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Teachers' Readiness and Knowledge About ADHD Students among Mainstream School Teachers: A Systematic Literature Review

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Abstract

The effectiveness of the teaching and learning process in the classroom will be achieved if all students focus their full attention and can give a good response to the ongoing teaching and learning activities in classroom. Teachers' readiness and knowledge of Attention-Deficit/Hyperactivity Disorder (ADHD) can provide teachers with an understanding of the behavior of ADHD students in creating a conducive and optimal learning environment for ADHD students in school. This study aimed to measure the differences in the attitudes of mainstream primary school teachers towards the willingness to teach students with ADHD in their classrooms and the level of teachers' knowledges of ADHD among students. This study uses a Systematic Literature Review (SLR) based on 10 articles that have been deliberately selected to find and evaluate the relationship between the readiness and knowledge of educators about ADHD students. The main source of this study is through the highlights of previous works obtained from the online database of Google Scholar and Scopus analyzed based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). This study provides insight into how teacher preparedness is influenced by their knowledge of ADHD students and this study can help to understand the problems and needs of mainstream school teachers who have ADHD students in their classrooms. This study proves that the willingness and knowledge of teachers is important in helping parents and students with ADHD. Further research needs to be carried out so that ADHD students will not miss out on learning and also able to provide more reference sources related to deal with ADHD students in classroom.

Keywords: Teachers, Readiness, Knowledge, Attention Deficit Hyperactivity Disorder (ADHD) Students, Mainstream School Teachers

Introduction

ADHD is a common disorder characterized by persistent patterns of supervision and/or hyperactivity-impulsivity that interfere with function or development. Behaviors or symptoms, of ADHD include attention deficit, hyperactivity, and chronic impulsivity. Many are diagnosed with ADHD as children, as symptoms become prominent in early development and

academic employment. ADHD symptoms can persist into adulthood and affect a person's social relationships as well as academic and employment performance.

All students have different "abilities, abilities and intelligences" and every child has the same right to education (Adiputra, 2019). Children with learning disabilities, hyperactivity and impulsiveness are characterized as children with ADHD problems. ADHD students tend to disrupt learning and teaching in the classroom because they are difficult to control and can sometimes be aggressive towards other students as well as towards teachers without understanding the consequences of their actions. ADHD students find it difficult to filter out environmental stimuli, maintain focus and stamina, find it difficult to complete assigned tasks or exercises and find it difficult to interact and collaborate with other students (Tibke, 2019).

ADHD students have trouble sitting still, being impatient, having difficulty paying full attention, being fidgety, being very active and often rebellious. This problem will cause problems for parents at home, at school and wherever they are. According to Bolinger et al p.291, (2020) affects about 3 to 5% of children globally at least one student with ADHD in every classroom of 20-30 students. Teachers need to be good at planning, creative in providing training or activities based on the level and level of achievement and abilities of students, especially students with ADHD. The different teaching and learning methods from mainstream students are able to make ADHD students stay focused and reduce movement during teaching and learning. Otherwise, the issue of ADHD students dropping out of academics will remain recurring endlessly (Merge, 2020). Adiputra (2019) said that, not all ADHD students are academically failure, in fact there are also ADHD students who are genius and above average intelligence quotients or IQS.

According to Gabriel Villarreal, LPC, Counsellor at ADHD Counselling in Roanoke Valley in Virginia, ADHD is a neurological disorder although the exact cause has not been confirmed yet. According to Villarreal, ADHD occurs when there is growth of the prefrontal cortex left behind in the back of the brain. People with ADHD will feel unhappy where neurochemicals will be produced in the brain, especially dopamine and norepinephrine.

Surveys around the world shows that the percentage of ADHD is higher in high-income countries. According to National Institute of Mental Health in 2017, the prevalence of United State lifelong ADHD among children increased with the latest estimate at 11%. An estimated 6.1 million American children ages 2-17 were ever diagnosed with ADHD, representing 9.4% of this group nationwide in 2016. Journal of Clinical Child and Adolescent Psychology (2018) stating that boys are twice as likely than girls to have ever been diagnosed with ADHD.

