

# Impaired Mobility in Intellectually Disabled Patients: A Single-Centre Study from Saudi Arabia

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## ABSTRACT

**Background:** People with impaired mobility have higher rates of morbidity, disability, and mortality. Patients with impaired mobility as well as having intellectual disabilities can face more challenges in compensating for a mobility limitation. In KSA, individuals with disabilities constitute 7.1% of the total population. The objectives of our study were to find out (1) The prevalence of impaired mobility among ID patients (2) The association between gender and age of ID patients with impaired mobility (3) The association between ID and impaired mobility in the study population.

**Methodology:** A Cross-sectional observational study was conducted on 147 patients admitted with intellectual disability in Rehabilitation Center Majmaah, Saudi Arabia. Data was collected using pre-designed research tools from the clinical records regarding the level of disability and impairment in mobility. All the data was entered in the SPSS software 23 and statistical analysis was done. A 95% degree of freedom with a p-value of <0.05 was considered statistically significant.

**Results:** Out of 147 patients, 102 (69.38%) patients had impaired mobility. Out of 102 patients, 24(23.07%) patients had mild difficulty, 16(15.68%) patients could walk with support and 62 (60.78%) patients were completely bedridden. More than half, about 63(61.76%) were males and 39 (38.23%) were females. Most of them were in an age range of 11 years to 40 years. A statistically significant association was found between age and impaired mobility for patients who were mobile with support ( $p=0.05$ ) and those who were completely bedridden ( $p=0.044$ ) respectively. A significant association was also found between the impairment in mobility and the severity of ID ( $p<0.001$ ).

**Conclusion:** There was a male preponderance (almost twofold at all levels of mobility limitation) in ID patients in our study population. About two-thirds of the patients with impaired mobility were bed-ridden. All patients with profound ID and about one-third of patients (30%) with severe ID were bedridden.

**Keywords:** Mobility, Intellectual disability, Rehabilitation, Saudi Arabia

## INTRODUCTION

World Health Organization (WHO) has defined a disabled person is anyone who has "a problem in body function or structure, an activity limitation, has difficulty in executing a task or action; with a participation restriction". Over 1 billion disabled people have been identified by WHO, out of which 20% of whom live with great functional difficulties in their day-to-day lives.<sup>1</sup> Characteristic of independent functioning is mobility is the ability to walk without assistance. People with impaired mobility have higher rates of morbidity, disability, and mortality.<sup>2</sup> Another study narrated the directly proportional relationship between mobility limitations with mortality and negative health outcomes both in the general population and among people with intellectual disabilities.<sup>3</sup> A systematic review revealed that the prevalence of mobility limitations varied between 3% and 63% in intellectually disabled patients. Roboz noted that intellectually disabled people with extensive brain damage had increased mortality and were completely bedridden or needed support. A significant association was found between severe mental retardation and a decrease in life expectancy generally and particularly for immobile patients.<sup>4</sup> Mobility limitations are linked with two important reasons for intellectual disability, including the increasing life expectancy of people with intellectual disabilities and the compounding effects of multiple disabilities.<sup>5</sup> Patients with Mobility limitations and intellectual disabilities can face more challenges in compensating for a mobility limitation.<sup>5</sup> In another study it was found that mobility seems to be the best predictor of survival out of all the variables between the association of life expectancy and any degree of mobility,<sup>4,5</sup> although the influence of mobility limitations upon the lives and lifestyles of people with intellectual disabilities remains poorly understood.<sup>3</sup>

In KSA, individuals with disabilities constitute 7.1% of the total population. The most common problem in people with disabilities is impaired mobility (833.136 patients).<sup>6</sup> People with mobility problems had 3.6 times enhanced difficulties and needed high-support settings.<sup>7</sup> Limited research has been carried out to determine the pattern of disabilities in KSA.<sup>8</sup>

