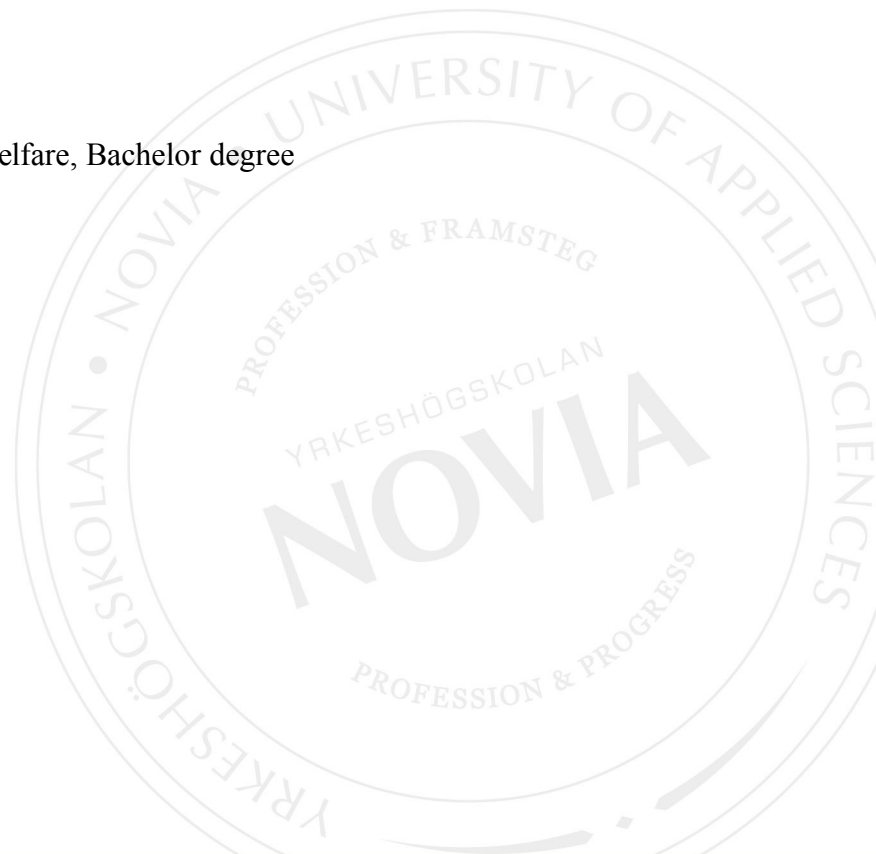


**IMPACTS OF ADHD SYMPTOMS TO PRESCHOOLERS and FAMILY  
FUNCTIONING and REVIEW THE FOUND NON-PHARMACOLOGICAL  
TREATMENTS FOR ADHD**

**Systematic literature review**

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## BACHELOR'S THESIS

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### Abstract

**Aim:** The thesis is about ADHD symptoms and its impacts on child life and family functioning. The gathered information is the base to search and find out non-pharmacological interventions. The research question is 'What non-pharmacological treatments was conducted for improving preschoolers 'ADHD?'. Social cognitive learning theory of Albert Bandura and Partnership in care of Anne Casey was used to explain the mutual influences of people, environment and behaviours; the impacts of behaviour learning with different reinforcement surroundings; and self-efficacy characteristics as well the nurse roles and family roles in child care.

**Method:** A systematic literature review was conducted to search articles from EBSCO Host CINAHL and MEDLINES database, then analyzed content of the found interventions to have an overview of different non-pharmacological interventions with inductive approaches

**Results:** There was total 123 articles from both database and 26 useable articles. Results of non-pharmacological interventions included parent training programmes, child focused interventions and teacher intervention. Parent training programs category was the majority intervention articles.

**Conclusion:** Parent education is important part of most found intervention (psychoeducation). Most interventions contributed to child behaviour improvement and family functioning. There is a need to rise awareness of parents about many available non-medical intervention as well as ADHD education to parents. More supports are needed to prevent dropout and inattending from parents in order to maximize intervention outcomes. Early diagnosis and treatment are benefit for ADHD children later on. ADHD with comorbid disorder needs to have specific intervention than ADHD. Children are small and still capable to be flexible and malleable by behavioural interventions.

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Language: English

Key words: "preschool", "nonpharmacological" "ADHD", "parent training", "child intervention", "parenting", ADHD impact"

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## 1. Introduction

My concern is that medication always associates with side effects either common and/ or complicated, no matter what kind of medication. Young children, particularly preschoolers, should not consume or prescribed a lot of medication if not for treating physical condition problems. A 13-year-old boy I acquainted was diagnosed with ADD under medication treatment in Vietnam but it seems that things has not gone well with situation. He is still complained by teachers, did not want to continue to study next year, continues to make some impulsive decisions at school and home. His mothers and auntie are really stress and pressure between money- earning and his future. These concerns lead me to wonder what if he got diagnosed earlier, and was under other type of treatments such as behavior earlier at younger age, the situation may be different. Therefore, idea of this thesis came from these concerns: ADHD, its symptoms impact to child and family, what kind of non-medical treatments to child at their early age.

First part of this thesis is to mention about ADHD symptoms, its impacts to patients' life (social, academic life) and relationship with family members. Theories of thesis are about the social cognitive learning therapy. The goal of this thesis is to review the current applied non-pharmacological interventions for family and ADHD children around 2 to 5 years old.

Second part of this thesis is the research methodology: literature review to collect relevant information, analyze, understand non-pharmacological interventions which have been applied for better outcomes to the ADHD child and to his/ her family. The collected information are gathered, described and then discussed.

## 2. Background

Around 7,2% of worldwide children and youth are affected by Attention-Deficit/Hyperactivity Disorder or ADHD (Wolraich, M.L., et al., 2019) and ADHD is the *third – most- common mental disorders* which depression and anxiety are in first and second range (Bélanger, S. A., et al., 2018).

### 2.1 Attention Deficit Hyperactivity Disorder- ADHD

The Diagnostic and Statistical Manual of Mental Disorders 5<sup>th</sup> edition (DSM-5) mentioned that ADHD is *a neurodevelopmental disorder* meaning that disorder associated with the development of nerve system causing the impairment of cognitive functioning. ADHD is defined as a life-persistent type of attention impairment with or without hyperactivity, impulsiveness. These impairments affect to child's functioning and development leading to negative consequences in social interactions, academic, occupation and well-being (Bélanger, S. A., et al., 2018).

Heritability is the main etiological factor to ADHD. Besides genetic factors, these below-assumed environmental factors are presumed as risks to develop ADHD although they has not been proven. Prenatal stage involves with material stress, consumption of alcohol and tobacco during pregnancy, or low birth weight and prematurity. Environmental toxins include organophosphates, polychlorinated biphenyls, lead. Disadvantageous psychosocial

conditions relates to severe deprivation in early childhood, maternal hostility. Nutrition is considered as risk factors to develop ADHD (Banaschewski, T., et al., 2017). Non-inherited neurological factors such as epilepsy disorders, traumatic and hypoxic-anoxic brain injury (HAI – partial or total lack of oxygen to brain) may be risks to develop ADHD. (Bélanger, S. A., et. al., 2018).

## **2.2 The base to diagnose ADHD**

It is challenging and complicated to diagnose ADHD especially to preschoolers and adolescents. Several scheduled visits need to be arranged for making the accurate assessment (Bélanger, S. A., et. al., 2018). Diagnose of ADHD should be a continuous process. Children from 4 to 18 years old who have academic - behavior problems and signs of the incapacity of concentration, impulsivity with/ without hyperactivity, should be noticed to begin evaluation whether at risk for ADHD. It is important for the primary caregivers and the health-care providers to identify the presence of main symptoms of children from 4 to 6 years old who do not attend pre-school or child care program. Hyperactivity is diagnosed and noticed easier in boys than girls because boys are likely to behave disruptive more often. The rating scales DSM-5 for ADHD can be used to diagnose for preschool- aged children because the scales include the specific behaviors for all ages children under 18 years old (Wolraich, M.L., et al., 2019).

History of family's illness, details of developmental history of child, psychological and physical diagnosis examination should be performed during the diagnose stage. The presence of the persistent psychological and functional impairments in different major settings (eg. social, academic, or occupational) and situations relating to daily activities (eg. at home, at school, or work) are the base to diagnose ADHD (Banaschewski, T., et. al. 2017).

Psychiatrists, paediatricians, specialist nurses specializing in disorder perform diagnosis. To diagnose preschoolers, it is necessary to arrange clinical interviews for collecting information from parents, teachers, at the same time, doing the examination and observation the child's behaviors basing on the DSM rating scales (Wolraich ML, et al., 2019). To diagnose young and adolescent children, the primary information for assessment are collected over telephone or face-to-face discussion from parents and other mature people who have interaction with the child mostly in different fields of life. An ADHD adult are mainly diagnosed basing on directly contact with patient; meanwhile, second sources are from family's members and others (Banaschewski, T., et. al. 2017). Diagnosis of ADHD uses rating scales, questionnaires, checklists, reports of parents, teachers, school staffs and mental health clinical interview to examine child's functioning and behaviors. Parental behavioral management, family functioning, a full history of well-being, family medical and physical examination should be considered (Campbell, L.,& Allan, C., 2014).

Checking child's developmental history is to check movement, emotion, language, social behavior and developmental milestones. All the collected information is the base to qualify the level of deviated behaviors from the norm. It is a ground for health care providers evaluate whether treatment is suitable or not (Bélanger, S. A., et. al., 2018).

During the ADHD assessment stage, the coexisting/ co-morbid conditions should be screened. Emotional and behavior conditions associates with anxiety, depression, ODD

(oppositional defiant disorder), CD (conduct disorders) and substance abuse. Developmental conditions connects to learning and language disorders, and autism spectrum disorders (ASD). Physical conditions may be tic disorder and sleep disorders (Wolraich, M.L., et al., 2019).

There are other disorders that may be misdiagnosed as ADHD such as learning disorder, sleep disorder, ODD, anxiety disorder, intellectual disability, language disorder, mood disorder, tic disorder, conduct disorder, ASD and developmental coordination disorder. For example, disruptive behavior can be false-identified for hyperactivity or impulsive reaction; attention impairment may be misdiagnosed as anxiety and depression in unipolar internalizing disorders; symptoms of BD (bipolar disorder) and ADHD resemble each other for mood swings, poor emotional regulation; impulsivity and social isolation in ADHD is similar with social dis-inhibition in RAD (reactive attachment disorder). Therefore, social history and relationships of the child should be long-term examined to recognize and differentiate between disorders. The typical first reason brings a ADHD child to visit physician for diagnosis may be the sign of inattention or hyperactivity symptom (Bélanger, S. A., et. al., 2018).

## 2.3 Symptoms of ADHD

Inattentiveness, impulsiveness and/ or hyperactivity inappropriate to the age are the core symptoms of ADHD. Levels of symptom are not the same through life areas and depend on the external requirements in different settings. For example, child cannot comply in situations where child is required to focus, still-sit, control impulse eg. classroom, homework or chair-circle activities (Banaschewski, T., et. al. 2017).

Impulsivity is the incapability to control or stop one's own acting in which is often dangerous to oneself and people surroundings (eg. *running out into the road, shouting out in class, and climbing without consider or thought of danger or injury*). Hyperactivity is described with inability to sit still (eg. moving all the time in the classroom or running away when going out with others). Older children's hyperactivity is described as moving constantly, fiddling with things with restless mind. Inattention is inability to concentrate, only able to focus in a short period of time, easily to forget the told instructions and often lost things forever (Laver-Bradbury, C., 2013)

In the early preschool years, the core symptoms of ADHD are indicated as the serious cause of long-term damage to many areas of the child functioning and it is risk to develop the co-morbid disorder such as ODD and CD later (Azevedo, A, et. al., 2014). ADHD symptoms appear in childhood and continue to present in adolescent stage and into adulthood. Clinical examinations and treatments vary for each stage of child development. Typical symptoms of ADHD preschoolers from 3 to 5 years old are needlessly physical movements or called "*motor unrest*", struggling in group work with other same-age children, and rebellion to adults' suggestion. From 6 to 12 years old, ADHD child 's symptoms show in lack of attention, hyperactivity, impulsiveness and the conflicting attitude with actions towards peers and studies. Obvious hyperactive and impulsive symptoms in adolescent stage decreases but child's rebellion and opposition to parents continue (Koumoula, A. 2012) and attentive impairment is likely to persist (Wolraich, M.L., et al., 2019). Although motor unrest/ hyperactivity behaviors tend to decline from adolescent stage forward but it changes to inner emotional state of unhappiness, uneasiness



and driving problem. Inattentiveness, lack of planning ability, carelessness still remains. At the adult stages, the noticeable symptom of ADHD are impairment to regulate emotion (emotional dysregulation), low tolerance of frustration, irritability and obvious mood swings (Banaschewski, T., et al. 2017). Lack of attention and impulsiveness continue in adulthood. The core symptoms may lessen over the lifespan but the impact and damage from disorder still remain (Koumoula, A. 2012).

Impulsive behaviors tend to be the cause of physical injury and accident of unexpected poisoning in young children (Lange, A. M., Daley, D., et al., 2016). ADHD symptoms are persistent and connects to SLD (specific learning disorder), mood and anxiety disorders, sleep disturbances. Moreover, clinical and epidemiological studies have constantly mentioned relationship between ADHD with overweight and obesity. This can be explained with binge eating, excessive daytime sleepiness possibly in ADHD children; abnormal in gene and neurobiology; relation of impulsivity and inattention to irregular and dysregulated eating patterns – weight gain (Sánchez-López, M., et al., 2015).

### **2.3.1 Impacts of ADHD symptoms to life of child**

ADHD relates to life quality of child and families. ADHD is a chronic condition which continues for years, and without treatment, perhaps into the adulthood. ADHD symptoms affect to children interpersonal relationships, and their academic execution (Churchill S. S., et al., 2018) as well occupational functioning (Matos M, Bauermeister J. J., Bernal G., 2009).

ADHD symptoms associates with impairment in self-regulation and decision-making leading to produce negative educational outcomes (Cohen, S., et al., 2018). Children with ADHD are four times lower capabilities to obtain a college degree as peers and in general achieve lower social and economic status. Family relationships with parents and siblings are conflicting-direction as well as to peers and partners (Banaschewski, T., et al. 2017).

ADHD symptoms mostly happens during the early stage of childhood which is affected to children's abilities in social associations, connections, and study. Educational outcome of ADHD childhood and adolescence are not positive. Impairments in childhood relating to ADHD continue into adulthood along with criminal behavior, substance abuse and suicide. This shows the urgent need of early intensive interventions at the young age (Campbell, L., Allan, C., 2014).

ADHD preschoolers perhaps are at risk of being placed in the classes for special need of education as well for needs of other services (Lange, A.M., et al., 2016). ADHD interferes with daily life activities of the child including play which is a key factor supporting a child to interact with surroundings. Play is considered as the main occupation of a child during childhood and is also one of the primary elements to develop life skills later. (Jasem, Z. A., Delpont, S. M., 2019)

It is possible for a ADHD child to start a social relationship but is difficult for them to maintain it because of emotional dysregulation (Bélanger, S. A., et al., 2018) Children learn language through playing. They use language to communicate, interact and set up the base for pragmatic skills needed for conversation. Pragmatic skills during play are *turn-taking, share concepts, verbalize thoughts and ideas*. While playing, children get chances

to learn from each other and to express themselves, to deal with their own feelings as well as to combine both concrete and abstract thinking. Language is a tool for children to interact, to arrange a pretend play, to come up with and rehearse problem-solving skills in different situations. Pragmatics indicate the use of social and language skills in appropriate ways in both timing, amount of interaction in the current situation. The Children's Communication Checklist, 2nd edition, CCC-2 is one of the used standardized questionnaires to evaluate the pragmatic problems of a targeted child comparing to typical developing peers. Pragmatics problems include difficulty in facial expression; difficult in understanding others' perspective or emotions; incapability to choose appropriate language in given social context; difficulty to catch the situational clues relative to emotion, task-avoiding behavior (Docking K., Munro N., Cordier R., Ellis P., 2013)

Problem-solving skills are important and necessary skills for successful interactions during play. Skills show the capability to decide quickly and efficiently for controlling a problem. ADHD children come up with fewer solutions to problems. It may be understood as ADHD children have poor knowledge of strategies for solving problem; therefore, they are probably incapable to apply suitable strategies when there is a problem. In addition, it is difficult for ADHD children to explain their own problem-solving strategies to others or to predict other person's response or to anticipate the situation outcomes. (Docking K., Munro N., Cordier R., Ellis P., 2013)

Majority of ADHD show the severe pragmatic deficits and poor problem-solving skills in social and play aspects leading to consequences of being rejected repeatedly and with fewer friends. In long term, the child develops anti-social behavior and other mental health problems. Play is understood as the interaction between an individual and environment. During play, it is necessary to use verbal problem-solving and pragmatics skills. Playfulness is considered as one of characters of children during the play/game but ADHD children are less playful than normal children. However, ADHD children have difficulty supporting other people's games, responding to other players' play clues, sharing or interacting cooperatively with playmates. This was explained that the ADHD child has its own needs that need to be met while incapable to express empathy feelings to other persons and it influences to maintain meaningful friendship. (Docking K., Munro N., Cordier R., Ellis P., 2013)

### **2.3.2. Impacts of ADHD symptoms to family**

Families of children and adolescences with ADHD commonly encounter the family dysfunction which weaken the capability of family to manage the outcomes of ADHD. (Churchill, S.S., et al. , 2018). Negative interactions of mother and child in the early childhood may be due to ADHD symptoms (Banaschewski, T., et. al. 2017). ADHD symptoms of children affect to relationships with parents, bothers, sisters, friends. By time age 10 of ADHD children, family social-economic burden increases and parental stable relationship reduces. Less person works to earn money while stress gather more (Lange, A. M., Daley, D., et. al., 2016). Moreover, ADHD symptoms are partly responsible for the high levels of stress as well as psychological problems in family. (Abikoff, H. B., Thompson, M., et al., 2015)

Symptoms affect negatively not only to child but also to family members, especially parents who deal with sudden mood swings, failure of angry management, thoughtless

behaviors and repeated mistakes without learning from it. Parents struggle to manage behavioral problems of ADHD child; particularly, mothers are suffering from serious stress because mothers perhaps spend time with children more than other family members. Mothers of ADHD children decrease tolerance capabilities and become extremely drained and tired more easily than mothers of normal children (Polat H., Karakas S. A., 2019).

Burnout is the consequence of excessive stress to take care children with special demand of health-care under condition of insufficient or without support from others. Burnout is described as an intensive collapse of mental state of a person after a long period of time of stressful conditions. Parents often experience incapability to manage family problems, high level of stress, and seem to suffer from extensive mental impairment because their ADHD child demands additional maternal care comparing to typical developing children. For example, attention impairment and hyperactivity lead to problems in academic and society. In order to solve a difficult situation of their ADHD children, parents sometimes adopt the undesirable parenting eg. physical punishment. It is as a vicious cycle. Child's undesired behaviors causes burnout, family stress leading to negative parenting that elevates more children's negative behaviors (eg. aggressive and destructive) which increase burnout and stress levels of mothers. (Polat H., Karakas S. A., 2019).

Regarding to family relation in some culture, parents may have different perspective in the level of strict discipline to apply to their child. Fathers tend to show 'authority' in management the house environment by using punishment for child's misbehavior. In addition, home parenting is also affected from grandparents perspectives in case of a three-generation living. Most parents expressed negative experience and reactions related to discover child's impairments. They feel guilty and frustrated, powerless, sad and was afraid of negative judge from others. It is also difficult for parents to accept that their child is diagnosed with ADHD. Interviews with 13 Latino families showed that the majority of Latino parents perceived that the causes of ADHD were from parental insufficient attention and lack of strict discipline in home education to child. Parents' working conditions were also acknowledged as one of the causes of ADHD from Latino parents' perspective because they believed that long working hours made them not have enough time for their children and family as well as not able to stay updated about conditions, situations and problems of their children (Araujo E., Pfiffner L., Haack L., 2017)

Mother of children with ASD, ADHD, SPD (sensory processing disorder) must encounter with social isolation experience, burnout, feeling of insecurity, high stress level, depression and feeling of incapability in mother roles. In family, mothers' typical role is to cultivate family cohesion and undertake the primary care burden; therefore, a primary caregiver for a child with behaviors disorders is the one at risk for extreme distress level (eg. daily fight, life stress, depression, anxiety). They need more time to fill their child's needs than mothers of normal children (eg. walking 3,6 hours more in their daily child care). Maternal stress affects to mother's capability to deal with daily activities, incompetence feelings, mother-child relationship and life qualify of whole family. Maternal stress is viewed as negative influence to many child outcomes even if child is able to adapt to early intervention. (Whitney, R. V., Smith, G., 2015).