Children with ADHD increases with age. Surveys showed 2.4% (388,000) of children aged 2 to 5 years, and 9.6% (2.4 million) of children aged 6 to 11 diagnosed with ADHD.

- The average age of diagnosis for severe ADHD is 4 years.
- The average age of diagnosis for moderate ADHD is 6 years.
- The average age of diagnosis for mild ADHD is 7 years.

(*Jurnal American Academy of Child and Adolescent Psychiatry*, 2014 & 2018)

ADHD is common developmental problems detected during childhood. Children with ADHD issues are found to have problems such as attention deficit, exhibiting impulsive behavior (acting without thinking of consequences) or being overactive.

Among the characteristics of ADHD are lack of attention, a lot of daydreaming, a bit careless, forgetting or losing a lot of things, frequent body movements or restlessness, talking too much, often making mistakes because of being too lazy or making high-risk behaviors, difficult

to wait for a turn and difficult to get along with others. Tuanku Muhriz, Chancellor's Hospital Child Development Pediatrician, Universiti Kebangsaan Malaysia (HCTM UKM), Associate Professor Dr Norazlin Kamal Nor in an interview stated that these behavioral and concentration problems occur more often and significantly than what is commonly seen in other children in the same stage of development.

There are three different types of ADHD, namely attention deficit predominance, Hyperactive-Impulsive predominance and a combination predominance of both types, "he said when contacted. Worldwide, the estimated prevalence of children's ADHD is 5.29 percent, while in Malaysia, the frequency or prevalence of ADHD is between 1.6 percent and 4.6 percent. It is one of the most common brain development problems found in childhood. Although the causes and risk factors of ADHD are not known, but medical research shows that genetic elements play an important role.

Among other factors that have been linked to ADHD are brain injury at birth, exposure to environmental risks when mothers have diabetes or high blood pressure during pregnancy and alcohol consumption and smoking during pregnancy. Children born prematurely and underweight are also at higher risk of developing ADHD. Scientific studies to date have no solid evidence to support the general view that ADHD is caused by consuming too many sugary foods or preservative foods," he said.

Literature Review

Students with ADHD often interfere with the teaching and learning process. This is because ADHD students are unable to provide focus for long periods of time. This is evidenced by Caroline Miller's study stating that ADHD is one of the first things identified when a child's behavior in class or school work performance is problematic. A child who cannot sit still, answer in class without raising his hand, who does not complete his homework, who looks daydreaming when the teacher insists on instructions are symptoms of ADHD.

According to Nigg, et.al (2020), ADHD is more or less same as attention deficit disorder (add), where add is also about hearing problems and failing to focus on any task, failing to get certain information and ADHD according to them is disorder in the beginning age and believed to continue until adolescence. Anxiety, and epilepsy may not appear in adolescence but poor focus and lack of attention such as adverse symptoms typically persist in ADHD individuals (Weibel et al., 2020; Capodiecici et al., 2018).

Various methods are used to verify the diagnosis that been carried out. According to nelson et al (2019) methods of interview, observation, and psychological tests can be used to diagnose adhd children. However, the process of collecting this information and data is likely trouble in time consuming and difficulty due to age factors for adults and adolescents. Probably because adults may not fully understand the signs of ADHD (Luthar et al., 2020).

The number of students ADHD increasing each day. Teachers need to deal with the students in the best possible manner (Siedentop et al., 2019). Studies have been conducted to look at the training needs of teachers to deal with ADHD students (Young et al., 2020). But typically, teachers always rely on self -study methods to deal with students with ADHD. De Sousa (2020), stated that usually teachers will learn independently in dealing with the problems of students especially ADHD students. Not only that, it is very important to know how teachers coop and deal with students with ADHD problems and look at the initiative and creativity of teachers in the mainstream school in addressing ADHD among mainstream students.