Considering the severity of the impact of mobility on ID patients and limited data available in KSA, we conducted this research with the objectives of our study were to find out (1) The

prevalence of impaired mobility among ID patients (2) The association between gender and age of ID patients with impaired mobility (3) The association between ID and impaired mobility in the study population

## MATERIAL AND METHODS

A cross-sectional observational study was conducted on patients admitted with a disability to Rehabilitation Centre Majmaah. The study participants were both males and females of the age range 7 to 60 years with intellectual disabilities. A systematic random sampling technique was used to collect data of patients from an approximate sampling frame. The interval size of 03 was calculated by using the following formula:  $k=N/n$  Where,  $n$  = sample size;  $N$  = population size;  $k$  = size for an interval of selection. Based on random value every 2nd patient was selected to reach the sample size of 104.

A team of doctors and medical students visited the Rehabilitation center who were trained in advance to understand disability. The questionnaire consisted of demographic details, the patient's diagnosis and the level of severity of Intellectual function, and other relevant information. Data was collected from clinical records and collateral information was obtained from attending staff who were allocated to each patient. The level of impairment in functional mobility was checked from records and was divided into 4 categories fully mobile, mobile with difficulty, mobile with support, and completely bedridden. Ethical approval was obtained from Majmaah University Ethics Committee. Participation consent from the family (signed informed consent) in advance through administration was taken. The objectives of the study were explained and the proposed future benefits to them and the community due to their participation. Confidentiality was ensured by using anonymous data and was only used for research purposes. The data was entered and analyzed using IBM SPSS 28. Frequencies and percentages are reported for qualitative variables. Pearson Chi-square and Fisher Exact have been applied to observe associations between qualitative variables. A p-value of <0.05 was considered as statistically significant.

## RESULTS

Out of 102 patients with mobility limitations, 63(61.76%) were male and 39 (38.23%) were women. Out of them, 45 patients were fully

mobile with females to male ratio of 30:15 (2:1 ratio) and both were in the age bracket of 11 -40 years. Men who had difficulty with mobility in a ratio of 1: 2(F: M) were in the same age bracket. Men needed more support for mobility as compared to women in a ratio

of almost 1:2. And it was found statistically significant as well. Bedridden patients were also more males and the association between mobility and age range was statistically significant. Details are given in Table 1 below.

Tab 1: Association between Gender, Age, and Mobility

Mobility	Gender	Less 10 years N (%)	11-20 years N (%)	21-30 years N (%)	31-40 Years N (%)	41-50 Years N (%)	More than 50 years N (%)	Total N (%)	P value
Full mobile	Male	-	4 (36.4)	5 (29.4)	6 (37.5)	-	-	15	0.852
	Female	-	7 (63.6)	12 (70.6)	10 (62.5)	-	1 (100)	30	
Mobile with difficulty	Male	-	3 (75)	9 (64.3)	4 (80)	-	-	16	0.464
	Female	-	1 (100)	1 (25)	5 (35.7)	1 (20)	-	8	
Mobile with support	Male	-	1 (20)	7 (87.5)	2 (66.7)	-	-	10	*0.050
	Female	-	4 (80)	1 (12.5)	1 (33.3)	-	-	6	
Bedridden	Male	-	16 (61.5)	17 (77.3)	4 (36.4)	-	-	37	*0.044
	Female	2 (100)	10 (38.5)	5 (22.7)	7 (63.6)	1 (100)	-	25	

Total patients 102 (69.38%) had varying degrees of mobility issues and 45 (30.61%) patients had no mobility problem. Out of 102, only 24(23.52%) patients had some difficulty,16(15.68%) patients walked with support and 62 (60.78%) patients were bedridden. All the profound cases were bedridden except one patient. Forty-eight patients with severe ID had mobility problems and 12 patients with moderate ID and only two cases of mild ID

whereas 40 patients with profound disability had mobility problems.

