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Comparative Study Among Healthy and Intellectually Disable Students Towards their Ability to Identify And Detect Pain

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Abstract: Pain is the major trouble for intellectual disable children. In spite of the importance of this disability, the affected child remains liable to mis-recognition and maltreatment of pain. The current study evaluated the abilities of students with intellectual disorder to detect and express their feeling towards induced pain in comparison with healthy students. Literature was searched on Pub Med, Cochrane Library and SCOPUS. A descriptive research design was adopted to conduct this research. A purposive sample of 40 female Saudi students (20 healthy and 20 intellectually disable students) at Shaqra province. Results showed that 70% for wrist and 65% for temple for students with intellectual disability took a great amount of time to react to induced pain (between 50 to less than 100 seconds), while the majority (95% for wrist and 100 for temple) of healthy students took from 6 to less than 20 seconds, p<0•0001.Conclusion: The comparative study among healthy and intellectually disabled students to define pain was very useful to define how much difference between them. A well organized and structured educational program about pain monitoring should be established for care provider and parents.

Key words: Pain · Intellectually Disable · Health children

INTRODUCTION

Intellectual disability (ID) is also called intellectual development disorder (IDD) and previously known as Mental Retardation (MR) [1, 2]. Intellectual disability includes disorder with overall mental capability that influence functions of two areas as thinking domain, which enhances learning, problem solving and reasoning skills and adaptive domain, which is essential for daily interaction (social) and motor skills [3, 4]. The term intellectual disability includes all individuals suffering from mental retardation and or liable to diagnose as mental retardation. Intellectual disability occurs in the developmental stages before the age of eighteen years and is recognized by below average of intellectual functioning [3]. Developmental Disabilities (DD) is a general concept that comprises intellectual disability and other disabilities that occur during life stages of development (early, middle and late childhood) [3-5]. Developmental disabilities are severe chronic disabilities that can be cognitive or physical or both. The disabilities appear before the age of eighteen and are likely to be life-long. Some kind of DD are related to physical issues, such as cerebral palsy or epilepsy. Other individuals may have a condition that includes a physical and an intellectual disability, for example Down syndrome or fetal alcohol syndrome [4, 6].

Intellectual disability is not confirmed by perform an IQ test only, but the evaluation and classification of it is more complex. There are three essential characteristics to diagnose intellectual disability as marked limitations in both intellectual functioning and adaptive manner and they should start before the end of puberty stage of development. For example, any retardation of mental is confirmed when intelligence quotient decreases than seventy and is associated with disturbance in coping patterns of usual living skills as communication and interpersonal behaviors [3, 4]. ID affects approximately three percent of the individuals and is caused by unusual differential environment, chromosomal

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disturbances. In addition, mental retardation demonstrates one of the more complicated challenges found by health member and geneticists [5, 7, 8]. Diagnosis and treatment of neurological complications are important in maintaining optimal cognitive functioning [6, 9].

On the other hand, the individuals suffering from ID have disturbance in motor and speech development like walk and talk. There are interrelated causes of ID depended on the types of risk factors, biomedical, social, behavioral and educational and the timing of exposure to those factors whether prenatal, perinatal and postnatal [10].

Intellectual disability composed the most common developmental disorders. Approximately 6.5 million Americans have an ID. More than 545,000 children between the ages of 6 and 21 have some group of intellectual disability and need specific learning services in general school, some children have a very low level of retardation, while others have a very high level [11]. There are many levels of retardation ranged from mild, moderate to severe one. Based on the level of impairment, health team may realize a child has an intellectual disability [12]. Children with very low, poorly defined intellectual disability may get along in an ordinary educational, but others will likely need special education services to learn basic life skills. The American Community Survey (ACS) stated that the overall rate of people with disabilities in the US population in 2015 was 12.6% [11]. This percent of ID changes is related to socioeconomic status. The highest rates were seen in countries from low to middle socioeconomic status [12]. In Saudi Arabia, more than half a million Saudi individuals (1 out of every 30 individuals) reported the presence of disability during the year 2016 [13]. Also, 20,000 children under 17 are affected with Down syndrome [14].

