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Identification of comorbid conditions among middle school students: A cross-sectional study of Jammu province

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ABSTRACT

Using a multistage sampling technique, the students completed the self-constructed Identification Battery on Comorbid Conditions (IBCC), which assesses 10 disorders, including dyslexia, dysgraphia, dyscalculia, dysphasia, dyspraxia, anxiety, attention deficit hyperactive disorder (ADHD), obsessive-compulsive disorder (OCD), autism, and tic disorder. The results revealed that 20.66% of the students exhibited comorbid conditions, with dyscalculia being the most prevalent, followed by dyslexia and others. Comorbid conditions varied, with some students having different combinations of disorders. The Jammu district had the highest prevalence. This study emphasizes the importance of early diagnosis and intervention, highlighting the need for increased stakeholder awareness to address these issues effectively.

Keywords: *Comorbid conditions, identification, Jammu province, middle school students.*

INTRODUCTION

In education, comorbidity refers to the co-occurrence of different learning difficulties or disorders. In the current era, addressing comorbidity is crucial because of its significance, prevalence, and influence on an individual's life. A. R. Feinstein, an American doctor and epidemiologist, popularized the term "comorbidity" in the 1970s by showing that rheumatic fever patients frequently suffer from multiple ailments at the same time (He et al., 2016). The term

“comorbidity” now refers to the presence of more than one mental or physical illness in a single person. Initially, the medical sciences used the term widely, but gradually, the field of psychology began to use it as well. Today, educationists are also demonstrating interest in studying comorbidities, given the equal likelihood of comorbidity among students. Understanding the rate and risk of comorbidity is crucial to preventing teachers and students from remaining ignorant about their problems. Research on the prevalence of comorbidities raises awareness among parents, teachers, educationists, and students, which helps the school administration identify comorbid students and encourages teachers to reevaluate their teaching strategies for comorbid students. Today, comorbidity is widespread in the field of education because of the common diagnosis of anxiety disorders alongside other disorders, such as depression, suicidal thoughts, and learning disabilities.

The comorbidity of disorders is now a common but serious problem among students (McGrath et al., 2020). Several studies (Antony & Ramnath et al., 2021; Jhambh et al., 2014; Sahoo et al., 2015; and Srivastava and Sreejayan, 2010) have highlighted the need to identify potential comorbidities among students in India. Only a few studies, mostly case studies, have focused on comorbidities in education rather than in the medical sciences or psychology. Therefore, we must implement adequate educational measures to bridge this gap (Ek et al., 2010). In this context, it is important to consider an individual's social and cultural environment before developing and implementing programs (Kwon et al., 2018). However, there is a lack of research on comorbidities in Jammu Province, unlike other regions such as Bikaner City, Kashmir Valley, Chandigarh, Puducherry, and the Shopian District of Kashmir (Choudhary et al., 2012; Housen, 2017; Jhambh et al., 2014; Lingeswaram, 2013; and Paul and Khan, 2019).

This study is an initiative in the Jammu region, home to the third-highest disability population, 7.74 percent of the state's disabled children (Government of India, 2016). The identification and assessment of children with special needs should be an integral part of the teaching and learning process (Hussu & Strle, 2010). However, there is a lack of professional research in the field of disability, making it necessary to identify CWSNs with single and multiple disabilities (Bashir & Ganie, 2013). According to the Government of India, in 2016, 9% of children (0–19 years old) had multiple disabilities, including hearing, seeing, speech, movement, mental retardation, and mental illness. There is a need to explore newly added, less-known, or hidden disabilities such as ADHD, OCD, learning disabilities (LD), autism spectrum disorder (ASD), anxiety, and many more. The results of this study can assist teachers, educators, and parents in comprehending the primary reasons for the underachievement or failure of students with disabilities. Furthermore, this study will aid students in overcoming their identity issues by providing them with the correct question, which will

make finding the correct solution easier. Teachers can assist students by identifying any hidden disability and administering appropriate remedial actions.