Teachers have an important role to play in identifying and make assessments of all students including students with ADHD in mainstream classrooms. Therefore, teachers' willingness to accept students with ADHD at in the mainstream class it is very important to ensure the students can learn together (Abidin et al., 2019). Teachers' knowledge about the characteristics of ADHD students (Ewe, 2019) including their age, qualifications, cultural differences, experience and training (Slobodin & Masalha, 2020) can provide knowledge and as a basic preparation for teachers to deal with adhd students in mainstream classrooms. This is because ADHD students do not belong to students with special needs.

Gialloreti et al (2019) stating that some teachers believe that ADHD is an illness and affected by size of the class. And based on this belief there are teachers who argue that Adhd students should be treated using drugs and psychotherapeutically (Anastopoulos et al., 2020). There are also teachers who believe that ADHD is socially constructed and environmental factors such as class size influence their behavior (Dort et al, 2020). These teachers suggest that changing the environment of ADHD students will help in benefiting and managing these students (Owens et al., 2020). ADHD is a label, but if teachers listen, they will truly get to know the child behind the label, and that is where success begins (Brittany, 2020).

Methodology

This study uses literature review methods to obtain research data and evidence. Researchers use this method to obtain as many relevant findings or information related to the title of the study. The process of obtaining information focused on reading and references from journals, papers and articles on the problems faced by teachers towards ADHD students. All the information obtained will be used by the researcher to write their study. Next, the material is used as a reading and reference source to help researchers in producing better scientific writing.

This study only takes into accounts journal articles published in 2018 to 2022 so that the information obtained is relevant and up -to -date. By using the PRISMA method to analyse the articles that have been collected and screened based on the objectives of the study. There are four steps in PRISMA that contain identification, screening, eligibility and inclusion. This method was chosen because it can help the researcher synthesize journal articles that are truly relevant to the title and aim of the study.

Research is important in leading human beings towards a more advanced life in the future. Systematic research can bring progress to our world. In this systematic survey, researchers have used Scopus and Google Scholar as databases to select journal articles relevant to the purpose of this systematic survey. Several criteria have been accounting to obtain the data required in this systematic study to obtain data required in the study. This literature review has referred to journal articles published in the range of 2018 to 2022. These journal articles are related to teachers' adaptation to the concept and management of formative assessment. This study used a systematic survey method based on Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). The PRISMA checklist has included guidelines for identifying, selecting, evaluating and synthesizing studies and is suitable for use in the field of Education and Social Sciences. In addition, the PRISMA guidelines can also help in multiplying the results of literature highlights and the results are more systematic and detailed. The PRISMA guidelines have four processes; identification, screening, eligibility and inclusion.

Identification

Article search years are limited to the past 5 years 2018, 2019, 2020, 2021 and 2022. Articles collected through Google Scholar and Scopus databases. The process is to search for related words and terms to be the primary key with various word variations to provide more options for the selected database in the search for more relevant articles to review. According to Okoli (2015), keywords can be developed based on research questions. The keyword used in the *Google Scholar* search is teacher’s readiness in teaching ADHD students while in *Scopus* the search keyword is ADHD in school as the search using the same keyword as Google scholar did not find any articles in the database. There are total of 137 journal articles accessed in the Google Scholar database while a total of 127 articles in the Scopus database. The total number of articles achieved is 264. Search using English and Malay languages.

Screening

The reviewers only chose journal articles. Proceedings, trial articles and books are excluded from this rating. Since the focus of the study is on low school rankings, the study population from secondary schools and in higher education is not counted. In addition, the selection of articles focuses on the respondent group consisting of teachers and parents because they are the stakeholders in managing ADHD students. Readiness and knowledges of mainstream teachers about ADHD students are the criteria for this study. Recurring articles are also discarded based on reading the header and abstract. After being filtered, as many as 99 articles in the Google Scholar database were removed as well as 94 articles on Scopus were removed from the list because did not relevant based on the study criteria. So, the remaining articles that will rank for eligibility are 38 articles in the Google Scholar and 33 articles in the Scopus database. The total number articles left for eligibility are 71. In this stage, the researcher has determined some criteria to filter and select the articles sought to match the quality of this study.