### 2.3.3. Peer relationship of child with ADHD

Low social acceptance or high social rejections (50%) and negative interactions within the groups of peers are often seen to children with ADHD. Social rejection happens in days and even in hours. By less spending time either direct or by telephone with friends outside of school show that quality of ADHD child relationship poorer than peers. Social interactions of ADHD children is different than normal. They tend to not understand or are disable to show empathy or put themselves in other persons shoes. Questionnaires based on BRI (behavior regulation index eg. emotion control, change, inhibition) and MI (meta-cognition index eg. self-motivation, working memory, planning, materials organization and observations). Questionnaire was answered by parents and school teachers about the behavior observation of ADHD children relating to peers association at home and in school. Results shows that performances of children with ADHD are lower than children with typical development. Children with ADHD are not capable to restrain themselves, to adapt the change of situations, to regulate emotional reaction, to start tasks/ activities, to putting learning materials in order, to keep track on work, to memorize and plan. These incapacibilities affects to the association of ADHD children with peer in a direct or indirect way (Forner C.B., Miranda B.R., et al., 2017).

Sudden mood swings, failure for angry management, thoughtless behaviors due to impulsivity and repeated mistakes without learning from mistakes affects negatively to the peer relationships. These behavior problems cause a feeling of anxiety and discomfort to other people leading to that people start to develop negative and unfavorable attitudes toward a ADHD child (Polat H., Karakas S. A., 2019).

ADHD children have less mutual and more problematic friendships. Girls with ADHD tend to be friend with other ADHD girls. Substance abuse happens more within friends in ADHD adolescents. Friends in group tends to be alike and influence each other both good and bad. If it is bad so the outcome is not good or even harmful (eg. misuse of drugs, delinquency and physical abusive behavior). For that reason, it is important to review and assess the behavior of people who are friends with ADHD children to make sure that ADHD children will not be influenced by harmful behaviors (Normand, S., et al., 2011).

ADHD children have limited pro-social behavior sources of friends. Reasons are that suitable peers may not like to be friends with ADHD children while parents of promising friends do not want their children to spend time with children who has the disruptive behavior. The behavior of breaking rules of ADHD children during the competitive games lead to the consequence of being rejected by peers. The core symptoms of ADHD -hyperactivity and/or perhaps coexisting disorder – anxiety can be used to explain this behavior. Hyperactivity during activities makes ADHD children to move more than required in both allowable and prohibited ways while other children still want their playmates to be fair as well as to follow and respect the rules. It is also problematic when children with ADHD are not sensitive and unconsciously self-centered in negotiations with peers. It shows that ADHD children are poor in catching other person's social perspective. Small finding shows that emotion of ADHD children is more extreme than peers and more dominant to their friend. Children consider that it is enjoyable to be with a company who is fair and respects for the rules while playing. ADHD children mostly do not succeed in respecting the fairness in friendship. They may not understand that fairness is the base of friendship or impulsiveness override the other thought. Findings showed that ADHD children with high anxiety disorders levels made less self-centered suggestions but more

illegal moves during games than ADHD children without anxiety (Normand, S., et al., 2011)

## **2.4 Co-morbidity/ co-existing disorders of ADHD**

ADHD coexisting disorders are anxiety disorders, sleep disorders, uncooperative behavior disorders, mood disorders, and particular academic incapacity (Campbell, L., Allan, C., 2014). 30% of ADHD patients have anxiety disorders. ADHD children with comorbid disorder are more anxious about school, lack of concentration, poorer social skills than ADHD children without AD (Bélanger, S. A., et. al., 2018).

ADHD person may carry one additional or many co-morbid mental disorders. At early stage of child development appears the limited developmental disorders such as motor function, language, educational/academic skills and anxiety disorders, tic disorders and aggressive disorders. At the end of the elementary school years to beginning of adolescence stage appears depression disorders and serious conduct disorder (antisocial and aggressive symptoms). Abuse and dependence to substance as well as personality disorders appears from the adolescence onward (Banaschewski, T., et. al. 2017). Co-existing disorders from 12 to 18 years old is higher during adolescence including mood and anxiety, risky sexual behavior, intentional self-harm and suicidal behavior. Externalizing co-morbid disorders in boys are probably ODD or CD while girls with internalizing co-morbid disorders such as anxiety or depression (Wolraich, M.L., et al., 2019).

Ideas of suicide are nearly 6 times higher than in peers to ADHD children from preschool to age 13 and, in lifetime, ADHD patients are 4 times risk of suicide especially severe ADHD people. Delinquent behaviors increase and associate with road traffic accidents leading to higher mortality in ADHD groups at all age (Banaschewski, T., et. al. 2017).

ID (Intellectual disability)/ LD (learning disabilities) is identified by developmental deficiency in cognitive function such as reasoning, problem-solving, planning, abstract thought, common sense, academic and study experience. The most common co-morbid of neurodevelopmental disorder with ID is ADHD. An ADHD+ID has intellectual functioning lower than only ADHD. It is possible to detect ADHD+ID when the requirements of academic exceed the child's capabilities to meet, then the core symptoms of ADHD begins to show limitations in more than two settings. Core symptoms of this type ADHD tends to be more severe than only ADHD. An ADHD + ID experiences serious challenging with primary scholarly skills such as reading, spelling, math. It is common to present higher rates of agitation, quarrelsome and self-harm actions, autistic traits. However, it is important to process all assessment of behavioral disorders in ID patient with a multidisciplinary approach and with specific expertises in order to check whether child is ADHD + ID or only ID (Clark, B., Bélanger, S. A., 2018).

## **2.5 Non-pharmacological and its benefits**

Non-pharmacological therapies include different approaches from well-organized behavioral interventions to complimentary medicines (such as dietary, herbal, omega fatty acid supplementation, vitamins, probiotics). Interventions associates with psychosocial, behavioral, school or cognitive training, learning training or biofeedback or neurofeedback. Non-pharmacological treatments can be applied alone or combined with psycho-stimulants



with the expectation of improving ADHD symptoms and for lower psycho-stimulants dosage (Goode, A.A.P., et al., 2018) as well lower risk of adverse effects (Wolraich, M.L., et al., 2019). Common side effects may be insomnia, anorexia and rare side effects are tics and seizure. Medication may improve inattention and impulsivity symptoms, but is not sure in improving social skills, or academic abilities or reducing family conflict. However, these skills and abilities were reported positive outcomes with cognitive treatments (McGuinness T.M., 2008)

Parent training – techniques of BPT (behavioral parent training) are strategies such as contingent reinforcement (praise, special activities, tokens) or punishment (forms of loss positive attention, privileges, tokens) which can be utilized if child presents appropriate or inappropriate behaviors. BPT is weekly training sessions disregarding to groups or individual parents. Each session concentrates on one features of an operant conditioning method. Teacher training – teachers are trained about classroom behavioral management. (McGuinness T.M., 2008)

Some believe that parenting intervention possibly influences most to young children who have not had yet experience of school failure, social exclusion, a long record of negative parenting due to child's disruptive behaviors (Webster-Stratton, C., et al., 2011). There are various delivery models from directly face-to-face with interventionists, or in a group, or self-help version (Laver-Bradbury, C., 2013)

Improvement of social and academic functioning might not be achieved with the use of medication/ stimulants alone (McCann, D. C., et. al., 2014). AAP (American Academy of Pediatrics) guides and suggests that evidence-based PTBM (parent training behavioral management) together with/ without classroom behavioral interventions should be the first choice of treatment for ADHD children under 6 years old. For children from 6 years old to adolescence (preadolescences), recommendation is to combine both pharmacological and non-pharmacological interventions. Medications (eg. Methylphenidate) for preschool children shall be used: if the applied behavior interventions do not improve the result significantly and results change from moderate ADHD level to severe at age 4 to 5; only if it is more harmful for children to delay medication treatment than to apply medication at an early age; if therapy is unsuccessful in increasing of adaptive functioning; or if there are not available behavioral therapies in areas. To school-age and adolescents children, AAP suggests to apply medication treatment with/without the evidence-based behavioral/training interventions. Non-medical interventions for over age 6 are the same as for preschool children and should contain the individualized instructional supports relating to school environment, classroom and instructional engagement, behavioral supports, individualized education program as well as plan of rehabilitation. Trainings focused on social functioning skills showed the benefits for adolescents more than children with ADHD after a long period of time (Wolraich, M.L., et al., 2019).

The preschool ADHD treatment study (PATS) in 300 preschool children reported that there were several limitation and less effective in using the pharmacological treatment in preschool compared with school-age children especially ADHD children with three or more than other coexisting disorders. There were also more side effects reported from using stimulants from pharmacological treatment to preschool ADHD children. Therefore, parent-based training can be considered as an initially intervention strategy to improve parenting skills, lessen the reported ADHD symptoms of the preschool – age child. (Azevedo, A, et al, 2014)

Preschool age is considered as the favorable period to involve the non-pharmacological treatments. Evidence showed that the brain development of the nerve's system in early life such as preschool age is still plasticity which means the possibility of being easily shaped or molded. Additionally, the violent pattern in interaction cycles between parents and ADHD child are not strongly formed yet so it is easy to change the interaction pattern (from negative to positive) in preschool-age (Abikoff, H. B., et al., 2015).

## **2.6 Nurse roles in the non-pharmacological interventions for family**

Parents with their own efforts still need guidance to care for their ADHD child. Psychiatric nurses are mostly contacted first by parents with questions for their ADHD child (eg. whether or not they should use medication to improve child's attention first; whether medication use is unavoidable). Although nurses cannot change many stressors in family but, with nurses' involvement, family engagement to treatment can be improved. Nurses can contribute to changes by showing empathy to parents, admitting their efforts and motivating them. Nurses make assessment of families conditions to potential treatments by interviewing each parent in order to understand each parent's point of views. If possible, nurse reviews the records of parent-teacher communication and treatment diaries to check the parents' commitment to treatment, then give feedback positively as encouragement to their commitment. Nurses work as a bridge to connect between family and treatment providers in improving communication between parents, teachers and providers. Nurses can explain to parents about possibility to achieve the desired outcomes if parents comply to treatment plan. Nurse is responsible for evaluate parents' understanding about treatment information eg. Medication dosages or aims of behavioral intervention because it is common to misunderstand ADHD treatment information. Listening, showing empathy, giving support to ADHD child and family is what nurses can do. It is stressful to live with a ADHD child and requires a lot of efforts to company child to adulthood; therefore, it is important that nurses acknowledge and praise parents' efforts even outcomes is small (McGuinness, T.M., 2008). If parents and patients misunderstand or misperceive the ideas and purposes of the treatment may lead to high or impractical goal-setting and result ineffective treatments.

## **3. Theory**

Assumption of this thesis is that nurse is not a person who directly influence to child's care, but parents and the closest ones surrounding the child. Nurse is only a trainer with evidence-based knowledge to convey correct information, appropriate strategies to parents and/or to train, coach parents the important, essential skills, techniques to manage child's care and behaviors. A young child is easily influenced by others because they are small, and young; moreover, everything is still a beginning, fresh, not firm or stable yet.

Thus, thesis author believes that suitable social cognitive treatments to children at early age would support children to learn more appropriate behaviors and reduce misbehaviors of ADHD symptoms. Writer also believes that the easiest and effective way to influence a preschoolers behaviors is from their closest ones such as parents, siblings or peers, perhaps teachers. If a person has knowledge, skills and believes on their own ability, their performance may impact to other person's outcomes. Therefore, Partnership in care of Anne Casey and Social cognitive learning theory of Alber Bandura were used to explain

the main family influence to child's health care in ADHD treatments and how the child learn social cognitive behaviors was impacted by

### 3.1 Partnership in care of Anne Casey

Nurse works as a partnership with the child and family. The main focus of theory is the child and parents' capabilities. Needs and rights of child is the primary concern of the nurse while family factors are secondary concern as long as they fulfill the child's needs. Family shall manage at home and seek for help from external sources if family cannot implement all the needed care. Nurse shall involve and share their knowledge as well as teach family members the required skills in order to meet the needs of the child effectively. Nurse supports to the child and family so that they can manage and maintain functioning. Nurse roles become teaching roles to teach family, child about skills and knowledge to be independent or referring the child to other health care services if needed. Casey's theory concentrated on the main role of parents in caring for their child with nurse's support as well as the partnerships of primary caregiver formally or informally. This model means that child and his/her parents shall perform self-care with the consultation of nurse (Snowden A., Donnell A., Duffy T., 2010, p 450- 466).

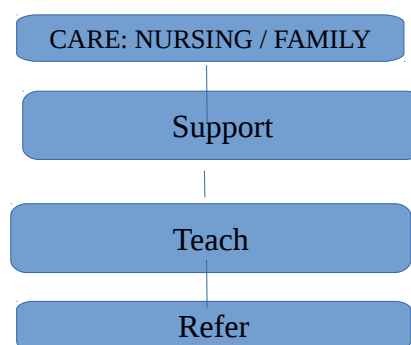


Figure 1: Role Of Paediatric Nurse-Partnership in care of Casey in 1988 (Farrell M. 1992)

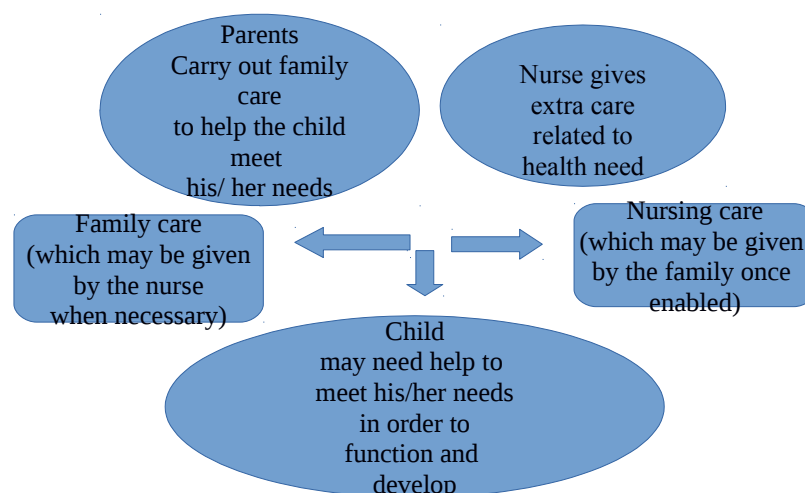


Figure 2: Casey, 1988, Partnership Model of Paediatric Nursing (adapted from an illustration by K. Spires (Snowden A., Donnell A., Duffy T., 2010, p 450- 466)



### 3.2 Social cognitive learning theory (SCLT)- Albert Bandura

SCLT bases on observational learning and focus on cognitive concepts in which personal social experience influence on a person's cognitive function, then cognitions impact to a person's behavior and development. *Assumptions of SCLT are people can learn by observing others; learning is an internal process that may or may not result in behavior change; learning can occur without a change in behavior (learning without imitation); behavior is directed toward particular goals; behavior eventually becomes self-regulation* (Nabavi, R.T, 2012)

Bandura viewed that children observed people (model) and imitate the social behaviors that they are exposed to. Model could be a person, a film, characters in a TV program, demonstration, picture, or instruction. From a doll experiment, Bandura viewed that new behaviors were learned mainly by copying from others and observational learning happens all the time. It depended on if the modeled behaviors led to desired outcomes or not (Olson, Matthew H., Hergenhahn B. R., 2012, p. 311-337)

Observational learning can happen and learner does not show any new behavior. It means that a person can observe, imitate, or model but that person may not learn it. A behavior is observed and learned when observational process including attention, retention (store observed information), reproduction (performance) and motivation / reinforcement (direct, indirect, inner self-feelings) happens. This shows that all learning does not always lead a behavioral change. There may not be a change in behavior even if learning occurs (Kurt, S., 2019)

Idea of interaction between factors of personal (cognitive, affective,...) – behavior (action, decision) – environment (external social environment-spaces, laws...) creating a *triadic reciprocity* that factors influence each other. Depending on different circumstances, each factor influences on human functioning on different levels in the circle of triadic reciprocity. Levels of influence of each factor may change over time (Smith M. J., Liehr P. R., 2013,p.197-224)

Self-efficacy of Bandura is described as an individual's belief on his/ her own abilities to accomplish a given task and to reach the goal. The key point of this theory means that everyone can practice to make influence and take control over self's life (Smith M. J., Liehr P. R., 2013,p.197-224).

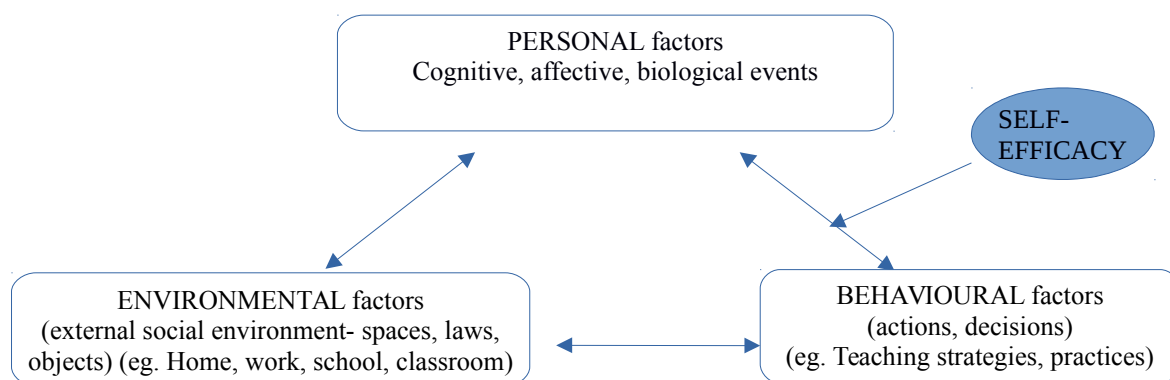


Figure 3: Internal principle of SCLT (Nabavi R.T, 2012)

## 4. Aim and thesis question

In health care, it is important for nurse to gain knowledge of ADHD and relevant treatments in order to advice, support parents and child with ADHD. The purpose of this thesis is to understand and learn more knowledge of ADHD symptoms and its challenging to preschool children and to family functioning. By reviewing these issues, the non-pharmacological treatments are found and reviewed.

Question: What non-pharmacological treatments was conducted for improving preschoolers' ADHD symptoms?

## 5. Method

*Literature review is a comprehensive study* and literature interpretation is relevant to a specific question. Doing literature review, researcher identify firstly a research question, then search, assess, analyze the found literature using a systematic approach. This means that researchers make a review in a systematic way in order to incooperate all the available information(Aveyard H., 2019, p 9).

### 5.1. Systematic literature review and qualitative content analysis

The research synthesis is another name of the systematic review with the purpose of providing a comprehensive and unbiased composite of many related studies in one document. Systematic review also follows the general principles to summarize the knowledge from literature content. The difference of systematic review is to seek for related evidence to answer the defined question and prefer data-report researches than content or theory researches. It is important to conduct systematic review in an explicit and rigorous methods because it affects to health care decisions (Aromataris, E, Pearson, A, 2014) and to reduce the bias when searching a comprehensive literature and appraising seriously the individual studies. Firstly, a defined clinical question should be made. Then, literature search is performed and it is necessary to describe inclusive and exclusive criteria applied as the base for selecting studies. Selected studies should be quality-appraised formally and then, summarizes data. Therefore, systematic reviews' inferences are mostly evidence based (Crowther, M., Lim, W., Crowther M. A., 2010)

Systematic reviews' question should be really specific to focus on the literature search. Reviewer should make sure that the found studies answer the original question while reading a systematic review. Bias of a systematic review is that the chosen systematic review did not answer original question but only answer to different question (Crowther, M., Lim, W., Crowther M. A., 2010)

Content analysis is a research method to analyze the contents of human communication in different forms such as written, visual, and oral. Collected contents are coded into word, phrase, sentence, or themes. *Content analysis focuses on meaning, structure and patterns in text.* Therefore, using content analysis to analyze information of scientific journal publications for the purpose of understanding *the meaning, structure and patterns in text* (Mahraj K., 2012). Content analysis is to summarize the usable information and also allow

researchers to analyze and interpret the collected information (Polit D. F., Beck C. T., 2004).