LITERATURE REVIEW

The presence of comorbidity in education is well documented in the literature, with several studies examining the high prevalence of comorbidity among students with specific learning disabilities (Ashraf & Najam, 2017; Bandla et al., 2017; Johnson, 2005; Mishra & Pahwa, 2018; El Sheikh et al., 2016; Sahu et al., 2019; Singh et al., 2017; and Vissser et al., 2020), where dyscalculia was more common among students (Cheng et al., 2022). More than half of the students with tic disorders have other comorbidities (Mohammadi et al., 2021), and students with attention-hyperactivity disorder (ADHD) are also prone to other comorbidities, such as anxiety and depression (Durrand & Arbone, 2022), oppositional defiant disorder (ODD), tic and major depressive disorder (MDD) (Ercan et al., 2022), ASD (Ghamdi and Al Musailhi, 2024), language disorders, and sleep disorders (Jogia et al., 2022).

According to a report spanning from 1990--2017, the burden of disorders in India nearly doubled. Sagar et al. (2020) reported that, in 2017, one out of seven individuals suffered from a form of disorder. Schrott et al. (2019) reported that autism spectrum disorders (ASDs) are common. Children often manifest comorbid behavioral problems. The most prevalent disorders are anxiety and depression (Dike et al., 2021). Generalized anxiety disorder (GAD) is the predominant anxiety disorder, impacting 1.3% of children of school age (Wang et al., 2024d). A large, cross-sectional study on comorbidities revealed that out of 7936 samples, 50% had more than one disorder, i.e., high comorbidity (Roca et al., 2009). The comorbidity of disorders is now a common but serious problem among students (McGrath et al., 2020). The prevalence of comorbidities among students can pose a serious threat to their academic achievement.

The prevalence rate in India is also quite alarming: 100–300 out of 1000 students experienced a learning disability, which requires a systematic and scientific approach that will help parents and educators deal with children with learning disabilities. The prevalence rates of learning disabilities in the UK, USA, and Singapore are approximately 3%, 4%, and 5%, respectively (Mishra & Pahwa 2018). The prevalence and comorbidity rates of dyscalculia and dyslexia are higher among children (Cheng et al., 2022). Students with ADHD are more likely to develop other comorbid conditions, such as depression and anxiety (Durand & Arbone, 2022), specific learning disabilities (SLD) (Khodier et al., 2020), phobia, tic disorders, MDD (Ercan et al., 2022), ODD and ASD (Huang et al., 2019), and PTSD (Margalit et al., 2020). More than half of children and adolescents have comorbidities with other psychiatric disorders (Mohammadi et

al., 2021), and individuals with depression have a high comorbidity of anxiety (Dike et al., 2021; Islam et al., 2021).

METHOD

The aim of the present study was to identify comorbid conditions among middle school students in Jammu province. This was a cross-sectional study involving descriptive surveys. It involves collecting and analyzing quantitative data collected via a self-constructed identification battery on comorbid conditions (IBCC). The study was limited to 70 government middle school students from Jammu province of Jammu and Kashmir (Union Tertiary), India only.

Participants

The population of the study included school students studying in government middle schools in Jammu province (Jammu & Kashmir). The schools were selected from all the districts of Jammu, viz. Rajouri, Poonch, Khistawar, Jammu, Samba, Doda, Udhampur, Reasi, Ramban and Kathua utilized a multistage sampling technique. The Identification Battery on Comorbidity (Self-Constructed) was administered to 1084 middle school students. A total of 224 students with comorbid conditions were identified.

RESULTS AND INTERPRETATION

The current research has focused on investigating comorbidities among middle school students. The collected data were subjected to statistical analysis, employing percentage statistics to fulfill this objective.

Table 1 reveals a notable prevalence of comorbidities (20.66%) among government middle school students in Jammu province. Furthermore, the distributions of students with comorbid conditions (Table 1) across different (59) zones are as follows: Udhampur (4.02%) < Ghat & Batote (3.57%) < Bhadarwah & Satwari (3.13%) < Kuniyan, Thopal, Gool, Ramban, & Jib (2.68%) < Buflaiz, Poonch, Rajouri, Assar, Vijaypur, Katra, Chenani, Akhnoor, Jourian, R.S. Pura, Jammu, Hiranagar, & Kathua (2.23%) < Surankote, Nowshera, Khistawar, Doda, Chowki-Chura, Miran Sahib, Dansal, Marheen, &Lakhanpusr (1.79%) < Kalakote, Manjakote, Pouni, Chinkah, GandhiNagar, Bishnah, Marh, Barnoti, &Sallan(1.34%) < Thannamandi, Dhangri, Dhandesar, Thathri, Samba, Arnia, Billawar, Mahanpur, & Bhaddu (0.89%) < Darhal, Dongi, Inderwal, Ghagwal, Purmandal, Reasi, Tikri, Khour, & Bhalwal (0.45%).

