Prevalence of health disorders among students with intellectual disability in Saudi Arabia

Abdulhade Issa Haimour

King Abdulaziz University, Faculty of Education, Special Education Department, Saudi Arabia
haimour79@hotmail.com

Abstract: This is a descriptive study aimed to provide prevalence rates of health disorders among students with intellectual disability (ID) in Saudi Arabia within segregated and included school sittings. This study also aimed to find differences of prevalence rates depending on students age and level of (ID).Revision of school medical records of (278) students of (ID) leads to different prevalence rates of health disorders affected by students with (ID). Results indicate that epilepsy, cardiac disorders, and visual-motor coordination disorders, were the most prevalent health disorders among students with (ID). Results also indicated that students within the age group (9-12 years) had the most frequent health disorders in comparison with other age groups. Furthermore, students with sever (ID) had the highest prevalence rate of health disorders, followed by students with moderate (ID), and then students with mild (ID).

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1. Introduction

From the turn of the century, interest in health of people with (ID) has increased, and more attention has recently directed towards their health needs. There is an evidence that people with (ID) affected by health problems higher than that in people without disabilities, and there is another evidence that Life expectancy is increasing for people with (ID) as well as for the general population (Lantman-de Valk & Walsh, 2008). This means that the risk for health problems increases with age in people with (ID).

The World Health Organization (WHO) definition of health states that: 'health is a state of physical, mental and social wellbeing, not just the absence of diseases or infirmity' (WHO, 1948). Intellectual disability is not a disease in itself, and the requirements for good and adequate health care are diverse and should be recognized and met. Our Expertise in this area has just started to develop (Cooper *et al.,* 2004).

There is a lot we do not know yet about demands of people with (ID) in developing countries. Nowadays, the majority of people in the world live in developing countries, and this also apply to people with (ID). In many of these countries, poverty, poor public health provisions, wars and meager educational services exacerbate the conditions of life for persons with disabilities. It is hard to realize that knowledge on intellectual disabilities is based on a minority of the world's population, and that interventions found effective in developed countries may be very impractical in developing societies (Parmenter, 2001).

There has been an increase in knowledge about prevalence of health conditions in students with (ID). In several studies researchers found that many of these students have a wide range of chronic health conditions (Emerson & Hatton, 2008; Lantman-de Valk & Walsh, 2008; Goddard *et al.,* 2008; Sturmey *et al.,* 2007). A chronic health condition was defined as a chronic physical, developmental, behavioral, or emotional condition in children ages 0 to 18 years. The condition had to be present for longer than 3 months, would probably last longer than 3 months, or had occurred three times or more during the past year and would probably recur. The chronic health condition had to be diagnosed according to professional standards or extracted from medical case files or registers (Mokkink *et al.,* 2008).

According to a study by (Lantman-de Valk *et al.,* 2000), people with (ID) had more than twice as many health problems as other people enrolled in the same practices, and that healthcare workers have insufficient knowledge and inadequate training on the special health needs of the patients with intellectual disabilities. They also stated that People with limited or no speech, and those who have problems in articulating and those who use gestures, pictures or pictograms to express their concerns are disadvantaged when the health care worker on the other side of the desk is unfamiliar with their ways of communication. Moreover, lengthy and technical explanations by well-intentioned medical practitioners are hard to understand for most people with intellectual disabilities and do not contribute to establishing confidence in what is seen by them as stressful situations or to the genuine sharing of information.

Results of study by (Lantman-de Valk *et al.,* 1997) indicated that youngest age group of students

with (ID) was more likely to be affected by cardiac disorders, congenital cardiac disorders, and cerebral palsy than people in the other age groups. Moreover, the youngest age group was less likely to be affected by visual impairments or by other psychiatric disorders. In Addition, (Moss *et al.,* 1993) found that health problems were more frequent in people with severe or profound ID than in people with mild or moderate ID. Mobility problems appear to be 14 times more frequent in people with (ID) than that in the general population (Lantman-de Valk *et al.,* 2000). Evidence exists for obesity, fractures, poor oral health, constipation, and gastro-esophageal reflux disease as secondary health conditions in people with (ID). Moreover, People with (ID) would have increased risk factors for fractures such as osteoporosis caused by many years of immobility or long term use of anticonvulsants (Bohmer *et al.,* 2000; Prasher & Gomez, 2007; Melville *et al.,* 2007).

