriate interventions for children with ADHD and develop more favorable attitudes towards them.

5.3 Teachers' Attitudes towards ADHD

The findings of the present study revealed that although Nur-Sultan mainstream school teachers possessed both positive and negative attitudes towards ADHD simultaneously, generally, their disposition towards ADHD was slightly negative ($M=3.02$, ranging between 1 and 6). This also accords with previous observations, which reported similar negative attitudes towards ADHD and its associated behaviours (Al-Omari et al., 2015; Yarde-Leavett, 2018). The present study employed SASA developed by Mulholland (2016) to explore teachers' attitudes towards ADHD under the guidance of a modified tripartite model of attitude by van Aalderen-Smeets et al. (2012) which focuses on teachers' cognitive beliefs, affective states and perceived control. Mulholland et al. (2015) divided attitudes into four constructs which are feelings towards teaching students with ADHD, beliefs about ADHD and its associated behaviours, accommodations, knowledge, and training regarding ADHD, and desire for more training regarding ADHD. The results of each construct in this study are discussed separately.

The present study found that teachers reported a mean score of 2.91 out of 6 in the category of beliefs about ADHD and its associated behaviours. This shows that participants in this study held negative beliefs about ADHD. For example, 70.8% of teachers in this study believed that children who exhibit ADHD-type behaviours need to try harder to focus on their schoolwork, compared with the 60% found in the study by Mulholland et al. (2015) and the 81.7% in the study by Cueli et al. (2020). Additionally, Greenway and Edwards (2020) found that 52% of teachers believed that students who exhibit ADHD-type behaviours need more structure and discipline, not assistance with their academic work. In this research, a similar result was observed. 56.3% of the surveyed respondents in this study agreed with that statement. Ohan et al. (2011) found that when teachers have negative beliefs about ADHD, they are more likely to demonstrate negative behaviours towards ADHD-affected children (as cited in McHargue, 2019). Moreover, it was reported by numerous studies that teachers' negative beliefs about children with ADHD could negatively influence those children's academic achievement (Anderson et al., 2012; Kendall, 2016 as cited in McHargue, 2019).

In addition to these results, although 61.55% of teachers believed that ADHD is a valid diagnosis, half of the respondents indicated that ADHD is overdiagnosed. This means that although teachers believe that ADHD is a real disorder, there is some concern about diagnostic criteria of ADHD among teachers possibly because of the increasing number of children diagnosed with ADHD. This finding supports evidence from previous observations (e.g. Cueli et al., 2020; Mulholland et al., 2015; Yarde-Leavett, 2018), which revealed that teachers have positive and negative beliefs about ADHD simultaneously. Nevertheless, the proportion of teachers who believed that ADHD is a valid diagnosis is relatively higher than those who reported ADHD is overdiagnosed in previous studies as well as in this study. These findings are rather encouraging as teachers with favorable

beliefs are more likely to support ADHD-affected learners to achieve academic achievement and personal development (Anderson et al., 2012).

Regarding the feelings towards teaching students with ADHD, it was found that half of the surveyed teachers agreed to some extent with the statements relating to positive feelings. In contrast, the remaining half appeared to respond to the statements about negative feelings. For example, although 81% of respondents felt that it is rewarding to see the accomplishments of students who display ADHD-type behaviours, nearly 60% found it challenging to teach students who exhibit behaviours associated with ADHD. This finding is consistent with previous literature in other contexts, which suggested that teachers' attitudes towards ADHD were ambivalent (Anderson et al., 2012; Cueli et al., 2020; Mulholland et al., 2015). Anderson et al. (2012) found that dual attitudes can negatively influence an individual's behaviour towards students with ADHD. Nevertheless, those authors found that these behaviours can be developed for the better with experience with ADHD and appropriate information about ADHD. The results of the present study do fit with the claims of Anderson et al. (2012) that receiving additional training on ADHD ($p = .02$) and experience with students with hyperactive or inattentive behaviours ($p < .001$) had a significant effect on the level of teachers' knowledge about ADHD. Consequently, as a component of cognitive beliefs of attitudes the knowledge about ADHD can lead to teachers' favorable behavioral intentions towards dealing with and teaching children with ADHD.

The surveyed teachers reported mainly negative attitudes in relation to accommodations, knowledge, and training. The mean score was 2.87 out of 6, which is the lowest domain among attitude constructs in this study. The results revealed that the majority of teachers felt that they were not knowledgeable about ADHD-type behaviours, classroom interventions to manage misbehaviour and managing ADHD-type behaviours.

