CHAPTER II
REVIEW OF LITERATURE

PGI statistics shows that 8 to 10% of clinic population suffer with learning disabilities as per the available population at Child and Adolescent Psychiatry Clinic, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India (Tanbir, 2014).

There is alarming increase in learning disability among student population. Additionally, Learning disability is also growing as a public health problem with comorbid conditions such as anxiety, depression etc. The statistics enumerate the necessity for proper school training, intervention programmes and Government policies to meet the requirements for a good scholastic performance from the student population.

It is also observed that adolescents with learning disability are at risk for developing psychotic disorders. Research says that 25 to 40% of people with learning disability are prone to develop mental health issues. Hence it is essential to identify learning disability at early stage *(Children and Young People with Learning Disabilities - Understanding Their Mental Health,* 2024*)*.

Ashraf et al. (2021) investigated the prevalence of learning disabilities among Pakistani female adolescents. The finding reveals that out of 252 participants, 34% had learning disabilities and also had other comorbidities like depression (21%) and anxiety (68%). According to Onofri et al. (2021), among 193 students in the age group of 8 to 18 years, 9.44% of the adolescent population were identified to have learning disability.

Zablotsky and Alford (2020) aimed to study the prevalence of ADHD and learning disability by race and ethnicity among students in the age group between 3-17 years. Based on their study, the following findings were concluded:

- Between 2016-18, 13.8% children (aged 3-17 years) had ADHD or learning disabilities. Among this, 16.9% were Non-Hispanic black children.
- Children in the age group of 3-10 years are less likely to be diagnosed for learning disability (10.1%) than children in the age group of 11-17 years (18.1%)
- Children from poverty are more likely to develop ADHD or learning disability (18.7%).

- Parental education also influences the prevalence of learning disability and acts as a risk factor. It was observed that around 15.4% of children diagnosed with ADHD or learning disability had parents who have had their education level below higher education.

Khuloud Khayyat et al. (2013) studied to find the prevalence rate of learning disability among Palestinian adolescents who were studying in class seventh to ninth in West bank and Gaza strip. Around 1337 students, 763 boys (57.1%) and 574 girls (42.9%) were selected randomly. Out of this sample, 41.4% were studying in class seventh, 24.2% in class eighth and 34.3% in class ninth. The students were assessed by their teachers using Al Quds University group learning disability tests which was designed to identify students with learning disability in 3 domains: reading in Arabic and English, writing in Arabic and English and mathematics. Based on the findings, it was concluded that 65.2% students did not have any problems in Arabic language, around 8.4% students had learning difficulty in Arabic and 26.5% had learning disability in English language. In mathematics, 61.7% did not have any difficulty, 11.8% had learning difficulty and 26.5% had learning disability in mathematics. The conclusion is the prevalence of learning disability high among Palestinian adolescent.

Causes of Learning Disability

Thomas and Woods (2003) stresses that learning disability can be caused by any condition that impairs the development of the brain either before the birth, during birth or within the childhood years. Out of the several causes, the main causes of learning disability may be due to genetic disorders (e.g. phenylketonuria), chromosomal divisions (Down's syndrome, Fragile X Syndrome), cranial malfunctions (e.g. hydrocephalus), congenital factors, e.g. maternal disease, substance exposure, prematurity, perinatal concerns, psychosocial and environmental factors

Biological Causal Factors

Out of the many potential causal factors for learning disabilities, the exact causal factor is unknown. Influence of heredity, birth complications, drug and alcohol usage during pregnancy and stress during pregnancy accounts as the major causes for learning disability condition (*Learning Disability*, 2015).

Poor nutrition, hormonal imbalance especially thyroid hormone, low birth weight present in a child can cause learning disability. The presence of asymmetrical brain structure (planum temporale is larger in left hemisphere than right hemisphere for normal person) is not present for person with dyslexia. Hence, brain structure remains as a contributing factor for learning disability (Fiedorowicz et al., 2001).

Environmental Causal Factors

Few environmental factors that leads to learning disability includes poor instruction to the child, lack of attention, lack of proper living conditions and poor academic achievement (Javaid et al., 2020). Exposure to lead and neurotoxic chemicals can cause damage to the infant brains and act as a causal factor towards learning disability (Landrigan, 2023).

Other environmental causes include exposure to stimulants like coffee, marijuana, use of artificial food additives like food colouring, consuming fluoride rich water, usage of monosodium glutamate etc. also expose a child to learning disabilities (Pressinger & Marfo, 2023).

Psychological Causal Factors

Psychological factors like poor perception, unhealthy classroom, lack of scholastic motivation, lack of conceptualization and educational factors like unskilled teachers, lack of materials, poor curriculum also contribute to learning disability (*The Causes of Learning Disabilities*, 2021).

Comorbidities

Comorbidity refers to cooccurrence of multiple disorders in one person. Learning disability occurs with the presence of other disorders like ADHD and conduct disorder. Children who have been hyperactive at young age were identified to possess learning disability at later age of after 8 years. Also children who have been identified as clumsy in young age were also assessed to have learning disability at later age. Reports of delinquency due to school failure, intellectual difficulties and engaging in delinquent acts are closely observed in students with learning disability. There are also plenty of behavioural and emotional problems that cooccur and forms as a risk factor in the development of learning disability (Jena, 2013).