However, the higher prevalence of both epilepsy and mobility problems among those with (ID) indicates that further investigation is warranted. Osteoporosis and fractures and inadequate dosage of anticonvulsants may diminish alertness. Long-term use of anticonvulsants may cause osteoporosis and thus raise the risk of fractures (Wagemans *et al.,* 1998; Jancar & Jancar, 1998). Fractures were three times more frequent in people with (ID) than in those without intellectual disabilities (Lantman-de Valk *et al.,* 2000).

Physical health problems of individuals with Intellectual disabilities are associated with a wide range of medical conditions that have effects on the person's physical and/or mental health (Kwok & Geung, 2007). These conditions are either associated (primary) or secondary conditions. The most common physical health problems are epilepsy, mobility problems, and sensory problems. Epilepsy occurs 15–30 times as often in people with (ID) as in the general population syndromes (Lantman-de Valk *et al.,* 2000). The main risks in epilepsy are sudden unexpected death caused by epilepsy, fractures caused by falls in epileptic fits, accidents and trauma caused by the loss of consciousness. In a general practice database study by (Mont, 2007) found that a quarter of people with (ID) had epilepsy. A cross sectional study (n=269) showed Increasing rates of lowered daily functioning and untreated visual problems in people with intellectual disabilities (Kwok & Geung, 2007).

In a systematic literature review study of the prevalence rates of chronic health conditions in populations of children with (ID) by (Oesburg *et al.,* 2011), researchers found that Ten studies were focused on congenital chromosomal malformation. Prevalence rates of Down syndrome, fragile X, cri-duchat, ranged from (0.1% to 20.3%). prevalence rates of malformations of the nervous system (e.g., spina bifida, hydrocephaly), and other malformations (e.g., Prader- Willi, tuberous sclerosis, malformations of the musculoskeletal, genital/urinary, digestive, or circulatory system) and metabolic, thyroid gland disorders (phenylketonuria, hypothyroidis), ranged from (0.8% to 13.1%) for the different disorders. prevalence rates of epilepsy were reported in 14 studies and ranged from(5.5% to 35.0%). And prevalence rates of cerebral palsy were reported in 11 studies and ranged from (8.4% to 33.8%). And In four studies researchers reported about visual problems such as refractive errors, strabismus, visual acuity, visual field, or visual impairment in general, prevalence rates ranged from (2.2% to 26.8%). And in Five studies about hearing impairment or disability in general, prevalence rates ranged from(0.0% to 7.1%). Researchers in 7 studies reported prevalence rates of miscellaneous somatic chronic health conditions, such as chronic obstructive pulmonary disease (8.9%), gastric and esophageal diseases (6.9%), back and neck disorders (6.9%), osteoarthropathia (2.5%), cerebrovascular accident (0.3% - 2.5%), Reye syndrome (0.3%), and other chronic health conditions (4%).

Physical inactivity and the use of medication such as anticonvulsants and neuroleptics may cause constipation. In a cross sectional study by (Cooper et al., 2007), results found that constipation was significantly correlated with lack of mobility, cerebral palsy, the use of anticonvulsants, benzodiazepines, proton pump inhibitors, and refusal to eat. Constipation may remain unreported and undetected for a long time and may cause severe problems.

Intellectual disability is associated with multiple medical conditions, and children with intellectual disability affected by health problems higher than that in children without disabilities. Therefor this study aimed to identify the prevalence of health problems among Saudi children with intellectual disability. In addition, this study attempted to find any differences in prevalence rates of health problems among children with (ID) based on their gender and severity of (ID) variables.

2. Material and Methods

A descriptive cohort study design was utilized to determine prevalence rates of health disorders among students with (ID) in relation with age, and severity of (ID) variables.

Participants

Children with (ID) presents in both inclusive and segregated sittings in Riyadh, Al-Baha, Jeddah,

and Al-Dammam districts which considered as a biggest cities in Saudi Arabia were involved in this research study. The researcher contacted the appropriate school administrators in the aforementioned cities to obtain permission to access and obtain data from school medical records of their intellectually disabled students. Participants were randomly selected from the study population and ends up with (278) medical record of children with intellectual disability distributed as shown in Table (1), according to study variables: Age of the child (5-8 years, 9-12 years, 13-16 years, 17 and more), and level of (ID) (mild, moderate, and sever).