Individuals with intellectual and developmental disabilities are experiencing pain moreover than their developing peers. Their pain can be difficult to manage and assess because their limited ability to communicate. Pain monitoring and management are most important concern in several scientific fields. However, research about pain monitoring among non-verbal intellectually disabled individuals has been very limited [15, 16]. The health staff may have difficulties in interpreting the clients' behaviors, towards pain among these clients may remain unidentified. Pain monitoring among intellectually disabled individual is generally very complicated in order to incomplete assessment skills and nurses may have inadequate knowledge and education [17, 18].

The expression of pain is critical for each individual with or without intellectual disability. Lack of pain assessment and management in children with intellectual disability threat their health. Little research has been done to support care aids [19-23].

This study aimed to compare the abilities of intellectual disable and healthy students to detect and identify pain. The technique of the current study was focused on detect site and severity of pain. The reaction time to react with the inducing pain and the ability to detect non-aching cool sensation were evaluated.

MATERIAL AND METHODS

Study Design: A descriptive research design was adopted to conduct this research aimed to evaluate the ability of students with intellectual disability to detect and express pain in comparison with healthy students.

Setting and Sample: This descriptive comparative study was carried out in general and intellectual schools at Shaqra province, central Saudi Arabia, from November to December 2007. A purposive sample of 40 female Saudi students, 20 healthy and 20 intellectually disable students aged between 8 to 20 years were included in this study.

Ethical Consideration: A written informed consent was obtained from students and their parents who were willing to let their children to participate in the research. Before conducting the study confidentiality and anonymity of the students were assured during the coding of the data. Students and their parents were assured that the data were not being reused in another research without acceptance. Also, the aim of this study was explained to the teachers of the studied and control groups.

Subjects and Selection Method: The study population was drawn from the Intellectually Disable Students (IDS) who are educated in intellectual schools and health students from general primary and intermediate schools from November to December 2007. The study was conducted on 20 intellectual disable students in the study group controlled by another 20 healthy students aged 8-20 years.

Inclusion Criteria for IDS: The study included intellectual disable students with mild or moderate mental retardation, IQ from 65-40, From 8 to 20 years old and able to use verbal communication.

Exclusion Criteria for IDS: The study did not include students with severe mental retardation, IQ below 40, in pain, less than 8 years or more than 20 and disable to use verbal communication.

Inclusion Criteria for Control Group: The study included healthy students. Aged from 8 to 20 years and free from mental illness.

Exclusion Criteria for Control Group: The study should not include students aged below 8 or more than 20 years, in pain and mentally ill students.

Research Hypothesis: Children with intellectual disability may respond slowly to pain and may find it difficult to detect the pain site exactly.

Procedure: An official permission was granted from administrative personnel of Shaqra general and intellectual schools to obtain their permission to conduct this study after clarifying the purpose of the study. The study tools one and two were developed by the researcher after reviewing the literature relevant to the study and content validity was tested by three experts in pediatric and psychiatric nursing field. Reliability was assessed by applying the tools twice by two different data collectors' on10 healthy and 10 intellectual disable students using test-re test, who were excluded from the study.

A pilot study was carried out on 10 healthy and 10 intellectually disable children to clarify the validity of the questionnaires and to test the research feasibility, clarity and objectivity of the tools. The sample included in the pilot study was excluded from the study sample and the necessary modifications were done accordingly.

The selected 40 students were divided into two groups. One for intellectually disable students which included 20 students, the other group included 20 healthy students. The average time needed to complete all tools ranged from 35-45 min for each student.

Instruments: In order to collect the necessary information for the study the following tools were used. *First tool* was structured questionnaire sheet. It included items related to socio-demographic characteristics of the intellectually disable and healthy students and their parents, such as age, student order, occupation and level of education of their parents. Second tool was pain tests which evaluated the student's expression to pain and localize the sites of induced pain [9]. Test1 measured the time spent to respond pain. By using gauze with the solid block of ice enveloped in Clingfilm and applied onto the wrists and then onto the temples of the student until the first reaction to pain was behaved. The test was stopped at 120 seconds, even if there was no expression from the student. While Test 2 measured their abilities to localize a non-aching stimulus by putting student on the comfortable chair with student hands rest on her. The researcher asked student to close her eyes then used artery forceps to place a cotton ball dipped in xylocaine 10 mg anaesthetic spray, onto the student hands and face. Each site was stimulated for 1-5 seconds. The hands were examined followed by the face. After every stimulus the student was asked to open her eyes and to point to the correct and precise point of stimulus with her tip of finger. The respondent was gained 0 = (close). When the tip of student's finger touched the site of stimulus, 1= (near) inward 2 cm of the site of stimulus and 2 = (far) 2cm outward the site of stimulus.

