

A Dissertation on

**“A STUDY OF CHILDREN WITH LEARNING
DISORDER IN A TERTIARY CARE CENTRE”**

Submitted for M.D. Degree examinations

**THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY,
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**GOVERNMENT KILPAUK MEDICAL COLLEGE,
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**MD (PSYCHIATRIC MEDICINE) EXAMINATION
BRANCH – XVIII**



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May 2020

BONAFIDE CERTIFICATE

This to certify that the Dissertation entitled “**A STUDY OF CHILDREN WITH LEARNING DISORDER IN A TERTIARY CARE CENTRE**” is a bonafide record of work done by **Dr.DINESH KUMAR.G** in the department of Psychiatry, Government Kilpauk Medical College, Chennai, during his Post Graduate Course from 2017 to 2020. This is submitted as partial fulfilment for the requirement of M.D. Degree examinations – Branch – XVIII (Psychiatry) to be held in May 2020.

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This dissertation is submitted to “**The Tamilnadu Dr M.G.R. Medical University, Chennai**”, Tamilnadu as a partial fulfillment for the requirement of **M.D. Degree examinations – Branch – XVIII (Psychiatry)** to be held in **May 2020**.

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ACRONYMS

- DSM - Diagnostic and statistical manual of mental disorders
- ICD - International classification of diseases
- LD - Learning Disorder
- ADHD - Attention Deficit Hyperactive Disorder
- ODD - Oppositional Defiant Disorder
- DPCL - Developmental Psychopathology Checklist
- CBCL - Child Behaviour Checklist
- CDRS - Childhood Depression Rating Scale
- HAM-A - Hamilton anxiety rating scale
- NIMHANS - National Institute Of Mental Health And Neuroscience

INSTITUTIONAL ETHICS COMMITTEE
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CHENNAI-10

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The Institutional Ethical Committee of Govt. Kilpauk Medical College, Chennai reviewed and discussed the application for approval "A STUDY OF CHILDREN WITH LEARNING DISORDER IN A TERTIARY CARE CENTER" submitted by Dr.Dinesh Kumar.G, Post Graduate in M.D Psychiatry, Department of Psychiatry, Govt.Kilpauk Medical College, Chennai-600010.

The Proposal is **APPROVED.**

The Institutional Ethical Committee expects to be informed about the progress of the study any Adverse Drug Reaction Occurring in the Course of the study any change in the protocol and patient information /informed consent and asks to be provided a copy of the final report.

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INTRODUCTION

Children with learning disorders (LD) are those who have difficulties in academic performance which is out of proportion to their intellectual capacities. They have impaired ability in learning and acquiring the academic skills of reading, writing, arithmetic or spelling.

Kirk by 1962 defined learning disability as: A retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subject resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances. It is not the result of mental retardation. Sensory deprivation, or cultural and instructional factors

COHN in 1968 put forth the term Dyscalculia is used to refer developmental problems in basic numerical processing, such as automatic or implicit processing of quantities or numbers

Dysgraphia means disorder of writing in broader aspect but in Specific Learning disorder in written expression emphasizes difficulties with accurate and fluent generation and composition of written text

The term Dyslexia is typically understood to refer primarily the problems in decoding single words and is associated with phonological deficits.

Humans wouldn't have the innate ability to read, write, and calculate by birth. Rather these skills are acquired from the society by looking at, following through the cultural symbols which were used to represent various letters, numbers.

Multiple skills are involved in learning to process one's cultural symbol systems. These include the awareness that spoken language can be segmented into smaller units that is words, syllables, phonemes and mapped onto written visual symbols like letters, characters, and numerals. Their ability to rapidly identify letters, letter clusters, and words that is orthographic awareness. Their ability to extract meaning from this written language, and their ability to transcode meaning between symbol systems.

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) uses the term "Specific Learning Disorder" (SLD) to describe persistent and impairing problems in acquiring and using the cultural symbols that are required for reading, writing, and arithmetic.

For assessing the deficits we need to know following terminologies

Alphabetic principle

The insight that words are made up of sounds and each sound can be notified by a symbol.

Phoneme

Smallest sound units in a word: The smallest unit of speech that distinguishes one word from another (e.g., the word “reach” has three phonemes: /r/ /ea/ /ch/; the phoneme /r/ distinguishes the word “reach” from “teach”).

Phonemic awareness

An explicit awareness that there are discrete speech sounds (phonemes) in speech. This skill usually starts to develop between ages of 2 to 4 years and it takes several years to develop. This is crucial for the capability of an individual in reading and spelling. For example, the child must be able to isolate the phoneme /f/ in words such as “fox,” “four,” and “fear” to fully understand that the grapheme “f” represents this sound and to associate the sound with this letter when attempting to decode a word like “fort.”

Phonological awareness

An explicit awareness that spoken language comprises discrete units, ranging from words and syllables to smaller subsyllabic units of onsets and rimes, and phonemes. It includes phonemic awareness. . An “onset” is the initial consonant sound of a syllable (the onset of “peach” is “p-”). The rime is the part of the syllable that contains the vowel and all that follows it (the rime of “peach” is “-each”).

Phonological coding

Translating the letters or spelling patterns of a written word into speech patterns to identify the word and gain access to its meaning.

Phonics

An instructional approach for teaching children the systematic relationship between letters and sounds and how to use that system (alphabetic principle) to read words. In other words, instruction in phonics requires the child to have some level of phonemic awareness

Orthography

The representation of the sounds of a language by written or printed symbols.

The purview of specific learning disorder varies between medical /mental health and educational system. Clinicians who diagnose Specific Learning Disorder must have knowledge about both the medical and educational definitions, as well as their different implications for accessing school-based supports and intervention services like exemptions by allocating additional time, use of calculator , allocating scribe etc.,

Medical/Psychiatric Definition

According to DSM-5, Specific Learning Disorder is a Neurodevelopmental Disorder that involves marked and persistent difficulties in learning and using one's cultural symbol systems (e.g., alphabetic letters, characters, Arabic numerals) that are required for skilled reading, writing, and arithmetic. Specific Learning Disorder disrupts the normal pattern of learning these essential academic skills and is not simply a consequence of an intellectual disability, sensory deficits, other mental or neurological disorders, lack of opportunity of learning or proficiency in the language of instruction, or inadequate educational instruction. Difficulties learning keystone (foundational) academic skills of reading, writing, and arithmetic may also impede learning in other academic subjects (i.e., history, geography, science)

Federal / Educational Definition

A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental dysphasia. This includes oral or spoken language impairments, which are classified as Communication Disorders in psychiatric taxonomies which were differentiated from Specific Learning Disorder. Moreover, the educational definition incorporates notions i.e., deficits in underlying psychological processes an etiological basis whereas psychiatric classification does not.

According to ICD-10, learning disorder has been termed as Specific reading disorder(F81.0), Specific spelling disorder(F81.1), Specific disorder of arithmetical skills(F81.2) and Mixed disorder of scholastic skills (F81.3) which comes under Specific developmental disorders of scholastic skills (F81) which in turn being classified in section F 80-89 that is Disorders of psychological development.

According to ICD- 10, Specific reading disorder is a specific and significant impairment in the development of reading skills, which is not solely accounted for by mental age, visual acuity problems, or inadequate

schooling. Reading comprehension skill, reading word recognition, oral reading skill, and performance of tasks requiring reading may all be affected. Spelling difficulties are frequently associated with specific reading disorder and often remain into adolescence even after some progress in reading

.During early stages of learning an alphabetic script, child has difficulties in reciting the alphabet, difficulties in giving the correct names of letters, difficulties in giving simple rhymes for words, and in analyzing or categorizing sounds (in spite of normal auditory acuity). In later stages there may be errors in oral reading skills such as omissions, substitutions, distortions, or additions of words or parts of words, slow reading rate, false starts, long hesitations or "loss of place" in text, and inaccurate phrasing and reversals of words in sentences or of letters within words. They may also have deficits in reading comprehension, which presents as an inability to recall facts read, an inability to draw conclusions or inferences from material read, and use of general knowledge as background information rather than of information from a particular story to answer questions about a story read. In later childhood and in adult life, it is common for spelling difficulties to be more profound than the reading deficits. It is characteristic that these spelling difficulties often involve phonetic errors, and it seems that both the reading and spelling problems may derive in part from an impairment in phonological analysis.

According to ICD-10, Specific spelling disorder is characterized by a specific and significant impairment in the development of spelling skills in the absence of a history of specific reading disorder, which is not solely accounted for by low mental age, visual acuity problems, or inadequate schooling. The ability to spell orally and to write out words correctly are both affected. Children whose problem is solely one of handwriting should not be included, but in some cases spelling difficulties may be associated with problems in writing. Unlike Spelling Errors in Specific Reading Disorder, the spelling errors tend to be predominantly phonetically accurate.

According to ICD-10, Specific disorder of arithmetical skills is characterized by a specific impairment in arithmetical skills, which is not solely explicable on the basis of general mental retardation or of grossly inadequate schooling. The deficit concerns mastery of basic computational skills of addition, subtraction, multiplication, and division. They also have impaired visuo-spatial and visual-perceptual skills which is in contrast to many children with reading disorders. According to ICD-10, Mixed disorder of scholastic skills is an ill-defined, inadequately conceptualized (but necessary) residual category of disorders in which both arithmetical and reading or spelling skills are significantly impaired, but in which the disorder is not solely explicable in terms of general mental retardation or inadequate schooling.

Specific Learning Disorder is a neurodevelopmental disorders, heterogeneous condition, in which the learning difficulties may be either selective (e.g., occur only with learning and also one specific aspect of reading such as word decoding) or broad (e.g., occur in learning to decode words, spell, understand what one has just read, as well as in arithmetic calculation), and frequently coexists with other neurodevelopmental (e.g., with Communication Disorders, Attention Deficit Hyperactive Disorder) or psychiatric traits or disorders (e.g., with anxiety, anxiety disorders).

Specific Learning Disorder having the onset in infancy and early childhood and steady in course has to be differentiated from other neuro developmental disorders as it is being related to central nervous system maturation which are as follows;

There may be an impairment or delay in language function which in turn could be acquired as in Landau-Kleffner syndrome (F80.3) which is an acquired aphasia with epilepsy or be an impairment in receptive language (receptive language disorder(F80.1)) or may be an impairment in articulation (speech articulation disorder(F80.0)) or may be an impairment in expressive language (expressive language disorder(F80.1))

There may be an impairment or delay in motor functioning as in motor coordination disorder

Specific language disorders is defined as the problems in either expressive or receptive language abilities

There may be an impairment or delay in scholastic skills which may be a specific disorder in reading, a specific disorder in writing, a specific disorder in arithmetic or a combination of them.

Epidemiology

Specific Learning Disorder is one of the most frequently diagnosed Neurodevelopmental Disorders. A recent epidemiological study suggested that the lifetime prevalence of Specific Learning Disorder is around 10 percent. Difficulty in reading-Dyslexia is the most common and well-studied manifestation, affecting at least 90 percent of all individuals identified as having Specific Learning Disorder. They are highly likely to show deficits in other domains as well either concurrently or emerging later

Etiology

Multifactorial neurodevelopmental disorder arising from the complex interplay of biological and environmental risk factors that shape the development of brain systems underlying academic learning. Two contrasting hypothesis namely generalist and specific risk hypothesis.

According to the generalist genes hypothesis, individual differences in academic achievement across the school years from entry to graduation are heritable and attributable to a set of genes that underlie these heritable traits. In other words, the same genes underlie both learning abilities and learning disabilities across various academic domains. By contrast, the specific risk hypothesis presumes that discrete domains of learning disabilities exist (e.g., dyslexia, dyscalculia) with different etiology.

Twin studies involving large samples with diverse abilities (e.g., including typical readers and those with dyslexia) reveal common genetic influences across the range of ability and disability, suggesting that a particular set of genes affects academic learning in both typically developing samples and those with Specific Learning Disorder

Structural and functional neuroimaging studies have revealed brain regions that are most consistently involved in reading words and which are altered in dyslexia. These regions are typically lateralized to the left hemisphere and include inferior frontal, superior and middle temporal, and temporoparietal regions.

Experienced readers also involve an area of the left fusiform gyrus, known as the visual word form area, which is activated for orthographic (print) processing and the most common difference is reduced activation in left temporal, parietal, and fusiform (visual word form area) regions.

The right intraparietal sulcus as a major locus of brain differences and cognitive deficits in children and adults with Specific Learning Disorder in mathematics. But the observed brain differences reflect underlying neurobiological etiology or the consequence of years of altered and dramatically reduced reading experience is unclear

Learning- Neurobiology

Learning is a process occurring through the integration of many nervous system functions, promoting better adaptation of the individual to the environment which provides information through afferent visual, hearing, and somatosensory (touch, taste, smell) pathways, making up the information sensory perception by the brain. Processing occurs in perception (gnosis) and motor (praxis) cortical areas. This processing requires integration between cortical and subcortical areas in which information is organized, complemented, and stored. The output or effector response occurs through motor efferent pathways. Motivation and positive reinforcement are central to learning

Pathophysiology

Working memory, which refers to the ability to temporarily hold and manipulate auditory–verbal and visual–spatial information, while learning new information or problem solving, is believed to be impaired in most individuals with Specific Learning Disorder. Thus, individuals with Specific Learning Disorder have difficulties suppressing irrelevant information from working memory, as well as simultaneously holding and processing information, which manifests as difficulties updating what they know or have just learned

Working memory deficits have an even greater impact on reading comprehension and writing: Reading comprehension requires updating information in working memory to monitor the meaning of each sentence and each paragraph, extract the main ideas, and construct mental images of the emerging situations and events. Writing requires the ability to plan, organize, compose and edit, while keeping in mind the writing goals, content, audience, as well as spelling, vocabulary, and grammar. Poor working memory will also impair mathematical abilities, including the ability to retrieve and hold math facts for use in computation, follow arithmetic procedures in calculation, and in math reasoning

Slow processing speed is another domain-general factor that has a negative impact on learning. Rapid automatized naming, which refers to the ability to rapidly name familiar alphanumeric (letters, numbers) and nonalphanumeric (colors, objects) stimuli, is impaired in a substantial proportion of individuals with Specific Learning Disorder. Rapid naming of nonalphanumeric stimuli is impaired in individuals with Specific Learning Disorder in reading and mathematics, whereas alphanumeric naming may be more specific to Specific Learning Disorder in reading. However, rapid naming deficits are not unique to Specific Learning Disorder: They are also shared with other neurodevelopmental disorders (e.g., Attention Deficit Hyperactive Disorder, Autism Spectrum Disorders, Communication Disorders).

Social and environmental factors like low socioeconomic status, the prenatal environment, and the postnatal learning environment provided by parents around 30% of children born very prematurely or with very low birth weight have special educational needs, especially for Specific Learning Disorder in mathematics.

Comparative Nosology

Specific learning disorder in reading or mathematics were included first in DSM-III (1980), with Specific learning disorder in written expression added in DSM-III-R (1987), under the general category of

“Academic Skills Disorder” on axis II where they were termed as developmental reading disorder, developmental arithmetic disorder, and developmental expressive writing disorder. But in DSM-IV-TR and in DSM-5 it is coded on axis I. Both of these DSM versions dropped the “developmental” descriptor

The 2013 revision of DSM-5 no longer recognizes subtypes of Specific Learning Disorder distinguished in previous DSM versions rather has specifiers referring to the three major academic domains that may be affected (reading, writing, mathematics) as well as the type of skills impaired.