Sahu et al. (2019) states that specific learning disability has other comorbidities such as ADHD, conduct disorder, anxiety and depression. Among 41 patients with SLD in the age range of 7 to 12 years, a diagnosis was carried out using child behaviour checklist, Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) and Conner's 3 Parent Short form – 45. The result emphasized that among the many comorbidities, ADHD was found to be prominent and co-occurs with SLD.

Willcutt and Pennington (2000) studied the association between reading disability and internalizing and externalizing psychopathology among 209 twins with reading disability (RD) and 192 twins without RD. The result shows that individuals with RD showed higher rates for internalizing and externalizing disorders than individuals without RD. There was no significant relationship between aggression, delinquent behaviour or conduct disorder. But there was a significant relationship with respect to anxiety and depression and RD when compared to ADHD. This suggests that internalizing disorders may be linked to the development of RD. And further analysis pertaining to gender reveals that the relationship of the occurrence of RD and internalizing disorder was prominent among girls whereas the association of externalizing psychopathology was prominent among boys.

Kishore et al. (2000) analyzed that 21 out of 56 students with SLD in scholastic skills had comorbid psychological disorder. Sahoo et al. (2015) listed the comorbid disorders of SLD are Externalizing Disorders such as ADHD, oppositional defiant disorder and conduct disorder; Internalizing Disorders are depression, suicidal ideation, behavioural and emotional problems, substance abuse and anxiety disorders.

Bilingualism and Learning Disability

Bilingualism has always been a barrier to test the efficacy of education through mother tongue. In India, there is a diversified language system and due to the colonial influence of British, English has been maintained as the official language. Also, migration of people from one place to another, marital bond between different ethnicity of people have given rise to the need for bilingual or multilingual languages. All of these has an effect on the education of the child and that learning language has become a serious problem. Considering these complex issues, Government of Tamilnadu, India, have exempted children with learning disability to learn a second language as a compulsory paper at school. In Delhi, Delhi School Education Act (1973) states that children with learning disability

should learn in mother tongue as long as their parents are comfortable and if the medium of instruction at school is different, due care to be taken to teach the different language to the child till primary level (Jena, 2013).

Riva et al. (2021) designed to comprehend the characteristics of bilingual children with SLD based on language related skills. Seventy two students in the age group of 9 to 11 years were selected and randomly assigned to 4 groups as 18 monolingual Italian students with SL, 18 monolingual students without SLD, 18 bilingual students with SLD and 18 bilingual students without SLD. The findings shows that SLD and bilingualism students committed less number of errors in words that were used frequently. The study iterates the importance of understanding the neuropsychological profile of bilingual children with SLD.

Cioè-Peña (2017) studied on Bilingualism, Disability and what it means to be Normal. Students with diversified exposure to multiple languages must have learning in home language and for students who are disabled seek inclusion in mainstream schools. To balance these two regulations and to cater to the Emergent Bilingual Learners Labeled As Disabled (EBLADs) to focus on inclusion in the mainstream with monolingual or bilingual education. Hence, to expose the disabled students to mainstream with bilingual teachings, the suggestions are consider student's linguistic performance along with academic performance to be given due importance during IEP meeting. It can be done by asking caregivers to monitor the exposure of student's activity towards bilingual atmosphere outside school; and enable the school to provide support to the students emphasizing that success to be adorned not just in academics but also at home and community. In an inclusive setup, teacher can motivate the students to use translanguaging.

Mohammadi et al. (2021) compared the working memory in monolingual and bilingual 60 children with specific learning disability. The 30 monolingual Persian speaking students were divided into 2 groups with 15 girls and 15 boys and another 30 bilingual students (15 boys and 15 girls) who speaks both Kurdish and Persian. The selected students were administered by Wechsler Intellectual Scale for Children-Revised and Wechsler's subscale of Working Memory Test. The result shows that there was significant difference between spatial working memory and working memory between monolinguals and bilinguals.

Jozwik et al. (2019) analyzed the development of academic language and reading comprehension among emerging bilingual students with learning disabilities were

administered by Self-Regulated Strategy Development (SRSD). The emerging bilingual students with learning difficulties benefitted and they were able to use comprehension monitoring strategies while reading will enhance their success level at school and in life.

Calvin and Gray (2020) investigated on efficacy of using double bubble mind map to deal with reading comprehension in bilingual middle school students with learning disability. Three female Spanish-English students with learning disabilities were assessed and administered by double bubble mind map that involved the reading comprehension passage. The intervention increased the reading comprehension of the students.

The studies emphasized that bilingualism is a risk factor for the development of learning disability and that remedial teaching, inclusive education and intervention training programmes helps a student with learning disabilities to get adapted to the demands of bilingualism. The studies also iterate emergent bilingual students with learning disabilities is an upcoming challenge, which needs to be discussed while framing IEP by the teachers, parents and other professionals.

Executive functions and Learning Disability

Role of Attention

Amani et al. (2018) compared 29 executive functions of students with specific learning disorder and 30 normal students. They were assessed by The Tower of London Test, Stroop Colour Word Test and Wisconsin Card Sorting Tests. The findings revealed that there was significant difference between specific learning disability students and normal students in cognitive flexibility, planning and selective attention. It reveals that students with specific learning disabilities had deficiency in executive functioning compared to normal students and recommended to explore interventions that could restore executive functions in students with specific learning disability.