Table 1: Distribution of students identified with comorbid conditions across districts and zones of Jammu province

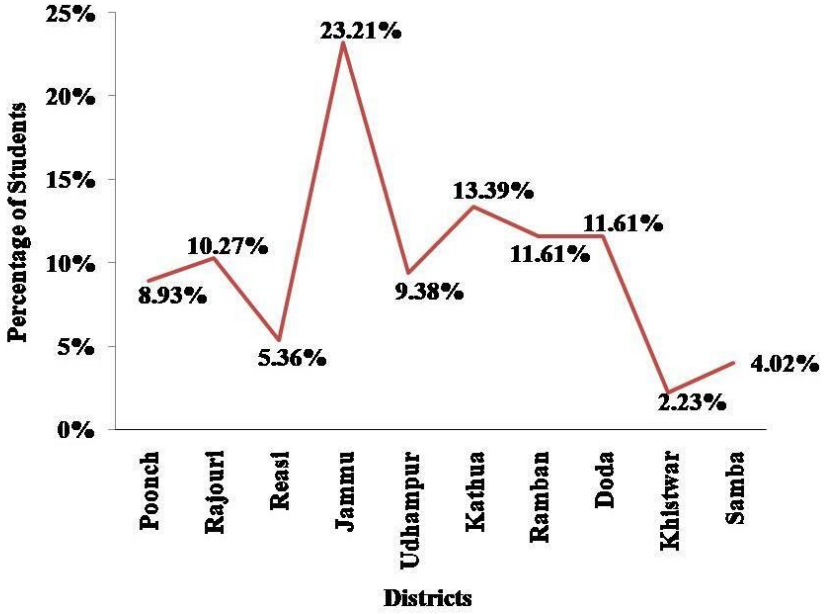
Sr. No.	District	Zone	No. of Students	NISCC	PISCC	DT-PISCC
01	**Poonch**	Buflaiz	19	5	2.23	**8.93%**
		Surankote	10	4	1.79	
		Poonch	18	5	2.23	
		Kuniyan	12	6	2.68	
02	**Rajouri**	Thannamandi	17	2	0.89	**10.27%**
		Darhal	15	1	0.45	
		Dongi	14	1	0.45	
		Dhangri	18	2	0.89	
		Rajouri	29	5	2.23	
		Nowshera	12	4	1.79	
		Kalakote	14	3	1.34	
		Manjakote	14	3	1.34	
		Dhandesar	10	2	0.89	
03	**Khistawar**	Inderwal	13	1	0.45	**2.23%**
		Khistawar	20	4	1.79	
04	**Doda**	Thathri	12	2	0.89	**11.61%**
		Doda	45	4	1.79	
		Bhadarwah	40	7	3.13	
		Ghat	42	8	3.57	
		Assar	15	5	2.23	
05	**Ramban**	Thopal	32	6	2.68	**11.61%**
		Gool	11	6	2.68	
		Batote	41	8	3.57	
		Ramban	49	6	2.68	
06	**Samba**	Ghagwal	16	1	0.45	**4.02%**
		Samba	14	2	0.89	
		Vijaypur	16	5	2.23	
		Purmandal	9	1	0.45	
07	**Reasi**	Katra	14	5	2.23	**5.36%**
		Pouni	9	3	1.34	
		Reasi	17	1	0.45	
		Chinkah	13	3	1.34	
08	**Udhampur**	Chenani	14	5	2.23	**9.38%**
		Udhampur	48	9	4.02	
		Tikri	11	1	0.45	

		Jib	18	6	2.68	
		GandhiNagar	24	3	1.34	
		Akhnoor	16	5	2.23	
		Jourian	10	5	2.23	
		Khour	15	1	0.45	
		ChowkiChura	13	4	1.79	
		Satwari	30	7	3.13	
		R.S. Pura	10	5	2.23	
09	**Jammu**	Miran Sahib	10	4	1.79	**23.21%**
		Bishnah	8	3	1.34	
		Dansal	13	4	1.79	
		Marh	13	3	1.34	
		Bhalwal	12	1	0.45	
		Jammu	26	5	2.23	
		Arnia	7	2	0.89	
		Marheen	15	4	1.79	
		Billawar	11	2	0.89	
		Hiranagar	24	5	2.23	
		Mahanpur	13	2	0.89	
10	**Kathua**	Barnoti	14	3	1.34	**13.39%**
		Lakhanpur	20	4	1.79	
		Bhaddu	8	2	0.89	
		Sallan	16	3	1.34	
		Kathua	35	5	2.23	
Total	**10**	**59**	**1084**	**224**	**20.66%**	