Specific Learning Disorder in reading may manifest as difficulties in accurately decoding single words (a.k.a., dyslexia), fluency in reading text accurately, or reading comprehension

Specific Learning Disorder in written expression may manifest as impairments in spelling words accurately, in accurate use of grammar and punctuation, or in the clarity or organization of written expression

Specific Learning Disorder in mathematics may manifest as impairments in basic number sense, memorization or retrieval of arithmetic facts, accurate or fluent calculation, or accurate math reasoning

ICD-10 includes learning disorder under disorders of psychological development under the subcategory of specific developmental disorders of scholastic skills which includes “specific reading disorder,” “specific spelling disorder,” “specific disorder of arithmetic disorder,” as well as “mixed disorder of scholastic skills” they differ in their requirement for the restriction of impairment to that specific academic domain. It is categorical and specific that is Specific Reading Disorder excludes individuals who also manifest impairments in arithmetic and spelling disorder, Specific Spelling Disorder excludes those who also manifest a reading disorder and arithmetic disorder and these presenting with deficits in more than one academic domain are given the diagnosis of Mixed Disorder of Scholastic Skills

CLINICAL FEATURES

The most common and earliest manifestation of **Specific Learning Disorder in reading**, particularly in the English language, is inaccurate, effortful and slow reading at the word level. Common signs of this difficulty include reluctance and resistance in reading aloud; reads hesitantly, slowly, and inaccurately, often with visible effort and discomfort; guesses based on the sound of the first letter; may recognize a few words by sight, but is unable to “sound out” unfamiliar words; or an inability to reconstruct the word having sounded out its component parts. Adolescents and adults may read accurately but so slowly and with such effort that reading is

notfunctional for everyday use, and so may avoid reading. Some may read the text accurately and fluently—often too fast—but is unable to extract and use the inherent meaning.

The most common clinical features of **Specific Learning Disorder in writing** is noticeable and persistent poor spelling for age often described as “atrocious spelling” (e.g., often adds, omits, or substitutes vowels and consonants; may spell phonetically but incorrectly, such as “pikchr” for “picture”). Sentences are often very short or incomplete and contain grammatical errors, omission of words, and little or no use of punctuation, as well as spelling errors. Also written paragraphs are often short, poorly constructed and organized (e.g., they use a starting sentence to introduce the topic; includes several topics in one paragraph without a logical order; does not maintain the correct verb tense, incorrect use of pronouns) and their intended meaning is unclear.

The most common clinical features of **Specific Learning Disorder in mathematics** across the lifespan is the sole reliance on finger counting for simple addition and subtraction that is inappropriate for age and also a poor sense of numbers in terms of their magnitude and relationship. Inaccurate counting and calculation failure to attend to key mathematical symbols (e.g., symbols for addition, subtraction, multiplication, division), difficulty

understanding the concept and use of zero or use of decimal points and getting lost in the middle of multidigit calculation

In addition to this embarrassment and low self-esteem; and extreme discomfort or even refusal when asked to read, write, or spell. Children and adolescents may be reluctant or refuse to go to school; may report being exposed to daily criticism, taunting, or bullying; they may look anxious, stressed, sad, depressed, or express despair or suicidal ideation

Co-morbidities

Specific Learning Disorder commonly, but not invariably, co-occurs with other neurodevelopmental disorders like Communication Disorders, Attention Deficit Hyperactive Disorder, Autism Spectrum Disorder, Motor Coordination Disorder and mental health disorders like Anxiety and Mood Disorders. These associated problems are clinically important because the diagnosis of Specific Learning Disorder cannot be confirmed until the child has started school and been exposed to formal academic instruction, but Communication Disorders in particular are likely to be apparent and diagnosed earlier and so may indicate a risk for later Specific Learning Disorder.

Communication Disorders includes Speech sound disorder, Specific language disorders

Speech sound disorder is defined as problems in producing sounds on one's language accurately and intelligibly

Language disorder:

Language disorder refers to problems in developing the structural aspects of language, such as grammar [syntax] and vocabulary [semantics]

International studies have estimated that 30-40% of children with language disorder meet criteria for dyslexia and 77% of dyslexics meet criteria for language disorder

Expressive Language-Children with expressive language difficulties exhibit slow vocabulary growth, pronunciation difficulties, difficulty in expressing (single words, poor/wrong retrieval of words, poor answering and narrative and conversational skills) and Grammatical difficulties, difficulty with word retrieval.

Receptive Language Difficulties-Difficulties with processing sounds affects understanding which in turn, Difficulty with sequencing, linking thoughts, difficulty with concepts

Attention Deficit Hyperactive Disorder

Around 20 to 45 percent of children with Attention Deficit Hyperactive Disorder also meet diagnostic criteria for Specific Learning Disorder, but the strongest link appears to be between the inattention

dimension of Attention Deficit Hyperactive Disorder and Specific Learning Disorder, particularly Specific Learning Disorder in reading and writing. Attention Deficit Hyperactive Disorder refers to a syndrome involving symptoms such as attentional impairments, impulsivity, and motor overactivity in two or more settings

Disorder is characterized by a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by Inattention and/or Hyperactivity:

Inattention:- Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities and in adults (age 17 and older), at least five symptoms are required.

- 1) Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).
- 2) Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).

- 3) Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).
- 4) Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
- 5) Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).
- 6) Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).
- 7) Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paper work, eyeglasses, mobile telephones).
- 8) Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).

9) Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).

Hyperactivity and impulsivity: Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:-

- 1) Often fidgets with or taps hands or feet or squirms in seat.
- 2) Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).
- 3) Often runs about or climbs in situations where it is inappropriate and in adolescents it presents as restlessness.
- 4) Often unable to play or engage in leisure activities quietly.
- 5) Is often “on the go,” acting as if “driven by a motor” (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).

- 6) Often talks excessively.
- 7) Often blurts out an answer before a question has been completed (e.g., completes people's sentences; cannot wait for turn in conversation).
- 8) Often has difficulty waiting his or her turn (e.g., while waiting in line).
- 9) Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people's things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).

Some of these inattentive or hyperactive-impulsive symptoms were present prior to age 12 years, in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities) which interfere with, or reduce the quality of, social, academic, or occupational functioning and are not better explained by another mental disorder.

Developmental coordination disorder 315.4 (F82)

It is defined by marked motor coordination impairment, with no neurological or sensory cause being identified, leading to academic and daily life activity losses.

Several motor aspects can be affected, such as fine motor ability, gross motor function, general coordination and control during movement execution. The impact is noted mainly in daily activities, such as dressing, tying shoes, using tableware and scissors, riding a bicycle, drawing, copying and writing. Prevalence is around-6%

Autism spectrum disorder 299.00 (F84.0)

Persistent impairment in reciprocal social communication and social interaction (Criterion A), and restricted, repetitive patterns of behaviour, interests, or activities (Criterion B). These symptoms are present from early childhood and limit or impair everyday functioning (Criteria C and D). The stage at which functional impairment becomes obvious will vary according to characteristics of the individual and his or her environment

Emotional Problems, Anxiety and Mood Disorders, Suicide Risk.

Individuals with Specific Learning Disorder are highly likely to manifest concurrent social, emotional, and mental health problems. As they are aware of their academic difficulties, leading to low self-esteem and these negative self-perceptions are very difficult to change and contribute to their problems in social and academic functioning. Avoidance of or reluctance to engage in activities requiring the academic skills is common in children, adolescents, and adults with learning disorder. This may precipitate

as well as a perpetuating factor in development of depression, anxiety. There exists higher rates of episodes of severe anxiety or anxiety disorders (including somatic complaints or panic attacks) are common across the lifespan and accompany both the circumscribed and broader expression of learning difficulties. Moreover, Specific Learning Disorder is associated with increased risk for suicidal ideation and suicide attempts in children, adolescents, and adults.

The co-occurrence of internalizing symptoms and disorders is clinically significant whereas Specific Learning Disorder is treated primarily in the field of education, these internalizing symptoms often remain unaddressed. Thus psychiatrists and other mental health practitioners play an important role in identifying, monitoring, and treating the concurrent internalizing problems like Depression, Anxiety.

Depressive Disorder

According to DSM-5 this disorder is characterized by 5 or more symptoms present during a 2 week period which includes depressed or irritable, cranky mood (outside being frustrated) or loss of interest or pleasure and any three of the following:

- a) Significant weight loss or decrease in appetite (more than 5 percent of body weight in a month),
- b) Insomnia or hypersomnia ,
- c) Psychomotor

agitation or retardation, d) Fatigue or lack of energy ,e)Feelings of worthlessness or guilt ,

f)Decreased concentration or indecisiveness, g)Recurrent thoughts of death or suicide

In addition to the above DSM-5 criteria, children and adolescents may also have some of the following symptoms:

- Persistent sad or irritable mood
- Frequent vague, non-specific physical complaints
- Frequent absences from school or poor performance in school
- Being bored
- Alcohol or substance abuse
- Increased irritability, anger or hostility
- Reckless behavior

Symptoms cause significant distress or impairment in functioning.

Conduct Disorder

It can present with learning disorder. Children with learning disorder can develop aggressive behaviour and conduct disturbances out of the criticism from teachers and peer groups indulging in substance use and gang activities

Disorder is characterized by a repetitive and persistent pattern of behavior in which the basic rights of others or majorage-appropriate societal norms or rules are violated, as manifested by the presence of at least three of the following 15 criteria in the past 12 months from any of the categories below, with at least one criterion present in the past 6 months

Aggression to People and Animals- Often bullies, threatens, or intimidates others, Often initiates physical fights, has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun), has been physically cruel to people, has been physically cruel to animals, has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery), has forced someone into sexual activity.

Destruction of Property- Has deliberately engaged in fire setting with the intention of causing serious damage, has deliberately destroyed others' property (other than by fire setting).

Deceitfulness or Theft- Has broken into someone else's house,

building, or car, Often lies to obtain goods or favors or to avoid obligations (i.e., “cons” others), has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery).

Serious Violations of Rules- Often stays out at night despite parental prohibitions, beginning before age 13 years, has run away from home overnight at least twice while living in the parental or parental surrogate home, or once without returning for a lengthy period, often truant from school, beginning before age 13 years.

The disturbance in behavior causes clinically significant impairment in social, academic, or occupational functioning and could be of childhood or adolescent onset type with a cut off age of 10 years

Oppositional Defiant Disorder 313.81 (F91.3)

Disorder characterized by a pattern of angry or irritable mood, argumentative/defiant behavior, or vindictiveness lasting at least 6 months as evidenced by at least four symptoms from any of the following categories, and exhibited during interaction with at least one individual who is not a sibling.

Angry/Irritable Mood-often losing temper, easily annoyed, angry and resentful.

Argumentative/Defiant Behavior- Often argues with authority figures or, for children and adolescents, with adults, actively defies or refuses to comply with requests from authority figures or with rules, deliberately annoys others, blames others for his or her mistakes or misbehavior.

Vindictiveness- has been spiteful or vindictive at least twice within the past 6 months and the disturbance is not associated with any other psychiatric disorder and causing significant social occupational and functional impairment

DIAGNOSTIC CRITERIA;

A. Difficulties in learning and using academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 months, despite the provision of interventions that target those difficulties;

1. Inaccurate or slow and effortful word reading
2. Difficulty understanding the meaning of what is read
3. Difficulties with spelling
4. Difficulties with written expression
5. Difficulties mastering number sense, number facts, or calculation
6. Difficulties with mathematical reasoning

B. The affected academic skills are substantially and quantifiably below those expected for the individual's chronological age, and cause significant interference with academic or occupational performance, or with activities of daily living, as confirmed by individually administered standardized achievement measures and comprehensive clinical assessment. For individuals age 17 years and older, a documented history of impairing learning difficulties may be substituted for the standardized assessment.

C. The learning difficulties begin during school-age years but may not

become fully manifest until the demands for those affected academic skills exceed the individual's limited capacities.

D. The learning difficulties are not better accounted for by intellectual disabilities, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction

Four diagnostic criteria are to be met based on clinical synthesis of the individual's history, school reports and psychosocial assessment.

Specifiers-315.0(F81.0)-impairment in reading

315.1(F81.2)- impairment in mathematics

315.2(F81.1)-impairment in written expression

REVIEW OF LITERATURE

According to a study done by Rutter M, Caspi A, Fergusson D, Horwood LJ, Goodman R, et al. (2004) Sex differences in developmental reading disability they infer that there exist a significant difference in gender. *Jama* 291: 2007–2012[2] V VMogasale et al.,[3] a study conducted in south india regarding the prevalence of specific learning disabilities it was found that the prevalence was 15.17% .The prevalence of difficulty in writing was 12.5%, difficulty in reading was 11.2% and difficulty in arithmetic's was 10.5%

Alpana Somale et al 2016 in their study found 83% of children had impairment in all three domains of SLD; that is reading (dyslexia), writing (dysgraphia) and arithmetic (dyscalculia), impairment of reading was seen in 94% cases, impairment of writing was noted in 99% cases, impairment in calculations was seen in 86% cases of SLD, 69% were boys and 31% were girls, and mean age of children was 12.2%; median age of children was 13.5 years[4]

Sahoo et al(2015) quoted prevalence as 2-10%, in school children

Schulte-körne G (2014) described prevalence of these disorders as 5-15%.

Lucia Margari et al (2013) Learning Disorders (LD) affect about 2-10% of the school-age population

Maja Altarac et al (2006) found that the lifetime prevalence of learning disability in US children is 9.7%. They also found there was an increased odd ratios of learning disability were associated with parental lower education, poverty, being male, having a 2-parent stepfamily or other family structure, being adopted, presence of a smoker [6]

Kristina Moll in their study on specific learning disorder inferred comorbid learning disorders were as frequent as isolated learning disorder. Regarding gender differences, more boys than girls showed spelling deficits, while more girls were impaired in arithmetic. No gender differences were found among children with isolated reading problems and with the combination of all three learning disorders [7]

Lucia Margari et al (2013) also found that neuropsychiatric comorbidities associated with learning disorder was found to be 62.2% of the total sample. Among them the prevalence of Attention Deficit Hyperactive Disorder was found to be 33%, Anxiety Disorder constituted 28.8%, Developmental Coordination Disorder was 17.8%, Language Disorder was present in 11% and Mood Disorder constituted 9.4% of patients [8]

Sahoo et al (2015) reported about 30% of learning disabled children have behavioral and emotional problems, which range from attention deficit hyperactivity disorder (most common) to depression, anxiety, suicide etc., to substance abuse (least common)[9]

Socio-economic status of parents was regarded as significant predictor of lower and higher learning performance -Ginsburg and Bronstein, (1993) [5]

Sridevi et al (2015) in their study found that 19% of children have learning disorder and there exists significant behavioral problems among them when compared to non-learning disorder children and also there exists a significant gender difference in behavioral problems in particular aggression and hyperactivity when compared to girls boys had a greater prevalence of them

Kellam et al (1983) reported that children having the reading disability are vulnerable to emotional as well as conduct problems. Badian(1983) reported that 42% of children with dyscalculia had problems with attention.

