Original Article

The Awareness of Developmental Dysplasia of the Hip Among Al Jouf Region Population After the Establishment of Saudi National Hip Dysplasia Program in 2018

Ziad A. Alanazi[1], Mohammed J. Alanazi[2], Badur M. Alaried[3], Khalid N. Alkhaldi[3], Araa G. Alruwaili[3], Mohammed M. Alorayyidh[3], Ghena J. Zenalabden[3]

[1]Division of Orthopedics, College of medicine, Jouf university, Sakaka, KSA.
[2]Consultant, Division of Orthopedics, Department of Surgery, King Abdullah Bin Abdulaziz University Hospital (KAAUH), Princess Nourah Bint Abdulrahman University (PNU), Riyadh, KSA.
[3]College of medicine, Jouf university, Sakaka, KSA.

ABSTRACT

Introduction: Developmental Dysplasia of the Hip (DDH), also known as congenital dislocation of the hip, occurs in infancy or early childhood and ranges from mild dysplasia to complete dislocation. Known risk factors include family history, female gender, breech presentation, and firstborn status. In Saudi Arabia, studies highlight gender and familial associations, emphasizing the importance of public awareness for early detection and intervention.

Objective: This study aims to assess the community's level of awareness regarding DDH among the population in the Al Jouf region of Saudi Arabia, with a focus on knowledge of risk factors, treatment options, and potential complications.

Methodology: A cross-sectional study was conducted in Al Jouf using convenience sampling among adults aged 18 and above. Data were collected through a self-administered questionnaire and analyzed using IBM SPSS version 29.

Results: A total of 386 participants were included, with females comprising 67.4% and the majority aged 18–25 years. Overall, 76.2% had heard of DDH. Key information sources included injured relatives (41.1%) and the internet (25.6%). Major identified risk factors were postnatal child lifestyle (41.2%) and breech presentation (39.4%). Surgical intervention was the preferred treatment for older children. Significant predictors of awareness included male gender (OR=0.449, p=0.002), Sakaka region residence (OR=1.237, p=0.016), Saudi nationality (OR=5.497, p=0.017), higher education (OR=1.646, p=0.018), health-related occupation (OR=2.322, p=0.004), and family history of DDH (OR=3.327, p<0.0001).

Conclusion: The study shows a high level of DDH awareness in Al Jouf, with several demographic and familial factors significantly influencing knowledge levels. These findings support the need for targeted educational interventions.

Keyword: Developmental dysplasia of the hip, Infants, awareness, Cross sectional study, Saudi Arabia.

Introduction

Developmental dysplasia of the hip (DDH) results from abnormal hip joint development. It typically manifests during infancy or early childhood. It encompasses a spectrum of anatomical irregularities from mild acetabular dysplasia to complete dislocation where the femoral head is improperly aligned with the acetabulum [1].

Access this article online	
Quick Response Code:	Website: www.smh-j.com
	DOI: 10.54293/smhj.v5i2.141

Address for correspondence: Khalid N. Alkhaldi, College of medicine, Jouf university, Sakaka, KSA.
E-mail: kh6677@gmail.com

Received: 10 Feb 2025 **Accepted:** 23 Apr 2025

Please cite this article as: Alanazi ZA, Alanazi MJ, Alaried BM, Alkhaldi KN, Alruwaili AG, Alorayyidh MM, Zenalabden GJ. The Awareness of Developmental Dysplasia of the Hip Among Al Jouf Region Population After the Establishment of Saudi National Hip Dysplasia Program in 2018 . SMHJ [Internet]. 2025;5(2):91-101. Available from: https://www.smh-i.com/smhi/article/view/141