There was a statistically significant association (p<0.001) between the mobility and severity of ID implying that the severity of the ID, the lesser the mobility. Half patients were on Physiotherapy, but the bulk of the patients was more than the services provided.

Table 2: Association between Mental Retardation and Mobility

Intellectual Disability	Mobility				p-value
	Full Mobile n (%)	Mobile with Difficulty n (%)	Mobile with support n (%)	Bedridden n (%)	
Mild	15 (33.3)	1 (4.2)	0 (0.0)	1 (1.6)	p<0.001*
Moderate	21 (46.7)	8 (33.3)	3 (18.8)	1 (1.6)	
Severe	8 (17.8)	15 (62.5)	13 (81.3)	20 (32.3)	
Profound	1 (2.2)	0 (0.0)	0 (0.0)	40 (64.5)	
Total	45	24	16	62	

**DISCUSSION**

In our study, the ratio of men to women ratio is 2:1. This is almost consistent with the finding in the study, Prevalence of mental health conditions, sensory impairments, and physical disability in people with co-occurring intellectual disabilities(give full name) study where 3769 (66.0%) were male and in 1940 (44.0%) were female.<sup>9</sup> In another study, one hundred and eleven children were studied and found to have mobility issue in 57(51.8%) boys.<sup>10</sup> On the contrary, the prevalence of mobility limitations was higher among older females with ID than males. But this research was conducted in old age patients only and women have more issues with diseases related to mobility in old age as compared to men.<sup>8</sup> Another study found that men were more likely to be physically active than women and older adults. However, if we compare extreme age adults who were found to be active with no mobility issues like our finding in the case of children.<sup>15</sup> Genetic disease preponderance in males might be the reason for male predominant in our study population but contrary findings might be due to scarcity of studies in the ID patient’s population with mobility problems and other studies which were conducted had different research populations like children or old age rather than life span pattern.

In our study, all patients were in the in-age bracket of 11-40 years which was neither too young nor too old Statistically significant association was found between mobility limitation with support and bedridden and age (p= 0.05 and p=0.044) respectively, our finding is consistent with a multistate survey (NCI-ACS), of people receiving IDD-related services were ranged in age from 18-94 years, with an average age of 43 years because of mental and physical diseases and mobility problem.<sup>15</sup> Contrary to

many other studies where physical disability was more common in children/youth and older people than in adults.<sup>10</sup> In another study, there was a high prevalence of mobility impairment (30% under and 58% over age 75).<sup>13</sup> Also, contrary findings reported in a study, impaired mobility does increase with age and varies according to the level of intellectual disability.<sup>11</sup>

These differences might be because we conducted a study in admitted patients who have more comorbid physical diseases and life span gets shorter with ID and associated comorbidities because only severely diseased patients are admitted than in the general population so we cannot generalize the results. And if we look at the age difference where less than 10 years were almost none, this might be due to admission criteria or stigma, or decreased family awareness in the early years of ID patients resulting in delayed admission. Secondly, data related to mobility is scarce in ID patients, so it’s difficult to compare findings with our study population.

In our study, (1) Mild ID: All the patients were fully mobile except one who was bedridden. (2) Moderate ID: 2/3<sup>rd</sup> was fully mobile while 1/3 needed support and had difficulty being mobile. (3) Severe ID: ½ walked with support or had difficulty walking and only 8 were mobile while 20 were bedridden. (4) Profound ID: All of them were bedridden except one patient. We also found an association between severity of ID and mobility meaning thereby that increased severity of ID was associated with a decrease in mobility. (p= 0.001).