Edelberk et al(1984) and Holborow et al (1986) found in their studies that children who exhibit attention deficits without motor hyperactivity are likely to have learning disabilities than those who display attention deficits and motor hyperactivity

Maughan et al (1985) in a review of studies on reading disabilities identified that these children have anxiety, low self-esteem, dysfunctional attributions, depression, inattentiveness, disruptive behaviour, aggression, delinquency

Maughan et al 2003- disruptive behaviour at school may be the result of attention problems which is common in both ADHD and learning disorder-Poor outcome

Isaacs, E.B., Edmonds, C.J., Lucas, A., *et al.* (2001). Calculation difficulties in children of very low birthweight: a neural correlate found preterm children with a low grey matter volume in a particular area in left parietal lobe is associated with arithmetic difficulty

Cantwell, D.P. & Baker, L. (1991) found positive association between Attention Deficit Hyperactivity Disorder and Learning Disabilities

McGee et al (1986), in a study in New Zealand, found that reading disabled boys were about three times as likely as their peers to have an externalizing disorder, particularly Attention Deficit Hyperactive Disorder, Conduct Disorder or Oppositional Defiant Disorder

Karade et al 2007 quoted that many parents of children with learning disorder didn't have knowledge about the term specific learning disorder

,remedial education, the frequency and duration of remedial education [10]

Prior et al (1999) found that in children with arithmetic difficulties, phobic disorder or anxiety was the most common co-morbidity (30%). They also found that children with both spelling and arithmetic difficulties had phobic disorder or anxiety which accounts for 24%

Fristad et al (1992) of Ohio State University, determined the occurrence of learning disability in 30 inpatient children aged 6 to 12 years with major depressive disorder and found that learning disabilities occurred seven times more often compared to community based rates

Shenoy&Kapur (1996) noted that 21 out of 88 children with learning disability had a co-morbid psychological diagnosis. Kishore et al (2000) reported that 21 out of 56 children with specific developmental disorders of scholastic skills had a co-morbid psychological disorder.

AIM OF THE STUDY

To Study The Psychosocial Factors, Clinical Profile And Psychiatric Comorbidities in Children with Learning Disorder.

Objectives

To evaluate the profile of defects of academic skills in learning disorder.

To assess the co morbid- psychiatric conditions in learning disorder.

To assess the associated psychosocial factors in children with learning disorder.

Need of the study

Specific Learning Disorder is a common but infrequently diagnosed cause of scholastic backwardness

Learning Disorder is frequently co-morbid with many childhood psychiatric disorders

There is a paucity of literature regarding learning disorder and associated factors in India

Methodology

Study design

Cross sectional study

Study place

Department of Psychiatry, Government Kilpauk Medical

College

Duration of study

18 Months

Sample size calculation

With 95% confidence interval and prevalence of 15.7% in previous study (1), with absolute error of 7 and 10% non responders,

Using the formula $4pq/e^2$ sample size calculated to be 119(n)

(Clinico-Epidemiological Profile of Psychiatric Disorders among Children in a Tertiary Care Hospital of Southern India- SavindiKaChamarinawarathna et al (2016)-[1])

Statistics:

Descriptive data;

Mean

Percentage

Standard deviation

Frequency

Comparison; Chi-square test to find association and $P < 0.05$ -significant

Inclusion criteria

1. Diagnosis of Learning Disorder
2. Age group-14 to 16 years, male and female
3. Informed Consent from Parents
4. $IQ \geq 85$

Exclusion criteria

1. Mental retardation
2. Neurological problems or Sensory impairment (auditory and visual)

METHODOLOGY

Consecutive children attending the psychiatry department for evaluation with complaint of poor scholastic performance and fulfilling the criteria were included.

A pre assessment form filled in by school teachers with a special emphasis on the problems in learning and the training they had underwent and adequate duration of training was ensured.

Individuals visual and hearing ability were assessed to rule out visual and hearing impairment

Physical examination done to rule out weakness of limbs which could impair the ability of an individual to write

IQ of the child were assessed using Wechsler Intelligence Scale for Children Version 4

Diagnosis of LD made by consultant psychiatrist according to DSM5 and assessed with NIMHANS LD Index.

In the eligible children, that is those with intelligent quotient more than or equal to 85 and having learning disorder, consent from the child and written informed consent from parents or guardian were obtained for study participation.

Socio-demographic details collected.

Psychiatric Co morbidity and Psychosocial Factors were assessed.

Children found to have high scores in psychiatric co morbidities while screening are evaluated further and diagnosed by consultant psychiatrist and severity assessed using appropriate scales

TOOLS:

1. Semi-structured Intake Pro-forma
2. Wechsler Intelligence Scale for Children Version 4 for IQ assessment
3. NIMHANS Index for LD Assessment
4. Developmental Psychopathology Checklist (DPCL) for evaluation of Psychosocial and Developmental Factors and to screen for Psychopathology
5. Child Behaviour Checklist (CBCL) - for assessing psychiatric co morbidities
6. Vanderbilt Rating Scale for measuring ADHD and Oppositional Behaviour
7. Childhood Depression Rating Scale (CDRS) to measure severity of Depression
8. Hamilton anxiety rating scale (HAM-A)

STATISTICAL ANALYSIS

Table 1: Distribution of study participants according to age.

Age (in years)	Frequency (n)	Percentage (%)
12	1	.8
13	2	1.7
14	41	34.5
15	50	42.0
16	25	21.0
Total	119	100.0

Among the study participants, 50 (42%) have completed 15 years of age.

Fig 1: Bar chart showing distribution according to age.

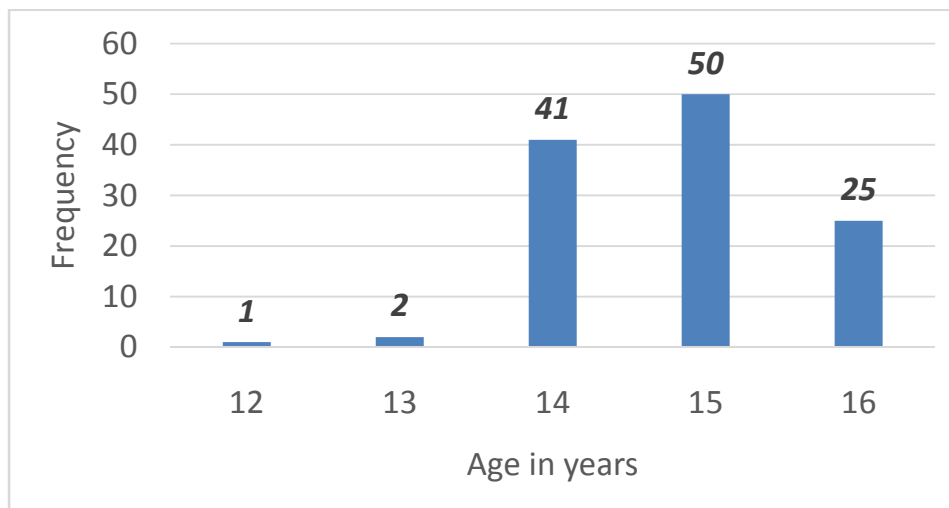
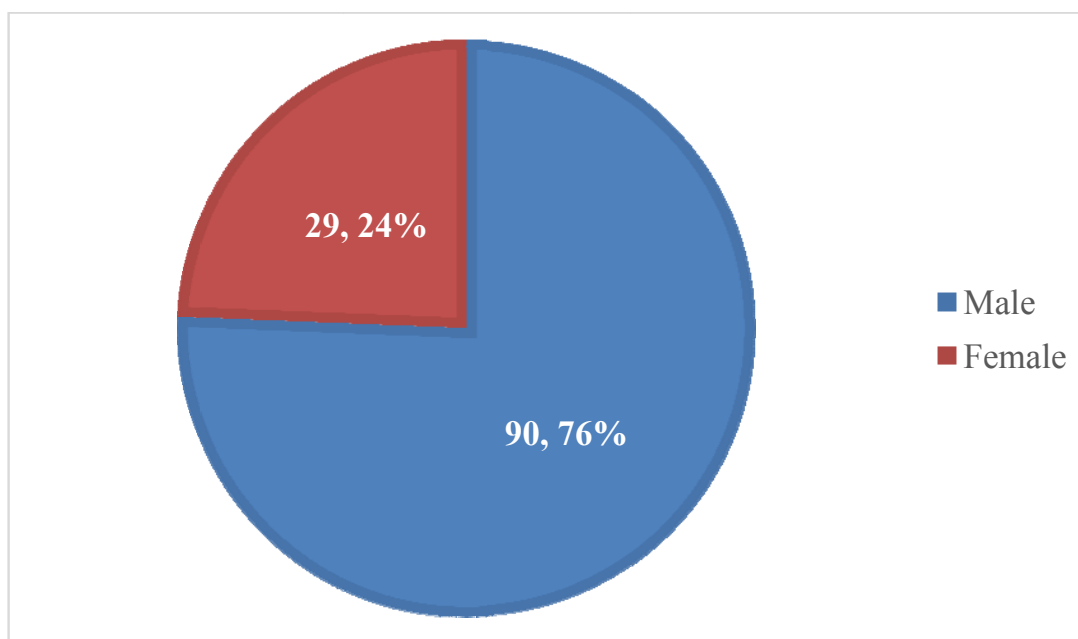


Table 2: Distribution according to sex.

Sex	Frequency	Percent
Male	90	75.6
Female	29	24.4
Total	119	100.0

Fig 2: Pie chart showing distribution according to sex.

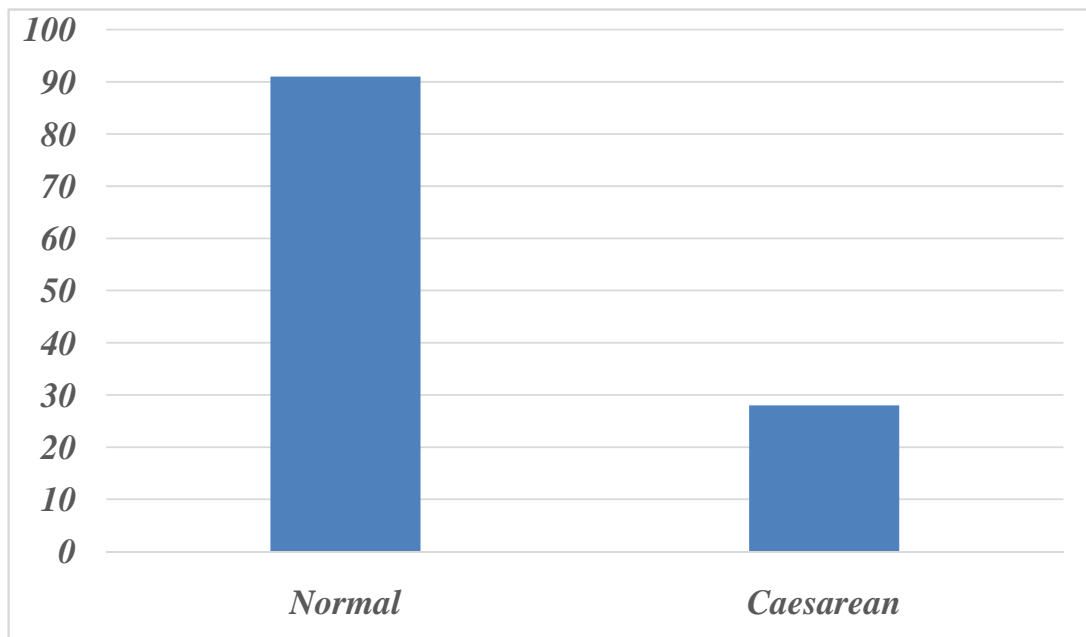


Out of 119 study participants, 90 (76%) were males.

Table 3: Distribution according to mode of delivery.

Mode of delivery	Frequency	Percent
Normal	91	76.5
Caesarean	28	23.5
Total	119	100.0

Fig 3: Bar chart showing distribution according to mode of delivery.

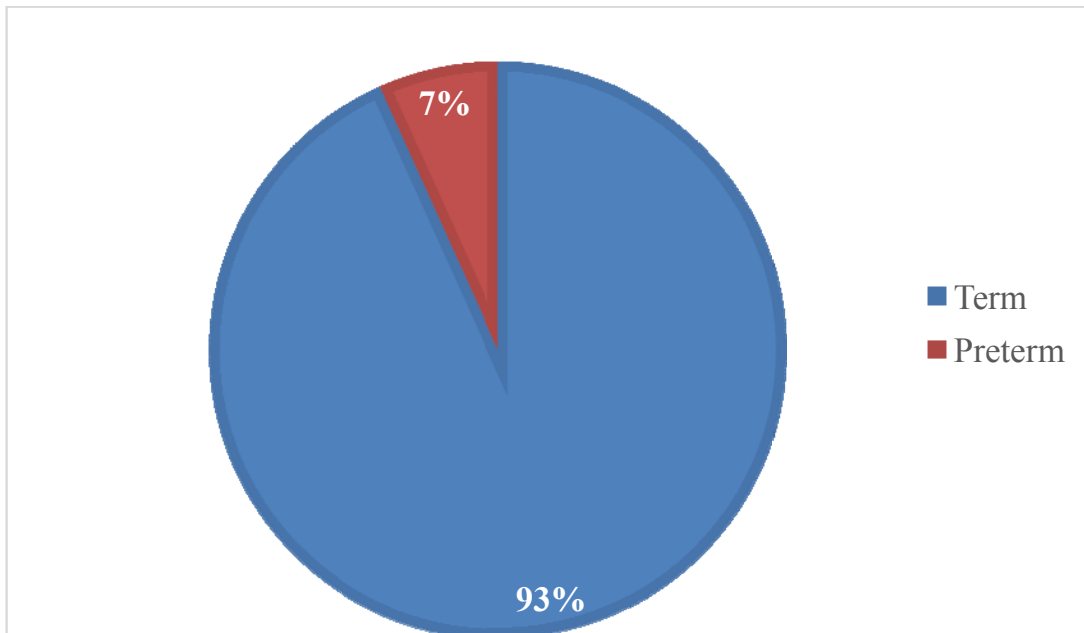


Out of 119 studied, 28 (23.5%) had Caesarean as the mode of delivery.

Table 4: Distribution according to gestational age.

Gestational age	Frequency	Percent
Term	111	93.3
Preterm	8	6.7
Total	119	100.0

Fig: 4 Pie chart showing the distribution of gestational age.

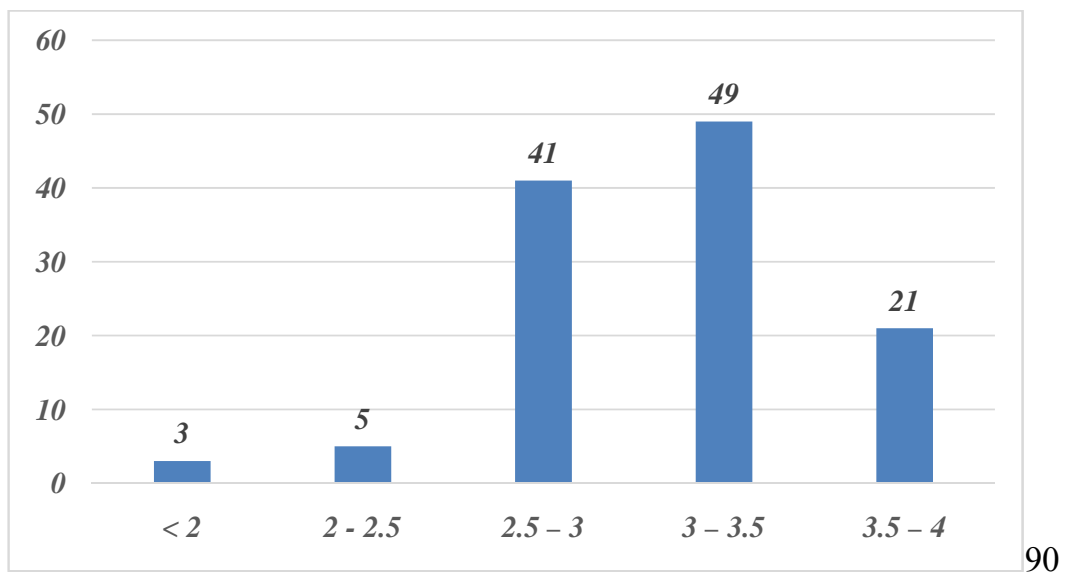


Out of 119 study participants, 8 (6.7%) had born out of preterm delivery

Table 5: Distribution according to birth weight

Birth weight (in Kgs)	Frequency	Percentage
< 2	3	2.5
2 - 2.5	5	4.2
2.5 – 3	41	34.5
Birth weight (in Kgs)	Frequency	Percentage
3 – 3.5	49	41.2
3.5 – 4	21	17.6
Total	119	100.0

Fig 5: Bar chart showing the distribution according to birth weight.

