

Original Research Article

Assessing the level of DDH knowledge among parents in Riyadh city in Saudi Arabia

Khalid Mohammed Alshahrani^{1*}, Abdulmonem Alsiddiky², Sultan Mohammed Alamro², Awn Abdulkhaliq Alqarni²

¹College of Medicine, King Saud University, Riyadh 11472, Saudi Arabia

²Department of Orthopedics, College of Medicine, Research chair of spinal deformities, King Khalid University Hospital, Riyadh, KSA

*Corresponding author email: kalalshahrani@gmail.com

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Abstract

Background: Developmental dysplasia of hip (DDH) is a condition in which there is an abnormal relationship between the head of femur and acetabulum. Currently there is no single definition of the disease in the aspect of morphology, clinical, radiological studies.

Objective: To know the level of knowledge, attitude and skills among parents with a DDH-diagnosed child, to compare the socio-demographic status between parents and how it affects the disease, to compare attitude between parents with previously diagnosed child with DDH against those who are not.

Materials and methods: A cross-sectional study was conducted on a sample of 340 across parents in city of Riyadh, Saudi Arabia. Using the simple random technique with the help of a questionnaire, the data were processed using SPSS version 23 (SPSS Inc., Chicago, Illinois, USA).

Results: From a total of 340, only 234 (68.8%) of the participants had a previous knowledge about DDH, while 106 (32.2%) had no idea about DDH. From a total of 72, only 42 (58.3%) of the fathers do know about DDH, while 30 (41.7%) of them do not. From a total of 268, only 192 (71.6%) of the mothers do know about DDH, while 76 (28.4%) of them do not. There is a significant association between being a mother and knowing about DDH ($p < 0.05$).

Conclusion: As the DDH awareness level in Saudi Arabia is suboptimal, additional efforts need to be done to ensure the delivery of simple and reliable information regarding this condition through various media portals and campaigns.

Key words

DDH, Parents, Awareness, Orthopedics, Saudi Arabia.

Introduction

Developmental dysplasia of hip (DDH) is a condition in which there is an abnormal relationship between the head of femur and acetabulum. Currently there is no single definition of the disease in the aspect of morphology, clinical, radiological studies. The term dysplasia is used with reference to infants born with dislocation or instability of the hip, which in the residual form are defined as hip dysplasia [1]. Since it is a disease of infancy and early childhood, parents play a major role in recognizing the child's condition for early management and to prevent possible complications.

The parents should be familiar with the clinical presentation of DDH to take their child to the orthopedics clinic for further evaluation.

It is important for us to know how common the disease among live births is. A cohort study was done recently in United Kingdom on all live births from January 1998 to December 2008, with a topic of "Epidemiology of developmental dysplasia of the hip within the UK: refining the risk factors". Timothy Woodacre, et al. [2] found that 1 in every 200 children born requires treatment for DDH.

A number of studies discussed how much parents know about their children's medical condition. de Bont EG, et al. [3], a population survey done on parent's knowledge, attitudes, and practice in childhood fever. B. N. Wilson, et al. [4], found out that Over 80% of parents feel that there should be more education for parents about the signs of DCD and other childhood conditions. Lewsirirat S, et al. [5], Cooperation of parents is a major factor for successful treatment of DDH. Since the treatment of DDH requires a long period of care not only in hospital but also at home therefore, it needs parent's intention and regularity to achieve the promised outcome.

Furthermore, early diagnosis and management have a better prognosis, different forms of treatment modalities have been reported to be successful and their success depends on the age of the patient [6]. The early detection can prevent surgical intervention and further complications after surgery mostly as osteonecrosis, residual dysplasia and re-dislocation [6]. Also, it is reported that "The older the child was at the onset of treatment, the greater the risk of necrosis, notably if treatment was begun after 6 months of age [7]". After seeing many parents presenting late to treat their children with DDH, it is a most to increase the level of the knowledge about the disease in our community. The aim of this study was to know the level of knowledge and awareness about DDH among parents in Riyadh, Saudi Arabia.