SMHJ
Saudi Medical Horizons Journal

There are many known risk factors for developing DDH, such as family history, female gender, breech position, and firstborn. In addition to oligohydramnios and foot abnormalities [2]. A prior study conducted at a tertiary care hospital in Riyadh reported a higher prevalence of DDH among females, with fewer than half of the affected patients presenting with bilateral involvement. [3]. DDH is one of the most prevalent conditions in pediatric orthopedic practice worldwide [4]. Furthermore, a study conducted in Arar City, Saudi Arabia, revealed that 70% of children diagnosed with the condition had a positive family history [6]. The incidence of DDH varies widely, ranging from 1.5 to 20 cases per 1,000 live births, influenced by factors such as diagnostic criteria, gender, genetic predisposition, and racial background [4]. The prevalence of DDH in Saudi Arabia is estimated to be 10.46 cases per 1,000 live births. This underscores the importance of raising community awareness about the condition. Increasing public knowledge of DDH and its associated risk factors is vital for facilitating early diagnosis, ensuring timely intervention, and preventing potential complications [5]. Pathological hip conditions can be detected early through neonatal screening, assessment of risk factors, and the use of appropriate imaging techniques, as it should be treated early to avoid a wide range of complications, including degenerative arthritis, length discrepancy, weakness, and chronic pain. Treatment is also important to achieve the maximum function of the hip. Early diagnosis and management are the key to preventing DDH complications [7].

Methods

Study design: Cross sectional study.

Settings: Prevailed forms sent online through social media, via convenience sampling.

Sample size: The population of the Al-Jouf region is 595,822 according to the General Authority for Statistics (GAStat). We targeted a sample aged over 18. We calculated the sample size using the Cochran formula keeping the confidence interval at 95% and the margin of error at 5%, and the sample size determined was 384

Data collection: We used self-administered questionnaires consisting of multiple-choice questions. It is designed to obtain information about awareness of DDH among Al Jouf population via questionnaire. The questionnaire consisted of six sections: participant consent, demographic information, awareness of DDH, knowledge of risk factors, treatment options, and potential complications. Respondents' knowledge levels were assessed using multiple-response questions, carefully designed based on reputable orthopedic literature and reviewed by a pediatric orthopedic surgeon to ensure accuracy and relevance. To validate clarity and reliability, the questionnaire was pilot tested prior to the main study.

Statistical analysis

A comprehensive statistical analysis was performed on the dataset, incorporating descriptive and inferential techniques. First, descriptive analysis was used to summarize the demographic characteristics of the participants, including age, gender, and other relevant factors, offering an overview of the study population. Following this, inferential methods, including Binary Logistic Regression, were applied to identify the adjusted predictors of high awareness among participants. Statistical significance was defined as a p-value of 0.05 or lower, with a 95% confidence interval. All statistical analyses were conducted using IBM SPSS Statistics software, version 29.0.0.

Ethical Considerations: The study was conducted after approval by the Kingdom of Saudi Arabia, Hail Health Cluster, the administration of academic and training affairs, and the research center (2024-87). The questionnaire did not include identifying questions.

Significance of Research: By assessing the level of awareness, we can enhance the awareness about the risk factors for DDH, which enables individuals to test, identify, and treat it sooner to prevent significant potential consequences linked to delayed detection. Even though DDH risk factors have been the subject of numerous research conducted globally, little is known about the population's awareness of DDH and its risk factors in the Al Jouf region. Increasing public awareness and educating them can help them recognize, screen, and seek care early on. This study evaluates the population's awareness of DDH and their understanding of its risk factors, treatment, and complications in the Al Jouf region of Saudi Arabia, as early detection and treatment are extremely important for the overall prognosis of the disease.

Results

Our study included 386 participants (Table 1). The majority were female (67.4%, n=260), and the age distribution included 37.3% (n=144) in the 18-25 age group. Most participants were Saudi (97.4%, n=376), with 53.6% (n=207) being married. Sakaka was the predominant region (65.5%, n=253). Educational levels varied, with 68.7% (n=265) having a Bachelor's degree. Health-related fields comprised 35.0% (n=135) of specializations. Notably, 71.0% (n=274) had no first-degree relatives with progressive hip dislocation, while 47.9% (n=185) had children with developmental hip dislocation, and 34.5% (n=133) had their children checked for developmental hip dislocation. (Table 2) shows the awareness of participants regarding DDH, its treatment, and associated complications. The majority (76.2%, n=294) had heard of DDH, with information often