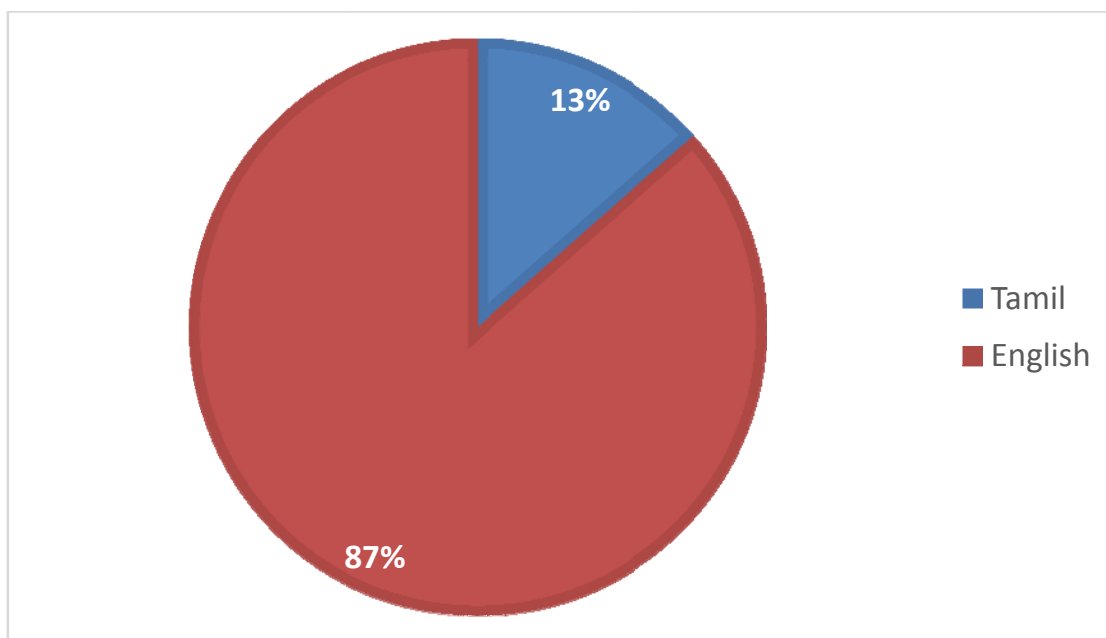


(75.7%) of the study participants had birth weight between 2.5 to 3.5 Kgs.

Table 6: Distribution of study participants according to medium of study.

Medium of study	Frequency	Percent
Tamil	16	13.4
English	103	86.6
Total	119	100.0

Fig 6: Pie chart showing distribution according to medium of study.

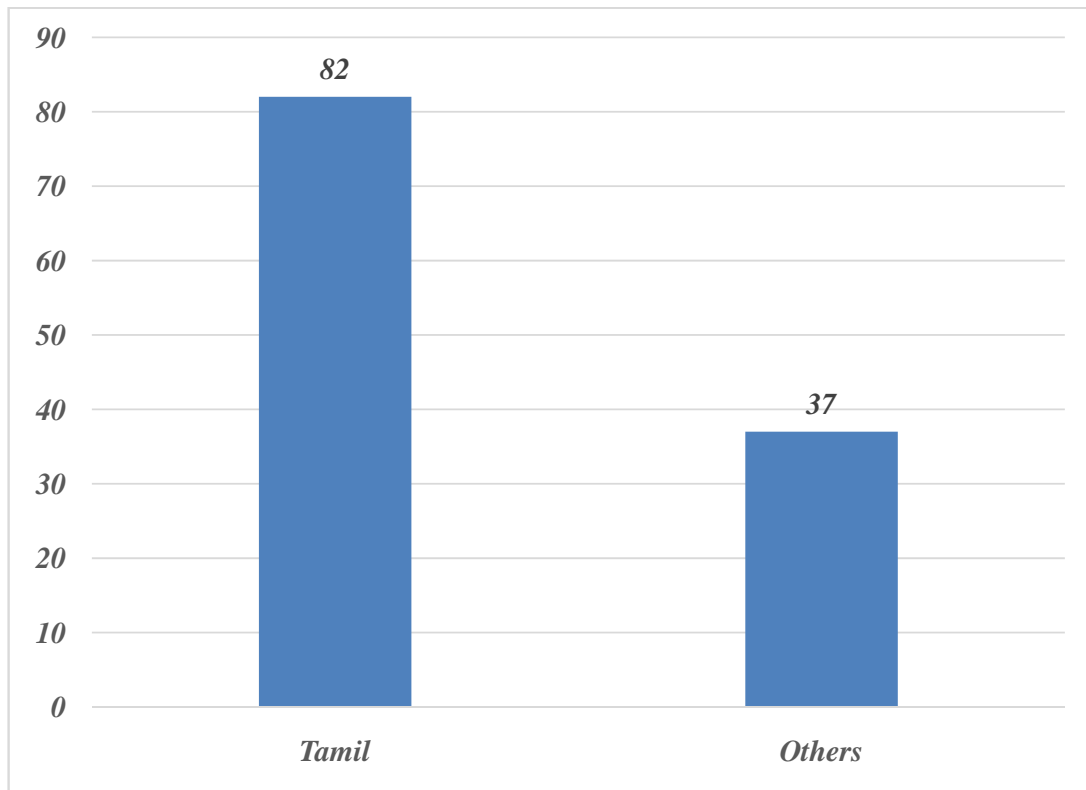


103 (87%) of the study participants were having English as their medium of study.

Table 7: Distribution according to mother tongue.

Mother tongue	Frequency	Percent
Tamil	82	68.9
Others	37	31.1
Total	119	100.0

Fig 7: Bar chart showing distribution according to mother tongue.

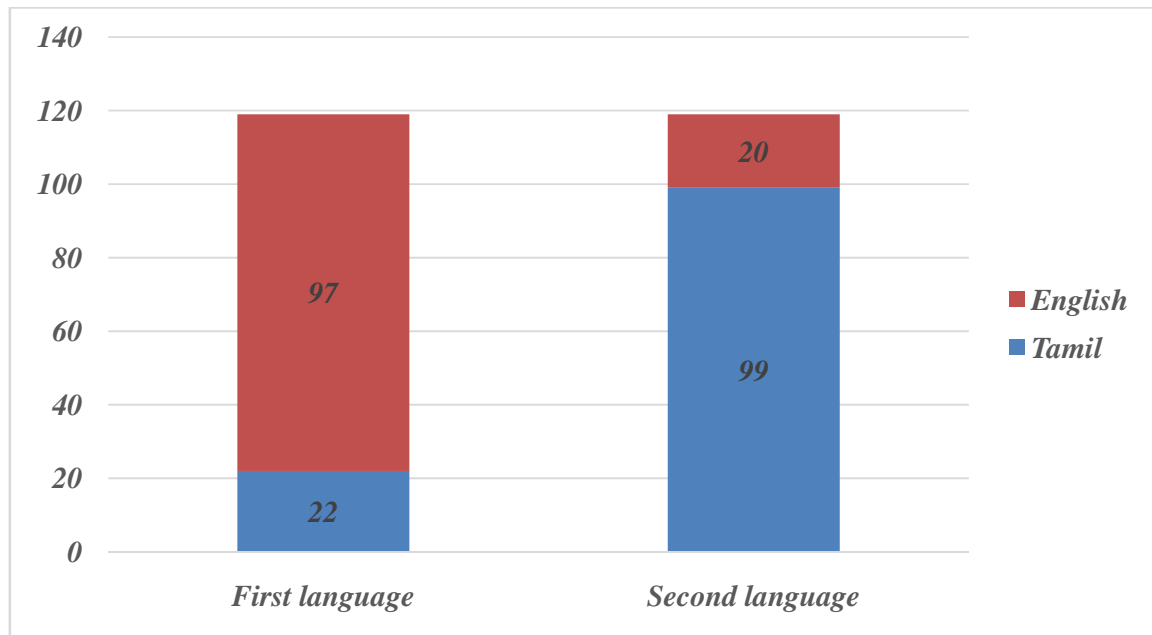


Mother tongue of 82 study participants (68.9%) were Tamil.

Table: 8 Distribution of study participants according to first and second languages.

Language preference in curriculum		Frequency	Percent
First language	Tamil	22	18.5
	English	97	81.5
Second language	Tamil	99	83.2
	English	20	16.8

Fig 8: Bar chart showing distribution of study participants according to first and second languages.



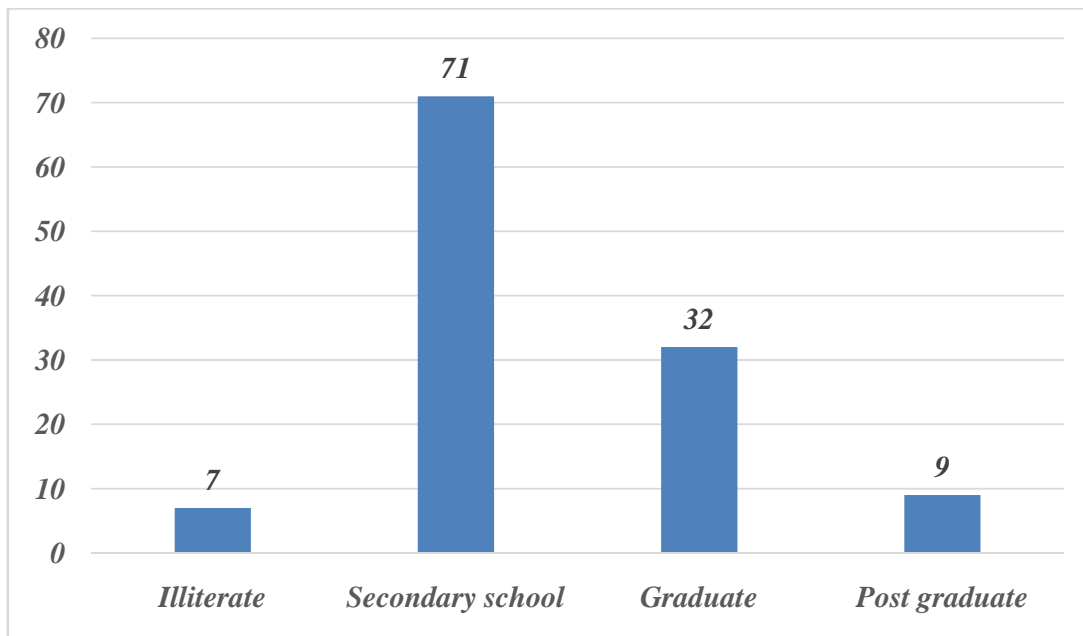
81.5 % of the study participants' first language was English

83.2% of the study participants had their second language as Tamil.

Table 9: Distribution of study participants according to father's educational status

Father's educational status.	Frequency	Percent
Illiterate	7	5.9
Secondary school	71	59.7
Graduate	32	26.9
Post graduate	9	7.6
Total	119	100.0

Fig 9: Bar chart showing distribution according to father's educational status.

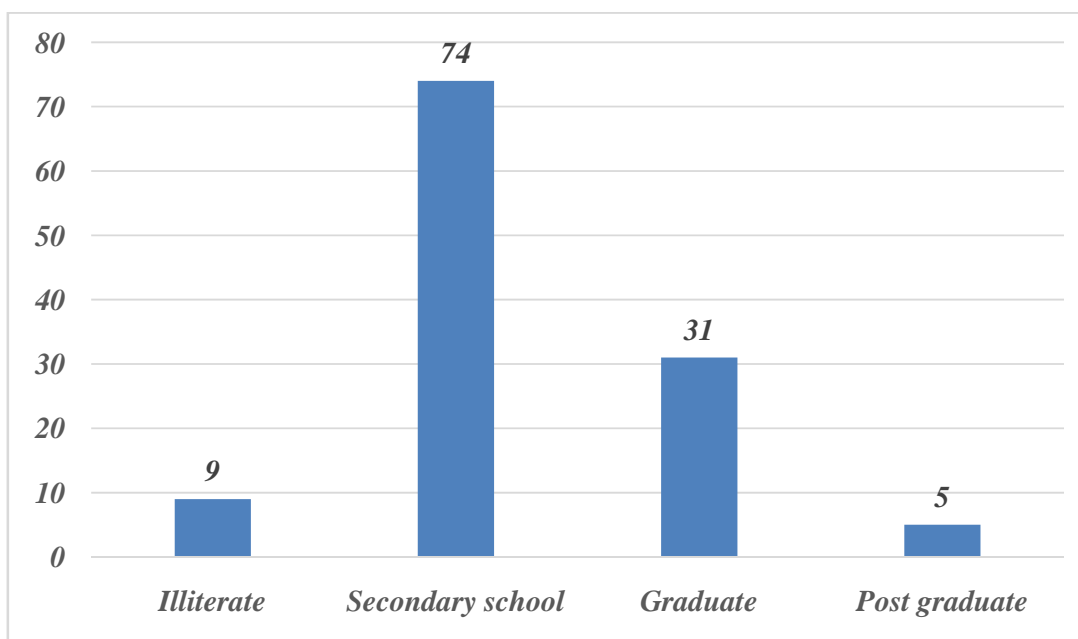


71(59.7%) of the study participants' father had studied up to secondary school.

Table 10: Distribution according to mothers' educational status.

Mothers' educational status.	Frequency	Percent
Illiterate	9	7.6
Secondary school	74	62.2
Graduate	31	26.1
Post graduate	5	4.2
Total	119	100.0

Table 10: Bar chart showing distribution according to mothers' educational status.



74 (62.2%) of the study participants' mother had studied up to secondary school.

Table 11: Distribution according to time spent by the parents with children in studies (hours per day).

Time spent by parents with children in studies (hours per day)	Frequency	Percent
Nil	63	52.9
.5	19	16.0
1.0	19	16.0
1.5	2	1.7
2.0	8	6.7
2.5	1	.8
3.0	4	3.4
5.0	3	2.5
Total	119	100.0

52.9% of the study participants' parents did not spend any time with children in studies and 32% spent less than or equal to one hour.

Fig 11: Bar chart showing distribution according to time spent by the parents with children in studies (hours per day).