Note. NISCC = Number of identified students with comorbid conditions
PISCC = Percentage of identified students with comorbid conditions = (NISCC*100)/(Total number of identified students with comorbid conditions)
DT-PISCC= Districtwise total percentages of identified students with comorbid conditions = {Σ (NISCC for Specific District)*(100)}/{Total number of identified students with comorbid conditions}

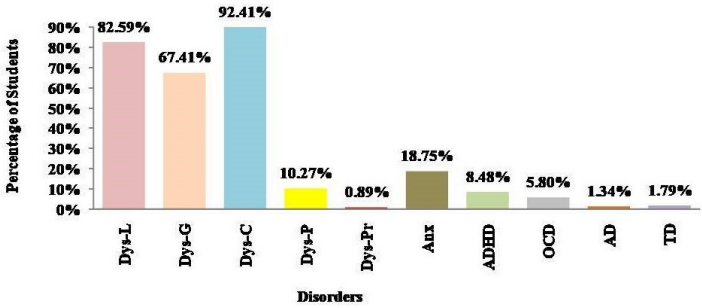
The order of the prevalence rates of comorbid conditions among government middle school students is Jammu (23.21%) < Kathua (13.39%) < Doda & Ramban (11.61%) < Rajouri (10.27%) < Udhampur (9.38%) < Poonch (8.93%) < Reasi (5.36%) < Samba (4.02%) < Khistawar (2.23%), as shown in Figure 1.

Figure 1: Distribution of students with comorbid conditions w.r.t. districts



Prevalence of different disorders among middle school students with comorbid conditions

Figure 2: Percentage of students corresponding to specific disorders



Note. *Dsy-L* = dyslexia, *Dsy-G* = dysgraphia, *Dsy-C* = dyscalculia, *Dsy-P* = dysphasia, *Dsy-Pr* = dyspraxia, *Anx* = anxiety, *ADHD* = attention deficit hyperactive disorder, *OCD* = obsessive compulsive disorder, *AD* = autism disorder, and *TD* = tic disorder

Figure 2 clearly shows that dyscalculia (92.4%) has the highest prevalence among these students, followed by dyslexia (82.59%), dyslexia (67.41%), anxiety (18.75%), dysphasia (10.27%), attention hyperactive disorder (8.48%), obsessive compulsive disorder (5.80%), tic disorder (1.79%), autism (1.34%), and dyspraxia (0.89%). This data underscores the significant presence of learning disorders, particularly dyscalculia, in the student population.

Prevalence of comorbid conditions w.r.t. the frequency of disorders among government middle school students

In order to find the different number of comorbities prevalent among middle school students, researcher further classified them into different groups of comorbidites with the combinations of two, three, four, five, and six disorders presented in the Figure 3.

Figure 3: Percentage of students corresponding to different combinations of disorders

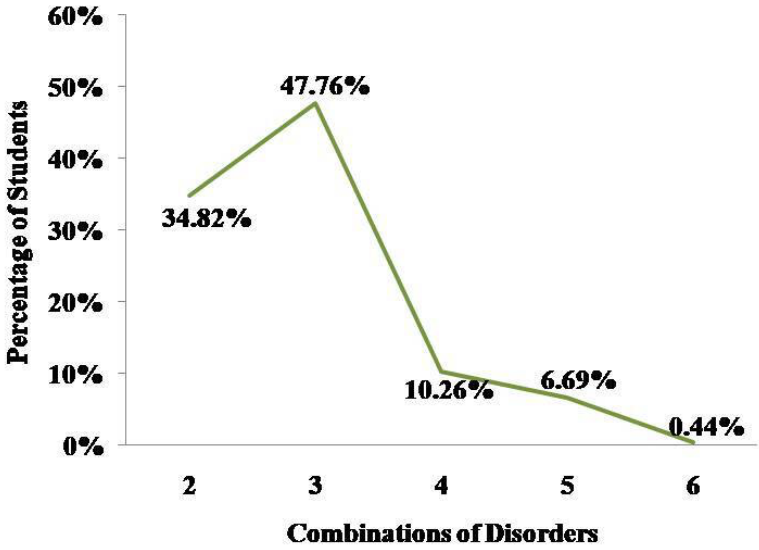


Figure 3 shows that, out of 224 students, 78 (34.82%) presented comorbid conditions with combinations of two disorders, 107 (47.76%) presented combinations of three disorders, 23 (10.26%) presented combinations of four disorders, 15 (6.69%) presented combinations of five disorders, and only

one student (0.44%) presented combinations of six disorders simultaneously. Notably, none of the students presented symptoms of more than six disorders.