Qualitative content analysis may be applied in an inductive or deductive way. It depends on purpose of study to decide which approach is used. It recommended to apply inductive approach if researcher has insufficiency previous knowledge or fragmented former knowledge. Data of inductive content analysis often formed categories. Deductive approach is used if analysis structure is operationalized on the previous knowledge basis and study purpose is to test theory or retest existing data in a new context (eg. testing categories, concepts, models or hypothesis). Inductive approach is based on from specific data to general data in order to observe specific instances before combining into a general statement. Deductive approach is based on a former theory or model from general to specific. Three phases in both approaches included preparation, organizing and reporting. The primary aspect of content analysis is that text's words are grouped into smaller content categories. Process of inductive content analysis consists of open coding, creating categories and abstraction. Process of deductive content analysis is firstly categorization matrix, then data coding relating to categories (Elo, S., Kyngäs, H., 2008)

In this preparation phase, trustworthiness based on method of data collection, sampling strategy, choice of appropriate analysis unit (eg. letter, word(s), sentence portion). A suitable data collection method is a measure for credibility which focuses on research and how well data connects to the focused topic. Dependability refers to the data stability over time and different conditions, thus, principles and criteria should be mentioned in select suitable sample size (eg. over 85 years old) or participants. Suitable analysis unit should not too broad, or too narrow (Elo,S., et. al., 2014)

The research method of this thesis is systematic literature review and qualitative content analysis with inductive approach. From understanding literature of specific group (ADHD preschoolers and its impacts to child's and family life) to search for non-medical treatments for either child or family, particularly, parents. The literature review of this thesis used the principles and guideline of systematic literature review and this thesis only concentrates on the contents of the articles. ADHD child, family challenges, and non-pharmacological interventions for treating ADHD were this thesis's criterion.

## **5.2. Search strategy - Inclusion and Exclusion criteria**

There are variety of available sources such as electronic databases which can be accessed online or CD-room. In nursing field, the mostly used databases are CINAHL and MEDLINE. Otherwise, there are also traditional way of collecting information by using the printed materials. After identifying and locating the references, searcher must sort out the relevant and irrelevant materials before reading them. The most materials are research journal articles including the abstract, the introduction, the method section, the results, the discussion and the bibliographic references. It is significant to sort out and organize the collected materials logically. Reviewer shall read and identify what the up-to-date information of studies are, if the studies are competent or acceptable and reliable, whether there are gaps in the research and what a new study should be aimed for (Polit D. F. & Beck C. T., 2004, p.79-103).

Purpose of applying inclusion and exclusion criterion is to make sure that all the suitable

and necessary information shall be collected as well as to assure the research not extend outside of the limits of the topic. (Aveyard H. 2019, p.77). Literature is also classified with the terms *primary source or secondary source*. Primary source is the original study conducted by the researcher. Secondary sources is the study not conducted by the researcher. It is better to review the primary sources if possible. Research should use systematic, detailed and comprehensive articles which are specific, equitable and objective ( Polit D. F. & Beck C. T., 2004)

Search strategy: this thesis used electronic EBSCO Host CINAHL and MEDLINES database. **ADHD and Attention Deficit Hyperactivity Disorder and preschool children** (from age 2-5) were the main search-words together with other below words in table 1 for combination. The combined words were chosen by reading and collecting from reading the materials for the background of this thesis as well as the suggestions from the subject search tool of CINAHL.

Inclusive criterion of this data collection was that materials from 2009 to 2020 and free available full text, peer review, 2009-2020, English, academic journals in the database CINAHL. Limitation in database MEDLINE (pubmed.gov) were free full text, journal article, English, medline, nursing journals. Important requirements of materials were that the relevant articles should be able to answer the research question.

Exclusive criterion of this data collection was that all materials published before 2009, all unrelated information to the topic, articles not written in English, nonscientific or nonacademic articles, and articles mentioning about medication as a primary treatment or treatment not for ADHD.

### 5.3. Data collection

This thesis only paid attention to the content of articles with interventions which answer to research question. Articles were searched with the combined words in table 1. The title was read first from the list of results, then to the abstracts because abstract is as a brief summary of whole article. In case the abstracts showed the relevant information, then whole articles shall be read. Only primary sources were chosen to analyze content. The relevant information should at least answer a part of thesis's research question, e.g. non-medical treatment for either child or family/school/peers. All found articles were not used because it depends on its contents. The articles that meet the criterion of thesis were used to analyze and the articles that were not relevant to the topics or did not provide the inadequate information were not used in this thesis. There were 123 results from CINAHL and only 17 results were chosen. There were 29 results found from MEDLINE (pubmed.gov) database and only 9 results were chosen after reading title and abstracts of articles. Some combination results the repeated articles so they shall not be counted in the end. List of 26 articles were detailed in appendix 1

**Table 1: Search-words in literature review in databases CINAHL and MEDLINES**

EBSCO Host CINAHL	Results	Articles after reading titles & abstract	Usable articles after omitting duplicate
+ interventions or strategies or best practices	63	15	15
+ family interventions	3	2	0
+ Parent child interaction	4	3	1
+ Parent child relationship	8	2	0
+ Parents intervention programs	3	2	0
+ Psychotherapy	3	2	1
+ family stress	2	2	0
+ family stress intervention	1	1	0
+ parental intervention	6	5	0
+ parenting improvement	3	3	0
+ program for parents	8	6	0
+ interventions for parents	13	8	0
+ parenting interventions	6	7	0
<b>PUBMED.NCBI.NLM.NIH.GOV</b>			
ADHD parent training program	29	9	9

## 5.4 Data analysis of found researches

Articles answer to research question were chosen to analyze. Intervention information is read, collected and categorized into different target groups (eg. parents, child, teacher, peers) in table 2. Categories of collected interventions were parent-focused programs, child-focused programs and school-focused programs (teacher involvement).

**Table 2: Grouping the found interventions into their target groups**

Parents	ADHD child	Child & peer	Teachers
<b>Psychoeducation</b>			<b>Psychoeducation</b>
<b>COPE</b> -Community parent education – parenting program			
<b>NFPP</b> – New Forest Parenting Package (home-based ) therapist and self-help version	Play-based behavioral guidance		
<b>IY</b> – Incredible year (group parenting training)	<b>IY Dinosaur</b>	Peer interaction play	<b>IY TT</b> - Intervention for teachers
<b>HNC</b> Helping the Noncompliance Child			
<b>PACT</b> parent and child together (home setting influences)	x		
<b>PCIT</b> parent-child interaction therapy (clinic playroom)	x		
<b>123 magic parenting program</b> (school-based parent group)			
<b>Stress management intervention</b> MBSR, Meditation, Yoga	<b>Stress management intervention</b> (Yoga, meditation)		
<b>Telehealth</b> (writing as emotion disclosure reduce stress)			
video feedback - feed forward techniques	<b>Play-based intervention :</b> (coaching during play)	Social cooperative skills	
Influence to child play	<b>Play choice and play</b>		

choice and setting	<b>setting:</b> (green nature, outdoor setting)		
Activities to build attention, inhibition, memory skill, praise	<b>Executive function training EF</b>		
Active lifestyle promotion	<b>MOVI-KID</b> (physical exercises group delivery)	x	Extracurricular schoolyard

### 5.5. Ethical considerations in research

Ethics is commonly defined as conduct of norms which differentiate between acceptable and unacceptable behavior. Ethical norms should be adhered in research. Standards (eg. norms of not fabricating, falsifying or misrepresenting data) improve the aims of research relating to eg. facts and information, accuracy and inaccuracy prevention. In case of researches with many people's involvement, ethical norms promote important values and equivalent to cooperation work (eg. authorship, copyright, patenting, data sharing, confidentiality in peer review). Norms make sure researchers is public accountable (eg. misconduct). With a quality and honest research, norms helps researcher to gain public support. Finally, research norms promote important moral and social values such as law, health and safe compliance, not harmful to people, animal, students, and public. Principals of ethical research included honesty, objectivity (eg. avoid prejudice in data analysis or data interpretation) , integrity (eg. sincerity), carefulness, openness, intellectual property (eg. not plagiarize, credit for contributions), confidentiality, responsible publication, responsible mentoring, respect for colleagues, social responsibility, non-discrimination, competence, legality, animal care, and human subjects protection. Each situation requires reasonable interpretation. Thus, in each different situation, researchers need to learn to interpret, evaluate, use different research rules and make decision as well behave ethically (Resnik, D.B.,2015)

This thesis writer shall try to document and convey collected information in a manner of trustworthy, integrity and meaning to make sure the original objectives of the articles' authors remained after interpretation and to ensure the collected and analyzed data relevant to thesis topic. The collected information from articles shall be rewritten and quoted with references in order to make sure the transparency and publication of the used sources. Plagiarism is forbidden and will not be used in this thesis. After analyzing, understanding, and interpreting the contents of articles, thesis writer expects to gain more knowledge relating to non-pharmacological interventions for ADHD child and family as well as be more confident for future work as a nurse.



## 6. Findings

Each intervention will be reviewed distinctly with interventions goals, details of training, interventions' effects and the outcomes. There were three main categories in articles' ADHD interventions including parent-focused programs, child-focused programs and programs with teacher involvement. The person delivered program was mentioned as facilitator who has background relating to child health care in this thesis. Facilitators were trained and qualified to conduct programs following protocol of programs and under supervise and support of program developers.

### 6.1. Parent-focused programs ( 1<sup>st</sup> category)

Each parent training intervention was reviewed separately. In this thesis, the main training contents for parents and children of each intervention was summarized in appendix 2, then the thesis author shall describe the detailed conduction of each intervention, its effects to ADHD child's behaviors and family function. Main training contents of each program were mentioned in appendix 2 to help the readers capture the highlighted skills and knowledge conducted for parents (as main target) and relevant people (child-teacher as secondary targets) in each intervention.

In general, different parent training researches for ADHD preschoolers had diverse results which based on different measures to report the significant gains of treatment. Measures can be compliance of child, interaction of parent and child, management skills, symptoms of ADHD, well-being of parents, treatment effects' maintenance (Matos, M., et al., 2009). Appendix 3 highlighted the achievement of parents-focused programs category. This appendix summarized the significant gains of each intervention.

#### 6.1.1 Psychoeducation program for parents

Psychoeducation program educates parents about child's developmental milestones at each age so that parents could understand and adjust their developmental expectations to the child (Bélanger, S. A., et. al., 2018). Parents were educated about ADHD disorders and details of the behavioral techniques to handle ADHD core symptoms, different optimal treatments ( pharmacological and non-pharmacological ), medication compliance as well how to decrease the children defiant behaviors. Program only focused on educating parents; therefore, parenting training or behavioral training was not included. However, parents was requested to express their feelings, experiences about their child and to reveal how child's condition impact on family life. A manual with all above-mentioned information, a hand-out to parents was included in each session. Programs hypothesized that parents were going to be capable to distinguish ADHD symptoms from other developmental appropriate behaviors, to improve parental parenting and change their perception about their child's behaviors which may lead to influence behaviors of their child (Ferrin M., et al., 2014).

A blinded assessment (an external observer) was used to measure program's outcomes which showed that ADHD index reduced but only moderate effects size; the same effects at one year follow-up assessment. Therefore, parent psycho-education program needs to be



considered as an additional support to pharmacological treatment because pure pharmacological management do not strong enough to reform the impact of ADHD child and families. Psycho-education's benefits to ADHD was the same as MTA studies for other psychiatric disorders (MTA-multimodal treatment of ADHD). It is important to focus on maintaining potential benefits instead of considering negative results (Ferrin M., et al., 2014)

### **6.1.2 COPE – Community parent education**

CUIDAR (Community Universtiy Initiative for the Development of Attention and Readiness) provided COPE-a community-based parent program with 10-weekly parent training sessions for families with preschoolers with/ at risk of ADHD, ODD and/or other behavioral difficulties. Aims of COPE program is to lead families towards a healthy parent-child relationship and child behaviors improvement. After each session, homework and the recorded video was reviewed to identify mistakes in parental parenting, then solution group discussion, modeling strategies and practices. (Lakes, K, et al., 2011) Summary of 10 weekly sessions of COPE detailed in appendix 4

8 out of 10 parental behaviors were reported by parents as experience the change towards positive parenting (more praising and positive attention, planning ahead, applying ignoring, point chart, rewarding, when-then, transitional warnings, and less physical punishment). Start chart was not applied often at the 1-year follow-up evaluation but planning ahead and transitional statement continued to show being useful and applicable for parent. Parents attitudes towards the child was more positive. With information from COPE classes, parent understood their child more, lessened negative parenting methods, being more patient towards their child, parent-child communication was improved. In addition, parent reported that levels of child's behavior difficulties was lower at the post-intervention than pre-intervention; particularly emotional and conduct problems, hyperactivity and peer problems while prosocial behaviors significantly higher. These improvement still maintained 1 year follow-up in both parents and child behaviors (Lakes, K, et al., 2011). Dropout rates was also big concerned in this programs.

### **6.1.3 The New Forest Parenting Package (NFPP)**

The NFPP is a home-based parenting program which was individualized one-on-one for parents with ADHD preschoolers in 8 week, each 90-minute session conducted by a trained clinician per week, 5 sessions for parents and 3 sessions for ADHD child at age 3 to 7. Clinician modeled, coached and nurtured the parental constructive parenting to manage children's' ADHD behaviors regarding to inattention, self-regulation, impulsive control and working memory (Abikoff, H. B., et al., 2015). Study protocol of another adapted NFPP version in Denmark was not delivered at home but at a family friendly clinic room due to geographical reasons and traditions of non-home diagnosis or treatment in Denmark. Child-only sessions are still at home (Lange, A. M., et. al., 2016). An another longer adapted NFPP version were home-conducted in 12 weeks with the purpose of slower pace of intervention delivered with additional sessions which focused on additional child's problems in sleeping, learning, speech, language and parental health (McCann D. C., et al., 2014)

The advantage of original NFPP is home-delivery, weekly in 8 weeks, there, facilitator can demonstrate, model and make strategies basing on home setting where the problematic behaviors happen mostly. At home, it is also easier to name the behaviors; for example, struggle to wait, lack of concentration, so on. It is important for parents to recognize moments of these labeled problems and know-how to apply the coached parenting techniques, strategies in order to nurture - improve child's skills which may be needed for a child in more real situation. (Abikoff, H. B., et al., 2015) The details of 12 week NFPP sessions were summarized in appendix 5

Psycho-education to parents about their child's disorders is to alter parents' ADHD perspective so that they do not criticize their child because of ADHD symptoms. Second is the tailored and individualized strategies (eg. firmly attention, using eye contact, praise, voice control, stop threatening, quite time, reminders, boundaries) to lead parental parenting towards proactive strategies (eg., better communication, know-how to create signal if task changes to a ADHD child, develop child's waiting ability). Third factor is to use the play-based approach to strengthen parent-child relationship and improve parents' tolerance levels. Last factor is to use structured games and catch 'teachable moments' for training the child attention skills (Sonuga-Barke, E. J. S., et al., 2018)

Before treatment, a clinical assessment combined with parents discussion was done to collect child's developmental records including information of current problems/ mental burdens, evaluation of child cognition, neuropsychological tests, examination of child medical, observation the day-care facility of the child. Five themes included psycho-education, scaffolding, parent-child interaction, appropriate behavior strategies and parent-child training games for ADHD core symptoms and delay, self-regulation training. All the sessions of treatment shall be recored/taped (Lange, A. M., et. al., 2016).

Parents firstly learned constructive parenting to create positive emotional environment for their ADHD child with goal of parent-child interaction should be playful, positive, corresponding and mutual. (Abikoff, H. B.,et al., 2015)

There are four components in NFPP constructive parenting (scoping, extending, scaffolding, consolidation). Scoping means parents observe and recognize their child's development and competence levels in order to set up practical expectations - goals for the child concerning to temper self-control, concentration and memory. Extending means parents know how to base on the performance and the improvement progress of their child to set up new practical goals. Scaffolding means that parents use play as a motivational game with feasible achievable goals (eg. self-control, attention, memory) to train, support, motivate, develop the child's skills easier. Consolidation means that parent encourage their child to use the trained skills in different life situations before setting new goals or expanding more performance. Parents need to teach the child how to use the developing skills e.g. take turn, patience, deal with frustrated situation (Abikoff, H. B.,et al., 2015)

Parent reported after NFPP intervention that they experienced large effects on improving their child ADHD symptoms and oppositional although direct observation and teacher did not see the improvement. Independent observer (IO) and program-blinded teacher viewed that NFPP could not target the underlying ADHD as assumed (attention, impulsive control and delay capability). Parenting practices was positively improved as parents rating but IO rating showed that parenting stress was not reduced. Explanation perhaps was due to parents were aware of treatment so devoted time and probably changed perception of

child's ADHD symptoms which might allow them to have higher tolerance and rated less severe. Or maybe NFPP actually influenced at home setting only and could not convey to another setting such as school. From post to follow-up stage, parents and teacher ratings showed a significant growth in severity of children's symptom scores (Abikoff H.B., et al., 2015). NFPP improvement generally decreased and could not maintain at follow-up.

**Version of NFPP-SH (self-help)** was the first (RCT) randomized controlled trial to assess whether self-help contributed to reduce the child ADHD symptoms. NFPP-SH included only one 2-hour group introduction. There, parents got information about NFPP self-help 's program focusing on 4 main parts (psycho-education, results of others research of NFPP therapist-led version, explanation the key strategies, discussion of potential barriers to implement at home and how to involve other family's members (eg. siblings, partner, other adults)). Parent got the self-help manual of ideas, techniques and extra copies to share with other relevant adults as they wished eg. grandparents, teachers. In manual, there are games' information to assist the child's attentive improvement; exercises' recommendation for development of patience; tips of self-organization for the child; and effective ideas for parent- school communication development. Weekly reminder by telephone weekly with 7 weeks of NFPP-SH program including reminder the next-week program to parents, a call to monitor the program 's participation not having unexpected side effects (Daley, D & O'Brien, 2013)

Assessment the interventions' outcomes was arranged at family home to measure the core ADHD symptoms and behaviors, parental mental health and parent-child interaction. Observation and video-taped was done during the interaction of parent – child and playing moment of child-alone (for example a play-dough animal set, large lego blocks, sets of toy cars and toys). Parent reported that SH treatment seemed have effects (moderate to large size) on ADHD symptoms of the child, and parent competence. However, there was no effects on parental mental health either to parent-child interaction basing on scales and observations. This showed that self-help version is positive effect in changing child's behavior the same as therapist-led version although parents did not get any therapist support (Daley,D & O'Brien,2013)

#### **6.1.4 The Incredible Years (IY)**

IY is a group parent training program for parents of children with behavior problems from 3 to 8 years old. Originally, IY 12-week program was not designed for ADHD children, but was primary targeted to ODD/CD children with/ without high levels of inattentive and hyperactive symptoms. However, with many confirmed positive results across multiple child functioning situations, IY is hypothesized as an effective intervention for preschool ADHD children with co-existing conduct behaviors. Aims of this IY 14-week program for parents of children with/ at risk of ADHD was to lead parents towards positive supportive parenting and positive parent-child interaction by targeting family risk factors (environmental modification) and effects was maintained after 12 months follow-up. Assumption: these positive modifications contribute to develop child's social-emotional self-regulation skills, particularly ODD behaviors (Azevedo,A., et. al., 2014)

IY was mainly designed for group of parents, children and teachers. The adapted IY version was also delivered as individualized home-coaching model with diverse combinations from 8 to 12 weeks. Parents were expected to able to applying positive

disciplines and interaction in managing child's behaviors in monitoring whole family's situations and developing parental self-confidence. Child was expected to have better school experiences and lessen behavior problems (McCann, D. C., et al., 2014) Summary of IY goal and strategies for 12-week intervention was detailed in appendix 6

Another applied IY group parenting intervention was modified and delivered longer period in 20 week (with some additional advance sessions) with 2 -hour session each week basing on revised 2008 basic IY preschool version. This version focused and combined both parent- and child- intervention (IY Dinosaur). Parents were taught on academic coaching, persistence coaching, social and emotional coaching, setting predictable family routines and schedules, strategies to regulate emotion, and coaching children to develop problem-solving skills. In addition, this program version used new vignettes (illustration) about ADHD child for psycho-education parts and child's temperament so that parents could know how to respond to their child's behaviors effectively. In additional advanced sessions, parents took part in adult-teacher problem-solving concerning to child behavior plan and learned strategies to call upon family interpersonal supports, depression reduction, and anger management (Webster-Stratton, C., et al. 2011)

Program applied role-play practices, video-detailed examination/modeling, brainstorming, practice the taught techniques in group, on-going homeworks, different group-discussed topics so that parents can assist their child in improving social learning aspects eg. problem-solving and cooperation (McCann, D. C., et al., 2014) There was different subjects in the program as play, descriptive comments, praise and rewards, rules and daily routines in family, straightforward and understandable commands, parent's calming thoughts, overlooking, time-out, consequences and problem-solving (Azevedo, A, et. al., 2014)

In order to prevent the dropout, the IY model used different methods such as make-up sessions, phone calls every week, schedule around post-labor stage or by providing the child care while parents attended training (Azevedo, A, et. al., 2014) and transport if needed according to IY protocol (Sonuga-Barke, E. J. S., et al., 2018). In case of missing a weekly session, parents shall have a weekly call from therapist or possible home-visit to encourage the parents and to check on progress (McCann, D. C., et al., 2014).