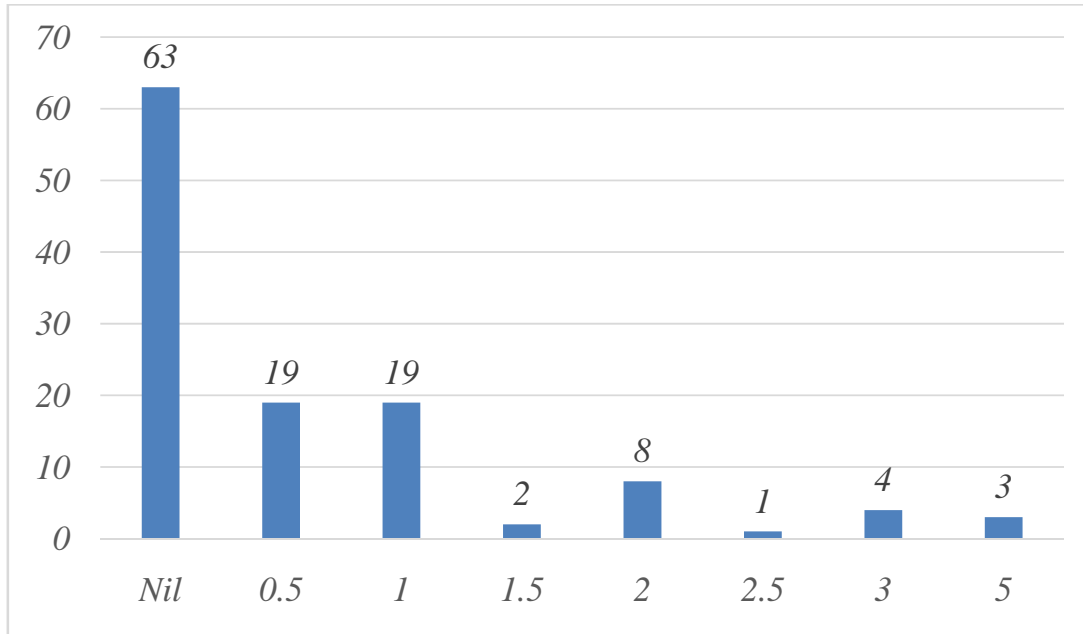
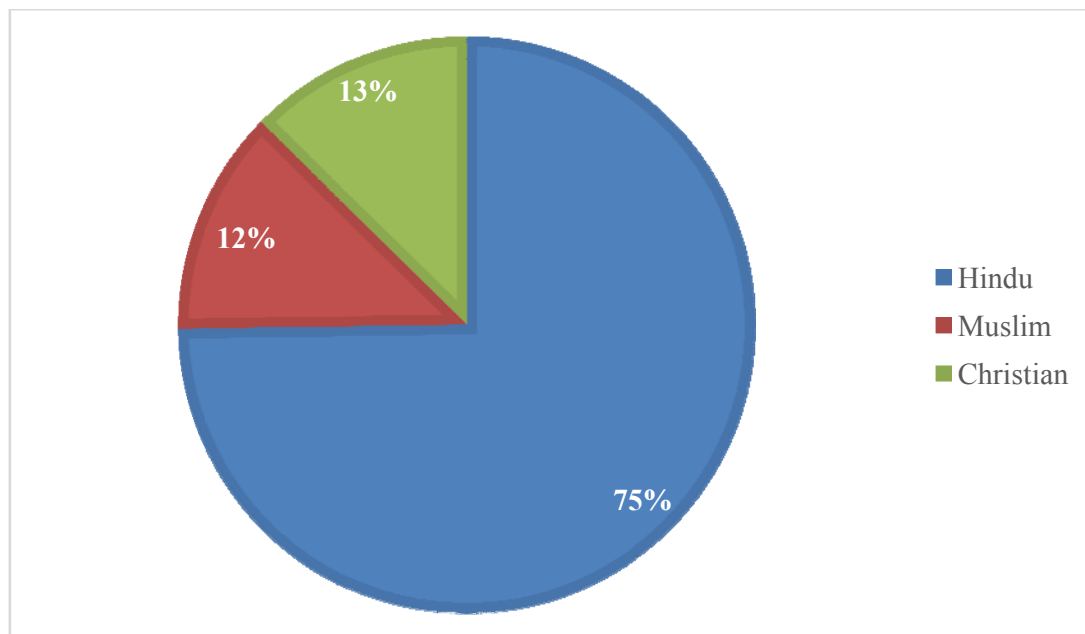


Table 12: Distribution of study participants according to the religion practiced.

Religion practiced.	Frequency	Percent
Hindu	89	74.8
Muslim	15	12.6
Christian	15	12.6
Total	119	100.0

Fig 12: Pie chart showing distribution of study participants according to the religion practiced.

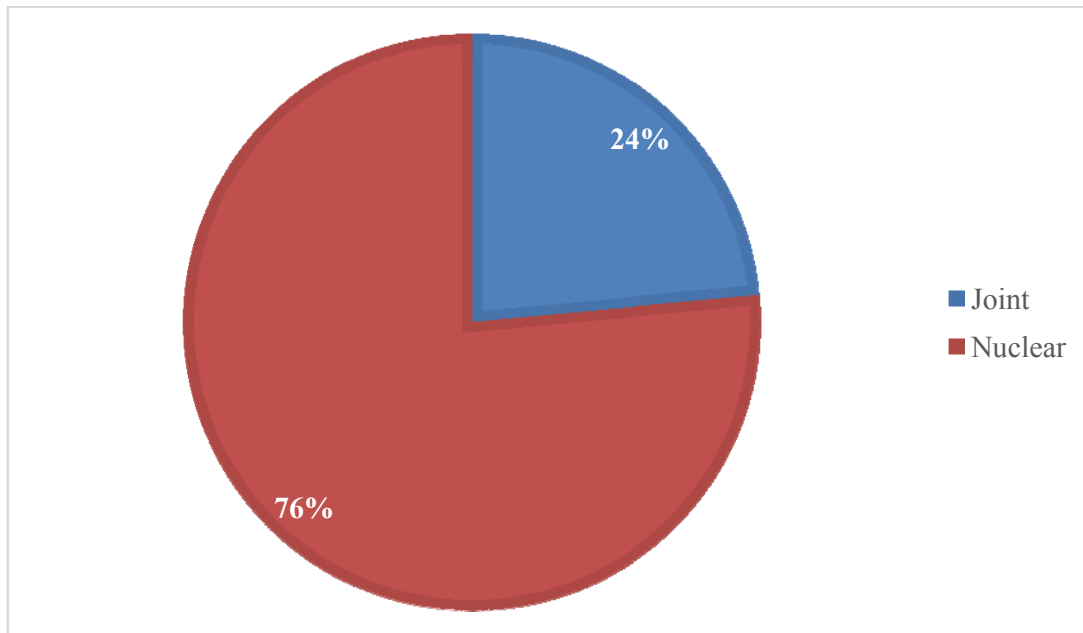


74.8% of the study participants practiced Hinduism.

Table 13: Distribution of study participants according to the type of family.

Type of family	Frequency	Percent
Joint	28	23.5
Nuclear	91	76.5
Total	119	100.0

Fig 13: Pie chart showing distribution according to type of family.

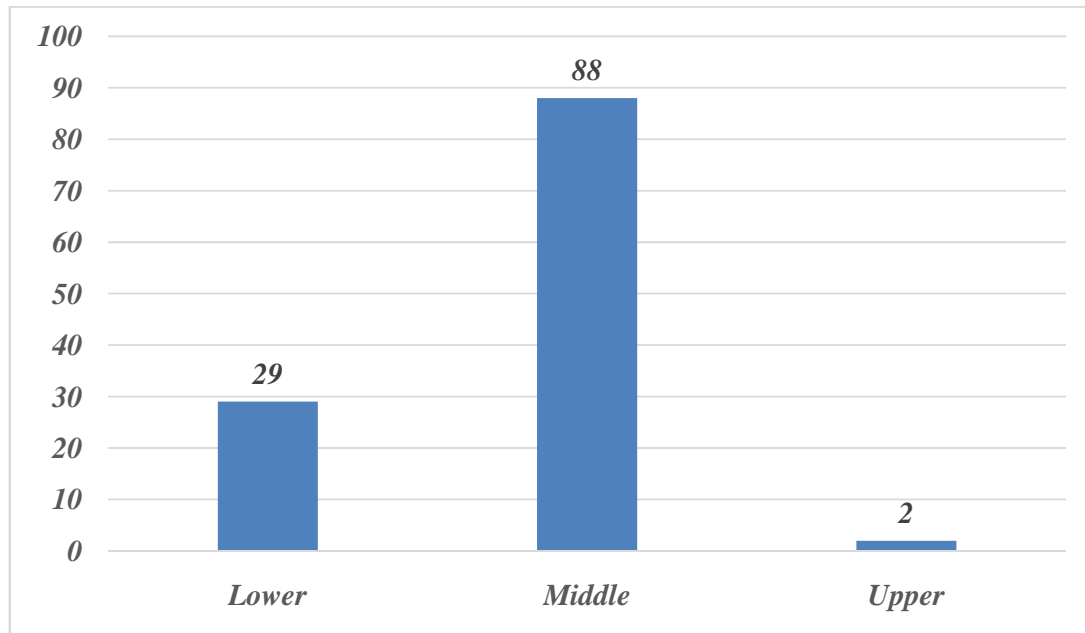


76.5% of the study participants were from nuclear family.

Table 14: Distribution according to socio-economic status.

Socioeconomic class	Frequency	Percent
Lower	29	24.4
Middle	88	73.9
Upper	2	1.7
Total	119	100.0

Fig 14: Bar chart showing distribution according to socio-economic class.

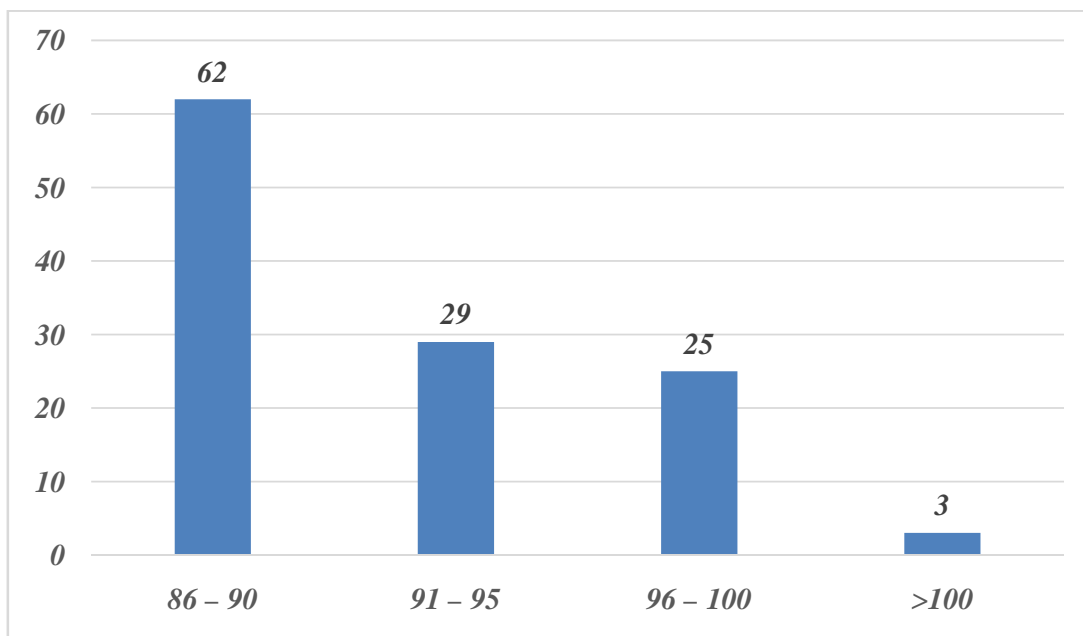


88 (73.9%) of the study participants belonged to middle socioeconomic class.

Table 15: Distribution of study participants according to Intelligent Quotient

Intelligent Quotient	Frequency	Percent
86 – 90	62	52.1
91 – 95	29	24.4
96 – 100	25	21.0
>100	3	2.5
Total	119	100.0

Fig 15: Bar chart showing distribution of study participants according to Intelligent Quotient.

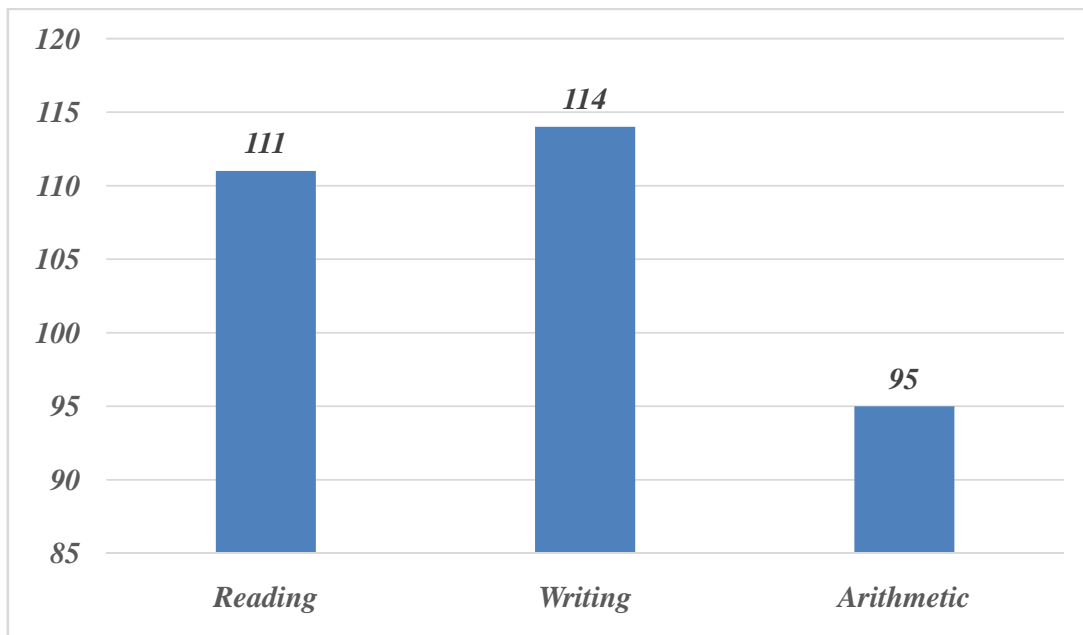


62 (52.1%) of the study participants had intelligent quotient between 86-90.

Table 16: Distribution of reading, writing and arithmetic difficulty among study participants.

Difficulty domain	Frequency	Percent
Reading	111	93.3
Writing	114	95.8
Arithmetic	95	79.8
Total	119	100.0

Fig 16: Bar chart showing distribution of reading, writing and arithmetic difficulty among study participants



95.8% of the study participants had writing difficulty followed by 93.3% with reading difficulty.

Table 17: Distribution according to combinations of difficulties in various domains.

Combinations.	Frequency	Percent
Writing only	1	.8
Arithmetic only	4	3.4
Reading and writing	23	19.3
Reading and arithmetic	1	.8
Writing and arithmetic	3	2.5
All the three domains	87	73.1
Total	119	100.0

87 (73.1%) had difficulty in all the three domains followed by 23 (19.3%) had difficulty in both reading and writing.

Fig 17: Bar chart showing distribution according to combinations of difficulties in various domains.