obtained primarily from injured relatives (41.1%, n=159) or the internet/social media (25.6%, n=99). About 51.3% (n=198) knew someone with DDH. Definitions varied, with 39.4% (n=152) accurately describing DDH as sliding of the femoral head in relation to the rest of the bones. Regarding diagnosis, 60.1% (n=232) correctly identified the period from birth to six months. Moreover, participants' perceptions of Developmental Dysplasia of the Hip (DDH) treatment vary by age group. For children aged birth to six months, the most common choice is conservative treatment with Hip Belt/Brace (47.2%, n=182). From 6 to 18 months, surgical intervention (29.3%, n=113) and Hip Belt/Brace (38.9%, n=150) are frequently chosen. In children 18 months and older, the majority opt for surgical intervention (56.2%, n=217). Most participants believe in early therapeutic intervention "As soon as possible" (67.4%, n=260) to prevent complications (70.9%, n=274), which were widely recognized, including walking problems (80.3%, n=310) and leg length differences (62.6%, n=242). A majority believed that all DDH cases should be treated (56.0%, n=216). (Figure 1) shows the main determinants affecting the management of DDH. The highest reported determinant is age (26.2%), followed by mal-dislocation (25.1%) and the presence of complications (21.5%). Other factors, such as baby weight, parents' choice, and gender, contribute to a lesser extent, with percentages ranging from 6.3% to 13.7%. This insight highlights the diverse considerations participants associate with DDH management. (Figure 2) shows participants' perceptions of risk factors contributing to the development of DDH. The highest perceived risk factors include Post-Natal Child's Lifestyle (41.2%), Breech Presentation (39.4%), and the Position of the Baby inside the womb (37.8%). Female Gender (35.8%) and High Birthweight Baby (35.5%) are also considered significant contributors. Interestingly, there is a perception that Male/Female are equally affected (30.5%). Other factors such as Child Cradle, Premature Infants, First Born Child, and Low Amniotic Fluid are acknowledged, with percentages ranging from 23.8% to 28.5%.(Table 3) shows the adjusted predictors of high-level awareness about DDH using a logistic regression model. Significant predictors of high awareness include male gender (B=-0.800, Sig.=0.002, OR=0.449), Sakaka residence (B=0.213, Sig.=0.016, OR=1.237), Saudi nationality (B=1.704, Sig.=0.017, OR=5.497), high educational level (B=0.498, Sig.=0.018, OR=1.646), specialization in the health field (B=0.842, Sig.=0.004, OR=2.322), having a first-degree relative with DDH (B=1.202, Sig.<0.0001, OR=3.327). (Table 4) shows the adjusted predictors of high-level awareness about risk factors for DDH using a logistic regression model. Significant predictors include age (B=-0.343, Sig.=0.021, OR=0.710), male gender (B=-0.622, Sig.=0.011, OR=0.537), and specialization in the health field (B=0.846, Sig.=0.001, OR=2.329). The negative coefficient for age indicates decreasing odds of high awareness with age. Male gender significantly lowers the odds of high awareness, while health field specialization increases the odds of high awareness about DDH. Non-significant predictors include residence, marital status, nationality, education level, having first degree relative with DDH, having children and examined for DDH. (Table 5) shows the adjusted predictors concerning participants' beliefs about complications occurring if DDH is left untreated. Significant predictors include male gender (B=-1.188, Sig.=0.000, OR=0.305), Sakaka region residence (B=0.241, Sig.=0.007, OR=1.272), specialization in the health field (B=1.087, Sig.=0.000, OR=2.965), having a first-degree relative with DDH (B=1.119, Sig.=0.001, OR=3.062). The negative coefficient for male gender indicates a substantial decrease in the odds of believing in complications among males. Health field specialization significantly increases the odds of believing about complications of DDH. Sakaka region residence and having a first-degree relative with DDH are also associated with higher odds of believing about complications of DDH if left untreated.