Table.1 distribution of study sample according to study variables

variable		frequency	Percent (%)
Age of the student			
	(5 - 8)	67	24.1
	(9 - 12)	116	41.7
	(13 - 16)	83	29.9
	(> 17)	12	4.3
	Total	278	100%
Level of (ID)			
	Mild	139	50.0
	Moderate	91	32.7
	Sever	48	17.3
	Total	278	100%

Procedures

After getting the approval of applying this study by the administrators of schools and centers of (ID) students within the above mentioned cities, the researcher by himself started with a comprehensive revision of the school medical records of the (ID) students. The researcher had a sufficient medical background as he had bachelor's degree in nursing, and this the ability to extract medical type data from school medical reports. Each student's demographic characteristics including age and level of disability were extracted from school health records. In coordination with the physician or nurse of the school, the researcher extracted all of the diagnosed health problems faced previously by the student. Those problems were then recorded on a form symbolizing each health disorder as follows: (A= Cardiac disorders, B= Epilepsy, C= Visual-Motor Coordination disorders, D= Muscular Dystrophy, E= Visual disorders, F= Hyperactivity disorders, G= Diabetes, H= Down syndrome, I= Hearing disorders, J= Blood diseases, K= Neurological disorders, L= Asthmatic disease, M= Paralysis of limbs, N= Cerebral Palsy, and O= Other health disorders). Proper descriptive data analysis procedures were done in order to reach study results.

Data Analysis

To answer the research questions, the data were analyzed using descriptive statistics for categorical data (i.e., means, standard deviations). Data were numerically coded and transferred to the statistical package for social science (SPSS) pack 20. Prevalence rates for each health problem were defined as a number of (ID) students suffering from a given health problem divided by the total number of persons regarding whom data were available. Prevalence rate is expressed as a percentage in relation to age and level of disability variables. The dependent variable was the presence of a certain health problem in each student with (ID). Independent variables were age of the student and level of (ID).

3. Results

The first aim of this study was to identify the prevalence of health disorders among Saudi children with intellectual disability. Table 2 shows the total number and percentages of each health disorder for students with (ID). We notice that epilepsy (n=98) (35%) was the most frequent health disorder among students with (ID), followed by cardiac Disorders (n=45) (16%) and visual-motor coordination disorders (n=41) (15%). In contrast, Cerebral Palsy (n=1) (0%) was the least frequent health disorder among students with (ID), followed by both diabetes (n=8) (3%) and neurological disorders (n=8) (3%). This gives an idea regard the most frequent health disorders that students with (ID) were suffered from.

The second aim of this study was to find any differences in prevalence rates of health disorders among children with (ID) based on their age and level of disability variables. Regarding the age of the child variable, as shown in Table 3, there were four age groups (5-8 years, 9-12 years, 13-16 years, 17 years and more). We noticed that students within the age group (9-12 years) had the most frequent health disorders (n= 165), and those within the age group (17 years and more) had the least frequent health disorders (n= 17). We can reach to a result that; generally, with more advanced age of the (ID) student, health disorders became less frequent between them.

Moreover, within the age groups level, as shown in Table 3, we noticed that student with (ID) within the age group (5-8 years) were affected most frequently by Epilepsy (n=28) (42%), followed by Cardiac disorders (n=12) (18%). And within the age group (9-12 years), students were affected most frequently by Epilepsy (n=37) (32%), followed by both Cardiac disorders (n=20) (17%) and Visual-Motor Coordination disorders (n=20) (17%). Also within the age group (13-16 years) students were

affected mostly by Epilepsy (n=27) (33%), followed by Visual-Motor Coordination disorders (n=11) (16%). And finally, within the age group (17 years and more), students were affected most frequently by Epilepsy (n=6) (50%), followed by Muscular Dystrophy (n=3) (25%).