Fadaei et al. (2017) explored the relationship between executive functions and problems with reading in children with specific learning disorder. Twenty nine children with specific learning disorder were administered by NAMA Reading and Dyslexia Test, The Tower of London Test, The Stroop Colour and Word Test and the Wisconsin Sorting Card Test. The results showed that there were significant relationship between selective attention and reading problem and also between planning and reading problem. It concludes that executive functions play an important role in the students with specific learning disabilities and it is essential to improve executive functions.

Hemati Almdarloo and Tavakoli (2020) examined the efficacy of attention in reading performance of female students with dyslexia from third grade Isfahan. The students were allocated to experimental group (n=15) and control group (n=15) and administered by Karami Nuri and Moradi Reading and Dyslexic Test. The results established that the intervention improved the reading performance of the dyslexic female students.

Soleimani (2020) evaluated the effectiveness of cognitive remediation on cognitive attention functions was conducted among 32 students with specific learning disabilities in grade five in Urmia elementary school. They were administered by Raven's Progressive Matrices, Wechsler Memory Scale of Numeric (Digit Span) and CPT scale processing of emotional. Meichenbaum cognitive restructuring interventions were administered for six months. The results showed that there was a significant difference between the experimental and control group in working memory and attention and it improved the attention and working memory in students with learning disability.

Role of Memory

Mammarella et al. (2018) examined visual, spatial-sequential, and spatial-simultaneous working memory (WM) performance in children with mathematical learning disability (MLD) and low mathematics achievement (LMA). It included 6 computerized tasks, 2 for each visuospatial working memory subcomponent. It was concluded that both MLD and LMA children had low visuospatial working memory function in both spatial-simultaneous and spatial-sequential WM tasks.

The functional structure of spatial working memory was studied in younger people in the age range 18 to 40 years and older people in the age range 64 to 85 years. It assessed the spatial working memory using modified version of the spatial span subtest of the Wechsler Memory Scale – Third Edition. Further exploration was done in both age groups pertaining to the effects of interference (control, visual or spatial) and forward as well as backward recall type. The results suggested that backward spatial span was more processing – intensive than forward span within both younger and older adulthood (Brown, 2016).

Gray et al. (2019) determined the emergence of working memory on a comprehensive battery of central executive, phonological, visuospatial and binding working memory with the different working memory profiles. Three hundred students from grade 2

with typical development, dyslexia, developmental language disorder were selected and administered 13 tasks from the Comprehensive Assessment Battery for Children – Working Memory to assess the central executive, phonological, and visuospatial/attention components of working memory. The findings showed that the importance of knowing the working memory profile of children with learning disability diagnosis and that working memory assessment could share important information regarding the child's cognitive functioning and helps in psychoeducational measures.

Alloway and Carpenter (2020) examined the relationship between learning disabilities, working memory and behaviour problems of 3 children with learning disorders and low working memory of 8 years age from UK. The results identified that each child had low working memory, low scores in academic and exhibited behaviour problems. This proves that working memory has an impact on the academic and behaviour outcomes.

Kamal (2021) scrutinized the verbal and visuo spatial memory of 36 students (13 years) with mathematical learning disabilities consists of one group with MLD and another group without MLD were matched with age and IQ were administered by Working Memory Capacity (WMC), Operation Span Task (OST), Symmetry Span Task and Coloured Square Test (CST). The results revealed that children with MLD scored lower in both verbal and visuospatial working memory.

Kizilaslan and Tunagür (2021) probed on understanding reading comprehension and high level language skills in students with dyslexia. The author posits that due to the presence of poor working memory processing, the children with learning disability experienced difficulty in attention, memory, perception, motor processing, information processing, speed, planning and problem-solving skills.

Carretti et al. (2021) examined the correlation between the characteristics of the typical population with the average performance of the people with dyslexia in working memory. The findings revealed that there was a linear relationship between APWM and reading ability in typically developing children (n=438). Also, the study identified a deficit in Associative Phonological Working Memory among children with dyslexia (n=26).

Poor memory as a predictor for psychosocial skills

Lerner et al. (2015) identified the neuropsychological predictor for social functioning. The participants answered to NEPSY II on neuropsychological factors that was

connected to social functioning. The major findings were that emotional perception, visuospatial perception, ability to discriminate auditory stimuli and understand instructions were related to poor social skills.

Kim et al. (2016) proved that fine motor skills predict the improvement in cognitive functioning as well as in social skills. Enhancing working memory has a tremendous effect on the improvement of social skills (Dučić et al., 2018). Ghasemi et al. (2019) also opines that working memory and other executive functions acts as a predictor for social skills in children with intellectual disabilities. They also suggested for an intervention that will improve the executive functions which improves social skills as well. The different types of learning disabilities due to difficulties in information processing reflects on the academic and social skills thereby leading to emotional problems and social problems as a consequence (Otu et al., 2016).

Karbasdehi et al. (2019) determined the impact of self-regulation empowerment programme training on neurocognitive and social skills in 26 students with dyscalculia were assigned to 2 groups. Assessment tests like Tower of Hanoi Task, Stroop Test, Dual N-Back Test, Wisconsin Card Sorting Test, and Social Skills Rating System were used before and after the intervention. The result showed that the self-regulation empowerment programme training improved the neurocognitive and social skills in students with dyscalculia.