Discussion

Bakarman et al., (2023) shows that DDH is common condition which occurred and diagnosed in early infancy [10]. Family history, female gender, breech position, and firstborn status are risk factors. Sadat-Ali et al., (2020) shows that according to different studies conducted in Saudi Arabia, the prevalence is 10.46 per 1000 live births [11]. It is essential to obtain an early diagnosis through newborn screening and risk assessment in order to avoid consequences like discomfort and arthritis. Nandhagopal et al., (2022) shows that Screening and identifying DDH before six months of age should be the goal to prevent long term complications [12]. Early intervention is crucial because it guarantees the best possible hip function. Our study aimed to assess the awareness of DDH in the Al Jouf region post the initiation of the Saudi National Hip Dysplasia Program in 2018. The findings, encompassing demographics, awareness levels, treatment perceptions, and risk factor considerations, provide valuable insights for improving preventive measures and healthcare strategies.[13]. Notably, the predominantly female participation (67.4%) aligns with the broader trend where women often take a more proactive role in

Table 1: Sociodemographic and other parameters of participants (N=386).

Variables		Frequency N (%)
Gender	Female	260 (67.4)
	Male	126 (32.6)
Age	18-25 Years	144 (37.3)
	26-35 Years	103 (36.7)
	36-45 Years	87 (22.5)
	> 45 Years	52 (13.5)
Nationality	Non-Saudi	10 (2.6)
	Saudi	376 (97.4)
Marital Status	Single	179 (46.4)
	Married	207 (53.6)
Regions	Other	51 (13.2)
	Tabirjil	11 (2.8)
	Dumat Aljandal	21 (5.4)
	Qurayyat	50 (13.0)
	Sakaka	253 (65.5)
Educational Level	Middle School or Below	9 (2.3)
	High School	92 (23.8)
	Bachelor's Degree	265 (68.7)
	Master's and above	20 (5.2)
Field of Specialization	Unsanitary/Other	251 (65.0)
	Health Field	135 (35.0)
Do you have a first-degree relative who has a progressive hip dislocation?	No	274 (71.0)
	Yes	112 (29.0)
If you have children, have they been checked for developmental hip dislocation?	Don't have Child	178 (46.1)
	No	75 (19.4)
	Yes	133 (34.5)

Table 2: Participants awareness about DDH, its Treatment and complications (N=386).

Items of the questionnaire		Frequency N (%)
Awareness about Developmental dysplasia of the hip		
Have you ever heard of developmental hip dislocation (congenital dislocation)?	No	92 (23.8)
	Yes	294 (76.2)
From Where did you know about developmental dysplasia of the hip?	Injured Relative	159 (41.1)
	Internet/social media	99 (25.6)
	Doctor/ Medical Awareness Campaigns	93 (24.1)
	Self-Teaching/Friend	79 (20.5)
	Don't know about DDH	74 (12.2)
Do you know someone with developmental hip dislocation (congenital dislocation)?	No	140 (36.3)
	Don't Know	48 (12.4)
	Yes	198 (51.3)
What is the best definition of developmental hip dislocation (congenital dislocation)?	Don't Know	106 (27.5)
	Hip disorder that allows the hip joint to dislocate partially or completely	128 (33.2)
	Sliding of the femoral head in relation to the rest of the bones	152 (39.4)
When can a person with developmental hip dislocation (congenital dislocation) be diagnosed?	Don't Know	96 (24.9)
	From birth to 6 months old	232 (60.1)
	From 6 months to a year	45 (11.7)
	From the age of one year	10 (2.6)
	From the age of two years	3 (0.8)
Treatment Of DDH		
What do you think is the treatment for DDH for a child from birth to six months?	Closed/Open Reduction (Surgical)	42 (10.9)
	Hip Belt/Brace (Conservative)	182 (47.2)
	Physical therapy	89 (23.1)
	Follow the child only	73 (18.9)
What do you think is the treatment for DDH for a child from 6 to 18 months old?	Closed/Open Reduction (Surgical)	113 (29.3)
	Hip Belt/Brace (Conservative)	150 (38.9)
	Physical therapy	82 (21.2)
	Follow the child only	41 (10.6)
What do you think is the treatment for DDH for a child from 18 months old or Older?	Closed/Open Reduction (Surgical)	217 (56.2)
	Hip Belt/Brace (Conservative)	46 (11.9)
	Physical therapy	89 (23.1)
	Follow the child only	34 (8.8)
What is the ideal time for therapeutic intervention?	As soon as possible	260 (67.4)
	Not require surgical intervention.	20 (5.2)
	When child reaches adolescence	20 (5.2)
	When the child starts walking	86 (22.2)
Reason for choose above Answer	To give the child the opportunity to grow	112 (29.1)
	Prevent Complications of DDH if left untreated	274 (70.9)
	Prevent further Surgical Interventions	122 (31.6)
	Other (like there is no cure)	9 (0.7)
Should all cases of developmental hip dislocation (congenital dislocation) be treated?	Not all cases require treatment.	16 (4.1)
	Yes, all cases should be treated	216 (56.0)
	Depends on the situation	154 (39.9)
Complications of DDH		
Does DDH cause complications	I do not know	92 (23.8)
	It does not cause complications	12 (3.1)
	Yes, it causes complications	282 (73.1)
What Complications does occur	Problems with walking	310 (80.3)