Table 2. number and prevalence rates of health disorders among students with (ID)			
code	Health disorder	Disorders (n)	Percentage Disorders (n) / Students (n)
A	Cardiac disorders	45	16%
B	Epilepsy	98	35%
C	Visual-Motor Coordination disorders	41	15%
D	Muscular Dystrophy	26	9%
E	Visual disorders	24	9%
F	Hyperactivity disorders	27	10%
G	Diabetes	8	3%
H	Down syndrome	18	6%
I	Hearing disorders	15	5%
J	Blood diseases	10	4%
K	Neurological disorders	8	3%
L	Asthmatic disease	13	5%
M	Paralysis of limbs	21	8%
N	Cerebral Palsy	1	0%
O	Other health disorders	12	5%
	Total	367	132%

Regarding the level of (ID), prevalence rates were calculated by summation of results indicate as shown in Table 4, that students with sever (ID) had the highest prevalence rate of health disorders (163%), followed by students with moderate (ID), prevalence rate (141%), and then students with mild (ID), who had a prevalence rate (116%).

Moreover, within the level of (ID) groups, as shown in Table 4, we noticed that student with mild (ID) were affected most frequently by Epilepsy (n=61) (44%), followed by Cardiac disorders (n=19) (14%). And within the moderate (ID) group, students were affected most frequently by Epilepsy (n=24) (26%), followed by Visual-Motor Coordination disorders (n=18) (20%). And finally, within the sever (ID) group, students were affected most frequently by Epilepsy (n=13) (27%), followed by Visual disorders (n=10) (21%).

Table.3 prevalence of health disorders among students with (ID) in relation to age								
	Age groups (%) Numb. of disorders / numb. of students							
	(5 – 8)		(9 – 12)		(13-16)		(> 17)	
	Students (n) = 67		Students (n) = 116		Students (n) = 83		Students (n) = 12	
Health disorder	N	%	N	%	N	%	N	%
Cardiac disorders	12	18	20	17	13	16	0	0
Epilepsy	28	42	37	32	27	33	6	50
Visual-Motor Coordination	8	12	20	17	11	13	2	17
Muscular Dystrophy	5	7	13	11	5	6	3	25
Visual disorders	3	4	15	13	4	5	2	17
Hyperactivity disorders	7	10	12	10	8	10	0	0
Diabetes	0	0	3	3	4	5	1	8
Down syndrome	4	6	8	7	6	7	0	0
Hearing disorders	4	6	6	5	5	6	0	0
Blood diseases	4	6	5	4	1	1	0	0
Neurological disorders	1	1	3	3	4	5	0	0
Asthmatic disease	3	4	4	3	4	5	2	17
Paralysis of limbs	2	3	15	13	4	5	0	0
Cerebral Palsy	1	1	0	0	0	0	0	0
Other health disorders	4	6	4	3	3	4	1	8
Total	86		165		99		17	

4. Discussions

Results from the first study objective indicated number of health disorders being affected by students with (ID), These disorders are represented in (cardiac disorders, epilepsy, visual-motor coordination disorders, muscular dystrophy, visual disorders, hyperactivity disorders, diabetes, down syndrome, hearing disorders, blood diseases, neurological disorders, asthmatic disease, paralysis of limbs, cerebral palsy, and other health disorders). Results indicated different prevalence rates for those health disorders among students with (ID). Generally; epilepsy, cardiac disorders, and visual-motor coordination disorders, were the most prevalent health disorders among students with (ID).

Table.4 prevalence of health disorders among students with (ID) in relation to level of (ID).

	Level of intellectual disability (%) Numb. of disorders/numb. of students					
	Mild Stud.(n) =139		Moderate Stud.(n) =91		Sever Stud.(n) =48	
Health disorder	N	**%**	N	**%**	N	**%**
Cardiac disorders	19	14	18	20	8	17
Epilepsy	61	44	24	26	13	27
Visual-Motor Coordination disorders	12	9	19	21	10	21
Muscular Dystrophy	7	5	12	13	7	15
Visual disorders	4	3	10	11	10	21
Hyperactivity disorders	16	12	11	12	0	0
Diabetes	4	3	2	2	2	4
Down syndrome	5	4	8	9	5	10
Hearing disorders	8	6	3	3	4	8
Blood diseases	4	3	5	5	1	2
Neurological disorders	2	1	1	1	5	10
Asthmatic disease	10	7	2	2	1	2
Paralysis of limbs	4	3	8	9	9	19
Cerebral Palsy	0	0	0	0	1	2
Other health disorders	5	4	5	5	2	4
Total	161	116	128	141	78	163

These findings may be related to the etiology of conditions related to (ID) and the fact that the same brain dysfunction that causes the limitations in intellectual functioning may lead to other manifestations of brain dysfunctions, such as neurological, sensory problems and motor disorders. Moreover the nature of syndromes associated with (ID), will eventually ends up with multi different health disorders among persons with (ID).