DISCUSSION AND CONCLUSIONS

The Government of India (2016) reported that Jammu and Kashmir have the third-highest disability population, accounting for 7.74% of the state's disabled children. The most prevalent condition among the students was dyscalculia, followed by dyslexia, dysgraphia, anxiety, dysphasia, hyperactive disorder, obsessive–compulsive disorder, tic disorder, autism, and dyspraxia. Plana-Ripoll et al. (2019) also support the prevalence of more than two combinations of disorders among students. The likelihood of comorbidity exists between all combinations of disorders. There are different reasons why a student may have comorbid conditions, such as overlapping risk factors, or a disorder causing another, such as anxiety leading to depression (Srivastava et al., 2010). As there is no single cause for comorbidity, there is no one-size-fits-all solution. Teachers and parents need to employ different teaching and learning strategies for each combination of disorders (Klein, 2004). Students with multiple disorders in the same class can pose challenges, not only for teachers but also for their peers. As a result, it is critical for teachers to be knowledgeable and aware of comorbid students in their early school years, as well as to provide appropriate interventions on the basis of the prevalent comorbidity types (McHugh, 2015). We must properly manage these comorbidities (Pollack et al., 2021), prioritize the use of both pharmacological and nonpharmacological treatments (Mohammadi et al., 2021), and ensure early detection and provision of remedial measures (Chacko & Vidhukumar, 2020). According to the Government of India, in 2016, 9% of children (0–19 years old) had multiple disabilities, including hearing, seeing, speech, movement, mental retardation, and mental illness. There is a need to explore newly added, less-known, or hidden disabilities such as ADHD, OCD, SLD, ASD, anxiety, and many more.

Early identification and interventions are crucial for preventing comorbidities. Researchers recommend a sensitization program and psychological evaluation (Dike et al., 2021), along with a multidisciplinary, tailored approach (Duke et al., 2021), to prepare interventions for improving mental health in school-going children (Islam et al., 2021). Parents need to look for any early signs of behavioral changes in their children. Collaboration among parents, teachers, and healthcare professionals is also important in addressing comorbidities among school students. It is important to have a clear understanding of primary and associated comorbidities before raising awareness among stakeholders (Bougeard et al., 2021). Further research is crucial to better understand the underlying mechanisms of comorbidity, reduce the risk of misdiagnosis and inappropriate treatment, and develop more targeted

interventions that address the unique needs of individuals affected by combinations of different conditions (De Filippis et al. (2024)

IMPLICATIONS

In the present scenario, it is imperative to gather data on multiple disabilities, i.e., comorbidities. This study is a pilot initiative in Jammu provision, an area where disability rates are substantial. Its objective is to gather crucial data for government policy-making and program evaluation. These data are crucial for empowering those with impairments and protecting them from discrimination. It is crucial for the future of the nation to prioritize resolving the difficulties that students, particularly those with comorbidities, encounter in Jammu. The political turmoil in Jammu and Kashmir exacerbates mental health problems among young people. It is important to implement interventions at an early stage within the school setting to reduce the impact of mental health problems. It seeks to support teachers and parents in modifying their strategies to address these issues. The program provides a comprehensive assessment of comorbid problems, with a specific focus on the most common disorders found in children. Detecting comorbidities at an early stage is difficult because of the masking effect. Teachers must possess the necessary expertise to recognize and assist children with learning difficulties, thereby averting the exacerbation of conditions such as ADHD, anxiety, and OCD (McHugh, 2015). This study helps to increase awareness among schools, families, and communities regarding the prevalence of comorbidities. By utilizing an identification battery for comorbid conditions, teachers and parents can easily identify the symptoms present among their children, which therefore help to prevent the onset of comorbidity.

Note. AI has been used for grammar checks.

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