Data Analysis: Data were analyzed using statistical package for social sciences (SPSS) version 20 windows and were presented in tables. Chi-square analysis was performed. Also, mean, median and standard deviations were computed to evaluate the precipitating factors. An alpha level of 0.05 was used to assess significant differences.

RESULTS

Table 1 deals with socio-demographic characteristics of intellectually disable and healthy students. The mean age of both was 12.50 ±6.3 years. As regards to level of education, most (70%) of both groups were at preparatory level. All (100%) of both intellectually disable and healthy students had sibling.

Table 2 shows that all (100%) of fathers of both intellectually disable and healthy students were educated and worked. In addition, the majority (90%) of mothers of intellectually disable students and 80 % of mothers of healthy students were educated, while less than quarter (10%) of fathers of intellectually disable students and 20% of mother of healthy students were not educated and two thirds (60%) of mothers of intellectually disable students and fifty percent of mother of healthy students were house wife.

Table no 3 shows that at wrists the most (70%) of intellectually disable students took long time to express pain (from 50 to less than 100 seconds) median 40•2 (11•5-120•0) seconds, while the majority (95%) of healthy

Table 1: Socio-demographic characteristics of intellectual disable and healthy students

Student (n=40)				
Healthy students (n=20)		IDS (n=20)		
%	No	%	No	
60	12	30	6	8-less than15
40	8	50	10	15-less than 18
-	-	20	4	18-20
				Mean ±SD =12.50 ±6.3
30	6	30	6	Primary
70	14	70	14	Preparatory
100	20	100	20	Yes
-	-	-	-	No

IDS= Intellectually Disable Student

Table 2: Socio-demographic characteristics of parents of intellectually disable and healthy students

Student (n=40)				
Healthy Students (n=20)		IDS (n=20)		
%	No	%	No	
100	20	100	20	Educated
--	-	--	-	Not Educated
100	20	100	20	Work
--	-	--	-	Not worked
80	16	90	18	Educated
20	4	10	2	Not Educated
50	10	40	8	Work
50	10	60	12	House wife

IDS=Intellectually Disable Students

Table 3: The difference between intellectually disable and healthy students towards pain latency period

	N= 40			
	IDS (n=20)		Healthy Students (n=20)	
Pain latency (by seconds)	No	%	No	%
At right wrist:				
3- ↓20s	0	0.00	19	95
20- ↓50s	3	15	1	5
50- ↓100	14	70	0	0.00
100-↓120s	3	15	0	0.00
At left wrist:				
3-↓20s	0	0.00	18	90
20- ↓50s	2	15	2	10
50- ↓100	14	70	0	0.00
100-↓120s	4	15	0	0.00
Median (range)	40•2 (11•5-120•0)		15•5 (6•0-110•0)	
At right temple:				
3 -↓20s	0	0.00	20	100
20 - ↓50s	2	10	0	0.0
50- ↓100	13	65	0	0.0
100-↓120s	5	25	0	0.0
At left temple:				
3 -↓20s	0	0.00	19	95
20 - ↓50s	1	5	1	5
50- ↓100	14	70	0	0.0
100-↓120s	5	25	0	0.0
Median (range)	20•6 (5•5-120•0)		10•7 (3•7-68•0)	

IDS=Intellectually Disable Students * statistically difference.

Table 4: The difference between intellectually disable and healthy students towards pain localization.

	N= 40				
	IDS (n=20)		Healthy Students (n=20)		
Pain localization	No	%	No	%	
Hand:					
Close (at pain point)	6	30	19	95	(5.339) *
Near (within 2 cm)	14	70	1	5	p< 0.001
Far (more than 2 cm)	0	0.00	0	0.00	
Face:					
Close (at pain point)	8	40	20	100	(5.339) *
Near (within 2 cm)	12	60	0	0.00	p< 0.001
Far (more than 2 cm)	0	0.0	0	0.00	

IDS=Intellectually Disable Students * statistically difference.