Ashraf et al. (2021) examined the relationship between reading deficits, executive functions and social adjustment problems of 210 adolescents. The results proved positive correlation between reading deficits, executive function deficits and social adjustment problems. The finding also shows that working memory plays a mediator role in associating reading deficit and social adjustment problem. It concludes that executive function deficits explained the association between reading deficit and social adjustment problem.

Karbasdehi et al. (2019) compared the neurocognitive and social skills of 100 students with and without dyscalculia from Rasht City, Iran. Tests like Tower of Hanoi, Stroop test, dual n back test, Wisconsin card sorting test and social skills rating system were used. The results revealed significant difference between neurocognitive and social skills in two groups. The students with dyscalculia performance were weak in the neurocognitive and social skills test than students without dyscalculia. Hence it can be concluded that attention to the cognitive aspects and social skills of students with dyscalculia is important.

Executive functions and academic achievement

Boccella-Perras (2019) studied executive functions among ADHD and LD students using McCloskey Executive Function Scale (MEFS), Executive Function Deficits (EFD) and Executive Skill Deficits (ESD). The findings suggested that LD students were identified to possess Executive Function Deficits (EFD) and Executive Skill Deficits (ESD) in academic areas and memory.

Hadi et al. (2017) predicted the executive functions and active memory of academic performance of students with learning disabilities. Varghese et al. (2021) enumerated that working memory had role in determining the academic performance among students with specific learning disability.

Pourabdol et al. (2020) studied the cognitive-executive functions of frontal-parietal lobes in 40 students with specific learning disorder and 40 normal students. They were administered Tower of London Test, Wechsler subtests of similarities, mazes and visual puzzles and Bender Gestalt Test. The result revealed that the frontal-parietal lobes in students with specific learning disorders were weaker than the normal students and malfunction in the cognitive executive functions lead to disability. Hence it is essential that psychologists and curriculum developers pay attention to training methods that focus on planning, organizing, logical reasoning etc.

Ghiyasi et al. (2018) evaluated the effectiveness of executive function training and neurofeedback on improving normal student's academic performance. In the study, 36 male students from primary class were selected and divided into 3 groups. First group had 12 students selected for executive functioning training and neuro feedback group, second group had 12 students for executive functioning training group and the third group was the control group. After undergoing the training for 16 sessions for first and second group, the result showed significant improvement in the academic performance of the students attending the training sessions of executive functions. The conclusion of the study shares the information that by providing training to executive functions, the academic performance of the students can be improved.

Executive functions and Metacognition

Children with specific learning disability are troubled with Tzohar-Rozen et al. (2021) investigated on self-regulated learning skills among children with at risk for specific

learning disability. It identified that children with specific learning disability had difficulties in metacognition which includes poor emotional, cognitive and motivational skills and recommended that intervention to improve metacognition and self-regulated learning skills among children with specific learning disability.

Khasawneh et al. (2020) described that the students with learning disability had low metacognition ability and recommended to study further about the relationship between metacognition and other psychological compatible variables.

Chaji et al. (2021) reiterates that teaching executive functions such as cognitive and metacognitive aspects improves the academic performance of students with dyslexia. The study was conducted on 30 students from Birjand City schools with experimental group and control group. They were provided with executive functioning training for 2 months and the result showed improvement in academic achievement.

Social Skills and Learning Disability

People with learning disability are often socially excluded with lack of friendship and loneliness. Tilly (2019) shares the information that people with learning disability faces social exclusion and they have the full right to be the members of the community. Tilly (2019) postulated that people with learning disability face social barriers that lead to social exclusion and loneliness. Some of the ways which people with learning disability can look forward for possible ways includes access to community safety training at the local level and identifying people with learning disability who are digitally excluded and providing skill training and safety ways of using internet. By removing barriers, the people with learning disability can become active citizens.

Mohammad et al. (2018) compared the humour styles and social skills between high school students with and without specific learning disability disorder. Eighty students comprised of 40 with SLD and 40 without SLD were administered by Raven's IQ test, Colorado Learning Difficulties Questionnaire (CLDQ), Matson's Social Skills and Martin's Humor Styles (HSQ). The results suggested that the social skills of students with learning disability were lower than those without specific learning disability. The findings suggested that students with SLD faced difficulty expressing social skills and they also preferred negative humour styles. Preferring positive humour style such as self-enhancing was considered to be adaptive humour style. Hence, it is important that students with SLD focus

on more healthy humour styles and develop social competency skills which will be a good predictor for their good academic performance and healthy social styles as well.

Cavioni et al. (2017) suggested that the role of social and emotional learning programmes for children with learning disability. In the paper, the author addresses issues that students with learning disability face in their educational realm such as peer group acceptance, friendship and social isolation, low self-efficacy and self-esteem, and externalized and internalized behaviour problems. The paper iterates the benefits of social and emotional learning for students with learning disability which suggests the need for universal social and emotional learning that fosters the academic and social inclusion for students with learning disability.

From the studies it implies the importance of social skills for students with learning disability. Just like how students with learning disability fall behind academically, they also experience a fall back when it comes to social skills. Hence, it is significantly important to provide early intervention programme and training programme. One such intervention programme named Better Emotional and Social Times (B.E.S.T) offered by Learning Disabilities association of Niagara Region was successful in imparting social skills to the students of learning disability and the students showed improvement in self-advocacy, self-esteem, emotional regulation and self-understanding (Maiuri, 2020).