Table 1 shows the search strings used by the researchers to search for articles using Google Scholar and Scopus.

Table 1
Searches for teachers’ readiness and knowledge

Database	Search String
<i>Google Scholar</i>	“kesediaan dan pengetahuan guru mengenai ADHD” “teachers’ readiness and knowledge about ADHD students”
<i>Scopus</i>	TITLE-ABS-KEY ((ADHD) AND (in school*)

Eligibility

In this process, involves the researcher selecting the appropriate article manually with the criteria to be studied. This involves a process of reading the title and abstract of the study in parallel with the teacher’s readiness and knowledge of ADHD students in school. A total of 71 articles were screened using the title, abstract, methodology, findings and discussion of the

study to ensure that the articles met the selection criteria and purpose of the study. A total of 22 articles have been removed from the total number of articles in Google Scholar and a total of 26 articles from Scopus. Makes the total number of articles left for review only 10. This is because most of the articles are more on ways and recommendations to parents of dealing with a child with ADHD.

Inclusion

At the final stage, total of 10 articles remained and met the selection criteria as expected and relevance to the research. By using PRISMA model, at this stage is to enter a list of articles that have been identified by meeting all the criteria into the group of articles to be analysed. At this time, articles that related with the selection criteria will be analysed according to a pre-determined theme that is the relationship of teachers' readiness and knowledge about ADHD among mainstream students. **Table 2** shows the articles selection criteria in this study:

Table 2

Criteria of the article choose

Criteria	Accept	Reject
Year	2018-2022	< 2018
Language	Malay and English	Beside Malay and English
Resource	Article journal (empirical study)	Proceeding, book, article summary

From the 294 articles that were screened, only 10 articles were selected based on accepted criteria. The article that was rejected was due to the study not involving teachers and not involving the field of teaching.

Figure 1 shows a flow chart of a literature review related to teachers' readiness and knowledges of ADHD students in mainstream schools based on four processes in the PRISMA Model guidelines:

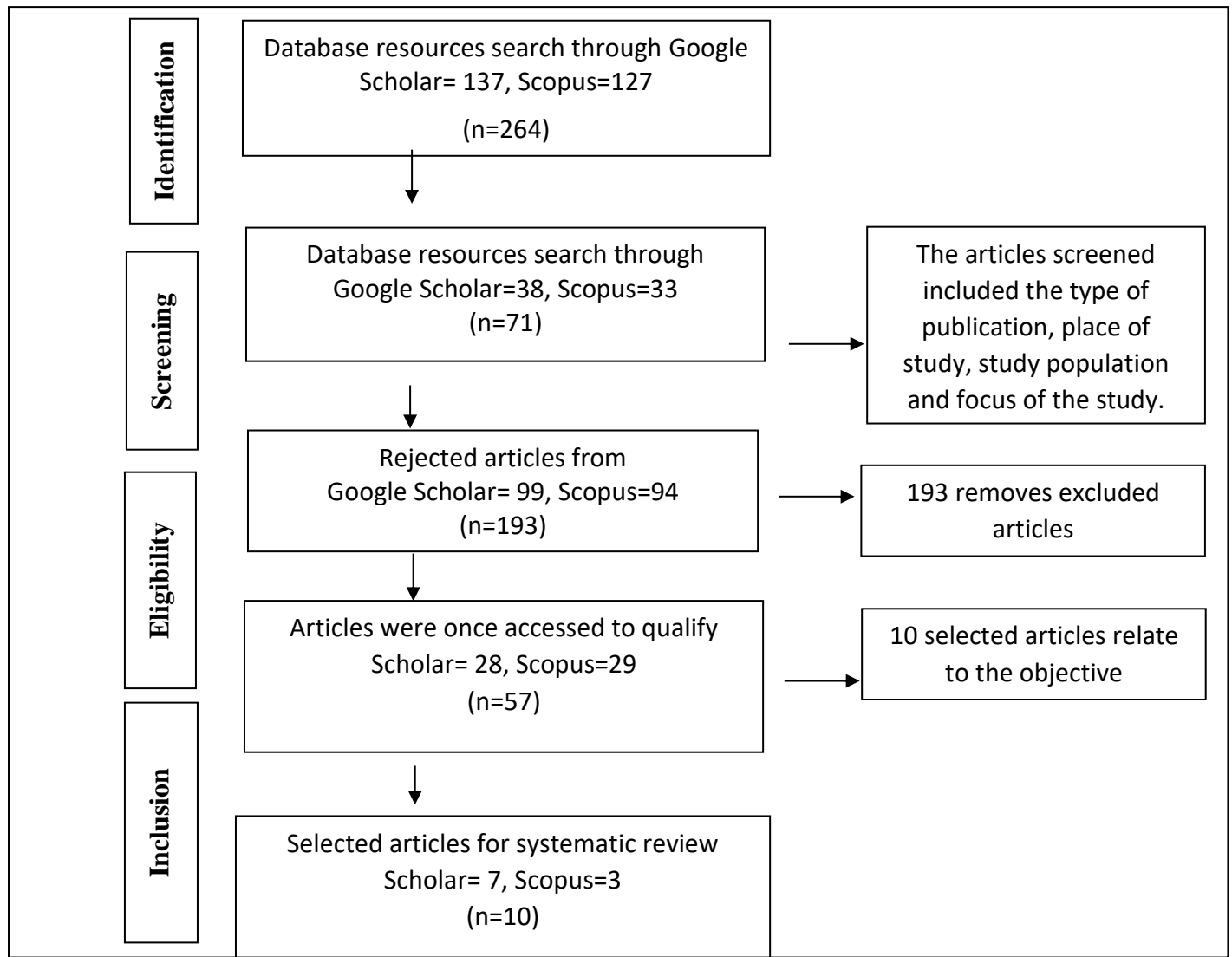


Figure 1: Selection process PRISMA based on Page et al (2021)

Results and Discussion

The findings show that there is a relationship between teachers' readiness and knowledge of ADHD among mainstream teachers. Teacher readiness and teacher knowledge were expressed in two different studies.

Table 3

Studies in the SLR based on the aim or the objective on the research.

Id Article (A)	Titles	Objectives of the study
A1	What Do Primary and Secondary School Teachers Know About ADHD in Children? Findings from a Systematic Review and a Representative (Mohr-Jensen et al., 2019)	Identifying primary and secondary school teachers know about ADHD and its factors that predicting their knowledge.
A2	Knowledge About ADHD in Primary Teachers of Public Schools of Sabaneta (Padilla et al., 2018).	Describing the knowledge of ADHD among primary school teachers
A3	Pembelajaran Daring Pada Siswa Attention Deficit Hyperactivity Disorder (Adhd) Di Sekolah Dasar (Prasetyo & Dasnim, 2022)	Obtaining information about the implementation of online learning by Attention Deficit Hyperactivity Disorder (ADHD) children in inclusive elementary schools
A4	The Effects of Using Positive Reinforcement Techniques to Reduce Disruptive Behavior of Pupil with ADHD (Abu Bakar &, 2020)	Studying the effects of using positive reinforcement techniques to reduce disruptive behavior of ADHD children.
A5	Modelling the Factors that Influence the Awareness on ADHD of Children Among Primary School Teachers: A PLS – SEM approach (Nafi et al., 2021).	Investigating the factors influence the awareness of ADHD among children among primary school teachers using PLS-SEM approach.
A6	Education Professionals' Attitudes towards the Inclusion of Children with ADHD: The Role of Knowledge and Stigma (Toye et al., 2019).	Investigating the effect of ADHD knowledges and stigma on professionals' attitudes.
A7	Tahap Pengetahuan Mengenai Attention Deficit/Hyperactivity Disorder (ADHD) Dalam Kalangan Guru Sekolah Rendah Di Daerah Alor Gajah, Melaka (Ariffin & Alias, 2021).	Determining the level of knowledge of primary school teachers about ADHD in Alor Gajah District, Melaka.
A8	Knowledge and Feelings of competence with Regard to ADHD among support staff in All-day Primary Schools (Domsch et al., 2021)	Improving student outcomes by supporting students with disabilities and their need effectively and efficiency strategies