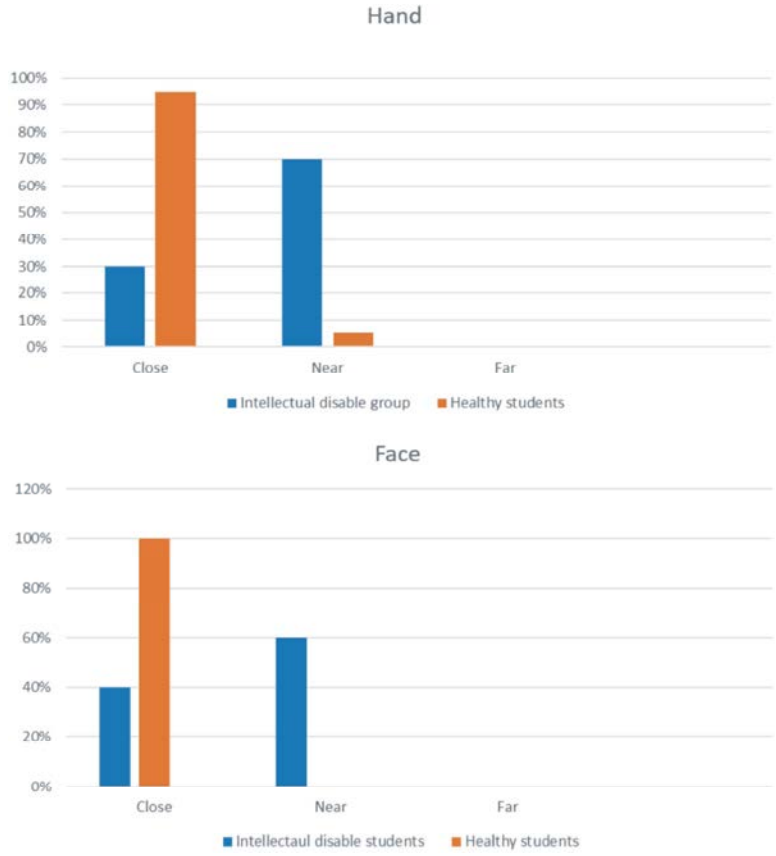

Fig. 1: The difference between intellectually disable and healthy students towards pain localization.

students took short time, (from 3 to less than 20 seconds), median 15•5 (6•0-110•0). There was statistical difference between IDS and healthy students related to pain latency t-test= 14.419, p-v<0.001. Also, at temples the most (65%) of intellectually disable students took long time to express pain (from 50 to less than 100 seconds), median 20•6 (5•5-120•0). While the entire healthy students took short time (from 6 to less than 20 seconds), median 10•7 (3•7-68•0). There was statistical difference between IDS and healthy students related to time spent till expression of pain, t-test= 15.158, p-v<0.001.

Table no 4 and Fig. no 1: demonstrate that according to pain localization, most (70% at hand) and two thirds (60% at face) of IDS did not touch the exact point of pain stimulation but touch within 2 cm of it, while the majority (95% at hand, 100% at face) of control group touch the exact point of pain stimulation. There were statistical differences between two groups t-test = (5.339), p-v< 0.001.

DISCUSSION

As a result of the passive concepts and offensive reflexes of the term "mental retardation" the "intellectual or developmental disability" term is gradually substituted nationwide [24-26].

Individuals with intellectual disability had different types of chronic or acute illnesses as the other people in addition to their physical and psychological comorbidities. This condition makes them more susceptible to frequent episodes of pain [2].

Pain is a significant problem for children with intellectual disability, these individuals remain vulnerable to under-recognition and under-treatment of pain [16]. Also, pain is a common experience, the research shows that chronic pain, is defined as pain remain longer than 3 months, extended almost 20% of the overall population. However, there are a few attentions of pain on persons with an intellectual disability [25].

Pain assessment is necessary for intellectually disabled individuals. Most of intellectually disabled individuals experience pain daily but their pain is not actively managed, related to its difficulty to define [27].