Outcomes of child's behaviors was positive after the IY intervention; for example, positive change in ADHD behaviors, less hyperactivity, fewer inattention. The ADHD behaviors and ODD characteristics reduced comparing to pre-intervention, child's social skills improved significantly according to parents and teachers' reports. Reports from mothers and IO confirmed IY program had significant effects on the prosocial behaviors at least 1 years after intervention. These significant effects was not different outcomes at 12-month follow-up evaluation to both ADHD symptoms and co-morbid disorders (oppositional behaviors) according to parents and teachers' reports as well IO. This showed that improvement of social skills can prevent negative outcome ODD of ADHD and increase positive social relationship of ADHD child with adults and peers. (Azevedo, A, et. al., 2014).

Competence sense and effectiveness in parenting increased and dysfunctional discipline practices reduced according to mothers' self-reports after intervention. Studies found that the IY intervention had impact more positive and effective, less critical and demands, fewer abnormal and unhealthy routines (dysfunctional practices) on maternal parenting

skills. However, in 14-week program, as IO's report, only the effects of parenting skills maintained until at least 12 months of follow-up but not coaching skills, as in 20-week program. This showed that parents may need more time to practice their learning (eg. descriptive persistence and social-emotion commands) to remain long-term effectiveness or the program was not enough intensive and success to maintain these skills. Program needed to have more methods (eg. additional booster sessions or post-intervention network for supporting parents) to increase and maintain parenting skills. IY interventions program reached its goal of improving symptoms, parenting although only child's behavioral stability maintained at least 1 year of follow-up. This result explains that the appropriate change of parenting skills is the key to alter child's behaviors. Research-blinded teachers also informed the level of oppositional and ADHD behaviors reduced and sustained at the follow-up stage. This program were in high participation rate and low dropout rate (Azevedo, A, et. al., 2014).

### **6.1.5 Helping the Noncompliance Child (HNC)**

HNC is BPT (behavioral parent training) intervention following manual of McMahon and Forehand 2003 for managing oppositional and noncompliance problems (ODD) in young children but this adapted program is flexible on number of sessions. This adapted program was first RCT of HNC for treating ADHD preschoolers. Treatment is individualized and clinic-based with the attending of parent and child. HNC includes 8-10 weekly sessions, 1 hour each session. Focus of HNC is to reduce noncompliance behaviors by applying different training models to educate parents on changing the current parent-child dysfunctional interaction (Abikoff, H. B., et al., 2015)

There are two components in HNC program. Facilitator gave didactic instruction and discussion during parent-role play, modeled for parent and educated parents skills such as accompanying, rewarding, ignoring, making simple and understandable instructions, time-out. Second component is home practice, assignments and exercises during the whole of program. There are two phases focusing on *differential attention and compliance training*. In the first phase, parents learn to observe and describe the appropriate behaviors to their child instead of giving commands or teach. Parents shall learn to reward the child with the positive physical attention; for example, hugs and specific compliment. In addition, parents are trained to deal with the minor, improper behaviors for seeking attention by ignoring, no eye-verbal-physical contact, or non-verbal signs. Compliance training phase focuses on coaching parents how to make simple, straightforward instructions; applying sequential approach to gain child's attention to instructions; positive rewards for compliance and negative sequel for non-compliance eg. time-out (Abikoff, H. B., et al., 2015)

Outcomes: parent reported that children were less inattentive and less hyperactive in the post-intervention stage for ADHD preschool children although HNC was not designed specifically for ADHD behaviors. Independent observer's rating at home and at clinic indicated that HNC helped to lower parenting stress and better parenting. The result was the same with parents' rating. However, at the follow-up stage, only attention improvement were remained but other ADHD core symptoms decreased. Outcomes also revealed that intervention effects did not transfer to school setting (Abikoff, H. B., et al., 2015)



### **6.1.6. Parent and child together (PACT)**

PACT is a BPT which focus on family support and non-medical treatments' roles for families of ADHD children from 4 to 18 years old to promote the success skills for family and child. ADHD symptoms and reduction of its impact to family and child were the focus of this program. After 12- month intervention, parents stress was expected to reduce while family function was expected to improve and positive effects were expected to remain at least 6 months after the end of intervention. Intervention used the nursing-case management in-home services to influence to the family's home-setting environment and to impact on family's ability in managing ADHD behaviors. Different families had different situations; therefore the case manager/facilitator judged each case differently in order to provide the appropriate intervention to specific family's needs. Nurse case manager shall base on the problem of family functioning to have one-on-one consultation and to coach parents how to manage issues and set family's behavioral rules (Churchill, S. S.,et al.,2018)

To increase parental awareness of program for more attending percentage, PACT advertised and spread information flyers to different community public and private services within 50 miles. To prevent dropout and confusion, PACT connected to control group (or mentioned as 'Usually Community Care' group) by providing parenting books. PACT results can be connected to maternal physical and mental health (Churchill, S. S.,et al.,2018).

Nurse- case manager firstly had an interview with primary caregiver to learn about child's development history as well examine child's condition. Then parents was taught how to set feasible goals each visit time to make it possible achieve plan. A printed booklet with baseline questionnaires was left for family to fill in and was collected to review in next visit. Follow-up evaluation was at 6, 12, 18 months. Every six months, newsletter about updated information of ADHD was sent to family (Churchill, S. S.,et al.,2018)

Intervention was modified and individualized to meet the needs and preferences of each family. Mothers were provided necessary information to take care of ADHD child, to become the effective case manager of their own family. Children did not directly attend in the program but their behaviors were the base to measure outcomes of intervention. Firstly, each family was educated about symptoms, diagnosis and treatment of ADHD, then, discussion section about family roles to ADHD especially role of fathers. Instructions about positive parenting were to coach parents on how to guide their children on developing the self-confidence, to teach the child about following the rules and limitation (eg. playing video-games and watching television). To adolescences, there were guides and tips for them while eating out, and self-care for parents. Guidances also included information about how to choose the suitable care providers, to cooperate with therapies, to understand medications information and its side effects, and schools' collaboration (Churchill, S. S.,et al., 2018)

Findings revealed that intervention positively impacted on family functioning, particularly, significant changes for behavior control and family satisfaction while maternal distress symptoms and child's behavioral problems showed improvement after 18-month intervention. Outcomes of behavior control were well-supervised children, organized family with behavioral rules, not over-control parenting. Family satisfaction presented on high scale score of 'like to do things together', laugh more easy and enjoy time together,

more laugh in family, happy in family. It showed that parental behavior control may lead to the child's behavior improvement including anxiety, depression, attention, internalizing and externalizing behaviors. PACT found that number of children in family also influenced to family connection, behavior control and social satisfaction. Nursing case management one-on-one and solution-focused crisis of PACT contributed to the effective parental behavior control, to strengthen family function leading to possible improvement of ADHD child's behaviors. Unique part of PACT was that parents had consultation with the nurse case-manager during the difficult and stress time as well to gain more knowledge to deal with these moments. Although child behavior improvements were not the aim of program in the beginning but its improvement supported psychological, social, economic and well-being of family members (Churchill, S. S., et al., 2018).

Study of Sellmaier et al, 2016 mentioned about mother who perceived that their child symptoms lesser, seemed to be employed for work more. This explained that lesser ADHD symptom of the child parents perceive, lesser difficulties in connecting family and work (Churchill, S. S., et al., 2018)

### **6.1.7 Parent – child interaction therapy (PCIT)**

PCIT is considered as a potential family-oriented treatment for children with ADHD and conduct problems from age 2 to 7 proved with clinical- and empirical- based which showed significant improvement in child's problematic behaviors, parental interaction manners, and its effects' maintenance at 1 year follow-up. After intervention, a warm and responsive parent-child relationship is expected in order to handle their child's behavior in effective ways. PCIT was conducted in play context of two persons. Parents were firstly instructed and rehearsed specific communication with their child, implemented the taught behavioral management skills to their child. Facilitator observed the parent-child interaction in a separate room with a bug-in-ear microphone to give instruction. An adapted PCIT version was made for Puerto Rican parents of ADHD preschoolers at age 4 to 6 (Matos M, Bauermeister J. J. & Bernal G., 2009)

During extra beginning time of each session, potential contextual issues towards treatment progress or social interaction was discussed. This was considered as valuable time for facilitator to build up connection with parents and to guide parents on how to instruct and involve other family members ( eg. grandparents in Latin cultures) to support them during treatment, not interfere. All the assessment with mothers was video-taped. Mother-child interaction was observed in three different situations such as child-directed play in 10 minutes, parent-directed play in 10 minutes and clean-up in 5 minutes. Psychoeducation for each family was to provide information about ADHD including the ADHD- related problematic behaviors, the relevant problems, risks, potential etiologies and choice of interventions. (Matos M, Bauermeister J. J. & Bernal G., 2009)

PCIT intervention was conducted in 3,5 months, 1,5 hour weekly session with facilitator. Each session was recorded and observed weekly by group and individual supervisor. PCIT delivered two essential phases: 8 child-directed interaction (CDI) sessions and 9 parent-directed interaction (PDI) sessions. (Matos M, Bauermeister J. J. & Bernal G., 2009)

Purpose of CDI phase was to build, nurture a positive parent-child relationships in mutually rewarding. In this session, children lead the play. Parents learned CDI skills by

following instructions, modeling, role playing with facilitator. Parents described, imitated and complimented if the child showed proper behaviors. Parents should reflect appropriate speech of child, and ignore inappropriate behaviors and let the child to be in charge of play activity. Parents learned to not criticize, not give commands and questions to child. After each session, parents received handouts (summary of materials) that can support parents to practice CDI skills by themselves at home on the basis of 5 minutes daily. Phase CDI ends when parents achieved 7 to 10 types of behavior management, labeled praises, less than three commands – questions and criticisms during 5 minutes intervention. (Matos M, Bauermeister J. J. & Bernal G., 2009).

Goals of PDI session was to reduce the child's problematic behavior and; at the same time, to improve the prosocial behaviors. Parents would learn to direct the child's activities using the clear, positive, straightforward commands; consistent outcomes of behaviors (e.g. give complement for compliant behaviors), and time-out in chair (eg. for noncompliance behaviors). At the same time, parents were taught to set up family's rules and implement rules to handle the child's behaviors in various setting (home and public places). Father and mother took turn to practice the taught skills with their child in play room while therapist and spouse observed interaction through one-way mirror. Therapist guided and assisted parent from the separate room with a bug-in-ear microphone. PDI parts completed if parents accomplished at least 75% direct commands which 75% of each-command-follow steps were correctly performed to the end during 5 minutes beginning of each session. (Matos M, Bauermeister J. J. & Bernal G., 2009).

In sessions required high activities, ADHD symptoms perhaps elevated leading to ODD intensified and prolonged which interrupted patterns of the parent-child interaction. Therefore, PCIT facilitator would quickly modify session in case the problem occurred and represented good problem-solving skills immediately for parents, then feedback for parents afterwards. For example, time-out method was modified for children who deny to go to time-out chair or room and parents need to use the excessive force. Facilitator used the checklist to evaluate each session's content (Matos M, Bauermeister J. J. & Bernal G., 2009)

Primary outcomes revealed that hyperactivity, aggression and ADHD +ODD symptoms significantly decreased after treatment comparing to pre-treatment and waitlist group. Intensity, frequency and amount of time conducting problem behaviors decreased. In secondary outcomes, child-related parenting stress and inattention reduced while positive parenting practices increased. At the 3,5-month follow-up stage, the achievement of post-intervention still remained. Mothers reported that they enjoyed during treatment and felt that therapist understood their effort and difficulties; therefore, this made mothers feel confident and be supported. PCIT involved both parents and children during intervention sessions; it showed that higher effective than intervention without child's involvement. Parents got encouragements and feedback after each sessions. This helped them to feel confident in their parenting skills and in making their own solution to manage difficulties from their child's behaviors during intervention. Children were involved and learned to improve their own problem-solving skills (Matos M, Bauermeister J. J. & Bernal G., 2009)



### 6.1.7.1 Community PCIT for families group

Group treatment is considered as potential cost-effectiveness option while its advantages are that people can build up a social support network and overcomes with barriers eg. limited financial resources, low social support and family with high stress levels as well as parenting tension. Therefore, PCIT was applied to examine its efficacy in the community-based setting with expectation of decreasing children's disruptive behaviors and lower parenting stress with more parental positive behaviors after attending PCIT sessions. Scales' measures based on self-reports and observation. Inclusion criteria for targeted children were around 2 to 8 years old without history of mental retardation (both parents and children) and English-spoken parents in need of help to deal with their children's behaviors. Locally notices included posting flyers in school, daycares, pediatric, dental, mental health offices. 31% of participants were ADHD + ODD, 15% ODD, 8% ADHD, 8% SAD (Separation Anxiety Disorder), 31% without any disorders. Total 27 families attended but only 17 completed intervention. Information was collected including demographics, parenting stress, child behaviors, parent-child interaction, therapy attitude. Program PCIT community – based was delivered in 6 groups of two to five families. Dinner, childcare, transportation, small reward (eg. restaurant coupon for completing and bringing homeworks till sessions) was included within intervention protocol in order to meet attendant's needs and to prevent drop-out. (Nieter L., et al. 2013).

There were total 12 sessions in 12 weeks including introductory session for motivational enhancement, 1 CDI teaching and 3 coaching sessions, 1 PDI teaching and 5 coaching sessions, last wrap-up and troubleshooting sessions, one hour for each session of parent-child dyad. Modified protocol of this project mentioned that participants could continue to move from CDI to PDI parts whether or not they meet the mastery criteria as mentioned in the original PCIT. CDI mastery criteria included parents were capable to use 25 combined description-reflection, 15 praises with 7 labeled praises, commands-questions-criticisms lesser than 3 (Nieter L., et al. 2013).

Results showed that the enrolled families completed at least 7 sessions during 8 weeks out of 12 weeks. Therefore, this means that this community-based setting project is promising to engage successfully different diagnosed groups of families. Frequency of child's behavior problems were reported significant less than pre-assessment by both completers and non-completers. This was understood as that parents learned skills to manage and improve their child's behaviors over time after attending intervention. ECBI (Eyberg Child Behavior Inventory) intensity scale's results showed parents used more positive, less negative parenting skills. Parents reported the same as reduction of using inappropriate parenting (questions, negative, critical statements and increasing prosocial parenting behavior (eg. compliment, positive attitudes). This community-based setting intervention made chances for parents to build social support because 6 months after intervention, reports of some families mentioned about keeping on with communicating and supporting others parenting. Stress was considered as one of key factors for parents to seek for treatments. Intervention-completed parents experienced reduction of parenting stress significantly. Outcomes of this PCIT pilot study showed that group PCIT can be applied and processed to community sample families with multiple problems(Nieter L., et al. 2013)

### **6.1.8. The 1-2-3-Magic parenting program**

1-2-3 Magic program was a school-based parent and teacher intervention and was modified to suit parents of children from 4 to 8 years old with ADHD diagnosis or at risk of ADHD (if SDQ > 6). Participants must answer the Strengths and Difficulties Questionnaires (SDQ) to measure mental health state, functional impairments of the child and family burden. SDQ included 4 sub-scales about emotional, hyperactivity, inattention, peer relationship problems. Outcomes evaluation was based on parents and teachers self-reported questionnaires in the beginning, 3 months and 6 months after intervention (Sayal, K, et.al. , 2016)

There was one 2-hour session each week and delivered in 3 continuous weeks. Sessions was delivered to parent groups including of one to seven persons and conducted by a group leader and facilitator who were trained and competence to run program. In the first session, parents learned strategies to motivate their child's good behaviors; for example, positive action, charting, natural consequences. In the second session, parents learned how to manage their child's difficult behaviors with simple counting technique without speaking or emotion, or timeout, or loss of privileges. The third session, parents learn different ways to enhance parent-child relationship; for example, nurturing self-esteem, not parenting too much, listening actively (Sayal, K, et.al. , 2016).

Results revealed that intervention seemed to impact but not significantly effects on reducing ADHD symptoms according to both parent-only and parent+teacher group; parents reported children's hyperactivity symptoms reduced in the combined group (parent+teacher). Parental burden and mental health decreased according to parent's reports. Parents mentioned that they, after intervention, knownd how to apply their learning into practice and how to use strategies to handle their child's behaviors. Parents evaluated that program was useful and they had enough time to learn strategies of each topic during interventions. Finally, this intervention was considered as cost-effective non-pharmacological intervention for ADHD children and is feasible to offer via schools for parents and teachers who are having problems with ADHD difficult-type children (Sayal, K, et.al. , 2016)

### **6.1.9. Stress management interventions for parents**

There were two findings which expected that parental stress-focus intervention shall alter children's behavior problems. It is MBSR and journal writing.

#### **6.1.9.1 Mindfulness -based stress reduction (MBSR)**

Parenting stress and child's behavior problems related each other especially to child with DD (developmental delay). Many interventions focused on child-focused approaches, or parenting skills training to handle problematic behaviors of the child and to parenting stress. In study of Neece, 2013, parenting stress is the focused factor of interventions for reducing child's behavior problems particularly ADHD symptoms (Neece C. L., 2013)

MBSR based on MAPS (Mindful Awareness for Parenting Stress) projects for investigating the connection between parental stress and child behavior problems; whether MBSR can

reduce parental stress and child behavior problems. After MBSR, parental stress and depression were expected to reduce significantly as well child's problematic behaviors for DD children including ADHD from 2,5 to 5 years old. Criterion excluded parents attending other psychological or behavioral treatment under project's period or with extreme intellectual impairments or severe physical disabilities which may hinder the parent-child interaction task (Neece C. L., 2013)

Three components in the intervention: (1) material with information about mindfulness, psychological stress, physiology stress, anxiety and how to carry out mindfulness in daily activities to deal with challenges and distress; (2) practice mindfulness in group meetings, between sessions; (3) discussion, sharing within 2 persons or more people in bigger group. After completion all sessions, parents got a short analysis and comparison of their child's behavior under effects of intervention for parental stress so that parents can improve their parenting skills and should be aware of the unsettle concerns (Neece C. L., 2013)

Program was carried out in 9 weeks and 2 hours each session per week. At sixth week, a 6-hour meditation in a quiet place. There were every day homeworks to practice following instruction from audio CDs. Exercises of formal mindfulness consists of body scan, sitting meditation while being conscious of breath and present movement. (Neece C. L., 2013)

The total parental stress point dropped averagely around half point after every session. At post-intervention, group attending MBSR had stress score lower. This means that study achieved its goal in reducing the parental self-report stress. Moreover, attendants agreed that their capabilities to deal with stress improved. In MBSR group, parents reported less depression and more satisfaction in life which also impacted to their everyday life activities. There were reduction in child's behavior problems according to parents report; parents satisfied with their parenting skills more as well as parent-child relationship. The same results also showed in children of parents attending in MBSR program: reduction of ADHD symptoms particularly inattention problems on this group after their parents attended MBSR. In conclusion, MBSR had well effect on parental mental health and small impact on children's behavior problems. Reduction of parental stress led to different perception of their child's behaviors and adjusted parental parenting attitudes and behaviors (Neece C. L., 2013)

#### **6.1.9.2. Journal writing (Telehealth Intervention)-releasing maternal stress**

Parenting style, child resilience and quality of family relationship was associated with maternal stress. Researchers believed that expressive writing can help a person to deal with stress and to improve psychological health. Expressing feelings externally is a method to help people to deal with stressors better, to have a healthier lifestyle and to be capable to understand themselves and life occurrences. When emotional stresses are written down, this also connects to improve health significantly. For example, blood pressure is lower, sense of well-being is restored, levels of self-reported life satisfaction is higher. Therefore, writing emotion into a journal has been reported as one of the effective methods to decrease stress and improve health (Whitney, R. V. & Smith, G., 2015).

Purpose of this journal writing intervention is to reduce maternal stress levels for mothers raising a socially disruptive behaviors child. Program's assumption was that stress is reduced if mothers are enable to share their emotions while parting from social supports

eg. friends. Parents of children from 3 to 18-year-old with socially disruptive behaviors (eg. ADHD, Autism, Asperger's, non-verbal learning disorder, and sensory processing disorder) can participate in 8-week session journal writing intervention (Whitney, R. V. & Smith, G., 2015).