Despite these arguments, half of those surveyed reported that they could effectively teach students who exhibit behaviours associated with ADHD. These findings are rather encouraging since teachers had adequate knowledge of symptoms and assessment of ADHD on the knowledge scale. However, good knowledge of those two dimensions may be insufficient for providing the appropriate interventions for students with ADHD. Nevertheless, these findings indicated that teachers' poor knowledge about ADHD does not influence their confidence (self-efficacy) to effectively teach students with ADHD. A possible explanation for these contradictory results might be that teachers gave random responses to the questions of this domain.

Although generally, the surveyed teachers held slightly negative attitudes towards ADHD, they reported more favorable attitudes in relation to the desire for more training and professional development regarding ADHD ($M=3.72$). Similarly, the study conducted in Australia also indicated that teachers desired better training on ADHD (Mulholland et al., 2015). Since only 21% of those surveyed did not receive training on ADHD, these results stress the need for professional development regarding ADHD for Kazakhstani mainstream school teachers.

Overall, the findings of the present study suggested that Nur-Sultan mainstream school teachers held slightly negative attitudes towards ADHD. Also, it is important to note that they agreed to some extent with positive and negative statements simultaneously. Looking at the four attitude constructs, participants in this study reported more favorable attitudes in relation to the perceived dependency on control (desire for more professional development regarding ADHD) and self-efficacy (confidence in being able to teach students with ADHD). However, they had negative cognitive beliefs about ADHD and negative affective feelings towards teaching children with ADHD.

5.4 Factors affecting Teachers' Knowledge of and Attitudes towards ADHD

The final aim of the present study was to analyze whether teacher-related background factors influence teachers' knowledge of and attitudes towards ADHD. Five separate models of multiple linear regression were performed to identify predictors of level of knowledge about ADHD and four domains of attitudes towards ADHD, which are feelings towards teaching students with ADHD, beliefs about ADHD and its associated behaviours, accommodations, knowledge, and training regarding ADHD, and desire for more training regarding ADHD. The findings revealed that additional training on ADHD and experience with students with hyperactive or inattentive behaviours did significantly predict the level of knowledge about ADHD, whilst the level of knowledge about ADHD, additional training on ADHD and age predicted teachers' favorable attitudes towards ADHD.

Numerous research studies found that years of teaching experience was considered as one of the main teacher-related factors which affected teachers' knowledge about ADHD (Guerra & Brown, 2012; Liviatan, 2015; Menikdiwela & Vojtova, 2017; Mulholland et al., 2015). However, the findings of the current study do not support the previous research. The results of the first model of multiple regression indicated that having an experience with students with hyperactive or inattentive behaviours was a significant predictor of knowledge ($p < .001$). This finding is consistent with the previous studies (Anderson et al., 2012; Kos et al., 2004; Sciutto et al., 2000 as cited in Guerra & Brown, 2012), which have suggested that teachers' experience with teaching students with ADHD had a positive impact on their knowledge about ADHD. That is, as teachers get more experience working with students with ADHD, they demonstrate greater levels of knowledge about ADHD.

From this study, it is also important to note that receiving additional training on ADHD ($p = .02$) was a significant predictor of the level of teachers' knowledge about

ADHD. This also accords with our earlier observations (Kos et al., 2004; Yarde-Leavett, 2018), which showed that more professional development on ADHD can lead to greater knowledge about ADHD. This means that teachers who had specific ADHD training are more knowledgeable about ADHD than their less trained colleagues.

The multiple regression of teacher background factors with feelings towards teaching students with ADHD revealed that teachers' level of knowledge about ADHD ($p < .001$) and receiving additional training on ADHD ($p = .01$) were significant predictors of the dependent variable. Results indicated that teachers who had a good level of knowledge about ADHD and who received additional training on ADHD are more likely to possess positive feelings towards ADHD. However, the findings of the current study do not support the previous research. On the contrary, previous research reported different effects on feelings towards teaching students who exhibit ADHD-type behaviours. For example, Mulholland et al. (2015) found that teaching experience had a significant effect on teachers' feelings. However, this finding contradicts the results of research conducted by Cueli et al. (2020) and McHargue (2019), in which they found that there was not a significant relationship between teaching experience and feelings towards teaching ADHD-affected learners.