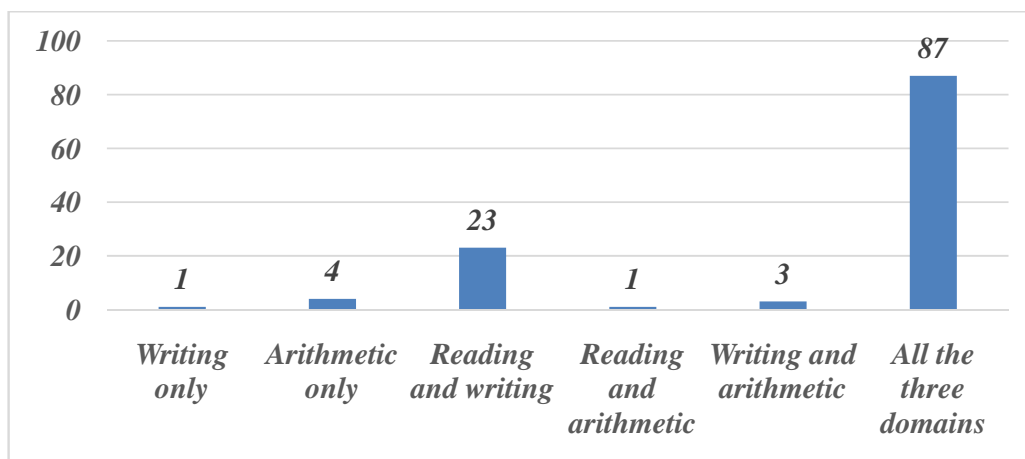
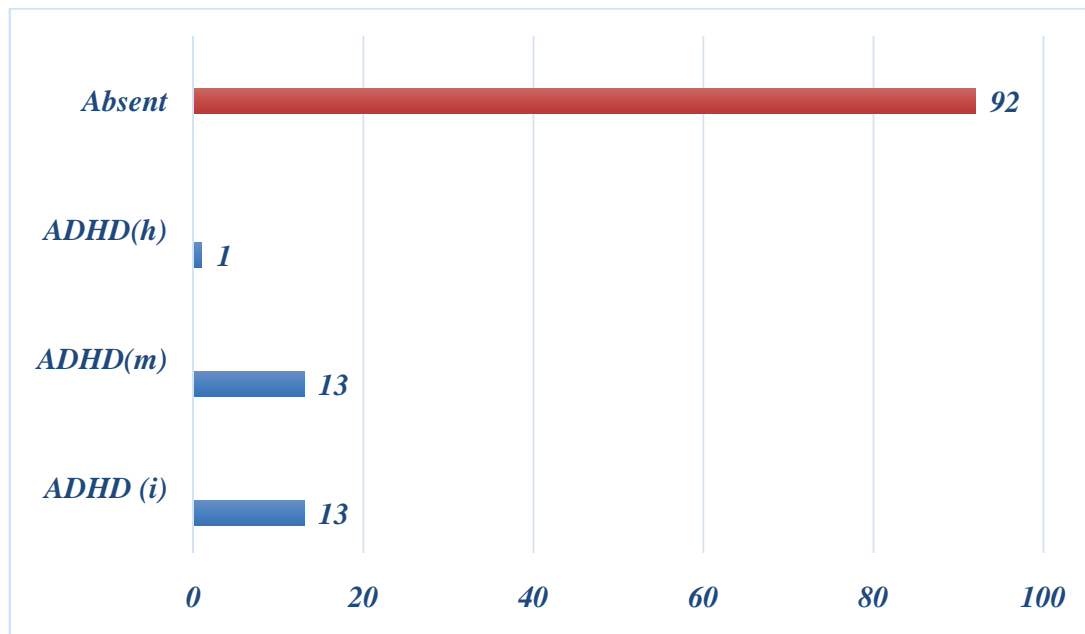


Table 18: Distribution of study participants according to the diagnosis of attention deficit hyperactive disorder (ADHD).

		Frequency	Percent
Present	ADHD (i)	13	10.9
	ADHD(m)	13	10.9
	ADHD(h)	1	.8
Absent		92	77.3
Total		119	100.0

Fig 18: Bar chart showing the distribution of ADHD among study participants.

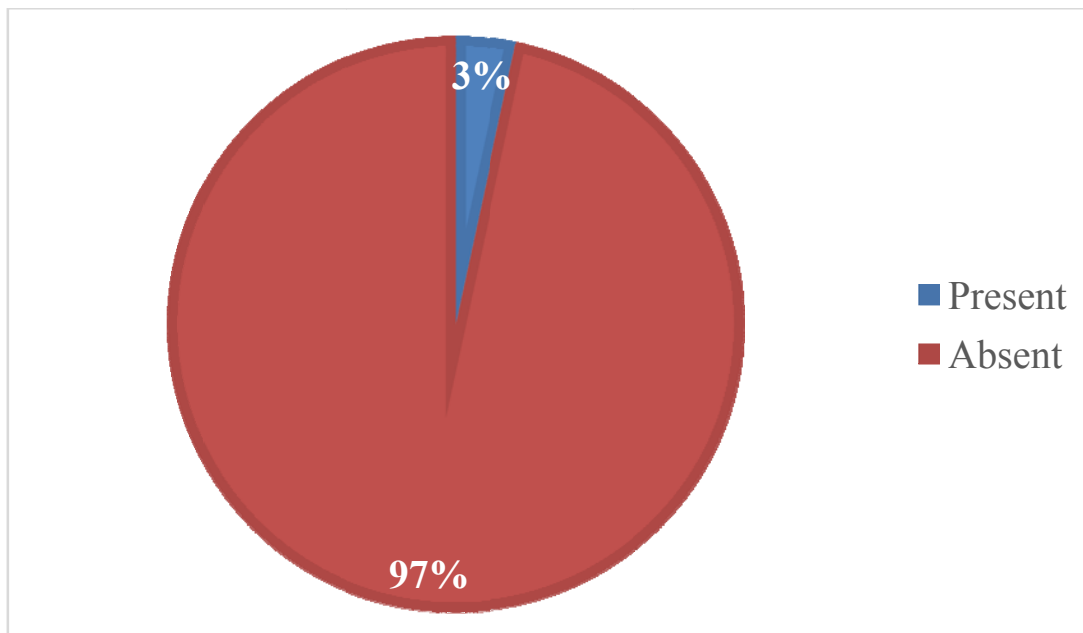


22.6% of the study participants were diagnosed with ADHD.

Table 19: Distribution of study participants according to the diagnosis of conduct disorder.

Conduct disorder	Frequency	Percent
Present	4	3.4
Absent	115	96.6
Total	119	100.0

Fig 19: Pie chart showing distribution according to conduct disorder.

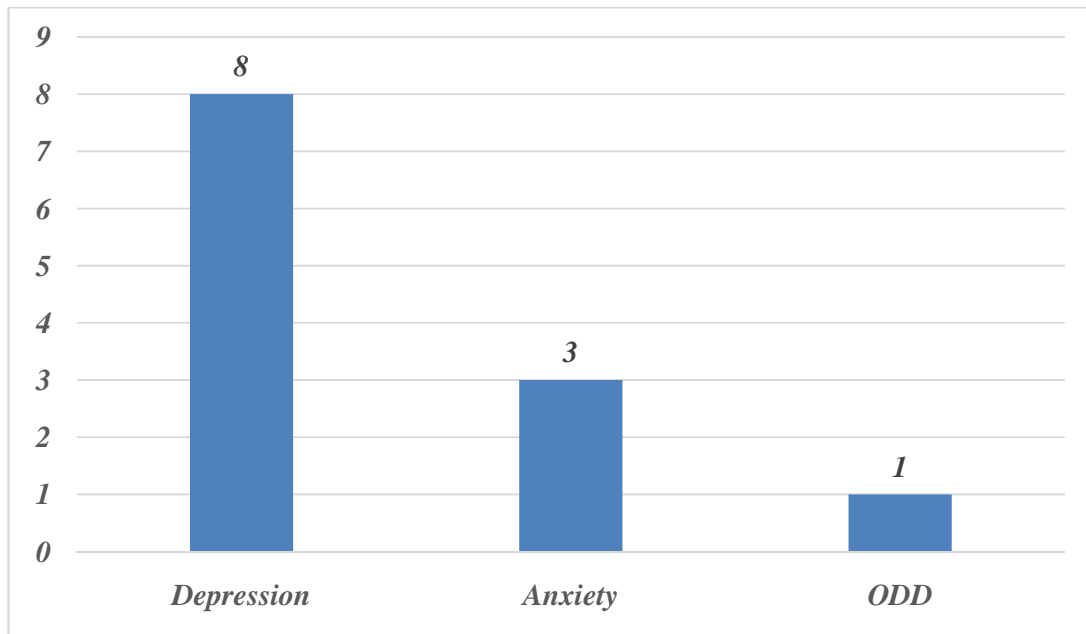


3.4% of the study participants had conduct disorder.

Table 20: Distribution of study participants according to depression, anxiety and ODD.

Disorder	Present	Percent
Depression	8	6.7
Anxiety	3	2.5
ODD	1	0.8
Total	119	100.0

Fig 20: Bar chart showing distribution according to depression, anxiety and ODD.



8 (6.7%) of the study participants had depression.

2 (2.5%) had anxiety and 1 (0.8%) had ODD.

Table 21: Distribution of psychosocial factors in the family of study participants .

Psychosocial Factor	Frequency	Proportion
Alcohol use in father of children	30	25.2
Sibling rivalry	8	6.7
Learning Problem	8	6.7
Marital Disharmony	9	7.6
Multiple care taking	3	2.5
Problem with peers	3	2.5
Over involvement	2	1.7
Single parent	2	1.7
Sleeping disorder	2	1.7
Change in school	2	1.7
Bed wetting	2	1.7
Problem with teachers	2	1.7
Punitiveness	2	1.7
Mental illness	2	1.7
Over expectation	1	0.8

Alcohol use (22.7%) was the common psychosocial factor present in the fathers followed by sibling rivalry and learning problem.

Table 22: Cross tabulation between domains with difficulty and ADHD.

Combinations.	ADHD						Absent	
	i		M		H		N	%
	N	%	N	%	N	%		
Writing only	0	0	0	0	1	100	0	0
Arithmetic only	1	7.7	1	7.7	0	0	2	2.2
Reading and writing	2	15.4	2	15.4	0	0	19	20.7
Reading and arithmetic	0	0	0	0	0	0	1	1.1
Writing and arithmetic	0	0	2	15.4	0	0	1	1.1
All the three domains	10	76.9	8	61.5	0	0	69	75
Total	13	10.9	13	10.9	1	0.8	92	77.3

X^2 -131.32d.f - 15

P-value < 0.05

The proportion of individuals with Attention Deficit Hyperactive Disorder was found to be more in the persons having difficulties in all the three domains followed by combined reading and writing difficulty. The above difference was found to be statistically significant.

Table 23: Cross tabulation between domains with difficulty and conduct disorder.

Combinations.	Conduct disorder		Absent	
	N	%	N	%
Writing only	0	0	1	100
Arithmetic only	0	0	4	3.5
Reading and writing	1	25	22	19.1
Reading and arithmetic	0	0	1	0.9
Writing and arithmetic	0	0	3	2.6
All the three domains	3	75	84	73
Total	4	3.4	115	96.4

$X^2 - .384$ d.f – 5 P-value >0.05.

The distribution of domain difficulty was found to be similar among both with conduct disorder and those without it.

Table 24: Cross tabulation between domains with difficulty and depression.

Combinations.	Depression		Absent	
	N	%	N	%
Writing only	0	0	1	100
Arithmetic only	0	0	4	3.5
Reading and writing	1	12.5	22	19.8
Reading and arithmetic	0	0	1	0.9
Writing and arithmetic	0	0	3	2.7
All the three domains	7	87.4	80	72.1
Total	8	6.7	111	93.3

$\chi^2 - 1.098$ d.f – 5 P-value >0.05.

The distribution of domain difficulty was found to be similar among both with depression and those who were not depressed.

Table 25: Cross tabulation between domains with difficulty and anxiety.

Combinations.	Anxiety		Absent	
	N	%	N	%
Writing only	0	0	1	100
Arithmetic only	0	0	4	3.5
Reading and writing	0	0	22	19.8
Reading and arithmetic	0	0	1	0.9
Writing and arithmetic	0	0	3	2.7
All the three domains	3	100	84	72.4
Total	3	2.5	116	97.5

$X^2 - 1.098$ d.f – 5 P-value >0.05.

The distribution of domain difficulty was found to be similar among both with anxiety and those who were not having anxiety.

Table 26: Cross tabulation between domains with difficulty and ODD.

Combinations.	ODD		Absent	
	N	%	N	%
Writing only	0	0	1	100
Arithmetic only	0	0	4	3.5
Reading and writing	0	0	22	19.8
Reading and arithmetic	0	0	1	0.9
Writing and arithmetic	0	0	3	2.7
All the three domains	1	100	86	72.9
Total	1	0.8	118	99.2

$$X^2 - 0.371 \quad \text{d.f} - 5 \quad \text{P-value} > 0.05.$$

The distribution of domain difficulty was found to be similar among both with ODD and those who were not having ODD.

Table 27: Crosstabulation between Sex and IQ.

Sex	IQ≤90		IQ>90	
	N	%	N	%
Male	48	77.4	42	73.7
Female	14	22.6	15	26.3

$$X^2 - 0.225 \quad \text{d.f} - 1 \quad \text{P-value} > 0.05$$

Among the study participants with intelligent quotient of less than or equal to 90, 77.4% were males. Similarly, among those having intelligent quotient of more than 90, 73.7% were males. Both the groups were similar with respect to sex as indicated by P-value of more than 0.05.

Table 28: Cross tabulation between sex and domains.

Combinations.	Male		Female	
	N	%	N	%
Writing only	1	1.1	0	0
Arithmetic only	3	3.3	1	3.4
Reading and writing	18	20.0	5	17.2
Reading and arithmetic	0	0	1	3.4
Writing and arithmetic	3	3.3	0	0
All the three domains	65	72.2	22	75.9
Total	90	75.6	29	24.4

$$X^2 - 4.51 \quad \text{d.f} - 5 \quad \text{P -value} > 0.05.$$

Among the males, 72.2% were found to have difficulty in all the three domains followed by 20% in both domains reading and writing. Similar pattern was observed among females with 75.9% were having difficulty in all the three domains and 17.2% had difficulty in both reading and writing. Both females and males experienced almost a same pattern with respect to difficulty domains and the same is reflected with P value of more than 0.05.

Table 29: Crosstabulation between ADHD and Sex.

		Male		Female	
		N	%	N	%
Present	ADHD (i)	9	10.0	4	13.8
	ADHD(m)	10	11.1	3	10.3
	ADHD(h)	1	1.1	0	0
Absent		70	77.8	22	75.9

$X^2 - 0.633$ d.f - 3 P value > 0.05

Among the males, 22.2% were having ADHD and among the females, 24.1% were having ADHD. The distribution of ADHD was not found to be influenced by sex. The P-value was also statistically not significant.

Table 30: Cross tabulation between Depression, Anxiety disorder and IQ.

Intelligent quotient	Depression, Anxiety disorder			
	Present		Absent	
	N	%	N	%
≤ 90	4	36.4	58	53.7
>90	7	63.6	50	46.3

$X^2 - 1.203$ d.f – 1 P-value > 0.05.