Children with ID are not insensitive to pain. However, they express pain or discomfort more slowly and less punctually than others. This makes that medical teams managing these patients should use pain-monitoring skill, even in the absence of obvious pain manifestations.

The present study found that most of intellectually disable students took long time to express pain (from 50 to less than 100 seconds). These results might be resulting from the fact that in the intellectual disable individuals there are delaying in transmission and integration of the pain process also there is slowing in motor response of these individuals. This is in agreement with Dubois and colleagues [22] who studied EEG readings obtained in response to certain stimuli. They suggested that the organization of the central nervous system was underdeveloped in babies and children with intellectual disorder rendering them unable to adapt or to modify their responses to repetitive stimuli.

In the present study the results showed that students with intellectual disorder are slow with lack of accuracy to determine pain site this due to cognitive factors and delays at the neuro-motor level. These difficulties are likely to be responsible for the delayed sensory threshold reported in this study and may result in an apparent insensitivity [28, 29]. In the localization test, significant differences were found between students with intellectual disorder and controls in their ability to locate sensations on the hand and face.

The current study compared the ability to recognize and localize cold stimuli. The students with intellectual disability showed delayed responses to the cold and were less able to localize the stimuli within 2cm. When the researcher asked students where it hurts, the intellectually disable students were not be able to pinpoint and said the exact site where the pain was coming from. This corresponds with Dahl [29]. When caring for individuals with Down syndrome, we need to pay attention to nonverbal cues as expression of pain. We need to be aware that they may not be able to localize or describe the pain and the evaluator must have a low threshold to investigate possible sources of pain. Also, the current results agree with Stein and Lukasik [27] who reported that the onset of pain differs depending on the part of the body stimulated.

CONCLUSIONS

This study has shown that there were significant differences between intellectually disable and healthy students in relation to expression of pain and determining site of pain. The form of pain expression is highly diverse between verbalize children, pre-verbal and these ones disable to express pain. This study take into account the characteristics of the children with intellectual disability. Students with intellectual disorder express pain or discomfort very slowly and less precisely than the healthy students. This implies that health teams managing these patients should use pain-control procedures, even in the absence of obvious pain manifestations.

REFERENCES

1. Gluck, S., (2014, May 21). Intellectual and Learning Disabilities in Children, Students, Healthy Place. Retrieved on 2019, July 12 from https:// www.healthyplace.com/ neurodevelopmental-disorders/intellectual-disability/intellectual-and-learning-disabilities-in-children-students.
2. Hauer, J. and A. Houtrow, 2017. Pain Assessment and Treatment in Children With Significant Impairment of the Central Nervous System, American Academy of Pediatric Clinical Report, 139(6): 1-29.