Eight weeks included 8 journal writing sessions with one prompt of each session for participants to write not more than 15 minutes. There were not limitation of session quantity or not specific writing schedule for mother to complete each week. Cues and reminders followed a structured writing protocol which enables participants to write in cathartic ways and to express their affective and internal emotions. Then, writers submitted writings through a secure online drop-box (Whitney, R. V.& Smith, G., 2015).

Results of intervention showed that mothers in both group (experimental and control) used emotional laden disclosure in higher level than common population. Impacts of demographic (income, education, age, marital status, ethnicity) to both maternal stress and mother-child relationship was little. Total maternal stress in both groups were not significantly different, but results showed that maternal stress was strongly associated with difficult level of child behaviors leading to negative mother-child relationship. The number of participated sessions did not affect to quality of mother-child relationship or to total stress. According to LIWC (Linguistic Inventory Word Count) results, the higher and frequency of negative emotional *laden vocabulary* words mothers used, the lower maternal distress mothers was. Mothers believed that everything became worse if they expressed their negative feelings verbally about their child or their situations. However, research showed that feelings of wellbeing was improved when a person enable to disclose his/her emotions and deep thought. Surprisingly, the 2<sup>nd</sup> experimental group (the waiting control group with 8-week delay) experienced significantly reduction in maternal stress, better quality mother-child relationship after their intervention completion. Meanwhile, the 1<sup>st</sup> experimental group (immediately attending) showed the level of maternal stress increased between pre and post intervention and mother-child relationship quality was not improved (Whitney, R. V., &Smith, G., 2015). Thesis writer assumed that the waiting list had more time to deal with their own need before attending the journal writing section. Therefore, they may have more time to prepare and focus better during intervention.

In conclusion, parental stress and mother-child relationship are possibly malleable by applying online journal writing intervention as emotional disclosure for people who use emotionally laden language. However, writing is not the key to reduce stress, only a way to expose, reveal a person's emotions is the key components in producing reduction of stress in intervention. (Whitney, R. V. & Smith, G., 2015).

## **6.2 Child-focus programs ( 2<sup>nd</sup> category)**

This category explained in detail the ADHD child-focused interventions and each intervention was reviewed separately. In this thesis, data review of whole psychosocial interventions in each article was firstly summarized into the main contents of the found interventions appendix 7, then later writer shall explain in detail of each intervention's conduct, effects to ADHD child's behaviors and family life as well as the follow-up information. Contents of each program were mentioned in appendix 7 to help the readers capture which skills and knowledge were conducted for child (main target) and others (parents-teacher-peers secondary targets) in each intervention. Appendix 8 highlighted the

achievement of child-focused program category

### 6.2.1 Play-based intervention

Majority of ADHD children has interpersonal difficulties and poor relationship with friends. Therefore, with time, these negative consequences develop into antisocial behavior and other mental health problems. The purpose of this play-based intervention is to improve the ADHD children's social and play skills. The study focuses on two aspects: whether intervention improve pragmatic and problem-solving skills (predicting skills) of ADHD children at age 5 to 11 with/without ODD, CD; to investigate if language difficulties of ADHD children affect the outcome of intervention(Docking, K, et al., 2013)

Two occupational therapist (OTs) conducted play- based intervention consisted of 40-minute weekly session within 7 weeks. Participations included ADHD child and a regular typically developing (TD) playmate (age 5-11). A primary facilitator was assigned to conduct a play-pair of ADHD child and playmate for a positive connection. First, play-pair's play session was recorded and then the primary facilitator and children watched video together and discussed about their past performance. This called 'video feedback' techniques. Next techniques was 'video feed-forward'. It means that facilitator enables children to discuss about the past plays problems towards the problem-solving discussion (eg. *What might happen if you do not play together and cooperate*) Facilitator helped play-pair to develop strategies to respond to the needed changes so that development of future social skills were going to happen. During play, therapist played together with children in a enjoyable social play in order to model prosocial behaviors to play-pair (eg. Sharing, supporting, responding), then motivated children to cooperative-pretend play. After reviewing the video, children received feedback and continue to the perspective-taking training and problem-solving skills. During play time with children, therapist demonstrated, pointed out and modeled pragmatic skills to child(Docking, K, et al., 2013)

Meanwhile, second facilitator and parents were at other room observing whole play with all feedback and feed-forward sessions through a one-way mirror. During observation, facilitator processed detailed education about session to parents such as explanation, supporting, training and feedback. Parents had also play tasks to complete during observation every week. They got a copy of their children's session video/footage (feedback/feed-forward) to review at home with their child in order to prepare for next week session. (Docking, K, et al., 2013)

Results of play-based intervention showed that the social play skills of ADHD children and their playmates were improved significantly based on results measured from the Test of Playfulness (ToP). In the beginning, screening showed there were 50% of ADHD children with language difficulties, but outcomes revealed that all children's language skills improved together with their play skills. Although intervention significantly impacted on prediction aspect of problem-solving but did not influence so significant to pragmatic skills of ADHD children. Children's results with the improved prediction skills mostly came from children without language difficulties. This may be understood that language difficulties influenced negatively to verbal problem-solving skills but not impact to social play skills of ADHD child with/wo. learning difficulties (Docking, K. ,et al. , 2013)



### **6.2.2. Play choices and settings**

ADHD children suffer from play deficits more than their peers who are typically developing. ADHD children prefer to play indoors, electronic games or TV mostly. Video games offer a child reward immediately, do not require much of attention to play and not restriction / inhibitors. However, this may increase to severe ADHD level because video games are risk of eg. loss of control, addiction and tolerance. ADHD children do not prefer physical activities which help to reduce level of impulsivity, control of inhibitors, and enhance neurocognitive functions, especially contribution of outdoor/ natural green settings in reducing ADHD symptoms. (Jasem, Z. A. & Delpont S. M., 2019)

Children engaged in green settings had less symptoms than those in in-house settings. Mothers have the most influence on decision of children play environment; therefore, it is important to improve mothers' knowledge regarding to play participations of ADHD children. Some studies' results showed that mothers perceived that their ADHD children behaved like other typical developing peers (eg. their sleeping and eating patterns) after outdoor activities or in green natural settings. Moreover, ADHD symptoms were reported more controllable as calmer, not much tension or aggressive. In the other hand, findings showed that indoor play worsen ADHD symptoms. Mother can learn to influence wisely to play environment and play choices of their ADHD children. In addition, mothers need to gain more knowledge and learn how to apply strategies in an appropriate and effective ways. It is important for mothers to understand the play characteristics of children, play routines and its impacts. For example, if a child spends time on playing outside more, a child has less time with electronic devices. Weather is considered as a key factor to outdoor time- spending. Mothers in deed need professional support and instruction on how to apply strategies suitably (eg. Setting rules of playing games – download / not, playing hours, behaviors in the absence of mothers; alter child's attention to others; or negative reinforcement- taking away privileges, delete) (Jasem, Z. A.& Delpont S. M., 2019)

### **6.2.3 Meta-cognitive Executive Function Training (EF)**

ADHD children struggle with executive functioning (EF) including self-regulation, attention, working memory, cognitive flexibility, behavior inhibition, capability to maintain attention. These impairments connected to academic impairments and social functioning. EF training was designed for ADHD children from 3 to 7 years old with expectation of improvement EF. Intervention was delivered in 8 sessions in 8 weeks and 60 minutes each session. A group consisted of 4 to 6 children with similar age (Tamm, L. & Nakonezny, P.A., 2015)

In the beginning of intervention, children were asked and discussed about their opinion on attention. With this, facilitator understood children's understanding on attention, then discussed and helped them to understand what they can do to pay attention better in other settings. After this, several designed activities of EF relating to different skills were arranged for children to practice their skills. Skills included attention, inhibition, memory, coordination between hand and eye, balance, sensory awareness, listening skills, and visual focusing. For example, memory card games to practice and improve memory, Highlight search activities for training attention in different levels from basic to difficult. All activities aimed toward learning with enjoyable experiences while still connected to cognitive strategies of EF. Strategies targeted to nurture attention skills, behavior

modification principles; for example, preventive approaches before behavior happened, environment aspects, group rules, ignoring, timeout (Tamm, L. & Nakonezny, P.A., 2015).

Group parent intervention with a facilitator was arranged at the same time. Parents were explained, modeled and coached by facilitator about the desired actions. Parents learned to carry out home activities focusing on well-timed attention, inhibition, memory skill building and applying specific and labeled praise. Then parents practiced meta-cognitive strategies for each activity, were asked to create their own different activities in order to help children activate the desired EF skills at home. Parents practiced to determine in which situations these EF skills were required. A short part of recorded video of their child's group from last week were shown to parents as a sample of strategies and activities applicable. Between sessions, parents had chances to practice over 3 times for at least one activity with their child. A feasible homework assignment for parents was to practice at least one activity per week at home. Interventionist made weekly phone calls to coach, remind and encourage parents to commit (Tamm, L. & Nakonezny, P.A., 2015)

Demographics characteristics did not differ in both groups (intervention and waitlist control) of total 19 families due to some drop-out reasons (eg. medication pursue). All parents attended 75% of scheduled sessions and executed their homework as planned. At post-test, according to parents ratings and clinician observation, results indicated children's attention improved (Emotion regulation and shift sub-scales). Intervention had large effects on inhibit, shift, working memory and General Executive Composite sub-scales while medium effects on planning. Clinician with observation viewed that hyperactive/impulsivity improved better than waitlist control. In general, this showed that children received intervention EF improved more than children in waitlist, lower rate in inattention, improvements in visual focus, matrix reasoning, concepts understanding and direction-following. Thus, EF training with a metacognitive focus is a promising intervention for ADHD young children, especially influence on emotion regulation and potential impact on ADHD symptoms (attention) (Tamm, L. & Nakonezny, P.A., 2015).

#### **6.2.4 Protocol of potential physical activity intervention (Movi-Kids) and TEAMS**

Some previous studies showed that schoolchildren with more physical activities and fitness positively connected to successful academic achievement because physical exercises affect to brain produce neurogenesis, angiogenesis and others. Movi-Kids program's purposes was to evaluate the effects of physical activity to improvements of academic achievement and adiposity in preschool children from 4 to 7 years old with/ without ADHD in Spain. Targets was also to improve quality of life, sleep as well as motor skills of children. Children were not included in program if severe Spanish learning difficulties, serious physical or mental disorders, chronic disorder (heart disease, diabetes, asthma). Outcomes evaluation based on information collected at baseline and post-intervention. (Sánchez-López, M., et al., 2015).

Movi-Kids followed social ecological model – a model of behavior change. Behavior is understood as physical-social environment interaction. Program aimed to influence people (eg. children, families, teachers) and environment (eg. modified playground). Intervention was delivered in group weekly for whole academic year 10 months and follow-up evaluation was one year after intervention. (Sánchez-López, M., et al., 2015)

First focus part was an school's optional extracurricular for children participate including

physical activity of Movi-Kids program for playful purpose, not competitive. These play programs were arranged three times weekly and 60 minutes per session with expectation of children spend more time on physical activities in school facilities. Play can be basic sport games, playground games, dance, motor skills – focused activities. Whole academic years was 90 sessions (Sánchez-López, M., et al., 2015)

Second part was involvement of parents and teachers in intervention. Parents' roles were to promote active lifestyle to children by using the motivational tools (eg. refrigerator magnets in different physical activities for children to see, play and intimate). A Movi-Kids blog for parents was provided to observe their children's progress, to read news with healthy lifestyle tips, to question or complaint the research team. (Sánchez-López, M., et al., 2015)

Last part was to modify environment (playground) to encourage children move around playground during breaktime eg. fixed (eg. painting attractive colors in playgrounds, using nets, climbing parks) and Mobil equipments (eg. different size and colored tyres). Children still attended standard physical education curriculum such as a hour weekly for psychomotor for younger children, older with physical education in 2 hours weekly. All activities was arranged after school-time. Movi-kids used available school facility and modified playground. This may take away a part of burden from parents and teachers. Movi-kids trial was in the recruiting stage at the time of punishment of this protocol. (Sánchez-López, M., et al., 2015). Program trial was at recruiting stage.

There was a **TEAMs** group intervention for preschool ADHD children from 3 to 6 years old. TEAMs means training, executive, attention, motor skills. Inclusion criteria: ADHD children without under medication treatment, not living in the foster house care or in violence or abuse environment, not having significant physical or psychiatric disabilities. Group consisted of 2 to 5 families who had 8 meetings weekly with 45 minutes per meeting for each parents and child session. Parents focused on psycho-education, problem-solving cooperation. Children focused on problem-solving development skills, aerobic exercise, and relaxation techniques. Results was comparisons of TEAMs group intervention and control group with conventional treatment under Danish national clinical guidelines (psycho-education, socializing, cooperation activities). Intervention outcomes was not as expected. ADHD symptoms or functioning under TEAMs intervention did not show any significant improvement more than control group under standard treatment. Although Danish health authorities recommended that non-medication treatment for preschoolers ADHD children first-in-line. Many parents believed that medication would help their children cope with transitional time from kinder garden to primary school more easily. They believed that medication can help with academic, social, familial or personal conflicts (Vibholm, H.A., et al., 2018)

### **6.2.5 IY Dinosaur child training + IY PT**

IY Dinosaur targets to development of school and attention skills, problem-solving skills, emotional regulation, and social competences as well as to prevent, reduce risk for later ODD, CD. Children from 4 to 6 years old with ADHD diagnosis with / without ODD, CD are criteria to participate program. IY Dinosaur was delivered in 20 weeks. In each week 2-hour session, there was 3 short circle times and 3-4 planned activities (Webster-Stratton, C., et al. 2011).



Facilitator helps to develop the child's social and emotional skills and promote a child for appropriate interactions with peers, coaching methods were used by therapist during normally disorganized play times. Topics included the group rules commitments, recognizing and expressing feelings, problem-solving, anger handling, friendship skills and teamwork. Methods included music, video vignettes, role play, child-size puppets, hands-on practices, on-going homework (letters, phone-contact to parents and teachers. (Webster-Stratton, C., et al., 2011).

According to Webster-Stratton, et al., 2008, the IY Dinosaur program was modified to match developmental age and to meet children's needs in the group. There were six children in each group; preferably mixed-age and -diagnosed groups but at least a pair was same sex and peers age which was to make sure that there was some children who can model for other children eg. appropriate social behaviors, self-regulation skills. For example, group of 4 to 5 years old shall focus on listening, waiting, and raising their hand; meanwhile, groups of 6 to 7 years old shall focus on working and learn to ignore distractions. Puppets was used and attended in the problem scenarios to encourage a child to solve problem which related to realistic problems at school. The related school problems may be eg. frequently out of seat at school (ADHD core symptoms), angry and hit if ball was taken away (emotional regulation), embarrassed and frustrated if being only one who cannot read in class (language, learning and developmental delays). Puppets was firstly engaged to express his/her feelings about problems with children, then, children shall engage in discussion to recommend solutions or other coping strategies to the specific situation (Webster-Stratton, C., et al., 2011).

IY dinosaur social and problem- solving skills aspects: rules, expectations and role-play was introduced in the first session of program so that children understand the classroom rules. Schedule was set to provide a predictable and consistent routine for children who feel more secured and easier to focus on learning in the environment. Schedule was made with pictures and heading (eg. review homework, circle time, small group activity, snack time, play choice time). Predictable routines; for example, in circle time, lessons began with familiar songs; in group, puppets greet each child every week; in video vignettes, statements 'ready, set, action' was always begun to make sure children focus. Each week included assigned jobs eg. change schedule, line leader, snack helper. A token system with tokens (eg. Dinosaur chips) was for appropriate behaviors and was gathered to exchange for stickers or small prize later. Ignoring method was used for small negative and off-task behaviors, then, therapist used non-verbal clues to redirect and prompt the child. For disruptive, non-compliant and aggressive behaviors, warnings of consequence was made such as loss of privilege, short timeout. It depended on children's needs to compliment or chips or other concrete (eg. Hand stamps) reward systems. Young ADHD children may receive chips and praise every 30 seconds if she/he sits properly on the chair with bottom or quietly raises hand. Older ADHD children, therapist shall verbally praise and token systems for good social interactions with peers eg. helping, sharing, listening, problem-solving with peer, making suggestions. For example, if a jar was filled with marbles as reward of each targeted social behaviors, whole group was rewarded with special snack or activity. Persistence coaching was used for ADHD children in order to help them stayed focused and continue to try if task was difficult. (Webster-Stratton, C., et al., 2008; 2011)

Intervention followed standard manual and protocols of original IY and checklist for group leaders. All sessions were videotaped and revived by IY developer, group leaders in each

supervision week. Group leaders are people with master degree and certified IY as group leader and co-leader are people with master degree or doctorate level clinicians (Webster-Stratton, C., et al., 2011).

Outcomes of combined IY dinosaurs oh IY parent training: Score for appropriate discipline parenting was highest (eg. brief time-out, ignoring, consequence). Next was harsh and inconsistent discipline with raising voice, threatening, saying mean things, then physical punishment such as spank or hit child. Following is praise and incentives and score for monitoring parenting was lowest. Perception of parents about their children's positive social behaviors and emotional regulation was high. Scores for positive strategies of social problem-solving skills in the conflict situation during class were higher than negative. (Webster-Stratton, C., et al., 2011).

Comparing to control group, both mothers and fathers in intervention group reported improvement in their children's core ADHD symptoms and aggressive, oppositional behaviors. In addition, externalizing behaviors, emotional regulation, social competences showed significant better condition than pre-intervention. Moreover, independence observation of children's behaviors during play with mothers in parent-direct tasks showed better interaction matching with mothers' reports. Under observation, mothers frequently praised, encouraged, used coaching more, used appropriate more than harsh discipline, or physical punishment and and were less critical during parent-directed task (play). However, fathers did not report significant improvement of parenting effects comparing to pre-intervention. Teachers mentioned after intervention children showed less externalizing misbehaviors but there were not much change to inattention, hyperactive. However, results from independent observations showed no changes to externalizing, inattentive, or hyperactive, only aggressive behaviors lessened in the classroom setting. Findings showed that combination of IY Dinosaurs and IY parenting training was benefits to improve social competences with peers of ADHD children (Webster-Stratton, C., et al., 2011). Father was be busy with work, less time to practice skills and spend less time with child to notice the improvement

One year follow-up after intervention, there was not much change in parents and teachers' reports from post-treatment to follow-up. Improvement still remained. It maned that improvement of externalizing behaviors, inattentive, hyperactive behaviors, social skills and emotion regulation was still maintained from post -intervention. Mothers still continue to reduce of using harsh discipline and physical punishment. Observation showed the social contact of children with peers at school, problem-solving skills, and emotional understanding improved. 70 -75% of ADHD children was below clinical cutoffs level of externalizing symptoms measures, this means that further development of ODD and CD was prevented successfully in ADHD children. Only 50% of ADHD children was below clinical cutoffs level of hyperactivity, inattentiveness at follow-up stage. However, a quarter of children was on psycho stimuli for ADHD symptoms after one year of intervention (Webster-Stratton, C, Reid, M. J., Beauchaine T.P., 2013)

## 6.2.6 Relaxation intervention for children

The same as parents-focused interventions, researchers also believed that helping child to relax and calm could result better behaviors. There were two found interventions conduct

### 6.2.6.1 Potential effects of meditation-mental training to ADHD child (age 5-13)

Meditation is a form of mental training which helps people relaxed in a alert state. Practicing meditation helps people especially adults to achieve a calm and stable mind. Children and adolescents with ADHD, conduct problem, anxiety reported the benefits from mindfulness meditation. Meditation seems to help children to reduce stress, to develop prefrontal cortex and goal-directed behavior, sensory information process, and attentional training. With meditation, physical effects affects to level of melatonin (sleep - linked), dopamine (pleasure and will - connected), serotonin (feeling healthy- associated). Higher serotonin level, lower cortisol means less stress. In psychological benefits, meditation improves resilience, a positive perspective, self-esteem, self-confidence, understanding of self and surroundings, self - sympathy and for others. (Williams-Orlando, C. 2013) This article is as a guideline for conducting meditation to children with ADHD.