Among the participants with depression, anxiety disorder, 36.4% had intelligent quotient of less than or equal to 90 and 63.6% had IQ level of more than 90. Among those not having depression, anxiety disorder, 53.7% had IQ of less than or equal to 90 and 46.3% had IQ of more than 90. Both the groups were found to be statistically similar with P-value > 0.05.

Table 31: Cross tabulation between Depression, Anxiety disorder and sex.

Sex	Depression, Anxiety disorder.			
	Present		Absent	
	N	%	N	%
Male	5	45.5	85	78.7
Female	6	54.5	23	21.3

$X^2 - 5.988$ d.f – 1 P-value < 0.05

Among those having depression and anxiety disorder, 45.5% were males and 54.5% were females while among those not with the diagnosis of depression and anxiety disorder, 78.8% were males and 21.3% were females. Females were found to be more prone to these disorder than males. The above difference was statistically significant with P-value < 0.05.

RESULTS

In our study Out of 119 study participants, 90 (76%) individuals were males, 28 (23.5%) individuals had Caesarean as the mode of delivery 8 (6.7%) individuals had preterm birth.90 (75.7%) of the study participants had birth weight between 2.5 to 3.5 Kgs.

Regarding the medium of education and mother tongue of study participants103 (87%) of the study participants were having English as their medium of study. Mother tongue of 82 study participants (68.9%) were Tamil,97(81.5 %) of the study participants' first language was English and 90(83.2%) of the study participants had their second language as Tamil.

Regarding parental education and support,71 (59.7%) of the study participants' father had studied up to secondary school. 74 (62.2%) of the study participants' mother had studied up to secondary school. 52.9% of the study participants' parents did not spent any time with children in studies and 32% spent less than or equal to one hour.

Regarding the family type, socioeconomic status, 74.8% of the study participants practiced Hinduism 76.5% of the study participants were from nuclear family. 88 (73.9%) of the study participants belonged to middle socioeconomic class.

With respect to Intelligent Quotient 62 (52.1%) of the study participants had intelligent quotient between 86-90.

On looking into the domains of learning disorder 114 (95.8%) of the study participants had writing difficulty followed by 111 (93.3%) with reading difficulty. 87 (73.1%) had difficulty in all the three domains followed by 23 (19.3%) had difficulty in both reading and writing.

About psychiatric co-morbidities, 25 (22.6%) of the study participants were diagnosed with ADHD, 4 (3.4%) of the study participants had conduct disorder. Out of the 119 individuals 8 (6.7%) of the study participants had depression, 2 (2.5%) had anxiety and 1 (0.8%) had ODD.

We found a statistically significant relationship between Attention Deficit Hyperactive Disorder and the difficulties in the domains of learning disorder, in that the proportion of individuals with Attention Deficit Hyperactive Disorder was found to be more in the persons having

difficulties in all the three domains followed by combined reading and writing difficulty.

Among those having depression and anxiety disorder, 45.5% were males and 54.5% were females while among those not with the diagnosis of these disorder, 78.8% were males and 21.3% were females. Females were found to be more prone to depression and anxiety disorder than males. The above difference was statistically significant with P-value < 0.05 .

Among the participants with depression and anxiety disorders, 36.4% had intelligent quotient of less than or equal to 90 and 63.6% had IQ level of more than 90. Among those not having depression and anxiety disorders, 53.7% had IQ of less than or equal to 90 and 46.3% had IQ of more than 90. Both the groups were found to be statistically similar with P-value > 0.05

The distribution of domain difficulty was found to be similar among both with conduct disorder and those without it. The distribution of domain difficulty was found to be similar among both with depression and those who were not depressed. The distribution of domain difficulty was found to be similar among both with anxiety and those who were not having anxiety. The distribution of domain difficulty was found to be similar among both with ODD and those who were not having ODD.

Among the study participants with intelligent quotient of less than or equal to 90, 77.4% were males. Similarly, among those having intelligent quotient of more than 90, 73.7% were males. Both the groups were similar with respect to sex as indicated by P-value of more than 0.05.

Among the males, 72.2% were found to have difficulty in all the three domains followed by 20% in both domains reading and writing. Similar pattern was observed among females with 75.9% were having difficulty in all the three domains and 17.2% had difficulty in both reading and writing. Both females and males experienced almost a same pattern with respect to difficulty domains and the same is reflected with P value of more than 0.05.

Among the males, 22.2% were having ADHD and among the females, 24.1% were having ADHD. The distribution of ADHD was not found to be influenced by sex. The P-value was also statistically not significant. Alcohol use in fathers of children with learning disorder (22.7%) was the common psychosocial factor present followed by sibling rivalry and learning problem.

DISCUSSION

Our study assessed the pattern and the prevalence of domains of learning difficulties among children approaching a tertiary care centre for poor scholastic performance and concession certificate. We found a greater proportion of male children (76%) when compared to female children approaching tertiary care centre. This disproportionate number of boys with problems in learning is in line with the previous research study suggesting that dyslexia is more apparent in boys than in girls[2][4]. Regarding the individual domains of difficulty the children has writing difficulty (95.8%) occurs mostly followed by reading difficulty (93.3%) with the prevailing arithmetic difficulties the least (79.8%). This is in line with previous study [3] where the prevalence of difficulty in writing was 82%, difficulty in reading was 74% and difficulty in arithmetic's was 69% regarding the order of difficulty in domains and in fact the proportion is higher in our study. This infer that there exists combination of domains of difficulty and the children had difficulty in all the three domains is noted to be 73.1% followed by those who had difficulty in both reading and writing (19.3%) which is similar to previous study[4].

Most of the children belong to middle socioeconomic status followed by lower and upper class which is in contrast with previous study where more children with difficulty in learning belong to low socioeconomic status the most with increasing level of performance towards higher socioeconomic status[5]. This indicates that it could be the level of awareness among parents regarding difficulties in learning as well as learning disorder which being added on by the inputs from school teachers and effective screening at school by school health medical officers who are referring for. Around 70% of children has parents who had completed secondary school when compared to graduates and post graduates which has a relation with learning disorder in the same way as in previous study[6].Regarding the associated psychosocial factors fathers of children with learning disorders were found to use substance in particular alcohol and nicotine which is found in previous study[6].This is followed by marital disharmony, single parenting, problems in parenting like punitiveness, overprotection, over expectation. Learning disorder of combined type involving all the three domains like writing, reading, arithmetic's is more common followed by individuals with difficulty in both reading and writing. Taking into consideration the individual domains of learning disorder more individuals has writing difficulty followed by reading difficulty and then arithmetic difficulty which is similar to previous studies[7].Females and males experienced almost a same pattern with respect to difficulty domains

which is in contrast with previous study by Kristina moll[7]. In our study we found around 27% of individuals were having behavioral and emotional problems which includes attention deficit hyperactive disorder, disorders like depression and anxiety, disorders with externalizing symptoms like conduct disorder, oppositional defiant disorder. This is similar to previous studies where around 30% of children with learning disorder have behavioral and emotional problems but in some other studies it was more than 60%. Among psychiatric co-morbidities there is higher prevalence of Attention Deficit Hyperactive Disorder followed in order by depression and anxiety disorders and other disorders with externalizing symptoms. There exist similar prevalence though lesser in proportion in previous studies by lucia et al [8]. We couldn't find any specific distribution of ADHD among male and female sex statistically yet there prevails a slight preponderance of female with inattention type than male with ADHD. Considering both depression and anxiety disorders females were found to be more prone to than males, though statistically significant we could consider this taking into account that depression ,anxiety disorder are more common in females in general and also most of the children report to department for concession certificate rather than for psychiatric problems. The stigma prevailing in the society regarding psychiatry may make the parents under report or minimize the problems the children have. Follow up studies of children with learning disorder may give a more accurate picture. We come across four individuals

with diagnosis of conduct disorder followed by oppositional defiant disorder. The problem behavior among those with these disorders is more with conduct disorder (next to attention deficit hyperactive disorder) than oppositional defiant disorder in a way which could be noted by parents and teachers which indicates the number of individuals to be much lesser than the actual number. Thomas j smith et al found in their study the frequency of behavior problems in school children evidenced by teachers and complaining about it to parents, in that children with co-morbid Attention Deficit Hyperactive Disorder with Learning Disorder parents were significantly more likely than children with Learning Disorder only to be contacted by teachers about behavioral problems at school. Additionally, students with co-morbid disorders of Attention Deficit Hyperactive Disorder with Learning Disorder were more likely than students with Attention Deficit Hyperactive Disorder only to show impaired academic outcomes. As mentioned in previous study by Karade et al 2007 regarding the knowledge of learning disorder and intensity of remedial education among parents of the children with learning disorder which they should get, we found a similar pattern of poor knowledge about these, as being noted by the poor commitment of parents in their studies as more than 60% didn't spend time in studies of their children which are part of remedial education.

CONCLUSION

Specific Learning disorder is a Neuro developmental disorder. Though neuro developmental the course can be modified by early identification by parents and teachers. These can be indirectly depicted by the behavior of children like avoiding to read and write, if so a tendency to misread information and comprehend, difficulty to summarize, difficulty with spelling ,omitting complex words and poor ability to apply mathematical skills. Early identification and remedial education at the earliest may make the children function to near normal. This also protects the children from depression, anxiety, conduct, oppositional defiant disorders as psychiatric co morbidity is high with specific learning disorder. Psychiatric co morbidities like ADHD, depression has to be addressed simultaneously as any untreated disorders could affect the outcome in learning disorder. Lower level of awareness among parents, teachers and public regarding specific learning disorder and co morbid psychiatric disorders makes most of the children presenting at a later stage with problematic behavior.Children with ADHD and learning disorder shows poor improvement in learning difficulties even after multimodal treatment approach which include Pharmacotherapy, Academic assistance which includes remedial pull out classes, after school programs and Skills

training. Cognitive and behavioral approaches has also to be included in the remediation programs for children with co-morbid depression, anxiety and conduct disorders.

Hence awareness about these among them may reduce the psychiatric co morbidities, together with appropriate remedial measures, the children could gain knowledge from learning, be independent and productive.

LIMITATIONS

As the Study participants are approaching the tertiary care centre referred by schools rather than from active screening at the community level the actual burden of the disorder and the psychiatric co morbidities couldn't be made which could be much more. Study design wise its a cross sectional study, follow up study reflects more clear picture regarding psychiatric co morbidities.

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சுய ஒப்புதல் படிவம்

ஆராய்ச்சி நிலையம்: கீழ்ப்பாக்கம் மருத்துவக்கல்லூரி அரசு
மருத்துவமனை, சென்னை.

பங்கு பெறுபவரின் பெயர்:

பங்கு பெறுபவரின் எண்:

பங்கு பெறுபவர் இதனை () குறிக்கவும்

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களைக் கேட்கவும், அதற்கான தகுந்த விளக்கங்களைப் பெறவும் வாய்ப்பளிக்கப்பட்டது. ()

நான் இவ்வாய்வில் தன்னிச்சையாகத்தான் பங்கேற்கிறேன். எந்தக் காரணத்தினாலோ எந்தக் கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகிக் கொள்ளலாம் என்றும் அறிந்து கொண்டேன். ()

இந்த ஆய்வு சம்மந்தமாகவும், மேலும் இது சார்ந்த ஆய்வு மேற்கொள்ளும்போதும், இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளைப் பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்துகொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன். ()

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக் கொள்ளவும், அதைப் பிரகரிக்கவும் என் முழு மனதுடன் சம்மதிக்கிறேன். ()

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்குக்

ஆராய்ச்சி தகவல் தாள்

கீழ்ப்பாக்கம் அரசு பொது மருத்துவமனைக்கு வரும் “கற்றலில் பின்னடைவு குறைபாடு” உடைய குழந்தைகள் / இளஞ்சிறார்கள் குறித்து ஆராய்ச்சி செய்ய உள்ளோம். நீங்கள் இந்த ஆராய்ச்சியில் பங்கேற்க நாங்கள் விரும்புகிறோம். இந்த ஆராய்ச்சியில் பங்கேற்பதால் தங்களது நோயின் ஆய்வறிக்கையோ அல்லது சிகிச்சையோ பாதிக்கப்படாது என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியின் முடிவுகளை அல்லது கருத்துகளை வெளியிடும் போதோ அல்லது ஆராய்ச்சியின் போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிடமாட்டோம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின் பேரில் தான் இருக்கிறது. மேலும் நீங்கள் எந்நேரமும் இந்த ஆராய்ச்சியில் இருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த சிறப்புப் பரிசோதனைகளின் முடிவுகளை ஆராய்ச்சியின் போதோ அல்லது ஆராய்ச்சியின் முடிவின் போதோ தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

ஆராய்ச்சியாளர் கையொப்பம்

பங்கேற்பாளர் கையொப்பம்

தேதி

INFORMED CONSENT FORM

STUDY: “A STUDY OF CHILDREN WITH LEARNING DISORDER IN A TERTIARY CARE CENTER”.

STUDY CENTRE: Department of Psychiatry Govt. Kilpauk Medical College Hospital, Chennai.

PATIENT’S NAME :

PATIENT’S AGE :

I.P NO. :

Patient may check () these boxes

I confirm that I understood the purpose of the procedure for the above study. ()

I had the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ()

I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ()

I understand that the ethical committee members and the regulatory authorities will not need my permission to look at my health records, both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the study I agree to this access. ()

However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. ()

I agree not to restrict the use of any data or results that arise from the study. ()

I agree to take part in the above study and to comply with the instructions given during the study and faithfully co-operate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well being or any unexpected or unusual symptoms. ()

I hereby consent to participate in this study. ()

I hereby give permission to undergo complete clinical examination and diagnostic tests including haematological, biochemical, radiological tests. ()

Signature / thumb impression

Patient's name and address:

Place:

Date:

Signature of the investigator:

Study investigator's name:

Place:

Date:

PARTICIPANTS' INFORMATION SHEET

Investigator : **Dr.Dinesh kumar.G**

Name of the participant :

Study title: “A STUDY OF CHILDREN WITH LEARNING DISORDER IN A TERTIARY CARE CENTER”.

You are invited to take part in this research study. We have got approval from the IEC. You are asked to participate because you satisfy the eligibility criteria.

What is the purpose of this research?

In this study, we aim to study the pattern of learning disorder, psychiatric co-morbidities and associated psychosocial factors in individuals with Learning Disorder

Benefits:

This study will help in identifying the most common psychiatric co-morbidities and psychosocial factors if any which will hinder the outcome following remedial measures. This will help to create awareness about learning Disorder and associated psychiatric illness and thus early intervention is possible in these individuals.

Discomforts and risks:

No interventional procedure is done in this study.

Confidentiality:

Patients who participate in the study and their details will be maintained confidentially and at any cost, those details will not be let out.

Right to withdraw:

Patients will not be forced to complete the study. At any cost, in such circumstances the treatment will not be compromised.