Cleaver’s study suggests that mobility limitations are more common in people with intellectual disabilities.<sup>11</sup> another study shows that adults with IDD are less likely to be physically active than adults without IDD. They may encounter barriers to being

physically active, including mobility or health limitations, trouble accessing exercise equipment, and having to depend on support staff for help getting to an exercise facility. Clinical evaluation of disabled children in the Al-Qassim region found that 69.3% of patients had limited mobility of varying degrees.<sup>10</sup> The review article of 32 publications pertaining to mobility for adults with intellectual disabilities estimated prevalence varied between 3% and 63% in studies, because of varied populations in characteristics and very different interpretations of what constitutes a mobility limitation therefore difficult to compare with our study as well.<sup>11</sup> In a study, which provided a list of 15 variables that resulted in a decline in mobility among participants, one item that was reported was the percentage of people not able to walk independently. Here the results range from 0.0-0.7%.<sup>4</sup> Regarding full mobility, in our study, all mild ID and 2/3<sup>rd</sup> of Moderate ID patients were fully mobile (overall 1/3<sup>rd</sup> of patients were fully mobile). A similar study finding quotes that 45(30.61%) patients had no mobility problem.<sup>14</sup> But a difference was seen in study results where 65 (58.6%) ID children were on their own and mobile.<sup>10</sup> Again, the study population was specifically children, and we had an in-patient study population exclusively with different age ranges. Other study results found that only 13.5% of the participants with IDD were physically active compared with 30.8% of the adults in the general population and they had more communication and mobility issues than adults without IDD. Among them, only 16% of the participants could walk with or without mobility aids.<sup>3</sup> In our study among severe ID patients, only 8 patients were fully mobile. Similar to other findings, severely intellectually disabled patients in old age were less likely to be physically active than those with milder disabilities or fewer health limitations.<sup>3</sup> But again the study population was old patients only therefore cannot compare with our findings. Regarding mobility with Difficulty, in our study 24 patients had difficulty in mobility, out of which 8 (33.3%) were moderate ID and 15 (62.5%) were Severe ID. Similarly, 16% of the participants could walk with or without mobility aids in old age whereas 2/3 of patients had mobility limitations.<sup>3</sup>

Regarding mobility with support patients, in our study, 16 patients were mobile with support out of which, 3 (18.8%) were moderate IDD and 13 (81.3%) were severe ID. Like our finding, severely intellectually disabled patients were less likely to be physically active.<sup>3</sup> In our study 2/3 had difficulty walking or needed support like 69.3% of patients who had limited mobility of varying degrees.<sup>10</sup> On the other hand, contrary results show 22 (19.8%) patients needed assistance, but this research study population was only children, therefore we cannot compare with our findings.<sup>10</sup>

The participants with mobility limitations were less likely to be physically active, 16% of the participants could walk with or without mobility aids.<sup>14</sup> Regarding Bedridden patients, in our study, 62 (60.78%) patients were bedridden out of which 40 had profound ID and 20 had severe ID. The study found children with ID, 23(20.7%) were fully dependent<sup>10</sup> which is less than the results found in our study. We found that 41(64.7 %) patients had a profound disability and were bedridden which is almost two-thirds as compared to the study possibly because of the difference in the study population.<sup>10</sup>

**Limitation:** It is difficult to generalize the results of our study owing to a simple research design and a localized setting. Moreover, most of the data were collected using clinical records instead of a direct assessment of the patient.

**Recommendations:** The findings of this study suggest that the following recommendations could be implemented

1) The mobility limitations are associated with residence in "high-support" settings and further investigation is needed to determine the direction of causality and to create programs and services that equalize opportunities.

2) Mobility of the patients should be improved through surgical intervention and provision of assistive aids as 40 patients were from categories where some intervention might have been done to improve mobility. A multidisciplinary approach involving the Physiotherapy, occupational therapy, and Orthopedic Departments could bring out ideal results.

3) Service needs assessments should be conducted to fulfill the unmet needs of the study population.

4) Further research is required on ID and mobility limitations to understand the individual needs of patients.

## CONCLUSION

There was a male preponderance (almost twofold at all levels of mobility limitation) in ID patients in our study population. About two-thirds of the patients with impaired mobility were bedridden. All patients with profound ID and about one-third of patients (30%) with severe ID were bedridden.

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