The third model of multiple regression was run to examine the relationship between demographic variables and beliefs about ADHD and its associated behaviours. It was found that teachers' level of knowledge about ADHD had a significant effect on their beliefs about ADHD ($p < .001$). This means that teachers with a greater level of knowledge about ADHD are more likely to have positive beliefs about ADHD. This finding was also reported by Mulholland et al. (2015) who found that the level of knowledge about ADHD and experience teaching a student with ADHD had a positive relationship with teachers' beliefs about ADHD.

The next multiple linear regression analysis was conducted to see if teacher-related background factors predicted accommodations, knowledge and training regarding ADHD. This model revealed that teachers' level of knowledge about ADHD was the only significant predictor at the $< .001$ level. This result reflects those of Mulholland et al. (2015) who also found that as teachers' level of knowledge about ADHD increases, they appear to agree with the statements of a construct of accommodations, knowledge and training regarding ADHD.

The final multiple regression analysis was run to determine how demographic variables predict the desire for better training regarding ADHD. The results indicated that the level of knowledge about ADHD and age significantly predicted teachers' desire for more training regarding ADHD. One of the predictors which is the level of knowledge about ADHD was also found as a significant predictor in the study conducted by Mulholland et al. (2015) who found that teachers' knowledge about ADHD affected their desire for better training on ADHD. In addition, the present study showed that the desire for more training tended to decrease as the teachers became older. This finding broadly supports the work of other studies in this area, linking the negative direction of age with desire for more professional development regarding ADHD (Cueli et al., 2020; Yarde-Leavett, 2018).

5.5 Summary

This chapter portrayed the discussion of the main findings obtained from this research. The results of this study revealed that teachers' knowledge about ADHD was low and that they held negative attitudes towards ADHD. In summary, the discussion illustrates that Nur-Sultan mainstream school teachers' low level of knowledge about ADHD is due to the fact that not all the surveyed teachers have been trained. Moreover, the discussion reveals that in addition to the professional development regarding ADHD, the level of

knowledge about ADHD was found to significantly predict teachers' favorable attitudes towards ADHD. In contrast to previous factors, age was found as a significant effect on teachers' attitudes towards ADHD in a negative direction. The older the age of teacher is, the less positive they are towards ADHD.

The findings of the present research suggest that there is a need to increase teachers' professional development training regarding ADHD in Kazakhstan and that these training programmes should be based on teachers' experience who had in-depth interactions with children with ADHD. In the next chapter, the limitations of the current study and educational implications for further research are presented.

Chapter 6: Conclusion

The purpose of the present study was to explore general education teachers' knowledge of and attitudes towards ADHD, as well as the influence of teacher-related background factors on their knowledge of and attitudes towards ADHD in Nur-Sultan. There are three research questions that drove this study: 1. To what extent are general education teachers knowledgeable about ADHD? 2. What are general education teachers' attitudes towards ADHD? 3. Do teachers' background variables affect their knowledge of and attitudes towards students with ADHD? This study employed a survey research design to answer these research question. Overall, 167 teachers from ten mainstream schools in Nur-Sultan participated in the survey.

6.1 The Summary of Findings and Discussion Chapters

Regarding the first question of this research, it was found that generally, Nur-Sultan mainstream school teachers had poor knowledge of ADHD. The findings showed that the most accurate knowledge about ADHD focused on symptoms and prevalence, and the poorest knowledge related to treatment and aetiology. Teachers' adequate knowledge of symptoms and prevalence might be evidenced by the fact that the majority of participants in this study had experience teaching students with ADHD-type behaviours. This means that teachers who contact ADHD-affected learners regularly appear to know more about the characteristics and extent of ADHD (Greenway & Edwards, 2020). However, a low level of knowledge about treatment and aetiology might be due to the insufficient quality of professional development regarding ADHD for teachers. Therefore, the findings of the present research highlight a need for additional training on ADHD to develop information on the nature of ADHD, treatment and effective classroom interventions for children diagnosed with ADHD.

The answer obtained for the second research question was that Nur-Sultan mainstream school teachers' disposition towards ADHD was slightly negative. The findings of this study indicated that although general education teachers had unfavorable attitudes towards ADHD in terms of beliefs about ADHD and its associated behaviours, feelings towards teaching students with ADHD, and accommodations, knowledge and training regarding ADHD, they reported more favorable attitudes in relation to the desire for better training about ADHD. These results also highlight an immediate need for additional training for teachers on ADHD because in accordance with the previous studies (e.g., Mulholland et al., 2015), the results of the current study revealed positive correlation between teachers' knowledge of and attitudes towards ADHD.