Signature/Thumb impression of the participant:

Signature of the investigator:

Date :

Place:

RECORD SHEET
DEVELOPMENTAL PSYCHOPATHOLOGY CHECK LIST FOR CHILDREN

Sl. No :

Date:

Name of the child:

Age:

Sex:

Class:

Mother tongue:

Languages spoken:

Medium of Instruction:

Handedness:

Details regarding the family:

Age education Occupation:

Child lives with: Father (Others.....)Mother

Number of siblings and the order of birth: 0 0 0 0 0 0 0 0 / () () () () (mark 0 for girls and () for boys
, darken the circle 0 for the index child)

Consanguinity : If present, specify:

Urban

Rural

A. Developmental History

1.	Pre- peri – post natal problems of Mother		1
2.	Post natal problems of child	0	1
3.	Epilepsy, head injury, infections	0	1
4.	Poor vision	0	1
5.	Poor hearing	0	1
6.	Gross – motor	0	1
7.	Fine – motor	0	1
8.	Speech/ language	0	1
9.	Emotional – social	0	1
10	Self help	0	1

B. Developmental Problems

11.	Clumsiness	0	1
12.	Breath holding	0	1
13.	Tics, mannerisms	0	1
14.	Speech / articulation	0	1
15.	Sluttering / stammering	0	1
16.	Elective mutism	0	1
17.	Echolalia	0	1
18.	Language (expressive)	0	1
19.	Language (receptive)	0	1
20.	Language (deviant)	0	1
21.	Inability to relate to people	0	1
22.	Inability to play with children	0	1
23	Feeding problems	0	1
24.	Enuresis (Primary)	0	1
25.	Enuresis (Secondary)	0	1
26.	Encopresis	0	1
27.	Sleeping	0	1
28.	Sexual Problems	0	1



Please print CHILD BEHAVIOR CHECKLIST FOR AGES 6-18

For office use only ID #

Form header section containing fields for CHILD'S FULL NAME, CHILD'S GENDER, CHILD'S AGE, CHILD'S ETHNIC GROUP OR RACE, PARENTS' USUAL TYPE OF WORK, FATHER'S TYPE OF WORK, MOTHER'S TYPE OF WORK, TODAY'S DATE, CHILD'S BIRTHDATE, GRADE IN SCHOOL, NOT ATTENDING SCHOOL, and THIS FORM FILLED OUT BY.

Section I: Please list the sports your child most likes to take part in. Includes a table for comparing time spent to others of the same age.

Section II: Please list your child's favorite hobbies, activities, and games, other than sports. Includes a table for comparing time spent to others of the same age.

Section III: Please list any organizations, clubs, teams, or groups your child belongs to. Includes a table for comparing activity to others of the same age.

Section IV: Please list any jobs or chores your child has. Includes a table for comparing how well they carry them out to others of the same age.

Be sure you answered all items. Then see other side

VANDERBILT ADHD DIAGNOSTIC PARENT RATING SCALE

Child's Name: _____ Today's Date: _____

Date of Birth: _____ Age: _____

Grade: _____

Each rating should be considered in the context of what is appropriate for the age of your child.**Frequency Code: 0 = Never 1 = Occasionally 2 = Often 3 = Very Often**

1. Does not pay attention to details or makes careless mistakes, for example homework 0 1 2 3
2. Has difficulty sustaining attention to tasks or activities 0 1 2 3
3. Does not seem to listen when spoken to directly 0 1 2 3
4. Does not follow through on instructions and fails to finish schoolwork (not due to oppositional behavior or failure to understand) 0 1 2 3
5. Has difficulty organizing tasks and activities 0 1 2 3
6. Avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort 0 1 2 3
7. Loses things necessary for tasks or activities (school assignments, pencils or books) 0 1 2 3
8. Is easily distracted by extraneous stimuli 0 1 2 3
9. Is forgetful in daily activities 0 1 2 3
10. Fidgets with hands or feet or squirms in seat 0 1 2 3
11. Leaves seat when remaining seated is expected 0 1 2 3
12. Runs about or climbs excessively in situations when remaining seated is expected 0 1 2 3
13. Has difficulty playing or engaging in leisure/play activities quietly 0 1 2 3
14. Is "on the go" or often acts as if "drive by a motor" 0 1 2 3
15. Talks too much 0 1 2 3
16. Blurts out answers before questions have been completed 0 1 2 3
17. Has difficulty waiting his/her turn 0 1 2 3
18. Interrupts or intrudes on others (e.g., butts into conversations or games) 0 1 2 3
19. Argues with adults 0 1 2 3
20. Loses temper 0 1 2 3
21. Actively defies or refuses to comply with adults' requests or rules 0 1 2 3
22. Deliberately annoys people 0 1 2 3
23. Blames others for his or her mistakes or misbehaviors 0 1 2 3
24. Is touchy or easily annoyed by others 0 1 2 3

Hamilton Anxiety Rating Scale (HAM-A)

Below is a list of phrases that describe certain feeling that people have. Rate the patients by finding the answer which best describes the extent to which he/she has these conditions. Select one of the five responses for each of the fourteen questions.

0 = Not present, 1 = Mild, 2 = Moderate, 3 = Severe, 4 = Very severe.

1 Anxious mood 0 1 2 3 4

Worries, anticipation of the worst, fearful anticipation, irritability.

2 Tension 0 1 2 3 4

Feelings of tension, fatigability, startle response, moved to tears easily, trembling, feelings of restlessness, inability to relax.

3 Fears 0 1 2 3 4

Of dark, of strangers, of being left alone, of animals, of traffic, of crowds.

4 Insomnia 0 1 2 3 4

Difficulty in falling asleep, broken sleep, unsatisfying sleep and fatigue on waking, dreams, nightmares, night terrors.

5 Intellectual 0 1 2 3 4

Difficulty in concentration, poor memory.

6 Depressed mood 0 1 2 3 4

Loss of interest, lack of pleasure in hobbies, depression, early waking, diurnal swing.

7 Somatic (muscular) 0 1 2 3 4

Pains and aches, twitching, stiffness, myoclonic jerks, grinding of teeth, unsteady voice, increased muscular tone.

8 Somatic (sensory) 0 1 2 3 4

Tinnitus, blurring of vision, hot and cold flushes, feelings of weakness, pricking sensation.

9 Cardiovascular symptoms 0 1 2 3 4

Tachycardia, palpitations, pain in chest, throbbing of vessels, fainting feelings, missing beat.

10 Respiratory symptoms 0 1 2 3 4

Pressure or constriction in chest, choking feelings, sighing, dyspnea.

11 Gastrointestinal symptoms 0 1 2 3 4

Difficulty in swallowing, wind abdominal pain, burning sensations, abdominal fullness, nausea, vomiting, borborygmi, looseness of bowels, loss of weight, constipation.

12 Genitourinary symptoms 0 1 2 3 4

Frequency of micturition, urgency of micturition, amenorrhoea, menorrhagia, development of frigidity, premature ejaculation, loss of libido, impotence.

13 Autonomic symptoms 0 1 2 3 4

Dry mouth, flushing, pallor, tendency to sweat, giddiness, tension headache, raising of hair.

14 Behavior at interview 0 1 2 3 4

Fidgeting, restlessness or pacing, tremor of hands, furrowed brow, strained face, sighing or rapid respiration, facial pallor, swallowing, etc.

CHILDREN'S DEPRESSION RATING SCALE-REVISED (CDRS-R)

1. Impaired Schoolwork (rate 1 to 6)

- 1 = Performance is consistent with ability
 - 6 = No motivation to perform
-

2. Difficulty Having Fun (rate 1 to 7)

- 1 = Interest and activities realistically appropriate for age, personality, and social environment. No appreciable change from usual behavior during at least the past 2 weeks. Any feelings of boredom are seen as transient
 - 7 = Has no initiative to become involved in any activities. Describes himself/herself as primarily passive. Watches others play or watches TV but shows little interest. Shows no enthusiasm or real interest
-

3. Social Withdrawal (rate 1 to 7)

- 1 = Enjoys friendships with peers at school and at home
 - 7 = Does not currently relate to other children. States that he/she has "no friends" or actively rejects new or former friends
-

4. Sleep Disturbance (rate 1 to 5)

- 1 = No difficulty or occasional difficulty that is situationally explainable
 - 5 = Has difficulty with sleep nearly every night
-

5. Appetite Disturbance (rate 1 to 5)

- 1 = No problems or changes in eating pattern
 - 5 = Avoids eating and/or is not hungry most of the time OR describes a noteworthy increase in appetite and/or excessive food intake
-

6. Excessive Fatigue (rate 1 to 7)

- 1 = No unusual complaints of "feeling tired" during the day
 - 7 = Complains of feeling tired most of the day. May voluntarily take long naps without feeling refreshed. Degree of fatigue interferes with play activities
-

7. Physical Complaints (rate 1 to 7)

- 1 = Occasional complaints that do not appear to be excessive
 - 7 = Preoccupied with aches and pains. These regularly interfere with play activities
-

8. Irritability (rate 1 to 6)

- 1 = Rarely irritable
- 6 = Constant experience of irritability. Nothing changes this mood

67	14	2	1	2	2.2	2	2	3	2	1	1	3	2	0	1	2	2	89	1	1	1	Nil
68	16	1	1	1	2.5	2	2	1	2	1	1	2	2	0	3	1	2	100	0	1	1	Nil
69	15	2	1	1	3	2	2	3	2	1	1	4	3	1	2	2	2	89	1	1	1	Nil
70	14	2	1	1	3	2	2	3	2	1	1	3	3	0	3	2	2	90	1	1	0	Nil
71	14	1	1	1	3	2	2	3	2	1	1	3	3	1	1	2	2	89	1	1	1	Nil
72	14	1	2	1	3.5	2	2	3	2	1	1	4	3	0.5	1	2	2	100	1	1	1	Nil
73	15	1	1	1	3	2	2	3	2	1	1	4	3	0.5	1	2	2	87	1	1	1	Nil
74	15	1	1	1	2.5	2	2	1	2	1	1	4	3	1	1	1	2	90	1	1	1	Nil
75	14	1	2	1	2.7	2	2	1	2	1	1	2	2	0.5	1	1	2	89	1	1	1	Nil
76	15	1	2	1	3.35	2	2	3	2	1	1	2	2	0	1	2	2	90	1	1	1	Nil
77	14	1	1	1	2.8	2	2	3	2	1	1	3	3	0.5	3	2	2	92	1	1	1	ADHD(m)
78	16	1	1	1	3.5	2	2	3	2	1	1	2	2	0	1	1	1	100	1	1	1	Nil
79	14	1	1	1	3	2	2	1	2	1	1	3	2	0.5	3	2	2	90	1	1	0	Nil
80	14	1	1	1	3	2	1	3	2	1	1	3	3	0	1	2	2	90	1t	1t	0	Nil
81	15	1	1	1	3.5	2	2	3	2	1	1	2	2	0.5	1	2	2	86	1	1	0	Nil
82	14	1	1	1	3.25	1	2	1	2	1	1	2	2	0	1	2	1	92	1	1	1	Nil
83	16	1	1	1	3	2	2	1	1	2	1	3	4	0.5	1	2	2	90	1	1	1	Nil
84	15	1	1	1	2.5	2	1	3	2	1	1	2	2	0	2	2	2	95	1	1	1	Nil
85	14	1	1	1	2.5	2	2	1	2	1	1	2	3	0	1	2	2	94	1	1	1	depression
86	16	2	1	1	2.5	2	2	1	2	1	1	3	3	0	1	2	2	93	1	1	1	Nil
87	14	1	1	1	2.6	2	2	3	2	1	1	3	2	0	2	1	2	90	1	1	1	ADHD, Conduct disorder(m)
88	15	1	1	1	3	2	2	1	2	1	1	2	2	0	1	2	2	89	1	1	1	Nil
89	15	1	1	1	3	2	2	1	2	1	1	1	1	0	3	2	2	88	1	1	1	Nil
90	16	2	1	2	2	2	2	3	2	1	1	3	2	0	4j	2	2	90	1	0	1	Nil
91	15	1	1	1	2.75	2	2	1	2	1	1	2	2	1	2	2	2	89	1	1	1	Nil
92	15	1	2	1	3	2	2	1	2	1	1	4	3	1	3	2	2	87	1	1	0	Nil
93	15	1	1	1	2.5	2	2	1	2	1	1	3	2	0	1	2	2	90	1	1	1	Nil
94	15	2	1	1	2.8	2	2	1	2	1	1	3	2	0	1	2	2	94	1	1	1	Nil
95	15	1	2	1	2.5	2	2	1	2	1	1	2	3	1	1	2	2	90	1	1	1	Nil
96	15	2	2	1	3.5	1	2	3	1	2	1	2	2	0	1	2	1	88	1	1	0	ADHD(i)
97	16	2	1	1	2.7	1	1	1	1	2	1	1	1	0	1	2	1	92	1	1	1	ADHD,anxiety(i)
98	16	1	1	1	3	2	1	3	2	1	1	2	2	0	2	1	2	96	1	1	1	ADHD,depression(m)
99	15	2	2	1	2.75	2	2	1	2	1	1	2	2	0.5	2	2	2	100	1	1	0	Nil
100	14	2	1	1	2.5	2	2	1	2	1	1	3	2	0	1	2	2	98	1	1	1	Nil
101	14	1	1	1	2.5	2	2	1	2	1	1	3	3	0.5	1	1	2	103	1	1	0	Nil
102	14	1	1	1	2	2	2	1	2	1	1	2	2	0	3	2	2	94	1	1	1	Nil
103	14	2	1	1	3.5	2	2	1	2	1	1	2	2	2	1	2	2	98	1	1	1	Nil
104	16	2	1	1	2.75	1	1	1	1	2	1	1	1	0	1	2	2	96	1	1	1	Nil
105	16	1	1	1	3	1	2	1	1	2	1	1	1	0	1	2	1	98	1	1	1	Nil
106	16	1	2	1	3.5	1	2	1	1	2	1	2	3	2	1	2	1	90	0	0	1	Nil
107	15	1	1	1	3.5	2	2	3	2	1	1	2	2	0	2	2	2	90	1	1	1	Nil
108	15	1	2	1	3.5	1	2	3	2	1	1	3	2	1	1	2	2	98	1	1	1	Nil
109	15	1	1	1	3.5	1	1	1	1	2	1	2	2	0.5	1	2	1	94	1	1	0	Nil
110	15	1	1	1	3.5	1	2	1	2	1	1	2	1	1	1	2	2	100	1	1	1	Nil
111	15	1	2	1	3.75	2	2	1	2	1	1	2	2	2	1	1	2	102	1	1	1	Nil
112	16	1	1	1	2.75	2	2	1	2	1	1	2	2	0	1	2	1	96	1	1	1	Nil
113	15	2	1	1	2.5	2	2	1	2	1	1	2	2	2	1	2	2	87	1	1	1	Nil
114	14	1	1	1	2.8	2	2	1	2	1	1	3	3	1	1	2	2	90	1	1	1	Nil
115	16	1	1	1	2.25	2	2	1	2	1	1	2	2	0	1	2	1	93	1	1	1	Nil
116	14	1	1	1	2.5	2	2	1	2	1	1	2	2	0	1	2	1	95	1	1	1	Nil
117	14	1	1	1	2.75	2	2	1	2	1	1	2	2	1	1	2	1	100	1	1	1	Nil
118	16	1	1	1	3	1	2	1	2	1	1	2	2	2	1	2	1	98	1	1	1	ADHD(i)
119	14	2	1	1	3	1	1	1	1	2	1	2	2	0	1	2	1	100	1t	1t	0	Nil

Nil
Nil
Nil
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learning problems
marital disharmony
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alcoholism
alcoholism,learning problems
alcoholism,sibling rivalry,marital disharmony
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Nil
sibling rivalry
alcoholism
Nil
Nil
Nil
Nil
alcoholism
Nil
learning problem,sibling rivalry
Nil
Nil