We believe that we have a poor knowledge about DDH in our community, due to many factors; we lack campaigns and parents have no idea about how their child could present with when he has a hip dysplasia.

It is important for the parents to know more about this condition, since the early diagnosis and treatment is very crucial for the prognosis of the disease.

Materials and methods

In this study, four main independent variables were measured to predict three dependent outcomes. Since the study independent variables are categorical, chi-square test will be used to measure the association with each of the outcomes. Subsequently, a post hoc analysis using the adjusted residual values will be done to interpret a deeper inference on this strong association evidence. Significant association between measured variables and outcome will be examined using multinomial logistic regression at a significance level of 0.05. Building blocks model technique will be used, in which

significant associated variables will be applied to the model independently. Finally, a reliable model will be achieved that will help in statistical inference of the data.

Analysis was conducted using a validated questionnaire composed of 10 questions along with demographic data for the participants. These validated questions were related to topics of interest with a main aim of measuring the overall awareness of participants on developmental dysplasia of the hip (DDH).

SPSS software, version 23 (SPSS Inc., Chicago, Illinois, USA) was used for data entry and analysis. All analyses were carried out at a significance level of 0.05. Chi square test was used for categorical variables, while continuous variables associations were examined using t-test.

Results

Descriptive Statistics

Table – 1 to 4 descriptive statistics of the study independent and dependent variables is listed along with their frequency and percentage.

From a total of 340, only 234 (68.8%) of the participants had a previous knowledge about DDH, while 106 (32.2%) had no idea about DDH. From a total of 72, only 42 (58.3%) of the fathers do know about DDH, while 30 (41.7%) of them do not. From a total of 268, only 192 (71.6%) of the mothers do know about DDH, while 76 (28.4%) of them do not. There is a significant association between being a mother and knowing about DDH ($p < 0.05$).

The answer to the question “Do you know about DDH?” was tested and analyzed against the study dependent outcomes. That was to have an overall inference on the data being collected from the surveys and whether answering this question with either “Yes” or “No” might affect the rest of the participant’s answers.

Chi-square test revealed a significant association between previous knowledge about DDH and the source of knowledge on DDH, whether the disease is preventable, whether a child diagnosed with DDH could walk and the best treatment for DDH. The table below illustrates the percentages and p-values.

Father employment had a significant association with previous knowledge of DDH. Since 174 (68%) of employed fathers and 48 (81.4) of retired fathers stated that they had a previous knowledge on DDH. Consequently, the chi-square test signified this association between that being employed or retired and previous knowledge of DDH (p -value < 0.05). Moreover, 77 (30.1%) of employed fathers stated that they acquired their knowledge on DDH from affected member of the family. After analyzing this through a chi-square this relation was significant (p -value < 0.05).

On the other hand, mother employment category was tested against several dependent variables (study outcomes). As for father employment category, employed and retired mothers had been associated the most with previous knowledge on DDH. Since 106 (70.7%) of employed mothers and 47 (81%) of retired mothers had a significant association with previous knowledge of DDH (p -value < 0.05). Moreover, compared to various sources of knowledge on DDH, employed mothers stated that the main source was from an affected member of the family. This relation was signified through a chi-square test (p -value < 0.05).

Regarding the question where participants were asked if they think a child with DDH could walk, employed and retired mothers had a significant association with a p -value < 0.05 . Since 109 (72.7%) of employed mothers and 52 (89.7%) of retired mothers stated that they believe that a child with DDH could walk.