Role of Social competence

Almakanin et al. (2021) ascertained the level of emotional security and social competence among 161 Syrian refugees' children with learning disabilities from Zarqa Governorate, Jordan. Emotional security scales and social competence scales were administered and the results showed statistically significant in emotional security among female Syrian refugee children with learning disability. The social competency level based on parental status was also statistically significant. There was a positive correlation between emotional security and social competence among the Syrian refugee children with learning disability. The study recommends conducting training programmes to improve emotional security, academic skills and social behaviour among children with learning disability from Syrian refugee.

Rani (2017) studied the independent effect of social problem solving skills on social competence of Learning Disabled (LD) and Non Learning Disabled (NLD) students. The

study had two objectives such as to study the social problem solving skills and social competence of LD and NLD students and the independent effect of social problem solving skills on social competence of LD and NLD students. The study was carried out on 200 students with 100 LD students and 100 NLD students. The data were collected using self-constructed tools to measure social problem solving skills and social competence. The results enumerated that social problem solving skills play an important role in influencing social competence of learning disabled students and non learning disabled students. Social problem solving skills is identified to be the predictor for determining social competence.

Rub (2018) recognized the effectiveness of psychodrama in improving social competence of 50 children with learning disabilities from government schools in Jeddah were assessed by social competence scale. Further, the students were divided into experimental group (n=25) and control group (n=25). The findings revealed that Psychodrama was effective in improving social competence.

Role of Emotional Intelligence

Panneerselvam and Sujathamalini (2014) studied the emotional intelligence of children with learning disability. They share the information that children with learning disability faces emotional problems and faces conflict in their learning conditions. These conflicts make them to give incorrect answers to the question posed by the teacher. As these children were already troubled with learning and faces academic difficulty, the added emotional problems contributed to low emotional intelligence and later in life these children become as individuals with less emotional intelligence.

Bryant (2007) assessed 47 students with learning disability for emotional intelligence using The Bar-On Emotional Quotient Inventory Youth Version. The result indicated a strong relationship between reading comprehension and emotional intelligence among high school students with learning disability.

Zysberg and Kasler (2017) concluded that emotional intelligence acts as a protective factor in interpersonal skills and other cognitive skills. The results showed that students with learning disability had low emotional intelligence. It reiterates that emotional intelligence intervention module to be administered to students with learning disability.

Olmedo et al. (2021) shared that there were relationship between social-emotional competencies and learning disabilities and identified that low social-emotional

competencies affected the academic performance of students with learning disabilities. The study revealed that though many studies were carried out on socio-emotional competency and its relationship with learning disabilities, the causal factor had been less investigated, which demands an in depth study considering other variables such as sex, types of disabilities, age and cultural context.

Correlation between Social Competence and Emotional Intelligence

Trigueros et al. (2020) studied the relationship between emotional intelligence and social skills and their effect on bullying. They included 912 Spanish high school students and administered Spanish version of Trait Meta Mood Scale. The results enumerated the positive relationship between emotional intelligence and social skills among the high school students.

Hosseini et al. (2015) discovered the relationship between emotional intelligence and social competence with academic performance among high school students in Iran. The findings proved that there was a positive relationship between emotional intelligence and social competence which enhances the academic performance of high school students.

Oliya et al. (2021) investigated the mediating role of emotional intelligence in relation to theory of minds with social skills in 227 students with learning disabilities from the elementary schools of Shiraz and Marvdasht. They were administered by Stairnamn's Theory of Mind Test, Emotional Intelligence Scale and Maston's Social Skills Scale. The results opines that emotional intelligence had mediating role between the theory of mind and social skills in children with learning disabilities. Thus there was significant relationship between the emotional intelligence, theory of mind and social skills in children with learning disabilities.

Montgomery et al. (2018) analyzed the current educational system to improve the emotional and social competencies of school going children that contributed in reducing under achievement and school violence and helped in promoting positive well-being. But unfortunately students with atypical development like children with autism, ADHD, specific learning disability, intellectual disability etc. experienced academic, emotional and social difficulties. Hence, the researcher described that emotional intelligence and social-emotional learning that focus on student's mental health of both typical and atypical learners by administering mindfulness based school programmes.

These studies strongly recommend the need for socioemotional learning in schools. Considering the importance of the relationship between social competence and emotional intelligence, the current study aims to cater an intervention training in Expressive Arts Therapy and Brain Gym to enhance the social competence skill and emotional intelligence in students with learning disabilities.

Quality of Life and Learning Disability

Karande et al. (2009) measured Health Related Quality of Life (HRQL) of children with specific learning disability, 9 clinical deficits such as limitations in family activities, emotional impact on parents, social limitations due to emotional behaviour problems, time impact on parents, general behaviour, physical functioning, social limitations due to physical health, general health perceptions and mental health were detected out of 12 domains using the Child Health Questionnaire – Parent form. Further, statistical analysis proved that nonacademic problem, ADHD or first born status predicted a poor psychosocial summary score and having nonacademic problem or first born status predicted a poor physical summary score.

Karande and Venkataraman (2013) found that the impact of comorbid attention deficit/ hyperactivity disorder on self-perceived health related quality of life of children with specific learning disability. In the study conducted, around 12 to 24% children with specific learning disability (SpLD) had cooccuring attention deficit / hyperactivity disorder. The study hypothesized that the cooccuring ADHD affects the health related quality of life (HRQoL) of children with specific learning disability, especially in psychosocial functioning. For the study, 136 children with SpLD with cooccuring ADHD were included. The instrument used to measure HRQoL was DISABKIDS (DCGM-37-S (V31). The results revealed that a better score in the perception of SpLD / ADHD children in physical functioning and psychosocial functioning.