Teaching meditation to children is different to teach adults. Key elements consist of combination of conducive environment and play, routine, simple and shorter period of practice (age- appropriate to children, eg. 5 -9 minutes for children from 5-9 year old, 10-13m for 10-13ys), suitable language and form (age – appropriate to children, using short words- eg. 'so, hum', 'in, out', 'garbage truck' meditation 'sa, ta na ma' 'kundlini' yoga), right to choose within limits, love and kindness attitudes, parents- involvement, and learning of children from observing therapist as an actively example during sessions. Goals of meditation teaching is to inspire children to practice at home in childhood and develop more in adulthood. (Williams-Orlando, C. 2013)

Conducive environment should be less distractions eg. simple, , uncluttered, less or without any toys, smaller space. Children nature is play and learn while playing. Therefore, therapist needs to allow, create play during meditation teaching. For example, during teaching, while imitating practitioners' posture, children may tend to experience their own posture or may sit floor/ cushion, lie down floors/ chairs, or feet up against the wall. Practitioners can suggest 'do you want to sit on the couch or the floor?'. Children may choose floor, as an their ideal option, for example. Therapist should allow children to pick out the comfortable posture for themselves on that day. If children attends with toy, then practitioners can use that toys as a support to make meditation desirable (eg. Singing bowls, drums, beads, ...). (Williams-Orlando, C. 2013)

Routine at home provides feeling of safety, security, success while reduces anxiety, depression, helplessness. Expressive art therapy is used to start a session because it is chance for therapist to identify, recognize, release and understand emotions of children. Meditation training happens near the end of each session by using last 10 -15 minutes of session for purpose of mind calming and clearing. With time, this part of session may become expectation to children. Transition into and out of meditation is suggested with a small ceremony in such a way that both practitioner and child sit – child lights a candle – then meditate – child blows out the candle while making a wish. This transition may contribute as an excited part and children are eager to perform. Meditation candle is small, playful and reverent for children and also a signal of quiet, reflective and meditative time.

With parents permission and observation, children may replicate at home (Williams-Orlando, C. 2013)

Simple language connects to interest of a child. For example, using *Star Wars* language to explain meditation training as training with the force, powerful mind as a Jedi Knight. Using visual aids eg. explanation to a child such as a sparkly glass jar of purple sand and water shall become water turbulent if shaking but turns clear after letting jar sit still and sand settles. It is the same as mind meditation - calm and clear. (Williams-Orlando, C. 2013)

Choice within limits gives children feeling of control, safety. ' *which meditation would you like to do today?* ' after a child got to learn a few different techniques. Children tend to fully attend with their choice of exercise. Practitioners mostly choose focused attention (FA) techniques to teach young children because it is easiest and age-appropriate. FA leads attention to word(s), sound(s), breath, persons, image, or object which provides a lot of choice for children. (Williams-Orlando, C. 2013)

There are three different meditation including sounding meditations (eg. kundalini yoga) , silent meditations, mindfulness meditation, imagery meditations. Sounding meditation includes understandable metaphorical imagery and out-loud words and hand movements eg. Garbage truck – a child-friendly meditation. This type of meditation aims to convey away negative experience, feelings, thoughts as the truck comes and takes away mental garbage. Silent meditations use words/ phrase(s)/ non lexical syllables (eg. Sa, ta, na, ma), / sound (s) silently in own mind known as 'mantra'. For example, words (love, peace)- ' *Om mani padme hum* ' - *i am love, i am peace*. Children can create their own mantras and play, enjoy, desire, cooperate during meditation. Mindfulness meditation connects to pause and focus on what is thinking and doing eg. walking, breathing, eating, waiting, driving, and working. You know what you are doing. ' to breath in mindfully means a person is conscious of air enters into body and breathe out mindfully means awareness of air goes out body'. Practitioners can use a stone and put it on a child's belly, then, a child focus on movement of belly up down while breath in and out. Children can use simple words' in, out', ' so, hum', or counting 1 to 10 breath in and 1 to 10 breath out. Imagery meditations draw concentration on an internal picture or mental image(s) because some children would prefer images than word(s). For example: heart-based imagery relates to happy and cheerful time, grateful things to you, connect to your-beloved one. To children, image can link to cat, a baseball game with fathers, siblings, family members. An ADHD boy mentioned of image ' black-nothingness-darkness' to clear his mind (Williams-Orlando, C. 2013)

It is benefits for the child if parents got educated about what meditation is and is not. Parents may become a good sample by practicing meditation to calm themselves down, then a child may follow doing meditation at home. Parents need to remember that meditation practice at home belongs to the child and should not be forced or threaten to do. Therapist is responsible for checking with the child about practice, not parents. (Williams-Orlando, C. 2013)

Benefits of meditation for children are in training the attentional skills, hyperactive and anxiety reduction, stress discharge, sleep improvement, and development of emotional regulation. Children with their own experience mentioned that meditation is beneficial for themselves at home and school, with friends and parents. (Williams-Orlando, C. 2013)

### 6.2.6.2 Potential effects of yoga on ADHD preschool-aged children (age 3-5)

Other prior preliminary evidence showed mindfulness training was viewed as a complementary therapy form for ADHD patients. Outcomes of this therapy showed at the decreased levels of ADHD behaviors, parenting stress, over-reactivity and increased children's mindful awareness to school age children. Typical developing preschoolers, after 10 hours of Integrated Body-Mind Training therapy, results from observers' rating, showed improvement of children's self-control and executive functioning performance; meanwhile, teacher highly evaluated the effects to social competence and social-emotional development after 12 weekly of mindfulness training. The same results with yoga, previous studies confirmed that children's attention improved by parents' rating and observation. Parents reported that they managed own stress better which makes parent-child relationship better (Cohen, S., et al., 2018).

Yoga is one of the meditation forms with movement. It involves practicing physical pose, breathing, and meditation to sharpen self-regulation skills inside body and mind. It is a combination of exercise and mindfulness. Purpose of this yoga intervention is to examine the effects of yoga on behavioral symptoms, attentional control and HRV(heart rate variability). This yoga study was for English-spoken children from 3 to 5 years old with four or more ADHD symptoms and not under any medical condition. Postflyers, discussion with parents and teachers was used to spread information of program. Five months before delivering school yoga program, two yoga instructors must attend three-day intensive training with founder of If I was a Bird Yoga and performed monthly group practices, twice a week preschool practices (Cohen, S., et al., 2018).

Yoga instructor ratings (time-on-tasks for each student and Yoga Fidelity Measures ratings) was filled in by teachers/ yoga instructor after every school yoga class focusing on poses (eg. bird-dog, chair, airplane, happy baby pose) and breathing exercise. Daily yoga logs was completed by parents via email, hard copy to identify how often children practiced yoga at home. Both teachers and parents completed Perception and Satisfaction Questionnaires after 6 week intervention (Cohen, S., et al., 2018).

Yoga intervention was organized at home and school. Yoga first practices occurred in different room from their classroom and with yoga DVD at home. Total 6 weeks intervention for each group, then evaluation based on time 1 (1<sup>st</sup> comparison of group 1 (after completion) with group 2 (still in waitlist control group) and group 1 baseline); Time 2 (2<sup>nd</sup> comparison of group 2 (after completion) with group 2 at baseline). Data was collected in the beginning, after intervention completion of each group and 3-month follow-up after group 2 completed their period. (Cohen, S., et al., 2018).

Yoga intervention at school focused on three themes: Ocean, Jungle, Space Yoga Adventures which expected to draw attention and engagement of children; one theme in two weeks. Group 1 got yoga lessons different places away from their classroom where was reported that ADHD symptoms of children became disruptive behaviors such as running, climbing, hitting. Therefore, these children was sent back to classroom for safety reasons on days presenting those inappropriate behaviors. Group 2 got yoga exercises in classroom together with typical developing peers with teachers/ yoga instructors, assistants manage behaviors by applying rules. At home, parents received a yoga DID and possible accessed online with 30- minute yoga themes following protocol so that children can practice on days that they did not do it at school. Home setting was assumed to be more



familiar to children; therefore, children were required to practice daily home yoga if their difficulties was persistent during school yoga classes (Cohen, S., et al., 2018).

KiTAP (a computer- based test for measuring attention) test results for attention measurement showed that many children of both groups could not pass or finish the actual test in the pre-intervention but after intervention. However, at post-intervention, adequate amount of children finished the actual tests in both groups with total of 23 students. Children reacted faster for correct responses, fewer distractibility while flexibility, alertness was not different much to baseline. Results were not significantly affected by children's age and severity of ADHD. Attention showed improved but impulsivity unexpectedly was higher on KITAP measure after yoga intervention (Cohen, S., et al., 2018).

Parents rated children less inattentive symptoms and SDQ significantly improved on average comparing to pre-intervention and were satisfied with the changes of their children's behaviors after yoga. Parents believed that yoga directed their children towards learning self-calming skills. However, appetite, sleeping patterns, mood, ability to manage transitional events of children did not show difference, either parents stress or parent-child relationship. Parents reported that their children did home yoga around 3- 4 days per week under intervention period but did not continue home yoga after intervention ended. During school classes, improvement of higher ADHD symptoms were not significantly satisfied. As mentioned in Yoga instructors ratings, children with higher symptoms score had lower score Time on Task ratings and often 'occasionally on task' marked. Poses were missed mostly requiring balance and coordination. Teachers did not view significantly improvement after practicing yoga, either to inattentive symptoms (Cohen, S., et al., 2018)

### **6.3 Programs with teacher involvement ( 3<sup>rd</sup> category)**

Writer shall explain in detail of each intervention's conduct. In school interventions, teacher were involved as the main target in school settings while parents child were main targets at home.

#### **6.3.1 IY- Teacher training (TT) + IY PT**

PT of IY gave the positive outcomes for parents -child at home but it could not transfer success from home setting to school setting so combination of PT and TT is needed and formed. Teachers face obstacles to perform their appropriate teaching plan to be suitable to ADHD children presenting behavior difficulties. ADHD child faces difficulties in academic performance and peer relations. Therefore, teacher training (TT) and classroom-based intervention were designed for school or kinder garden teachers to gain knowledge and provide tools for them to manage difficulties of ADHD. Primary goal of combination IY PT and TT is to the ADHD child get better outcomes both home and school and to support the child in dealing with school's problems such as peer rejection, academic dysfunctional and low self-esteem (Rimestad, ML, et al., 2018)

Program was carried out for ADHD children from 2 to 8 years old in a ADHD center in Aarhus, Denmark. Fathers and mothers were encouraged to take part in intervention. After screening and signed consent stage, teachers were contacted to associate with the child in



TT. Evaluation was done for pre-, post-, follow-up intervention stage. Intervention was about 5 months for both PT, TT while PT was weekly session and TT was monthly session. Post intervention evaluation was carried out after 4 weeks of completed intervention and 6 months for follow-up (Rimestad, ML, et al., 2018).

PT with 18 sessions (once a week) in groups of 6-7 parents. Program was adapted from 12-session IY parent training- basic version, 3 sessions from advance version and 3 additional sessions (psycho-education and ADHD problems-focused exercises). Basic version aimed for outcomes of positive parenting, parent-child interactions with play, routines, house rules, rewards, behavioral consequences principles (timeout, privilege away). There included group discussion, rehearsal of strategies, and video demonstration of effective and ineffective strategies in managing children behaviors. Advance version aimed to help parent manage their own reactions (effective communication, anger self-control, depression feelings). Additional session was social network such as grandparents, neighbors, leisure time instructors, an individual session, a group sessions of all families together (Rimestad, ML,et al.,2018)

Teacher training (TT) program was manualized at the ADHD center, Denmark including 4 sessions, 3 hours for each session per month and extra 2 hours of individual guidance session to solve the previous experience of teacher with the ADHD child. IY teacher training program was modified shorter than PT program due to teachers' busy schedule. Its target was to improve outcomes of ADHD child's behaviors in classroom setting. Teachers was taught about psycho-education on ADHD and disruptive behaviors, strategies to help special-need children be inclusive in kinder garden and school settings, learn to implement behavioral contingency principles to inspire and stimulate the child's collaboration; concentrate on the child's positive behaviors. There were also group discussion, role playing, exercises and everything was video vignettes. TT group sessions was conducted by two teacher program developers (Rimestad, ML, et al., 2018)

This combination of both training in this research did not show effects as expected. Outcomes was not significant differences between PT only and PT+TT (Rimestad, ML, et al., 2018)

### **6.3.2 The 1-2-3 magic teacher program**

There were suggestions of teachers involvement in parent training programs by sharing strategies between parents and teachers in order to increase the effects of intervention to ADHD children. Schools may attribute to provide a suitable setting for early children identification with ADHD and it is better to apply early intervention before symptoms become severe or firmly established. Aim was to evaluate the effectiveness and cost-effectiveness of program to ADHD children (Sayal, K, et.al. , 2016)

Teachers also got introduced to 1-2-3-magic program which was modified for teachers who received only one 1,5 hour group session. The information was about how to use 1-2-3 Magic program at home and school, helped teachers to understand the needs of children, potential causes, children behaviors and motivated teachers connect to current practice in class. Teachers also got updated information weekly from each session of parents' parts during 1-2-3 Magic parenting program at home.(Sayal, K, et.al. , 2016) Results was mentioned on above in parent-focused programs.

#### 6.4. Potential prevention of drop-out and inattending problems to parenting programs

35 to 68% of families with child having behavioral problems did not want to participate in parenting programs and around 40% dropout for parenting programs (PPs). '*Low take-up and high drop-out*' is one of the challenges for better treatment outcomes and influence to the core ADHD symptoms. Some reasons for dropout included family with low income, education, single-parent, unstable or shift occupation, size of family, minority group, maternal age, child's severe behaviors '*difficult-to-treat*' or psychopathology of parents (depression, ADHD). Or dropout occurred because parents encountered with 'barriers to treatment' such as psychological eg. stigma or childcare issues, unhelpful programmed-services. (Smith, E., et.al. , 2015)

Parents mentioned low-confidence and feel shame or embarrass to participate group-based PPs as well as was afraid of being viewed as 'bad' parents or any problems with Social Services. Family situation (single or young parent, children with many siblings, unsupportive partner-family, educational deficit, different culture, domestic violence, financial problems) made it more difficult for parents to deal with the time-consuming child's problems (eg. complains from school...), their own household (eg. shopping); therefore, incapable to focus or spend time on a long-time-required program. Parents viewed that their child's problems did not associated with their parenting; therefore, they did not think that their own behaviors needed to or not ready to be changed as in Pps' recommendations. Both parents and practitioners mentioned that rewards, encouragement, positive, realistic expectation can improve the participations to Pps as well as parent-group-shared strategies may also improve self-confidence, motivation to attend and feel being respected in group. (Smith, E., et.al. , 2015)

Practitioners mentioned that Pps should be begin with a home visit first in order to build up trust with parents and to explain about benefits of PPs' program as well as to engage with parental concerns. Parents wanted to be active in decision of the starting time for Pps. It is important that parents should get their own needs (mental health, domestic violence, low confidence) to be solved first before focusing on any intervention. Pps should be individualized flexible and relevant to the child whose parents wished to receive more personal support during programs in 'crisis moments' or with complex problems (language, communication, learning difficulties). For that reason, Pps should associate with other support service to provide a complete intervention (eg. speech and language therapy). Both parents and practitioners agreed that it could be more practical for parents to observe a role model using strategies (how strategy is done) in dealing with difficult behaviors. Strategies need to be relevant and connect to real life. Parents tended to drop out of intervention process because the improvement of their expected outcomes did not quickly happen or seen. Therefore, it is important for therapist and parents to set up realistic/practical expectations in the beginning of intervention. In addition, the significant improvement may take time to show but it is necessary for therapist help parents to recognize and spot small changes so that parents can realize the helpfulness of programs to continue. Regular contact between parent and practitioner by calls, messages is a key to remind participation of the incoming section. Parents desired to have a program support them at the post- and follow-up stage. Positive aspects of group Pps to parents were to meet and share problems, solutions with other people having similar difficulties. Parents gain a network to connect and feel valued and less alone. Age, culture, education, marital status, child's problems severity and progress perception seemed to cause feeling 'not

fitting in' leading to drop out or inattending to Pps (Smith, E. et.al., 2015)

Parents mentioned that they did not know any potential and accessible Pps. There is a need of programs advertisement to connect parents and Pps. Information can come from words of mouth, leaflet placed at the general practitioners office, any health care providers relating to children. The most crucial role is therapist who was expected to already have own child, have good knowledge of ADHD and gained direct experience working with ADHD children before. Therapists can build the therapist-parent relationship better by working with mind of non-judgment using informal and caring approach (Smith, E., et.al. , 2015).

## **7. Discussion**

### **7.1 Discussion of the use of method**

Trustworthiness connected with how well categories was set, and its interpretation. Results' structure should be corresponding and answers the defined study question. Reviewers should explain on how categories were created and the concepts should be described. Credibility and conformability are associated with whether findings are trustworthy, information is accurately represented and interpreted and not from reviewers invention, not over interpretation. A study is viewed as dependability when the data is stable over time and under different conditions. Thus, principles and criteria for selecting participants and its characteristics should be mentioned. A qualitative study is transferable if findings can be conveyed and used to other settings or groups. Trustworthiness also depends on researchers' knowledge, ability, experience, skills in performing an accurate analysis which researchers is capable to correctly report and apply the results. Face validity to an experience person is one of methods to measure trustworthiness (Elo, S., et al., 2014)

This thesis is considered as a fair study with goals to contribute deeper knowledge and information in improving the ADHD patient care, particularly preschoolers. Systematic literature review and qualitative content analysis provided variety of ADHD information and interventions. Reviewer gained a deeper understanding about the topic ADHD preschoolers and non-pharmacological interventions. Study used qualitative content analysis to analyze the usable articles. This study is possible considered as qualitative research in meeting major criteria including dependability, credibility, transferability, and trustworthiness. Database CINAHL, MEDLINE, EBSCO was used with inclusive and exclusive as well as the principles to choose the data. Explanation of data categories and interpretation from data were presented. All chosen articles were used to analyzed and answered the research question. The findings answered the defined questions and also provide variety of choice and solutions for family and preschoolers with ADHD symptoms

Limitation of thesis:

The study mentioned about ADHD and its impacts to child's life and family's functioning as well the importance of early diagnosis and psychosocial treatments for parents, preschool child, peers to achieve better outcomes for ADHD child and family. However, this thesis's search words should be broader than 'family, children, intervention' with additional search words classroom, peer, sibling. Therefore, the found articles were mostly associated with parent training and child-center while fewer interventions for classroom and peers problems. Results could be variety of interventions if the search-words also

included school/ classroom, peers, siblings intervention for ADHD children. Another limitation of this thesis was from limited numbers of free articles and studies about ADHD treatments.

Other way to collect data of non-medical intervention is to interview psychologist and parents of ADHD in Finland to check which interventions they have been involved. Future research about ADHD and interventions, it would be interesting to find out how non-pharmacological treatment or pharmacological treatment has been conducted in Finland. Or future study could focus on some these found interventions which had positive outcomes and use them as a study background, then find out which intervention is mostly or effectively conducted in Finland, parents point of view and experience in order to gain deeper knowledge about interventions and perhaps develop better versions to fill the gaps between the needs and service in Finland.

## 7.2 Discussion of results

This thesis used theory of Bandura (Social Cognitive Learning) and Casey's theory (Partnership In Care) in ADHD child behavior management and improvement. These findings and results emphasized the roles of nurses/ health care providers and roles of family, particular parents in providing basis need and care to child's health improvement. Majority articles were mostly about the parent training interventions. This indicated that parents were considered as the direct factor to child care and nurse (extra care) is responsible to support, teach, coach, educate, motivate, and guide parents during intervention periods. Necessary skills, strategies were conveyed to parents, additional psycho-education was an essential part found in majority of findings. This can be understood that nurse roles do not directly affect to child improvement but directly impact to parent improvement which conveyed to child.

Parents also got educated about characteristics of ADHD symptoms and behaviors, about each intervention's aims in order to avoid mis-perception of treatment, to set practical goals (Feldman, M. E., Charach, A., Bélanger, S. A., 2018). Individual or group parent training (PT) based on social learning theory with purposes of teaching parents methods, principles, techniques and strategies to improve behaviors of their ADHD preschoolers (Sonuga-Barke, E.J.S., et al., 2018). Parent training is the most common used for ADHD preschoolers in non-pharmacological treatment which parents learn to reform or alter their child behaviors by using techniques obtained from principles of social learning theory (Goodwin A., et al., 2016).

Findings emphasized Bandura's observational learning process (attention, retain, reproduction, motivation/reinforcement) presenting in the child learning of new behaviors (eg. problem-solving, self-regulation, attention, social skills) during interventions. External reinforcement (negative/ positive parenting) seemed to affect most improvement of child behavior. Outcomes measures showed that parents learned and applied positive parenting which also led to better child behaviors and higher parental self-efficacy. Words self-efficacy was mentioned in intervention outcomes meaning more confident in parenting. Findings also emphasized the importance of triadic *reciprocity* – mutual interaction of person, environment and behaviors. This is confirmed in the parental parenting stress reduction. When (environment) parental parenting improved, (personal) parent perception of their child is different led to positive parent-child interaction (behaviors) which resulted

improvement of child behaviors and stress. However, not all found interventions achieved their goals or good outcomes (eg. child behaviors did not show improvement after 1-2-3 Magic intervention as expected of combination of both parent and teacher training interventions). This may link to Bandura's assumption that *learning is an internal process that may or may not result in behavior change*. In general, Bandura theory reflects correctly on social cognitive learning which associates with design of child behavioral intervention.