Further analysis was conducted regarding the education levels for both the mother and the father with the study outcomes. There were a

significant association between mother's education level and source of previous knowledge on DDH (p -value < 0.05). After the post-hoc analysis, mothers who had bachelors were related to having their previous knowledge from affected family member (33.3%). Moreover, mothers with a high degree (39.5) or diploma (50%) stated that they acquired their DDH knowledge through self-education or from their assigned doctor. Also, 87.7% of mothers holding a bachelor degree believe that this disease is preventable. This association was signified through a chi-square test and scored a p -value < 0.05 . Moreover, the suggested way of treatment had significant association with the mother's level of education p -value < 0.05 . From post-hoc analysis, 69.5% of bachelor holding mothers choose no initial surgery is required, while diploma holding mothers choose an initial surgery for treatment. Regarding the disease prognosis, 56.1% of bachelor holding mothers believed that this disease can be completely healed. This association was signified through a chi-square test and scored a p -value < 0.05 . As for early treatment, mother education level was significantly associated with stating that it is always better (p -value < 0.05).

After testing monthly income for association against the study outcomes, a significant relation was noticed with the previous knowledge on DDH through a chi-square test with a p -value < 0.05 . Participants with monthly income of more than 20000 Saudi Riyals had significant association with choosing self-education as the source of DDH knowledge while participants with lower monthly income were associated with choosing their source of DDH knowledge from an affected family member.

Question: **In case of no treatment what do you think will happen to the child?**

Regarding this question in the survey, the participants were required to list down the possible outcomes if DDH was not treated. It is important to note that some of the listed items are incorrect. They were added to measure the level of awareness of DDH for the participants

and exclude any possible bias from guessing the correct answer. The possible (valid) complication that might be associated with neglecting DDH treatment are limping, back pain, osteoarthritis of the dislocated hip and lower limb discrepancy. Therefore, hip pain, unable to walk and no complication were considered as a not valid choice.

Table - 5 illustrates the counts with percentages for each of the listed complications in the question along with either this complication is Valid or Not Valid. As per **Table - 5**, it can be concluded that limping was the most chosen complication in case of neglecting DDH treatment (221, 24.02%), which is considered as a valid choice. On the other hand, the least chosen complication was "Nothing" (13, 1.41%), which is considered as a not valid choice. It is important to mention that hip pain was the second complication to be chosen (175, 19.02%), which is considered as a not valid answer.

Statistical analysis tests were conducted to measure the correlation between the answer to this question and the study independent variables. From the chi-square test, a significant association was noticed between having a previous knowledge about DDH and choosing either limping, back pain or being unable to walk as a complication (p -value < 0.05). Also, participants with no previous knowledge on DDH, tend to choose hip pain as a complication for neglecting DDH treatment (p -value < 0.05).

Discussion

Developmental dysplasia or dislocation of the hip (DDH) is defined as a structural deformity of the hip, essentially an incompatibility between the head of the femur and the acetabulum. Throughout the past clinical research years, DDH has been ascertained to be a condition that progresses over time, developing during the period before and even after birth [9]. DDH can lead to several complications, these may include premature degenerative joint disease, impaired walking, and chronic pain. Worldwide estimates

of DDH incidence rate in infants vary between 1.5 and 20 per 1000 births [8, 9]. The incidence of DDH in infants is influenced by a number of factors, including diagnostic criteria, gender, genetic and racial factors, and age of the population [8, 9]. However, it is important to

note that the majority of cases of DDH have no identifiable risk factors [8]. Insufficient awareness of infants' parents as to concepts of early detection for signs of DDH may lead to delay in diagnosis and treatment, and in some cases to complications and disability [8, 9, 10].

Table – 1: Descriptive statistics of the study independent and dependent variables.