According to study results, epilepsy is considered one of the most prevalent health disorders among students with (ID).This result was confirmed by (Lantman-de Valk *et al.,* 2000) who indicated that Epilepsy occurs 15–30 times as often in people with intellectual disabilities as in the general population syndromes. (Oesburg *et al.,* 2011) with a systematic literature review also reported prevalence rates of epilepsy ranged from(5.5% to 35.0%).

Also these findings are in agreement with results of (Emerson & Hatton, 2008; Goddard *et al.,* 2008; Lantman-de Valk & Walsh, 2008; Sturmey *et al.,* 2007) studies who found a wide range of chronic health conditions among many children with (ID). And also in a similar manner (Lantman-de Valk *et al.,* 2000), found that people with (ID) had more than twice as many health problems as other people enrolled in the same practices. He also indicated that mobility problems appear to be 14 times more frequent in people with intellectual disabilities than that in the general population.

And in accordance with (Oesburg *et al.,* 2011) In a systematic literature review study for the prevalence rates of chronic health conditions in populations of children with (ID), researchers reported different prevalence of health disorders among students with intellectual disability as follows; down syndrome, ranged from(0.1% to 20.3%) , malformations of the nervous system and other malformations ranged from (5 0.8% to 13.1%) for the different disorders, cerebral palsy ranged from (8.4% to 33.8%), visual problems ranged from (2.2% to 26.8%), and hearing impairment ranged from(0.0% to 7.1%).

With regard to the other aim of this study, results indicated that students within the age group (9-12 years) had the most frequent health disorders. This may related to the low possibility of early detection of these disorders before the school age phase. This may reflect the logical result of the high prevalence rates among students with (ID) within

school age group (9-12 years) compared to the earlier age group (5-8 years). Moreover, results indicated less prevalence rate among students with the age group (> 17 years), in comparison with the other age groups. Those findings were partially in agreement with results of (Lantman-de Valk *et al.,* 1997) study that indicated youngest age group of students with (ID) was more likely to be affected by cardiac disorders, congenital cardiac disorders, and cerebral palsy than people in the other age groups, and the youngest age group was less likely to be affected by visual impairments or by other psychiatric disorders. And this may be related to the nature of the medical services that may be received by individuals with (ID) during the previous age phases, which contributed to some extent in reducing prevalence rates of health disorders among them.

With regard to prevalence rates of health disorders among students with (ID) depending on level of (ID), results of current research indicated that students with sever (ID) had the highest prevalence rate of health disorders, followed by students with moderate (ID), and then students with mild (ID). Those findings were confirmed by (Lantman-de Valk *et al.,* 1997) who reported that People with severe or profound ID were more likely to be affected by visual impairments , cerebral palsy and auditory disorders than people with mild ID. in Addition, (Moss *et al.,* 1993) found that health problems were more frequent in people with severe or profound ID than in people with mild or moderate ID.

5. Conclusion

People with intellectual disabilities have more health disorders than their peers. Results of this research can be highly beneficial for both policymakers and healthcare professionals who usually value the need of valid prevalence rates of health disorders among students with (ID). Moreover Decision makers may be in dire need require these data for the planning and financing of adequate care arrangements (e.g., health, education, work) in order to enhance the well-being and societal participation of children with (ID) and their families. Professionals need these data for the early detection and adequate treatment of chronic health conditions and prevention of these conditions for children with (ID) and their families.

Corresponding Author:
Dr. Abdulhade I. Haimour
Department of Special Education
King Abdulaziz University
Jeddah, Saudi Arabia
E-mail: haimour79@hotmail.com

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