### 7.2.1 ADHD and co-morbid disorder's treatment choice

Thesis's background provided important information about ADHD preschoolers, how ADHD impacts on child and their family life which are in critical situations (eg, relationship, stress, burnout, income burden). Therefore, the early urgent interventions are needed, especially non-pharmacological treatments to preschoolers who should not be prescribed medication as the first-in-line treatment. However, not all parents understand about ADHD, thus, psycho-education is an essential part in the found interventions to ensure parents' updated knowledge and understanding correctly about ADHD in order to support their child development, adjust goals and expectation, choose the suitable interventions for ADHD type: either only ADHD or with co-morbid disorders (eg. NFPP for ADHD, HNC for ADHD+ODD).

PACT found that child's co-morbid conditions (eg. depression, asthma, ear infections...) probably worsen child's negative behaviors. (Churchill, S.S., et al., 2018). Outcomes comparison of PT-parenting training (NFPP) and BPT-behavior parent training (HNC) clearly indicated that different intervention is suitable to the different ADHD-focused group. Typically NFPP was designed for ADHD which outcomes did not impact to ADHD+ODD, only impacted to ADHD group; meanwhile, HNC intervention influenced to both groups- ADHD and ADHD+ODD. Co-morbid disorders are a mediator factor impacting on treatment choice of parents and design of the behavior training programs. Treatments need to be individualized with specific personal needs for more effective intervention and positive outcomes (Forehand, R., et al., 2016). It is important for parents and health care providers (nurses) to choose intervention wisely that is suitable for child; whether child has ADHD only or ADHD + co-morbid disorder because some interventions were designed just for specific disorders. If diagnosed was wrong or suitable treatment was delayed so late, child's condition may elevate to severe.

BPT (eg. IY), parents were taught behavioral strategies of applying positive and negative reinforcement principles to manage behavioral problems, particularly noncompliance and oppositional. Assumptions of BPT are that ADHD symptoms are the same as other conductive problems responding to environmental modification by using effective reward and punishment. While in PT (parenting training) (eg. NFPP), parents were taught both behavior management techniques and constructive parenting building to improve the targeted impairments (self-regulation, attention, impulse control, working memory) which was supposed to lead to ADHD symptoms in children. (Abikoff, H.B., et al., 2015). Although BPT and PT main target is ADHD child's improvement, but different interventions have specific focus in design. BPT may focus on effects from external environmental factors while PT focus on specific problem. Children are growing and it is necessary to consider their environment and symptom's characteristics also change. In general, parent training program seemed have good effects to ADHD child's behaviors



which also affect child's life and family functioning as free from stress. For example, if parents want to have results on core symptoms, academic and social skills, it suggests to try the IY combination, HNC, PACT, or COPE. Besides, stress-focused interventions for child should be considered to multiple the outcomes.

### **7.2.2 Parental self-efficacy and functioning**

It is worth to investigate whether positive parenting skills are still maintained even after-12 month follow-up because parenting skills are an important factor for improving and managing child's behaviors. Many parents seemed to perceive less competent in their positive parenting after 12 -month follow-up (Azevedo, A, et. al., 2014). Lakes' study revealed that family structure affected to outcomes as well. Time spending with both biological parents showed more positive influence to child's emotional behaviors and peer problems than with only one parent or one guardian. However, evaluation were only based on parents' reports without from teachers or independent observation (Lake, K, e al., 2011). It is significant necessary to avoid or reduce the possibility of reporting biases by including observational measure (Azevedo, A, et. al., 2014). All learning skills, no matter which, should be reinforced and re-conducted after a period of time. There were not many interventions having long-lasting results, therefore, it is necessary to put intervention on continuous replication. This is really important for family (parents) and child because ADHD is a lifespan disorder; therefore, learning skills should be sharpened to continue management and control their everyday life in positive direction. Child spends most of time with parents who have chance to have positive influence to child's emotion. If parents feel competent in their parenting, child's behavior is possibly improved.

Many previous interventions mostly focused on child behavior management or parenting skills improvement with assumption of reducing child behavior problems leading to reduce also parental stress. MBSR is an intervention directly targeting parental stress management in order to improve child's behavioral problems. This intervention may be considered as an experimental test of relationship between parent's stress and child behavior problems. MBSR only managed parent's stress, not child behavior. However, parents also reported the reduction of child behaviors, especially inattention and hyperactivity after parental stress was handled. Explanation may be that stress was controlled, parents became more sensitive and responsive positively to child which influenced positively to child's behaviors later on. In stress-control state, parents did not react much on their child's behaviors issues and this was probably reasons of reducing negative parent-child relationship. Parents became calmer and child became more self-regulation and attention. Future research can focus on handling parent-stress to improve child' behavior issues with larger participants and control group as well as using additional measures (eg. observation, teachers' reports), not only on parents 'reports (Neece C. L., 2013) This is a good finding for other researchers to target on main factors of parental stress in designing an effective intervention to alter child's problems. For example, combination between parental stress relaxation and parent training interventions to maximize results. Of course, parents' time investment and own needs also should be considered for totally intervention commitment and prevention of drop-out or inattending.



### 7.2.3 School factors to ADHD child

Future combination research of IY parenting and teacher training for managing ADHD symptoms at home and classroom settings should consider to have more training sessions for teachers instead of only 4 sessions in 5 months. Better outcomes of TT training perhaps need more time to show effects particularly child-peer relationships which need time to build human-human connection and show outcomes. Busy schedule of teachers as one of the dropout reasons should be also considered for future intervention's design (Rimestad, ML, et al., 2018). Busy classroom with many students may also be a problem for teachers to observe, notice some silent improvement of ADHD child (eg. inattention) (Cohen, S., et al., 2018). Teachers are also a person who contacted with children almost 7 to 8 hours per schooldays. They have many children to pay attention at the same time including ADHD child. It is also important to convey enough intervention time for them to train and apply as well psycho-education at early time so that they could understand the cause of those children's behaviors problems; perceive different perspective of teaching to special child and have higher tolerance to nurture child development skills in positive way. From these positive issues, it is possible that child and peer relationship at school would be improved as well and child shall be inclusive in environment, not rejection.

### 7.2.4 Non-medical treatment consideration and nurse roles

Although non-medical intervention was strongly recommended as the first-in-line treatment for ADHD preschoolers eg. for preventing undesired medication side effects. Pharmacological treatment was mentioned by parents as one of reasons to dropout during intervention period. Some parents believed and expected that their child's transition from kinder garden to primary school would be smoother with the use of medication. Parents assumed that medication could lessen future social – academic problems as well familial - personal conflicts without knowing that methylphenidate and other psychostimulant to ADHD symptoms may influence little but surely medication side effects are troublesome (Vibholm, H.A., et al., 2018). Design of non-pharmacological treatment should consider the needs of target to deliver the effective treatment, motivate treatment compliance, and prevent dropout. Some parents dropped out because they also thought that their child's symptoms were severe and the treatment did not meet their need as well as were not enough patient to go through whole treatment as mentioned in study of Smith, E., Koerting J., et.al. , 2015

Medication can affect to inattention and impulsivity but not surely to social skills or to reduce family conflict or academic abilities improvement. ADHD treatment study of Smalley et al, 2007 with involvement of 457 children in Finland from birth to late adolescents, there were only 1% of ADHD youth were treated with drugs while in USA were around 60% ADHD children with medication treatments. 188 ADHD children in Finland, by their late adolescence, people who received medication for inattention were managing social and academic fields as well as people who did not received medication treatment. Therefore, value of medication in long term effect was still parents' concern (McGuinness, T.M., 2008). Therefore, it is worth to start non-medication treatments to preschoolers and important for parents to get enough information, explanation, instruction in order to make the right and appropriate decision in catching the golden time to improve their child's problems at a child's early age.

This links to nurse role in ADHD treatments. To maximize effects of intervention, it is important to update parents knowledge about ADHD. Many parents did not accept the biological causation for ADHD disorder, but considered it as being spoiled by parents or ADHD symptoms are signs of curiosity and bright intelligence. Nurse's roles associate with educating parents and updating their knowledge of ADHD in order to correct parents misunderstood information about ADHD. Some teachers' belief of ADHD causation is the same as parent: spoiling child. Nurse may as well educate teachers, and with correct understanding, teachers can have higher tolerance for ADHD children. Parents of ADHD children mostly have also similar psychiatric disorders which affects to their relationship and interaction. Nurse may assists family interaction and help family members to understand, detect, and recognize the disorder's characteristic as well as lead parents and family to suitable treatments. Nurses roles in ADHD treatments require both knowledge, experience, and patience (Ghanizadeh, A., 2009) Early diagnosis, early intervention, better outcomes and long-term benefits. Better outcomes are not only for child but also for people surroundings. The roles of nurse are to provide updated education to parents as well support, advice, teach, encourage, explain, check commitment, remind, and connect parents with needed services and treatments.

### **7.2.5 Nursing implication**

Study's findings hold implications for psychological nursing in paying attention on family factors relating to psychological disorder particularly ADHD preschoolers. Nurses -health care providers are not the direct influence to child's behavior modification but with right conduction and target choice from health-caregivers can influence to family perception, behaviors and skills leading to alter child's behaviors. Nurses need indeed improve their knowledge and skills in recognizing core symptoms of disorders to educate, advice, encourage parents for early diagnoses and interventions. Nurse's understanding about parents difficulties and health-life conditions during behaviors management is important in order to suggest the necessary support services. For example, stress relaxation courses for parents, treatments for parents disorders, or only listening which may also help parents to release the negative and frustrated emotion during self-management of child's behaviors.

From awareness to acceptance of their child diagnosed with ADHD is not easy for parents and family. However, at least parents understand what is the cause of their child misbehaviors after psycho-education which also contributes their perception, expectation, goals and parenting. Here come the nurse role not only educate, but also guide, support, inform parents with different appropriate treatments whether it is non-medication or medication treatments. It is still worth to start with non-medication for young children especially preschoolers for lower side effects risk. Parents are important key factors in intervention process to improve their child behaviors and skills. With parenting training and other supplementary methods such as meditation, journal writing, parents could balance themselves, release stress, negative energy before coaching their child. Teachers were together with family can make change on ADHD child's social integration; therefore, it is worth to involve teachers as the intervention focus, not as additional factor.

## 8. Conclusions

Parents and environment contributes to effective influences to all family members, particularly to the child with special needs of care. Social skills and interactions guidance, stress and behavior management is to reduce child's symptoms, stress and improve confident to have better quality of life. Positive impact shall improve quality of life not only to the child but also to family because family members influence and support each other for the lifespan. Clinician/nurses rise awareness of available treatments to parents with advertisements to close barriers between patient and service. It is important to consider which intervention for whom e.g. ADHD or ADHD + co-morbid disorders. Preschoolers are young and still developing in both physical and psychological eg. brain, thought, behaviors, reception, skills, etc. Everything is still young, in process, flexible and easy to be malleable. It is crucial and a gold time to remediate key factors (eg parenting, child's behaviors at home, school, needs, family, environment ...) as soon as possible before everything becomes firmly foundation and high risk, more difficult later.

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# APPENDIX

## Appendix 1 : List of the collected and analyzed articles

1	2014	A parent-based intervention programme involving preschoolers with AD/HD behaviours: are children's and mothers' effects sustained over time?	Azevedo, A, Seabra-Santos, M, Gaspar, M & Homem, T 2014	To evaluate IY program effects and its 12 -month follow-up to parents of ADHD preschoolers	Longitudinal RCT mothers of 52 preschool children Report and observation was used to measure outcomes. Data was collected at baseline, after intervention and 1 year follow-up	the Incredible Years basic parent training (IY) - high effects, low dropout, high participants
2	2014	Mindfulness-Based Stress Reduction for Parents of Young Children with Developmental Delays: Implications for Parental Mental Health and Child Behavior Problems	Neece, CL 2014	- to measure the 'connection between parental stress and child behaviour problems,	46 parents who participated in the Mindful Awareness for Parenting Stress (MAPS) parents of children, aged 2.5–5 years old with DD developmental delays	mindfulness-based stress reduction (MBSR)
3	2009	A small-scale randomized controlled trial of the revised new forest parenting programme for preschoolers with attention deficit hyperactivity disorder	Thompson MJJ; Laver-Bradbury C; Ayres M; Le Poidevin E; Mead S; Dodds C; Psychogiou L; Bitsakou P; Daley D; Weeks A; Brotman LM; Abikoff H; Thompson P; Sonuga-Barke EJS 2009	to examine NFPP and usual control group (TAU) in reducing children's ADHD symptoms. To examine effects on the quality of mother-child interaction and mother's mental health (i.e., depression and ADHD symptoms)	A small-scale randomized controlled trial 41 children	revised new forest parenting programme (NFPP) is an 8-week psychological intervention
4	2011	Parenting Intervention to Reduce Attention and Behavior Difficulties in Preschoolers: A CUIDAR Evaluation Study	Lakes, K, Vargas, D, Riggs, M, Schmidt, J & Baird, M 2011	To evaluate COPE – community based parent program for families with preschoolers with or at risk of ADHD, ODD and/or other behaviours problems.	A CUIDAR Evaluation Study 154 children and their families data was collected before, right after intervention and one-year follow-up	Community Parent Education (COPE) – moderate effects (10 weeks, 1 session per week)
5	2015	Overcoming barriers to effective early	Smith, E, Koerting, J,	Understand barriers and	qualitative study - interview	Parenting programmes (PPs)

		parenting interventions for attention-deficit hyperactivity disorder (ADHD): parent and practitioner views	Latter, S, Knowles, MM, McCann, DC, Thompson, M & Sonuga-Barke, EJ 2015	accessibility to training program	25 parents and 18 practitioners regarding currently available PPs for ADHD children in UK	
6	2013	A small-scale randomized controlled trial of the self-help version of the New Forest Parent Training Programme for children with ADHD symptoms	Daley, D & O'Brien, 2013	to measure the effects of the NFPP-SH in reducing children's ADHD symptoms.	small-scale randomized controlled trial Forty-three children from age 4 - 11	self-help version of the New Forest Parent Training Programme NFPP – Self -help
7	2014	Evaluation of a psychoeducation programme for parents of children and adolescents with ADHD: immediate and long-term effects using a blind randomized controlled trial	Ferrin M., Moreno-Granados, J, Salcedo-Marin, M, Ruiz-Veguilla, M, Perez-Ayala, V & Taylor, E 2014	To assess the clinical effectiveness of a psychoeducation programme for parents of ADHD children and adolescents	a blind randomized controlled design observing child between 3 and 19 years 5 groups of 8-10 families	psychoeducational programs (12 weeks, 90 minutes per session per week) - moderate effects
8	2019	Mothers' Perspectives on the Play of Their Children with Attention Deficit Hyperactivity Disorder	Jasem, ZA & Delport, SM 2019	To view mothers' perspectives on their ADHD child's play preferences, how the play influence on ADHD behaviours, and the strategies to influence positive way	purposive sampling 8 mothers of ADHD children at age 5-10	Play choice influence
9	2018	Combining Parent and Teacher Training for Early ADHD: A Randomized Study of Effectiveness	Rimestad, ML, Trillingsgaard, T, O, TMS & Hougaard, E 2018	to measure the effects of a combined PT and TT of IY to ADHD children	Randomised controled 64 families of ADHD children at age 3-8	IY PT + TT
10	2013	Examining the language skills of children with ADHD following a play-based intervention	Docking, K, Munro, N, Cordier, R & Ellis, P 2013	To examine if modification in pragmatic skills and problem-solving skills were observed in children with ADHD	exploratory study 14 children with ADHD aged between 5;0 and 10;7,	Play-based intervention
11	2009	Parent-child interaction therapy for Puerto Rican preschool children with ADHD and behavior problems: a pilot efficacy study	Matos M, Bauermeister J. J. & Bernal G., 2009	To assess effectiveness of Parent-Child Interaction Therapy (PCIT) for Puerto Rican preschool children aged 4–6 years with (ADHD), combined	consisted of 32 families version of PCIT to a wait-list (WL) control group for the treatment of ADHD symptoms and conduct problem	Parent-Child Interaction Therapy (PCIT)

12	2015	Emotional Disclosure Through Journal Writing: Telehealth Intervention for Maternal Stress and Mother-Child Relationships	Whitney, R & Smith, G 2015	- to investigate if a journal writing intervention is possible to reduce maternal parenting stress of children with socially disruptive behaviours (ASD, ADHD, SPD)	a randomized control pre-test post-test study design of an online journal writing intervention,	telehealth intervention
13	2018	A comparison of the clinical effectiveness and cost of specialised individually delivered parent training for preschool attention-deficit/hyperactivity disorder and a generic, group-based programme: a multi-centre, randomised controlled trial of the New Forest Parenting Programme versus Incredible Years	Sonuga-Barke, EJS, Barton, J, Daley, D, Hutchings, J, Maishman, T, Raftery, J, Stanton, L, Laver-Bradbury, C, Chorozoglou, M, Coghill, D, Little, L, Ruddock, M, Radford, M, Yao, GL, Lee, L, Gould, L, Shipway, L, Markomichali, P, McGuirk, J & Lowe, M	Comparison of the efficacy and cost of IY, NFPP for ADHD preschoolers against generic group-based PT and treatment as usual (TAU)	a multi-centre three-arm, parallel group randomised controlled trial conducted participant_ parents of .... children at age....	IY, NFPP, TAU
14	2016	Effectiveness and cost-effectiveness of a brief school-based group programme for parents of children at risk of ADHD: a cluster randomised controlled trial	Sayal, K, Taylor, JA, Valentine, A, Guo, B, Sampson, CJ, Sellman, E, James, M, Hollis, C & Daley, D 2016	*evaluate the effectiveness and cost-effectiveness of a brief school-based programme for parents (with or without a session for teachers) * assess the acceptability of the programme and of sharing information about behavioural strategies with teachers.	Randomised controlled trial RCT(parents, teachers and children) a three-arm cluster aged 4–8 years, parent-teacher report at baseline, 3 and 6 months	‘Parent-only’ intervention ‘1-2-3 Magic’ programme ‘Combined’ (parent and teacher) intervention 1-2-3 Magic in the home and classroom
15	2018	Longitudinal Impact of a Randomized Clinical Trial to Improve Family Function, Reduce Maternal Stress and Improve Child Outcomes in Families of Children with ADHD	Churchill, SS, Houck, GM, Leo, MC, Brennan, EM, Sellmaier, C, Kendall, J 2018	Evaluate the efficacy of a 12 month nursing case management intervention for families of ADHD children with 6 months follow-up stage	randomized controlled clinical trial 150 families of 4-18 years old ADHD children intervention group and control group	Parents and Children Together (PACT, - high effects

16	2013	The Effectiveness of Group Parent-Child Interaction Therapy with Community Families	Nieter, L, Thornberry, T & Brestan-Knight, E 2013	To investigate the applicability of a group PCIT protocol with a mixed clinical sample of primarily low-socioeconomic status community families	pilot study 40 families with a child at age 2 -10 Independent observers	Parent-Child Interaction Therapy (PCIT)
17	2013	Teaching Meditation to Children as Part of Psychotherapy	Williams-Orlando, C 2013	Goal is to draw child attention towards meditation and experience	Report of how to process meditation to children from 5 to 13 years old	teaching children lifelong skills that build intrapersonal and interpersonal intelligences.
18	2016	The Effectiveness of Parent Training as a Treatment for Preschool Attention-Deficit/Hyperactivity Disorder: Study Protocol for a Randomized Controlled, Multicenter Trial of the New Forest Parenting Program in Everyday Clinical Practice	Lange, A. M., Daley, D., Frydenberg, M., Rask, C. U., Sonuga-Barke, E., & Thomsen, P. H. (2016)	to investigate if NFPP as an official community pathway can be delivered effectively for parents of ADHD children in daily clinical practice	A randomized controlled trial with parallel arms parents of 140 ADHD children at ages of 3-7 Data was collected at baseline-beginning, week 12 after intervention, 6 months follow-up	The New Forest Parenting Programme (NFPP) - 8 weeks
19	2015	Parent training for preschool ADHD: a randomized controlled trial of specialized and generic programs	Abikoff, H. B., Thompson, M., Laver-Bradbury, C., Long, N., Forehand, R. L., Miller Brotman, L., Klein, R. G., Reiss, P., Huo, L., & Sonuga-Barke, E. (2015)	to evaluate the short- and long-term effectiveness of NFPP and ['Helping the Noncompliant Child' (HNC)]- an established clinic-based parenting intervention for treating noncompliant behavior in ADHD young children	A randomized controlled trial (RCT) with three parallel arms parents of 164 children at age 3 to 4	The 'New Forest Parenting Package' (NFPP) -large effects - not maintain effects at followup evaluation ['Helping the Noncompliant Child' (HNC)] – large effects -
20	2011	Combining parent and child training for young children with ADHD	Webster-Stratton, C. H., Reid, M. J., & Beauchaine, T. (2011)	Combination of IY parent and child training targets development of school and attention skills, problem-solving skills, emotional regulation, and social competences...as well as to prevent, reduce risk for later ODD, CD	a randomized control trial (intervention group and waitlist group) ; 99 children diagnosed with 50% ADHD ages 4-6s and 50% ADHD + ODD ; 5 drop out; 6 months intervention period (November- April) , 2 months post -intervention evaluation (May-June); assessment based on interview, report and clinical visit, observation	IY PT and IY dinosaur