Independent Variable		Frequency	Percentage
Relationship	Father	72	21.2
	Mother	268	78.8
Marital status	Single	2	0.6
	Married	327	96.2
	Divorced	10	2.9
	Widowed	1	0.3
Nationality	Saudi	335	98.5
	Non-Saudi	5	5.1
Father employment	Employed	256	75.5
	Unemployed	25	7.4
	Retired	59	17.4
Mother employment	Employed	150	44.1
	Unemployed	132	38.8
	Retired	58	17.1
Educational level father	Middle school	8	2.4
	High school	86	25.3
	Bachelor	175	51.5
	High degree	62	18.2
	Diploma	4	1.2
	Unschoolled	5	1.5
Educational level mother	Middle school	4	1.2
	High school	57	16.8
	Bachelor	243	71.5
	High degree	32	9.4
	Diploma	2	0.6
	Unschoolled	2	0.6
Monthly income	Less than 1000	7	2.1
	1001-5000	22	6.5
	5001-10000	61	17.9
	10001-15000	88	25.9
	15001-20000	69	20.3
	More than 20000	93	27.4
Do you know about DDH	Yes	234	68.8
	No	106	31.2

In this study, surveys were distributed among candidates to answer questions related to DDH, and designed specifically to measure their level

of awareness. Some of the questions had correct answers, and it is important to note that all the study candidates had freewill to choose whatever

they believe is the correct answer. About 69% of the participant had a previous knowledge regarding DDH, either from their own child or a family member. The majority of these participants were the mothers, which was not a surprising fact, as mothers tend to be more exposed, though long contact hours, to their infants. The main aim of the questionnaire was to measure the level of DDH awareness among the participants. It was important to add the question “Do you know about DDH?” at the beginning of our survey. First, to be able to filter the candidates in two groups based on whether they

have any prior knowledge on DDH, second, in order to ease the analysis and interpretation of the survey answers for each of these groups. Third, it will assist in validating the reliability and precision of the candidates’ answers. Subsequently, we were able to detect some significant associations between prior knowledge on DDH and source of knowledge on DDH, whether the disease is preventable, whether a child diagnosed with DDH could walk and the best treatment for DDH. As these associations were anticipated, however, it generated a solid base to build the following data interpretation.

Table – 2: Independent variable.

Independent Variable	Mean	Standard Deviation
Father’s age	43.65	11.55
Mother’s age	38.44	10.63

Table – 3: Independent variable.

Independent Variable		Frequency	%
From where did you know about DDH	Affected member of the family	104	30.6
	From doctor	23	6.8
	From social media	45	13.2
	From friend	51	15.0
	Self-education	12	3.5
	Missing	105	30.9
Are any of your children diagnosed with DDH	Yes	36	10.6
	No	304	89.4
How old was your child on time of diagnosis	Since birth-6 month	19	5.6
	6m-1y	5	1.5
	1years	11	3.2
	2years	1	0.3
	Missing	304	89.4
Do you think the disease is preventable	Yes	281	82.6
	No	59	17.4
Do you think that a child with DDH could walk	Yes	259	76.2
	No	81	23.8
What do you think the best treatment for DDH	Initially no surgery	228	67.1
	Surgery if it gets worse	84	24.7
	Initially surgery	28	8.2
What do think the prognosis after treatment	Completely healed	226	66.5
	Partial heal with limping	111	32.6
	No treatment	3	0.9
What do you think about early treatment	Better	327	96.2
	No difference	6	1.8
	Late treatment better	7	2.1

Table – 4: Independent variable.

Independent Variable (Choice)	Dependent Variables	Choice (Percentage)	p-value
Do you know about DDH? (Yes)	From where did you know about DDH	Affect family member (44.4%)	< 0.05
	Do you think the disease is preventable	Yes (77.4%)	< 0.05
	Do you think a child with DDH could walk	Yes (84.6)	< 0.05
	What do you think the treatment for DDH	Initially with no surgery (72.2%)	< 0.05
	What do you think is the prognosis after treatment	Completely healed (70.9%)	< 0.05
Do you know about DDH? (No)	Do you think the disease is preventable	Yes (94.3%)	< 0.05
	Do you think a child with DDH could walk	No (57.5%)	< 0.05
	What do you think the treatment for DDH	Surgery if it gets worse (41.5%)	< 0.05
	What do you think is the prognosis after treatment	Partial heal with limping (56.5)	< 0.05

Table – 5: Choice.