The results for the third research question of this study identified teacher-related background variables which significantly predicted teachers' knowledge of and attitudes towards ADHD. Specifically, additional training on ADHD and experience with students with hyperactive or inattentive behaviours are significant to formulate Kazakhstani general education teachers' knowledge about ADHD while the level of knowledge about ADHD, additional training on ADHD and age are significant predictors of teachers' attitudes towards ADHD. More specifically, as teachers receive more additional training regarding ADHD and gain more experience working with students with ADHD, they demonstrate greater levels of knowledge about ADHD. Moreover, it was found that as teachers' have a greater level of knowledge about ADHD and more professional development regarding ADHD, they possess more favorable attitudes towards teaching students with ADHD. In addition to this, age was found as a significant predictor of attitudes in a negative direction, e.g. as teachers get older, they hold less positive attitudes towards ADHD. It is also important to note that demographic factors such as educational qualifications, initial

teacher training programmes and general teaching experience did not significant impact on teachers' knowledge of and attitudes towards ADHD.

The results from the current research provide valuable information about the phenomenon of ADHD since this is the first study conducted in Kazakhstan that focuses on assessing teachers' knowledge of and attitudes towards ADHD. It is significant to highlight that teachers' knowledge of and attitudes towards ADHD and teacher-related factors influencing them might be distinctive for each country since every country has its education practices in place for children with ADHD.

6.2 Implications

The findings of this study are consistent with previous studies (Kos et al., 2004; Yarde-Leavett, 2018), which found that additional training regarding ADHD significantly predicted a good level of knowledge about ADHD. Consequently, there is evidence that greater levels of knowledge about ADHD can lead to favorable attitudes towards students with ADHD (Mulholland et al., 2015). The findings of this research also indicated that the level of knowledge about ADHD was the best predictor of attitudes towards ADHD. Therefore, the main implication of this research is focused on providing Nur-Sultan general education teachers with professional development courses on ADHD and increasing the level of this training based on teachers' experience who had in-depth interactions with children diagnosed with ADHD.

6.3 Limitations and Recommendations for Further Research

There are a few limitations of this study that should be acknowledged. First, the current study focused on a survey research design, which prevented gaining an in-depth understanding of the phenomenon of ADHD. Therefore, it should be recommended for future research to conduct a qualitative research method to get in-depth understanding of teachers' experiences with children with ADHD-type behaviours.

Another limitation of this research was that since the present study is the first to explore teachers' knowledge of and attitudes towards ADHD in Kazakhstan and it focuses on Nur-Sultan, the need to conduct more research on ADHD in other cities and regions of Kazakhstan has emerged.

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Appendices

Appendix A

The letter to the Head of Department of Education in Nur-Sultan



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«Назарбаев Университеті» Дербес білім беру ұйымы
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«07» 02 2022

№19-36/6

**Нұр-Сұлтан қаласы Білім
басқармасының басшысы
Қ.С.Сенғазыев мырзаға**

Құрметті Қасымхан Сенғазыұлы!

Біз осы хат арқылы Сізге және Сіздің мекемеңізге өзара ынтымақтастық үшін алғысымызды білдіреміз. Сонымен қатар, Назарбаев Университеті Жоғары білім беру мектебі, Білім беруді басқару магистратура бағдарламасының студенті Акатаева Айжанға 2022 жылдың 10-20 ақпаны аралығында Нұр-Сұлтан қаласының барлық жалпы орта мектептерінде зерттеуге қажетті ақпарат жинауға (сауалнама) рұқсатыңызды беруді сұраймын. Зерттеу тақырыбы «Солтүстік Қазақстан мектеп мұғалімдерінің Гипербелсенділік және Зейін Жетіспеушілігінің Белгісі (ГЗЖБ) бойынша білімі мен көзқарасы». Зерттеу жұмысы Жоғары Білім Беру Мектебінің Ғылыми этика комитетінің тексерісінен өтіп, зерттеу құралдары мен сұрақтары қолданылуы құпталған.

Құрметпен,

Декан

А. Сагинтаева

Орынд: А.Сиргебаева
Aidana.sirgebayeva@nu.edu.kz

Appendix B**Nazarbayev University****M.Sc. in Educational Leadership: Inclusive Education****INFORMED CONSENT FORM**

**Nur-Sultan Mainstream School Teachers' Knowledge and Attitudes toward students
with Attention Deficit Hyperactivity Disorder (ADHD)**

DESCRIPTION: You are invited to participate in a research study entitled "Nur-Sultan Mainstream School teachers' knowledge and attitudes toward ADHD".