A9	Hubungan antara Pengetahuan dan Kesiapan guru menerima murid ADHD di dalam kelas arus Perdana (Abidin et al., 2019).	Investigating the relationship between knowledge and teachers willingness to accept students with ADHD in mainstream classrooms
A10	What Do Primary and Secondary School Teachers Know About ADHD in Children? Findings From a Systematic Review and a Representative, Nationwide Sample of Danish Teachers (Mohr-Jensen et al., 2019)	Describing how the implementation of special services provided by inclusive schools for children with ADHD

Searches for articles that coincide with the title of the study are not widely available in the Google Scholar or Scopus databases. The article analysed is an article that states the objective of the study which is similar to the objective of this study where the objective of the study is to determine the readiness and knowledges of teachers in managing ADHD students. Table 4 will show the relationship between teachers' readiness and knowledge about ADHD students based on the finding articles.

Table 4

The relationship between readiness and knowledges based on the finding in the articles

Id Article (A)	Title	Readiness and Knowledges
A1	What Do Primary and Secondary School Teachers Know About ADHD in Children? Findings from a Systematic Review and a Representative (Mohr-Jensen et al., 2019)	Teachers require knowledge about ADHD to successfully include and manage children with ADHD and additionally to ensure positive working environments for teachers
A2	Knowledge About ADHD in Primary Teachers of Public Schools of Sabaneta (Padilla et al., 2018).	The need for initiatives to be implemented to ensure that reflected in new teaching techniques that facilitate the learning and development of children who suffer from the disorder.
A3	Pembelajaran Daring Pada Siswa Attention Deficit Hyperactivity Disorder (Adhd) Di Sekolah Dasar (Prasetyo & Dasnim, 2022)	Teachers and school administrators need to know how to deal with ADHD students so that learning can be carried out effectively.
A4	The Effects of Using Positive Reinforcement Techniques to Reduce Disruptive Behavior of Pupil with ADHD (Abu Bakar & Zainal, 2020)	Assist and guide teachers in addressing pupil behavior problems

A5	Modelling the Factors that Influence the Awareness on ADHD of Children Among Primary School Teachers: A PLS – SEM approach (Nafi et al., 2021).	Knowledge and attitude have significant influences towards awareness. Primary school teachers should gain knowledge about ADHD.
A6	Education Professionals' Attitudes towards the Inclusion of Children with ADHD: The Role of Knowledge and Stigma (Toye et al., 2019).	Teachers with more knowledge of ADHD and less stigma held more positive attitudes towards mainstream inclusion.
A7	Tahap Pengetahuan Mengenai Attention Deficit/Hyperactivity Disorder (ADHD) Dalam Kalangan Guru Sekolah Rendah Di Daerah Alor Gajah, Melaka (Ariffin & Alias, 2021).	Moderate knowledge of primary school teachers about ADHD. Teacher's knowledge is important and determines the acceptance of students in the classroom. Educational background and teaching experience also influence teachers 'level of knowledge' about ADHD and indirectly affect teachers' willingness to accept and teach ADHD students.
A8	Knowledge and Feelings of competence with Regard to ADHD among support staff in All-day Primary Schools (Domsch et al., 2021)	The importance to trained pedagogical teachers in the supervision of children with concentration problems.
A9	Hubungan antara Pengetahuan dan Kesiapan guru menerima murid ADHD di dalam kelas arus Perdana (Abidin et al., 2019).	This study found knowledge of ADHD has no relation in ensuring teachers are willing to accept students with ADHD in the mainstream classroom.
A10	What Do Primary and Secondary School Teachers Know About ADHD in Children? Findings From a Systematic Review and a Representative, Nationwide Sample of Danish Teachers (Mohr-Jensen et al., 2019)	Most teachers identified the symptoms of ADHD and effective classroom intervention strategies. Knowledge about other characteristics, etiology, prognosis, and treatment was inconsistent. Among the strongest predictors for correct knowledge was having been provided postgraduate education about ADHD.