Choice	Frequency	Percentage
Nothing (<i>Not Valid</i>)	13	1.41
Limping (<i>Valid</i>)	221	24.02
Hip pain (<i>Not Valid</i>)	175	19.02
Back pain (<i>Valid</i>)	123	13.37
Osteoarthritic of the dislocated hip (<i>Valid</i>)	143	15.54
Lower limb discrepancy (<i>Valid</i>)	163	17.72
Unable to walk (<i>Not Valid</i>)	82	8.91

Regarding employment, fathers and mothers who are currently employed or retired had a significant association with DDH awareness and early treatment. Also employment was associated with how employed mothers thought that a child with DDH can walk normally again. This may be due to the vast exposure that work experience offer to employees, aiding their acquisition of knowledge for various diseases and conditions including DDH. Moreover, the source of information which was considered significant as stated by employed mothers was through a family member. This gives an idea that DDH as a condition is not widely discussed though different media portals.

Following the same logic in regards to employment, higher education levels were associated with higher rates of DDH awareness and early treatment for both fathers and mothers. After further analysis, bachelor holding mothers believed that the condition is preventable and can be cured through different means with surgery not being the first line of treatment. All the previous replies were the most appropriate, hence were the one presented to measure the level of awareness. Again, it was not a surprise to associate high education levels with DDH awareness levels. The one point to note here is the unsuccessful answers from lower education level candidates regarding DDH awareness

which may also be related to the limited knowledge shared with the public regarding DDH.

A comparison between high and low income candidates revealed that highly income candidates prefer self-education material as a source of DDH knowledge. On the contrary, low income candidates stated that an affected family member was their source of DDH knowledge. Here we could interpret the general attitude of people from different economic classes with respect to their chosen source of information. This is really important when launching an awareness campaign to target specific class of people. As higher classes tend to read more information and understand about DDH through various media channels, on the other hand, lower classes prefer the information to be presented to them directly without the burden of effort searching for it.

Finally, the participants were required to list down the possible outcomes if DDH was not treated. As mentioned before, this was one of the questions containing false answers. Reason being was to have a primarily analysis on the candidates who truly know the risk factors of untreated DDH. Limping as, a possible valid, outcome for untreated DDH was the most chosen answer, and was significantly associated with prior knowledge about DDH. This solidify the fact that prior knowledge on DDH is a key factor to understand the condition and be able to deal with the infant or toddler in a scientific and systematic way. It was also important to mention to mention that the second most chosen answer was hip pain, which was a false answer. In the same manner, educating the public in general through different channels is a necessity to firstly understand then defeat any condition or disease.

As previous studies have shown that a delay in diagnosis and treatment of DDH can lead to long-term functional disability including shortened limb, limping, and restricted movement. This should be addressed clearly as DDH requires prudent awareness of the public as

to early diagnosis and treatment with the aim of optimal outcome [8, 9].

Further to note, the limitation of our study was mainly the limited sampling and respondent availability for the study questionnaire. The use of hand written survey was to ease the delivery of the questionnaire knowing that it would cause some inherent bias for the highly educated respondents. It is advised for future studies to include a larger sample size with more emphasis on participants who have no family history in regard to DDH. Thus, relying entirely on information gained from various media channels. In this manner, it will result in more rigid conclusions for the influence of general DDH campaigns on the level of the condition awareness.

Conclusion

Knowing the level of population awareness aids to address the problem more effectively and raise the awareness level, which will hopefully lead to a significant decrease in DDH incidence in Saudi Arabia as seen from campaigns in several countries that managed to reduce their incidence levels of DDH. It is also important to address and emphasize through these public campaigns the importance of early detection, diagnosis and treatment of DDH which will help to prevent disability and impairment of quality of life among children and adults. As the DDH awareness level in Saudi Arabia is suboptimal, additional efforts need to be done to ensure the delivery of simple and reliable information regarding this condition through various media portals and campaigns.

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