Lambert and Dryer (2018) opines that the quality of life of students with learning disability studying in higher education through online were affected and these students were troubled with learning challenges also. The study used a qualitative analysis of semi structured interview methods on eight students of 34 years old. The results concluded that the students with learning disability studying in higher education face low quality of life due to online learning and that they had poor psychological well-being, social relationships and

financial situation. The study emphasized in reducing the learning challenges faced by the students with learning disabilities in higher education.

Role of mental well-being

Watson and Keith (2002) compared the quality of life of 76 school aged children with and 64 without disabilities were administered by Quality of Student Life Questionnaire (QSLQ). The findings identified that students with learning disability had low quality of life in domains such as satisfaction, well-being, social-belonging and the total QSLQ score. This suggested that the need for intervention to improve the quality of life of students with learning disability.

Upadhyay (2021) investigated on Positive Psychology Intervention (PPI) to improve the subjective well-being (SWB), academic self-concept and academic achievement of 75 children with learning disability (61 boys and 14 girls) were selected and administered by Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS), Positive and Negative Affect Schedule for Children (PANAS-C), Academic Self Concept Scale and total marks from the core subjects were used to measure Academic Achievement. The intervention had activities to strengthen gratitude, mindfulness and attributional style provided for 12 weeks. The results showed an increase in the levels of subjective well-being, academic self-concept and academic achievement of children with specific learning disability.

Sandhu and Zarabi (2019) identified the impact of self-regulated strategy on the self-efficacy and well-being of students with learning disability. The tools used were Self-Efficacy Scale (SES-SANS) (Singh & Narain, 2014) and General Well-Being Scale (GWBS-KADA). The results opine that the self-regulated strategy contributed towards a significant change in self-efficacy, self-confidence, efficacy expectation, positive attitude, outcome expectation and also in the well-being such as physical well-being, emotional well-being, social well-being and school well-being. This concludes that self-regulated strategy is a successful intervention to students with learning disabilities facing learning problems.

Academic achievement and quality of life

Chan et al. (2017) analyzed on children with special learning disability had high self-stigma and poor quality of life due to low academic achievement. This poor academic performance due to learning struggles are biological and permanent in children with learning disability. They concluded that a learning programme that caters to improve quality of life by involving the parents of children with special learning disability is recommended.

Waber et al. (2019) devised a questionnaire to measure the quality of life for children and adolescents with learning problem. The questionnaire named as LD/QOL 15 consisted of 35 items. The questionnaire was developed through a survey from 151 parents of children with learning disorders. The questionnaire included academic performance factors, school understanding factors and child/family psychological factors. Using this tool devised, Waber et al. (2021) studied the impact of school education services on the school-related quality of life in children with learning disorders and their families. The study hypothesized that a positive school response would show an improved quality of life. The tool, LDQOL 15 was used and the sample size was 155 parents of children with learning disorder. The results indicated that the prevalence of school –related QOL problems remained high and that positive schooling will certainly have a huge impact on the quality of life of these children with learning disorders. This necessitates the role of special education and intervention to these students to improve their quality of life.

Woods (2020) measured the quality of life of students with oral and written language difficulties/disabilities. He compared quality of life with the proximal outcomes (academic and school functioning) and distal outcomes (overall life satisfaction). The sample used in the study were 24 children with written language disorders in the age group of 8-14 years and 14 children with oral language difficulties in the age group of 5-13 years. The tools used were parent-reported quality of life measures (PROMIS, PedsQL, LD/QOL 15). The results showed poor score in psychological domain for children with written language difficulty and poor score in academic domain for children with oral language difficulty. There was a correlation between the proximal and distal outcomes.

Brain Gym

Ferree (2001) administered brain gym training programme to 30, IV graders. The students were assessed for their behaviour and cognitive measures using Stanford 9 achievement test as well as teacher's rating scale. The findings proved that brain gym was an effective practice to enhance cognitive performance among students especially mathematics but the claims of brain gym programme remain uninvestigated.

Jalilinasab et al. (2021) examined the effects of brain gym exercise on development of fundamental motor and social skills of 84 children of 10 years old. They were randomly assigned to one group with Brain gym intervention and another group as control group. The measurement tools used were test of gross motor development, Matson evaluation of social

skills with youngsters. The results opines that brain gym intervention group out performed the control group. This concludes the effectiveness of brain gym to improve motor and social skills of children.

Cerezo and Prudente (2018) evaluated the effects of brain gym movements' on 36 kindergarten pupils' learning engagement and achievement in reading from Philippines. In the study, brain gym intervention was incorporated along with the daily English lessons for a period of 2 weeks. The results showed significant difference in the pupils' achievement in reading before and after brain gym intervention. It can be concluded that brain gym training enabled the students to get more engaged in their learning.

Ocampo et al. (2017) explained the organization and legibility of writing before and after brain gym intervention among the subjects. The subjects included were 4 pupils of grade one who had a variety of writing concerns such as getting started, organization, attention to details and producing sufficient length of writing. After administration of brain gym activities, it was observed that there was an improvement in the writing of the pupils in terms of neatness, legibility, correct spacing between lines and words. It can be concluded that brain gym exercises brought excitement, cheerfulness and relaxed mood among pupils. Hence, the study recommends the use of Brain Gym exercises to enhance writing performance among pupils.