3. American Association of Intellectual and Developmental Disabilities. 2013. Definition of Intellectual Disability Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, VA, pp: 33.
4. Kaufman, L., M. Ayub and J.B. Vincent, 2010. The genetic basis of non-syndrome intellectual disability. a review, J Neuro development Disorder, 2(4): 182-209.
5. Pivalizza, P. and R.S. Lalani, 2018. Intellectual disability in children: Definition, diagnosis and assessment of needs. Up To Date.
6. Chelly, J., M. Khelfaoui, F. Francis, B. Cherif and T. Bienvenu, 2006. Genetics and pathophysiology of mental retardation. Eur J. Hum. Genet., 14(6): 701-13.
7. Lott, I.T. and M. Dierssen, 2010. Cognitive deficits and associated neurological complications in individuals with Down's syndrome. Lancet Neurol., 9: 623.
8. Hennequin, M., C. Morin and J.S. Feine, 2000. Pain expression and stimulus localization in individuals with Down's syndrome: Lancet., 356: 1882-87.
9. Dijk, M., A. Valkenburg, Boerlage, D. Tibboel and J.S. Veerkamp, 2009. Children with intellectual dusability and pain perception A review and suggestion for future assessment protocols.
10. National Institute on Disability, Independent Living and Rehabilitation Research. 2018. Institute on Disability / UCED 10 West Edge Drive, NH 03824 603.862.4320.iod@unh.edu. © January 2017. Institute on Disability. University of New Hampshire.
11. Pallab Maulik, P.K., M.N. Mascarenhas, C.A. Mather, T. Dua and S. Saxena, 2011. Prevalence of intellectual disability, A meta-analysis of population-based study's Author links open overlay, Research in Developmental Disabilities, 32(2): 419-436.
12. Bindawas, S.M. and V. Vennu, 2018. Type of Disability and Severity in Saudi Arabia, The National and Regional Prevalence Rates of Disability, Demographic Survey Data ID and ID Department of Rehabilitation Sciences, January 2018.
13. Kankkunen, P., P. Janise. and K.V. Julkunen, 2010. Pain Assessment Among Non-Communicating Intellectually Disabled People J. Nursing Staff, 4: 55-59.
14. Baldridge, K.H.1. and F. Andrasik, 2010. Pain Assessment Among Non-Communicating Intellectually Disabled People Described by Nursing Staff. Am J. Nurs. 110(12): 28-35.
15. Boody, O. and M.E. Bailey, 2017. Pain and pain assessment in people with intellectual disability, Issues and challenges in Practice, 45: 157-165.
16. Masterson, M., 2011. Understanding Pain In Patients With Intellectual Disabilities, American Nurse Today. Official Journal of ANA. October 6(10).
17. Zabalia, M., 2016. Pain Assessment: A Relevant Concern to Increase Quality of Life in People with Intellectual Disabilities. J. Gen. Practice 4:231. doi:10.4172/2329-9126.100023.
18. Dijk, M., A.J. Valkenburg, A. Borelage and J. Veekamp, 2009. Children with intellectual disabilities and pain perception: A review and suggestions for future assessment protocols Official Journal of the European Academy of Paediatric Dentistry, 10(2): 57-60.
19. Valkenburg, A.J., T.G. Leeuw, M. Dijk and D. Tibboel, 2015. Pain in Intellectually Disabled Children: Towards Evidence-Based Pharmacotherapy? Paediatr Drugs., 17(6): 339-348.
20. Dubois, A., X. Capdevila, B. Bringuier and R. Pry, 2010. Pain expression in children with an intellectual disability.European Journal of Pain, 14(6): 654-660.
21. Alaki, M. and N. Bakry, 2012. Dental pain in children with intellectual Disabilities caregivers perspective, International Journal of Dentisty, ID701608. pp: 7.
22. Brenna L. Esther, O. Seibold and L. Haymam, 2015. Pain Assessment in children with sepicial needs, a Review of Literature, SAGE Joural, Concile for children, 82(1).
23. Wolfe, K., K. Stueber, A. McQuillin, F. Jichi, C. Patch, F. Flinter, A. Strydom and N. Bass, 2018. Genetic testing in intellectual disability psychiatry: Opinions and practices of UK child and Intellectual Disability Psychiatrists, 31(2): 273-284.
24. Kramer, J.M., C.T. Ryan, R. Moore and A. Schwartz, 2018. Feasibility of electronic peer mentoring for transition-age youth and young adults with intellectual and developmental disabilities: Project TEAM (Teens making Environment and Activity Modifications), J. Appl. Res. Intellect Disabil., 31(1): e118-e129.
25. Martin, C., A. Baerdemaeker, J. Poelaert, A. Madder, R. Hoogenboom and S. Ballet, 2016. Controlled-release of opioids for improved pain management. 19(9):491-550.https:// doi.org/ 10.1016/ j.mattod.2016.01.016.
26. Breau, L.M. and C. Burkitt, 2009. Assessing pain in children with intellectual disabilities. Pain Res. Manag., 14(2): 116-120.

27. Dahl, l.D., 2016. Reduced Pain Responses in Individuals with Down Syndrome. Adult Down Syndrome Center 1610 Luther Lane, Park Ridge, IL 60068847-318-230. November.
28. Stein, M.T. and M.K. Lukasik, 2009. Development Screening and Assessment for Infant, Toddlers and Preschoolers, Developmental behavioral Pediatrics, 3rd edition, Saunders Elsevier, Philadelphia, pp: 785.
29. Kathy, B. and A. Frank, 2010. Pain Assessment in People with Intellectual or Developmental Disabilities, AJN, American Journal of Nursing, 110(12): 28-35.