21	2018	Training, executive, attention and motor skills (TEAMS) training versus standard treatment for preschool children with attention deficit hyperactivity disorder: a randomised clinical trial	Vibholm, H. A., Pedersen, J., Faltinsen, E., Marcussen, M. H., Gluud, C., & Storebø, O. J. (2018)	compared the effectiveness of manualised training, executive, attention, and motor skills (TEAMS) training against standard treatment in ADHD preschool children	a randomised parallel group, single-blinded, superiority trial Parents and primary school teachers assessed outcomes at pretreatment, posttreatment, and at one, three, and 6 months follow-up 67 children (aged 3-6 years) were randomised.	training, executive, attention, and motor skills (TEAMS)
22	2015	Physical activity intervention (Movi-Kids) on improving academic achievement and adiposity in preschoolers with or without attention deficit hyperactivity disorder: study protocol for a randomized controlled trial	Sánchez-López, M., Pardo-Guijarro, M. J., Del Campo, D. G., Silva, P., Martínez-Andrés, M., Gullías-González, R., Díez-Fernández, A., Franquelo-Morales, P., Martínez-Vizcaíno, V., & Movi-Kids group (2015)	To examine the effectiveness of physical activity interventions to academic achievement in preschool	randomized to intervention and control groups 10 months in group, 1 year follow-up	physical activity based on playground MOVI-KIDS
23	2014	Study protocol for a randomized controlled trial comparing the efficacy of a specialist and a generic parenting programme for the treatment of preschool ADHD	McCann, D. C., Thompson, M., Daley, D., Barton, J., Laver-Bradbury, C., Hutchings, J., Coghill, D., Stanton, L., Maishman, T., Dixon, L., Caddy, J., Chorozoglou, M., Raftery, J., & Sonuga-Barke, E. (2014)	To compare the adapted-NFPP with Incredible Years (IY)	multicentre randomized controlled trial comprises three arms: adapted-NFPP, IY and treatment as usual (TAU). A sample of 329 parents of preschool-aged children with a research diagnosis of ADHD T	NFPP, IY, TAU,
24	2013	One-year follow-up of combined parent and child intervention for young children with ADHD	Webster-Stratton, C., Reid, M. J., & Beauchaine, T. P. (2013)	to evaluate 1-year follow-up outcomes among ADHD young children under IY interventions with 6-month treatments	One year follow-up study 49 ADHD children at age 4-6	IY improvement maintained after 1 year
25	2015	Metacognitive executive function training for young children with ADHD: a proof-of-concept study	Tamm, L., & Nakonezny, P. A. (2015)	-view the effectiveness of EF to ADHD. To examine child performance on three neurocognitive tasks	RCT- Children with ADHD (ages 3-7) intervention group and control group	EF: executive function

				assessing cognitive flexibility, auditory/visual attention, and sustained/selective attention		
26	2018	Effects of Yoga on Attention, Impulsivity, and Hyperactivity in Preschool-Aged Children with Attention-Deficit Hyperactivity Disorder Symptoms	Cohen, S., Harvey, D. J., Shields, R. H., Shields, G. S., Rashedi, R. N., Tancredi, D. J., Angkustsiri, K., Hansen, R. L., & Schweitzer, J. B. (2018)	- evaluated yoga in preschoolers on parent- and teacher-rated attention/challenging behaviors, attentional control	randomized waitlist-controlled trial tested a 6-week yoga intervention in preschoolers with $\geq 4$ ADHD symptoms on the ADHD baseline, T1 (6 weeks), T2 (12 weeks), and follow-up (3 months after T2)	Studies support yoga for school-aged children with ADHD

**Appendix 2 Main training contents for parents and children of each parent training program were summarized.**

These details shall help readers to capture the main ideas of what knowledge and skills that parents and children was taken part in.

Program	<u>Training contents for parents and children</u>
<b>Psychoeducation</b>	<ul style="list-style-type: none"> <li>- child's developmental milestone, ADHD disorder, practical goal setting, medication information</li> <li>- importance of medication compliance and commitment to intervention</li> </ul>
<b>COPE</b>	<ul style="list-style-type: none"> <li>- psycho-education, problem-solving management, anger control, positive parenting techniques and strategies, feasible and effective rules-setting.</li> </ul>
<b>NFPP</b>	<p><b>Parents:</b> Psycho-education, constructive parenting, proactive behaviour strategies for core symptom, teachable moments, know-how to tutor the child, the parent-child training games, parent-child interaction, age-appropriate task and game-creating, home-barriers solution, communication, scaffolding techniques; tips to overcome barrier for home-implementation, game information, exercises for developing patient, tips to coach child about self-organization and communication</p> <p><b>Child:</b> Guidance to control ADHD core symptoms during game training, delay training, self-regulation training</p>
<b>IY</b>	<p><b>Parents:</b> psycho-education, positive and supportive parenting; use of appropriate disciplines; boundaries setting, communication, parent-child interaction, social-emotion skills strategies, predictable family routines, tutor children problem-solving skills, anger and depression management, interpersonal support, ADHD problems-focused exercises, parental reaction self-management; (adapted IY version) coaching skills for child's studying, persistence coaching skills, adult-problem-solving</p> <p><b>Child:</b> problem-solving skills, cooperation skills, social skills, social-emotion training, peer- interaction skills, commitment group rules, expressing feelings, anger self-handling, self-regulation</p> <p><b>Teachers:</b> psycho-education, classroom behaviour management guidance, contingency principles</p>
<b>HNC</b>	<p><b>Parent:</b> Parental skills, techniques focusing on training child attention and compliance; parenting strategies</p> <p><b>Child:</b> Attention, compliance skills</p>
<b>PACT</b>	<p><b>Parents:</b> Goal-setting skills, psycho-education, positive parenting, nurture child be self-confidence, limit setting, school cooperation, ADHD symptoms management, self-care</p> <p><b>Child:</b> Compliance skills, Rule commitment</p>

<b>PCIT</b>	Psycho-education, parent-child interaction style, communication, problematic behavioural management (PDI), positive parenting(CDI), family rule setting and implementation, problem-solving skills,
<b>123 magic</b>	<b>Parents:</b> Motivation strategies, difficult behaviour management, enhancing strategies for parent-child relationship
	<b>Teachers:</b> Group discussion, parent cooperation, psycho-education
<b>MBSR (stress)</b>	Calming-attention, less anxiety, stress, better sleep
<b>Telehealth</b>	Writing as a way of disclosure emotion to reduce stress

### Appendix 3: The achievements of each intervention was summarized

(Tr means blinded assessment of teacher, IOr means independent observer's report, Pr means parents-report, Mr-Mothers' reports) (F-U: follow-up, Post:Post intervention)

<b>Program</b>	Maintenance of treatment effects	ADHD symptoms-behaviors	Child compliance/comorbid disorder	parent-child interaction/communication	behaviour control-management skills	positive parenting skills	effective dropout prevention	parental mental health and well-being
<b>Psycho-education (Tr, IOr)</b>	Post	x- moderat effects						
	F-U	x 12 months						
<b>COPE (Pr)</b>	post	x		x	x	x		
	F-U	x (emotion, conduct, hyperactivity, prosocial )		x	x	x (planning ahead, transitinal warning)		
<b>NFPP NFPP SH (Tr, IOr, Pr)</b>	post	x as Pr (ej IOr or Tr)	X (oppositional as Pr)			X (as Pr , but not in NFPP-SH)		
	F-U							



#### Appendix 4: The weekly sessions' contents of COPE program

(Lakes, K, et al., 2011)

Week 1	<i>Introduction an information</i>	<ul style="list-style-type: none"> <li>- information about COPE program to parents</li> <li>- discussion of goals setting and desired outcomes</li> </ul>
2	<i>Attending &amp; rewards</i>	<ul style="list-style-type: none"> <li>- concentration on improving parent -child relationship</li> <li>- strategies discussion (praising, social rewards (eg. Hugs))</li> <li>- basic skills application (eg. showing encouragement, cooperation, warmth expression – affection, excitement, friendliness ) during parent-child interaction</li> </ul>
3	<i>Planned ignoring</i>	<ul style="list-style-type: none"> <li>- concentration on managing angry state and conflict; problem-solving practice</li> <li>- practice the ignoring techniques (goal: avoid to not use the comments that may turn into arguments)</li> </ul>
4	<i>Transitional warnings &amp; When-then strategies</i>	<ul style="list-style-type: none"> <li>- parents get to understand and learn how to apply 'transitional warnings' techniques to encourage, prepare their child in planning and predicting the changes of daily tasks</li> <li>- When-then: combination of parent's requirements and reward for child to encourage compliance behavioural eg. <i>when you pick up your toys then you can watch ...</i></li> </ul>
5	<i>Planning ahead</i>	<ul style="list-style-type: none"> <li>- parents learn to predict the challenging situation for the child (eg- to the store)</li> <li>- then parents need to plan step-by-step in order to help the child be prepared for this</li> </ul>
6	<i>Point system</i>	<ul style="list-style-type: none"> <li>- facilitator helps parents to understand how to use the point chart which should be simple and is suitable to the child's development and age</li> </ul>
7	<i>Time out</i>	<ul style="list-style-type: none"> <li>- last method to apply and only in the really difficult situations</li> <li>- parents rehearse to give commands in a neutral manner and firm voices.</li> <li>- parents also practice how to implement whole time-out procedure with facilitator</li> </ul>
8	<i>Response cost-time out from privileges</i>	<ul style="list-style-type: none"> <li>- parents get to know how to apply 'gentle' punishment: the withdraw from privilege. This specific punishment helps the child understand the realistic consequences.</li> <li>- during this session, there is discussion between parents and facilitators about punishment options including both positive and negative so that they understand and recognize disadvantage and advantage of each option.</li> </ul>



		<p>Discussion in group about impacts of the short and long-term of each punishment option → parents understand the bad affects of negative punishment → then, parents practice strategies of how to control their negative behaviours eg. Not using physical disciplines, consider its long-term impacts</p> <p>- at the end of session, parents practice to change other discipline forms that are less destructive</p>
9	<i>Problem solving</i>	<p>- parents review and demonstrate their newly found abilities and execute these skills in a <i>strategy framework</i> (pick a skill for a specific circumstance).</p> <p>- Parents get to know PASTE: P – pick a problem, A- consider alternative solution, S- select the best strategy, T- try it out, E- evaluate it</p>
10	<i>Closing</i>	<p>- is a review the learned skills and discussion about the advantage of skills and in which situation skills need to be used</p>

## Appendix 5 : NFPP 12 weeks

Structure of adapted NFPP with goals and contexts for the extended 12 weeks program of McCann, et. al 2014

Table was modified and based on structure of 8-week program in article of Thompson, et. al 2009. (p: parent, p & c: parent and child)

GENERAL GOALS	TARGETS	PSYCHO-EDUCATION		MAJOR REVIEW	PARENT-CHILD PLAY			MAJOR REVIEW		PARENT-CHILD TASK		FINAL REVIEW	
		w1 - only parent	W 2 - only parent		W 3 – only Parent	W4 p & c	W5 p&c	W6 p & c	W7 p	W8 p	W9 p&c	W10 p&c	W11
	Clinician - gain information - check, investigate - assess p&c - discuss - model, instruct - coaching, teaching	- problems, symptoms, - developmental history - developmental delay? (speech, language)? - assess p , mental health, education of parents	- review diary, messages, techniques of previous weeks - discuss feelings of p, temper tantrums	- review diary, messages, techniques of previous weeks - new game	- assess p capacities to carry out strategies	Review previous weeks messages	- Overall review of progress - psycho-education - focusing on achievements (positive moments of mother – child interaction) - identify parts of weakness - Continue to developing and tailor strategy in each area for each parent - feedback on play sessions to language and speech	- psycho-education - review of impact of using social stories - reinforce techniques and strategies - play sessions of parent and child - discuss parents about feelings, difficult-to-treat areas, concerned problems.	- Repeat what went through in week 10	- Review psycho-education; of using social stories, strategies, techniques, - discussion on parents’ concerned areas; about positive ways of problem-solving to deal with difficult situation that may happen in the future - positive feedback to parents - discuss the future - ‘playtime’ to			
<b>Improve parental style</b>	P to be - • understanding • constructive • positive • organized	- engage P in focusing on moments with child - build up p-c relationship - Psycho-education	- connect child behaviour with ADHD concept. - suitable program to P & C needs	- Extend use of teachable moments within the session. - Brain storming and	Review identified problems & given solution - p -c relationship,	- focus on the one that parents have difficulties - applying							

		about ADHD (characteristics, acceptance of the child) - review and discuss parent's feeling basing on diary (w2)		modeling	mindfulness	other techniques to suit needs of p & c	development (using book, nursery rhymes, social stories) - continue to write diary (positive, negative, play) to identify problems and difficult areas			prepare child for school and friends' readiness/willingness - planning ahead - use diary to keep tracks on progress
<b>Parental communication</b>	P to - listen be authoritative/reliable be clear be consistent	- Work on communication, eye contact; short sentences, clear messages, Praise, simple language - practice listening	- firmness, voice control	- 'I' and 'we' concepts- tone of voice: enthusiastic, respectful	- assess p is capable to carry out strategies so strengthen weakness					
<b>Improve ADHD +ODD</b>	P to learn - • behaviour principles • preventative strategies • Contingencies	Work on - - how to draw attention - keeping focus - avoid confrontation - clear boundaries	- keeping calm and focused; - avoid confrontation - Importance of being active & well-planned, routine	-the power of distraction, countdowns - houses rules/boundaries; giving choices -quiet time/timeout	- Psycho-education - observation the child & planning in advance - distraction techniques - behaviour modification					

<b>improve regulation through interaction</b>	P to improve - joint play/ • turn taking • scaffolding of skills. • C self regulation.	-( w.1) homework (diary of positive and negative moments with child, practice techniques) - introduce 1 new game; teachable moments/training games for attention and impulsivity - play diary (week 2).	- Review games progress/ adjust targets. - - New two games - Introduction to parents scaffolding concepts	- Fun play modification and self-control. - play	- Increase difficulty of games/ review teachable moments - attention training - development of language and speech				
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**Appendix 6: Session goals of adapted 12 weeks IY parenting program**

(McCann, D. C., et al., 2014)

Goals	Parental Strategies / Techniques
	Child-Directed Goal
Nurturing positive parent-child relationships - Developing child's positive behaviours	Parents: - model attention, appreciation, joys with song and games to the child; modeling principles to attention; encourage imaginary, pretend play - learn to apply child-directed technique; to end play with child; child's developmental needs & milestones - balance parent-child power - build self-esteem, creativity of the child

	- understand and follow rules of attention
Promoting language	Child-Directed Coaching
	<ul style="list-style-type: none"> <li>- p model to the child how to use language and inspire child to develop their own language ; modeling principles to language development</li> <li>-p learn how to coach readiness skills for preschool children (per-writing, per-reading, discovery learning)</li> <li>Parents learn how to make 'descriptive comment' to direct and coach child</li> <li>- 'persistence coaching': to helps ADHD child recognize when they need to concentrate, be focused, calm, patient with difficult tasks.</li> <li>- <i>Appreciating normal differences in the child's developmental abilities and temperament; completing temperament checklist.</i></li> </ul>
Social and emotion coaching	<ul style="list-style-type: none"> <li>- modeling principles of social and emotion coaching: parents do not use critical statements and demands. Utilize more positive and polite language</li> <li>- emotion coaching : to help children to develop their vocabulary of different emotion status and encourage them to express their own feelings</li> <li>- social coaching: to help children develop their social skills eg. sharing, being respectful, waiting, asking, turn-taking</li> <li>- parents train siblings and child's friends to use modeling techniques while playing and praise, prompt to help child develop social skills</li> <li>- know how to develop different stage of play which is age and developmental appropriate</li> <li>- know how to apply coaching principles in other moments and setting eg. mealtimes, bath time, grocery store</li> </ul>
The art of praise and encouragement	<ul style="list-style-type: none"> <li>- labeled praise: 'give to get' principles for both parents and children</li> <li>- focus on process of learning , not only results</li> <li>- self-praise; parents model to child how to make compliment</li> <li>- parents use praise during support child, to build child's self-esteem and during developing child's social and self-regulation skills</li> <li>- use, model positive self-talk as a sample for children become familiar with</li> <li>- . compliment with specific statement, avoid to use general statement</li> </ul>
Spontaneous incentives for children	<ul style="list-style-type: none"> <li>- 'small step' to direct child's behaviour to desired behaviours, - first-then principles</li> <li>- remember each child is an individual and not compare or assume one strategy applies for all children.</li> </ul>

	<ul style="list-style-type: none"> <li>- acknowledge immediately to positive behaviour</li> <li>- use reward if child learns new positive behaviour; use unplanned reward (spontaneous, unexpected)</li> <li>- parents plan child-related activities in consideration of age and developmental appropriate eg. dressing, picky eating, bedtime difficulties, noncompliant behaviours, toilet training, rough animal care</li> </ul>
Handling separations and reunions	<ul style="list-style-type: none"> <li>- clear and predictable routines for each child; goodbye routines; peek-a-boo game</li> <li>- appropriate and adequate control, not over control at all times,</li> <li>- safety and security with predictable routines</li> <li>- child – proof – home setting</li> </ul>
Positive discipline; effective limit setting	<ul style="list-style-type: none"> <li>- only make commands when needed</li> <li>- politeness , respect principle: parents act as a sample of politeness, respect to child</li> <li>- commands: clear, short, respectful, action- directed eg. when-then,</li> <li>- distraction and redirection technique; - give chances for child to make choice</li> <li>- rules for all, not only ADHD child</li> <li>- warning, reminders if being distracted</li> <li>- clear, predictable family rules</li> <li>- monitoring principles: constant monitoring and supervision children</li> </ul>
Positive discipline; handling misbehaviour	<ul style="list-style-type: none"> <li>- parents model distraction, ignoring technique (whining, tantrums...)</li> <li>- calm, self-control strategies</li> <li>- positive self-talk</li> <li>- train children to practice calming</li> <li>- parents know how to find supports</li> </ul>



**Appendix 7: Main training contents for children of each program were summarized.**

These summarized details shall help readers to capture the main ideas of what knowledge and skills that parents and children was taken part in.

Programs	Main training contents for children
<b>Play-based intervention</b> (coaching during play)	- social and play skills, play-pair interaction,
<b>Executive function training (EF)</b>	- attention techniques, EF practice skills (self-regulation, attention, working memory, cognitive flexibility, behaviour inhibition, capability to maintain attention)
<b>MOVI-KID</b>	- physical exercises
<b>IY dinosaur + IY parents</b>	- Commitment to group rules, feelings expression, problem-solving skills, angry management, friendship skills, teamwork
<b>Meditation, Yoga</b> (less anxiety, stress, sleep)	- Self-calming skills

**Appendix 8: Achievement of child-focused programs**

Outcomes	Classrom change	ADHD symptoms behaviors	Child compliance/comorbid disorder	Skills impacted in positive way	parent-child interaction/communication	behaviour control-management skills	positive parenting skills
<b>Play-based (IOr)</b>				X social play skill, language, play skill, prediction			
<b>EF+ Parent involvement (Pr, IOr)</b>		X	inhibit, shift, working memory			X meta-cognitive strategies	
<b>IY dianosaur +IY PT (Pr) (IO)</b>	X (externalizing behaviours) Not adhd core sysmtpoms	X	X (aggressive, oppositional) (externalizing) emotional, social competences	X problem sovling x skills,			x
<b>Yoga (Pr)(Tr)</b>		X attention, self-calming skills (Pr)					