Enhancement of academic achievement

Marpaung et al. (2017) introduced brain gym practice to children in the age group between 10 to 12 years old. The design used was pre test and post test experimental design by measuring intelligence quotient. The findings provided evidence that brain gym can provide increase academic performance in children aged 10 to 12 years.

Basuki and Faizah (2020) examined the influence of brain gym training on 26 students studying at Stikes Nu Tuban. The selected participants were allotted equally to experimental group (n=13) and control group (n=13). The result proved that brain gym training improved concentration while learning. Hence, it is suggested to use brain gym activities before the lesson starts or in the middle of the lesson.

Sele (2019) try to investigate on improving quality of learning through brain gym learning techniques. He used a learning model called Children Learning in Science (CLIS) to find the optimization of CLIS model with brain gym that will empower the students'

human circulatory conception. The study used 173 students of class XI and the instrument used in this test was human circulatory conception developed by Andriani. The findings showed an increase in the human circulatory conception learning in CLIS model with brain gym than the one students' human circulatory conception learning in CLIS model only. Thus, it can be concluded that brain gym can improve the CLIS model and thus empowering the students towards human circulatory conception learning.

Al Herbawi (2018) investigated the effectiveness of brain gym exercises in enhancing boys' academic and behavioural achievements of 44 students from grade six. The results showed that at behavioural level, the students were able to settle down and listen to teacher's instruction upon brain gym administration. The aggressive level of the students decreased and the students began to enjoy learning upon brain gym administration. But in academic achievements, the effect of brain gym intervention did not show any significant rise. It can be concluded that brain gym exercises were effective in improving the behaviour and attitudes of the students that made them to focus in class but more research is needed to prove the effectiveness of brain gym towards academic achievement.

Enhancement of executive functions

Bayanfar and Tabatabaee (2019) analyzed the effectiveness of brain gym in reducing attention defect and to increase academic self-efficacy. The experimental group consisted of 15 students and 15 students in control group. The subjects were administered by attention, academic self-efficacy and academic performance before and after the intervention. The finding revealed significant improvement in the attention and concentration among the students. The findings also show improvement in the academic self-efficacy and academic performance among the students due to brain gym activity.

Abduh and Tahar (2018) identified the effective approaches to enhance the working memory function of 15 students with learning disability. The participants were divided into 3 groups with 5 students in each groups: brain gym group, brain training intervention group and control group. The brain gym intervention group underwent brain gym super space exercise for 4 weeks. Brain training intervention also had the intervention for four weeks. The working memory was measured using Digit Span Memory Test, Spatial Memory Test and Picture Identification Test. The findings showed an increase in Digit Span Memory and Spatial Memory skills for the group that underwent intervention programmes.

Amiri et al. (2021) studied the effect of brain gym intervention to suppress the theta / alpha ratio and on working memory of 20 students with dyslexia or dysgraphia in the age range of 8 to 12 years. Brain gym intervention was administered to the experimental group for 20 sessions. The instruments such as neurofeedback device was used for recording the brain waves and Wechsler memory software was used to measure active memory. The results showed suppression of theta waves and active memory increase in the experimental group. Hence, it can be concluded that brain gym intervention has proven a positive neurological evidence in improving the memory of students with learning disability.

Septian et al. (2018) improved the ability of concentration among 42 students of grade IV to VI from Ciparay Elementary School, Indonesia. The tool used was Concentration Grid Exercise Test. The results conveyed that brain gym activities increase the ability to concentrate among the students of the elementary school, Indonesia.

Expressive Arts Therapy

Henley (1997) highlighted the importance of expressive arts therapy as a curriculum. The author identified that for emotional disturbances and educational objectives, expressive arts therapy offers a therapeutic curriculum which includes phototherapy, biblio therapy, studio work form and poetry therapy. The one year project on expressive arts therapy was proved to be beneficial.

Forrest-Bank et al. (2016) investigated on efficacy of expressive arts therapy among adolescents from low socioeconomic status to enhance positive youth development and prevent problematic behaviours. The findings favoured to apply expressive arts therapy as an intervention but more so it can be used as a process in using expressive arts therapy as an after school programme for a promising progress among the youth.

García (2020) suggested to improve the emotion recognition and communication skills in individuals with autism using expressive arts therapy. She focused on improvements in cognitive, technical, and social capabilities as well as the ability of visual autistic individuals to assist for a professional position in the neurotypical creative industries. The intervention included administering expressive arts therapy to high functioning and low functioning autistic children as well as group based social skills training sessions with children and young adults with autism. The results showed that the high functioning autistic children who were visual thinkers benefitted from digital arts intervention and expressive arts therapy. It was found that expressive arts therapy was

beneficial in improving communication, emotion recognition and helped in professional integration to the neurotypical creative industries.

Williams (2020) proposed on theorizing and designing an expressive arts therapy workshop for 45 clinicians who are interested in exploring the effects of organizational trauma. The study included a choreography of ideas taken from expressive arts therapy, psychoanalytic group relations and organizational consultancy. The result of the workshop helped in improving the progressive disillusionment, which is feeling relieved and stress free, that reflected in the restorative practice for clinicians who practiced healing work with clients in trauma affected organizations.