TIME INVOLVEMENT: This survey will take approximately 15 minutes to complete 62 questions (12 demographic questions and 50 statements concerning ADHD). If you do not wish to answer any question included in this survey, you may skip it and move on to the next questions.

RISKS: The potential risk of participating in this study is that you may spend your working hours to answer the survey questions. To avoid this issue, you are recommended to complete the survey in your free time. Your name or other identifying information will not be included in the survey, so you will not be linked to any information you provide.

BENEFITS: Anticipated benefits from this study are that the results of the study can be used in the development of courses or workshops for teachers supporting students with ADHD. In addition, teachers, psychologists, researchers and scholars investigating the similar topic can find the results of the research useful for the future studies in education and promotion of inclusive education practices in Kazakhstani secondary schools.

PARTICIPANT'S RIGHTS: If you have read this form and have decided to participate in this research, please understand your participation is voluntary and you have the right to withdraw from a survey at any time without penalty. The alternative is not to participate.

You have the right to refuse to answer specific questions. The results of this research study may be presented at scientific or professional meetings or published in scientific journals.

Contact Information:

If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the Master's Thesis Supervisor for this student work, (Filiz Polat, filiz.polat@nu.edu.kz). If you have any other questions or concerns or if you are not satisfied with how the research was conducted, you may contact Nazarbayev University Institutional Research Ethics Committee at gse_researchcommittee@nu.edu.kz

Statement of Consent.

By clicking "I agree" below you are indicating that you are at least 18 years old, have read and understood this consent form and agree to participate in this research study.

- I Agree
- I Disagree

Appendix C

Survey Questions

Section 1

Demographic Questions

What is your age?

- ☐ 25 years or below
- ☐ 26-35 years
- ☐ 36-45 years
- ☐ 46 years or above

1. Indicate your gender

- ☐ Male
- ☐ Female

2. What is your highest education degree?

- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ Ph.D.
- ☐ Other, please specify _____

3. What is your language of instruction?

- ☐ Kazakh
- ☐ Russian
- ☐ Other _____

4. How many years have you been teaching?

- ☐ 0-2 years
- ☐ 3-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ 21+ years

5. What grade level do you teach?

- ☐ Primary school
- ☐ Secondary school
- ☐ High school

6. What subject do you teach?

- ☐ Primary school
- ☐ Mathematics
- ☐ Physics
- ☐ Kazakh language and literature
- ☐ Russian language and literature
- ☐ Foreign language (English, Chinese, German, French, etc.)
- ☐ History
- ☐ Geography
- ☐ Biology
- ☐ ICT

- ☐ Music
 - ☐ Art
 - ☐ Technology
 - ☐ Self-education
 - ☐ Military training
 - ☐ Other _____
- 7. Have you taught a student who exhibited hyperactive or inattentive behaviours?
 - ☐ Yes
 - ☐ No (if No, go to question 9)If yes:
 - a) Did that student have an Attention Deficit Hyperactivity Disorder (ADHD) diagnosis?
 - ☐ Yes
 - ☐ No
 - ☐ I don't know
 - b) Do you currently teach a student who exhibits hyperactive or inattentive behaviours?
 - ☐ Yes
 - ☐ No
 - c) How Many?
 - ☐ 1-3
 - ☐ 4-5
 - ☐ more than 5
 - ☐ Other, specify _____
 - d) How many currently have an ADHD diagnosis?
 - ☐ 1-3
 - ☐ 4-5
 - ☐ more than 5
 - ☐ Other, specify _____
- 8. What type of school best represents your school?
 - ☐ Mainstream school
 - ☐ Gifted school
- 9. Have you covered ADHD during your initial teacher training programme?
 - ☐ None
 - ☐ Some
 - ☐ High
- 10. Have you had additional training/courses on ADHD?
 - ☐ Yes, I have had
 - ☐ No, I haven't had
- 11. Would you like to participate in additional professional development courses on ADHD?
 - ☐ Yes
 - ☐ No

- I don't know

Section 2

Scale for ADHD-specific knowledge (SASK)

The following questions ask about ADHD. Please answer the following questions to the best of your ability.