Based on the finding, many educators in Malaysia do not have the appropriate knowledges, information, training, and resources for effective pedagogy for ADHD students in mainstream classrooms. Pathetically, some teachers are not ready with ADHD knowledge. Knowledge can come from teaching experience or can be gained from educational training received. Previous studies have found that teachers 'readiness and knowledge of mainstream teachers' ADHD are at a moderate level. Pupils who exhibit behaviors characteristic of ADHD in the mainstream can disrupt or disturb the learning environment, such disruption can lead to ineffective pedagogical processes and also affect academic, social success and the

development of the whole class. Therefore, having adequate knowledge about ADHD and ADHD in the classroom is necessary for teachers.

Teachers' attitudes towards and willingness to teach ADHD students in their classrooms were more positive than what was found in the results of the study. Previous studies have shown that something needs to be done to increase teachers' understanding of ADHD students if they want to increase teachers' positive attitude towards teaching those students. Previous studies have suggested three intervention methods that can be useful in enhancing positive attitudes among ADHD teachers: In-service preparation for ADHD, a collaborative consultation model and simply educating teachers about ADHD.

Recently, experimental studies have shown the importance of providing additional training on ADHD because this training effectively enhances knowledge. After attending an in-service program that promotes their "knowledge and understanding" of ADHD, the teaching application of positive behavior management strategies and high-level teaching support. Teacher need initiative to be implement to ensure that teaching strategies and techniques that facilitate the learning and development of ADHD students. Base on the finding also, teachers in mainstream classes should gain knowledge about ADHD as the preparation if they have ADHD students in the future class.

The classroom environment in schools also needs to be improved based on appropriate classroom practices to deal with ADHD students and provide greater care and attention in their classrooms. the previous study suggested that there were differences of ADHD students in the regular classroom and in addition to their peers. Teachers and communities should avoid labelling those ADHD students. Teachers should accept, willing to help and teach ADHD students with extra guidance and attention towards ADHD students.

Conclusion

Teachers are the second individual besides parents who play a role in shaping the personality and character building. Therefore, having adequate knowledge of ADHD and the ability to implement classroom behavior management interventions is necessary for teachers. Adequate knowledge has a correlation with teachers' willingness to accept ADHD students in their classrooms. Therefore, efforts should be made to encourage teachers to be willing to improve their knowledge and skills by providing the necessary training courses on ADHD. This will help them work with students with ADHD in their school, accept their problems in the classroom, improve their academic achievement, work with special education teachers to develop successful intervention plans for students with ADHD and be more mindful of the needs of students in in class.

The fallacy about ADHD among children is perpetually valid and diagnosed. Teachers need to be familiar with this problem because it involves the effectiveness and level of student mastery in teaching and learning. In addition to parents, teachers can also provide referrals to doctors if they have identified students who have ADHD problems to be diagnosed with. Teacher knowledge about ADHD is very important in ensuring conducive learning in the classroom and preventing teachers from being mistaken at the students because ADHD can be considered as a sensitive issue for some people, especially parents. At the same time, teacher knowledge about ADHD among students able to help teachers formulating the best strategies and interventions for students so that these ADHD students will not be left behind in their lessons. This is because the needs and managing ADHD students are different from students who are in the mainstream classroom. In conclusion, this study proves that the willingness and knowledge of teachers are important in helping parents and students who

have ADHD problems. Educational background and experience also affect the willingness and knowledge of the teachers to teach ADHD students.

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