Joines (2021) used expressive arts therapy during COVID 19 pandemic to reach out to children via telehealth. From the theoretical approaches from cinematherapy, narrative therapy, metaphor therapy, play therapy and expressive arts therapy, the researcher had developed an eight week story telling intervention to 4 children in the age group between 6 to 11 years old, outpatient at a family counselling center. Six unique stories were developed to administer to these selected children. The themes of the story included topics like family, isolation, helping others, confusion, problem solving and needing help. In general, the intervention was beneficial in providing insight and reflection towards the growth of the children.

Enhancement of academic achievement

Wang (2022) suggested the significance of expressive arts therapy to enhance family atmosphere which in turn increases self-esteem and reduces academic stress.

Eisner (2010) analyzed various literatures pertaining to expressive arts therapy and academic achievement places four major outcomes. The outcomes were students focus on the process of arts therapy and feel towards the art form, students develop aesthetic sense towards art form and life, art education reflects the time and culture and the connection between them and finally, students were to be trained to be creative, explore and accept multiple perspectives. The author shared that when art is used to intentionally to raise academic achievement in reading and writing it is evidently found to be effective. Hence, the author concludes that art education fosters the development in children and to be made as a part of the education.

Stuebing et al. (2020) evaluated the efficacy of literary free 12 step Expressive Arts

Therapy curriculum to enhance personal change and treatment outcomes for substance abusers with mental health disorders. The study targeted 47 individuals under rehabilitation treatment in US and through the study a 12 step guideline, cognitive behavioural therapy, rational emotive behaviour therapy and expressive arts activities were provided. The results provided positive increase in commitment to recovery, attitude toward making lifestyle changes and hopefulness. There was also significant change in the reduced amount of curriculum dropouts.

Enhancement of executive functions

Lusebrink (2004) assessed the efficacy of expressive arts therapy at cognitive level. The paper provides information that expressive arts therapy activates emotional states, helps in the formation of memory and processing of motor, visual and somatosensory information.

Kearns (2004) analyzed the impact of art therapy among students with attention deficit hyperactivity disorder and Asperger's syndrome. The researcher identified that the students might experience sensory integration difficulties and identified art therapy might help with both classroom behaviours and academic performance. The results proved that expressive art therapy to be effective in increasing positive behaviours as well as decreasing negative behaviours.

Haley (2018) used arts to regulate emotions through mindfulness and to strengthen empathy through story telling activity. Learning to regulate emotions during childhood days could benefit in academics. The study hypothesized that when a child develops the ability to understand and identify emotions of another person, it enhances the classroom community. This classroom community enhancement improved through better social skills, regulation skills, skills of empathy and good relationship building during lunch hours. These observations enabled a good understanding of how students benefitted through story telling and the use of mindfulness techniques that enhanced executive functioning on the whole.

Enhancement of social skills

Sutherland et al. (2010) narrated the role of expressive art therapy as an intervention to enhance group identity, group cohesion and cooperation. At the end of the intervention programme, the subjects (students of class 3 – 12) were able to gain good mental health along with feelings of belongingness and trust towards their group. The expressive arts therapy that included prosocial behaviours, interpersonal communication and problem

solving skills development was effective to improve the social skills, academic achievement and career success among adolescents based on the study by Lenz et al. (2010).

Olson (2021) presented a 10 weeks curriculum using expressive arts therapy to a sample of children aged 6-7 years studying in grade 1 & 2. The curriculum focuses on the combination of dance/movement therapy and expressive arts therapy. The aim behind this curriculum is to enhance social skills among the participants who lack social skills and to enable them to make friends and build relationships.

Enhancement of quality of life

Burns and Waite (2019) investigated on the efficacy of arts therapy intervention among elderly clients. The subjects were measured for their resilience and positive well-being. The findings showed an improvement in the quality of life among the subjects with an increase in joy and positive well-being and decrease in low mood and social anxiety.

Huyett (2018) studied the efficacy of expressive arts therapy in mental health community in the age range of 26 to 68 years and administered by 10 weeks intervention in expressive arts therapy. The result did not show any drastic improvement in the quality of life of the participants but there were other notable observations like participants' consistent participation, themes of hope, passing time, moving forward and demonstration of trust among group members. It suggested that expressive arts therapy have influenced the quality of life of individuals living with a mental condition.

Olson (2019) studied the incorporate expressive art therapies into the lifestyle of elderly people, who suffer with cognitive decline and to improve their overall well-being. Expressive arts therapy will benefit the participants in inducing creativity, performance and pleasure. The abundance source of literature provided in the study narrates on the benefits of expressive art therapy in enhancing quality of life of elderly people by increasing their subjective happiness.

Research Gaps

The above listed literature review iterates the prevalence of poor working memory, poor social skills, increasing emotional problems affecting emotional intelligence and quality of life and thereafter significantly affects the academic performance of the learning disabled adolescents. The literature recommends using intervention strategy to improve emotional intelligence, social competence, working memory, attention, academic

achievement and quality of life among those with learning disability. In the study, Expressive Arts Therapy and Brain Gym activities will be administered to enhance academic achievement and other variables. Intervention studies especially using Expressive Arts Therapy is rare in Learning Disabled Adolescents and through this study an attempt is made to deliver Expressive Arts Therapy and Brain Gym activities to learning disabled adolescents.