#	Statements	True	False	I don't know
1.	ADHD is a neurobiological, developmental disorder.			
2.	Special diets (e.g. reduced sugar, wheat free, lactose free, additive free) are an effective treatment for ADHD.			
3.	Children with ADHD tend to have poor concentration.			
4.	A combination of stimulant medication and behaviour management is an effective treatment for ADHD.			
5.	There are different subtypes of ADHD which can present with different behaviours.			
6.	ADHD can be inherited.			
7.	Children with ADHD can present with hyperactive behaviours, inattentive behaviours, or a combination of both.			
8.	Children with ADHD are easily distracted.			
9.	Children with ADHD benefit from stricter parenting and schooling.			
10.	ADHD is caused by too much sugar in the diet.			
11.	Children who have the hyperactive type of ADHD often talk excessively, and have difficulty staying in their seat.			
12.	ADHD is caused by poor parenting.			
13.	Children with ADHD can choose to be better behaved.			
14.	Some children can present with inattentive or hyperactive behaviours, yet not meet the criteria for an ADHD diagnosis.			
15.	There is approximately 1 child in every class that exhibits ADHD type behaviours.			
16.	Children with ADHD often have problem concentrating on table-top work.			
17.	Children with ADHD often fail to give close attention to their work and make careless mistakes.			
18.	Teachers are often the first to recognize ADHD type behaviours and refer children for assessment.			
19.	The cause of ADHD is unknown.			
20.	Children who present with ADHD behaviours, regardless of ADHD diagnosis, can benefit from individualised behaviour management strategies.			

Section 3

Scale for ADHD-specific attitudes (SASA)

We would like to know the degree to which you agree or disagree with the following statements. Please read the paragraph below and then indicate your response to the following statements. There are no “right” or “wrong” answers.

The behavioural characteristics associated with ADHD can manifest in different ways within the classroom setting. Students who exhibit ADHD associated behaviours often fail to give close attention to detail, make careless mistakes, have difficulty sustaining attention and do not seem to listen when spoken to directly. Students, who display ADHD type behaviours have difficulty organising themselves, are easily distracted, lose things, and are forgetful. Often they have problems with orientation (i.e. where to orientate their attention within the classroom), lose assessment criteria, books, or other equipment, often fidget and leave their seat, avoid tasks that require sustained mental effort, run about or climb excessively, have difficulty doing things quietly, talk excessively and have difficulty waiting their turn, interrupt others and may come to class unprepared to learn, without any note taking equipment.

Please tick the choice that most corresponds with your response.

Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
SD	D	SwD	SwA	A	SA

#	Statements	SD	D	SwD	SwA	A	SA
	Students who exhibit behaviours associated with ADHD:						
1.	are rewarding to work with						
2.	interfere with my ability to effectively teach my class						
3.	perform well in some subjects and not others						
4.	have no excuse for their poor behaviour if they do not have a formal diagnosis						
5.	misbehave because they don't want to follow the set rules						
6.	need more structure and discipline, not assistance with their academic work						
7.	bring new perspectives to the topics I am teaching						
8.	need to try harder to focus on their school work						
	I believe:						
9.	ADHD is over diagnosed						

10.	ADHD is a valid diagnosis						
11.	ADHD is an excuse for poor parenting						
12.	children who exhibit ADHD type behaviours are deliberately misbehaving						
	I would:						
13.	refer a student who exhibited ADHD-type behaviours in my classroom to the school psychologists for a possible ADHD assessment						
14.	like to know more about ADHD and its associated behaviours						
15.	like to have more information about classroom interventions to assist me with educating students who display ADHD-type behaviours						
	I find:						
16.	behaviours associated with ADHD, irritating in the classroom						
17.	students who exhibit ADHD-type behaviours rude						
18.	it challenging to teach students who exhibit behaviours associated with ADHD						
19.	it rewarding to see the accomplishments of students who display ADHD-type behaviours						
20.	students who display ADHD-type behaviours cause me to experience stress						
	When it comes to differentiation, I feel:						
21.	ADHD is a benefit to the growth of my teaching skills						
22.	I don't have the time						
23.	I already change my lessons and teaching styles						
24.	educational accommodations for students with ADHD-type behaviour are easy to implement in a general education classroom						
	I feel I am knowledgeable about:						
25.	ADHD-type behaviours						
26.	classroom interventions to manage misbehaviour						
	I feel:						
27.	I have received adequate professional development about managing ADHD-type behaviours						

28.	I can effectively teach students who exhibit behaviours associated with ADHD						
29.	I want to be more effective teaching students who display ADHD-type behaviours						
30.	I dislike teaching classes that contain students who display ADHD-type behaviours						

Thank you for the participation in this survey!