	Difference in leg/lower limb length	242 (62.6)
	Chronic hip pain	232 (60.1)
	Hip friction	191 (51.0)
	Chronic back pain	170 (44.1)
	Inability to walk	138 (35.7)

Table 3: Adjusted predictors of high-level awareness about DDH (Logistic Regression Model).

Variables	B	Sig.	Adjusted OR	95% CI	
				Lower	Upper
Age	.059	0.727	1.061	.763	1.475
Gender (Male)	-.800	**0.002**	.449	.271	.746
Residence (Sakaka)	.213	**0.016**	1.237	1.041	1.471
Marital Status (Married)	.162	0.728	1.176	.472	2.931
Nationality (Saudi)	1.704	**0.017**	5.497	1.363	22.175
High Educational level	.498	**0.018**	1.646	1.089	2.486
Field Specialization (Health)	.842	**0.004**	2.322	1.313	4.106
First degree Relative with DDH (Yes)	1.202	**0.000**	3.327	1.767	6.266
Your Child Examined for DDH	.363	0.158	1.437	.869	2.377
Constant	-5.77	**0.000**	.003	---	

Table 4: Adjusted predictors of high-level awareness about risk factors (logistic regression model).

Variables	B	Sig.	Adjusted OR	95% CI	
				Lower	Upper
Age	-.343	**0.021**	0.710	.531	.949
Gender (Male)	-.622	**0.011**	0.537	.333	.866
Residence (Sakaka)	0.092	0.246	1.096	.939	1.281
Marital Status (Married)	0.098	0.815	1.103	.485	2.511
Nationality (Saudi)	-.234	0.740	0.792	.199	3.144
High Educational level	0.145	0.453	1.156	.791	1.690
Field Specialization (Health)	0.846	**0.001**	2.329	1.388	3.908
First degree Relative with DDH (Yes)	0.492	0.058	1.635	.984	2.715
Your Child Examined for DDH	-.092	0.673	0.912	.593	1.401
Constant	-1.14	0.355	0.319	---	

Table 5: Adjusted predictors of who thinks complications occurs if DDH left untreated (logistic regression model).

Variables	B	Sig.	Adjusted OR	95% CI	
				Lower	Upper
Age	0.283	0.108	1.327	.939	1.874
Gender (Male)	-1.18	**0.000**	0.305	.180	.517
Residence (Sakaka)	0.241	**0.007**	1.272	1.068	1.516
Marital Status (Married)	-.177	0.719	0.838	.320	2.193
Nationality (Saudi)	-.781	0.482	0.458	.052	4.030
High Educational level	0.148	0.510	1.160	.746	1.803
Field Specialization (Health)	1.087	**0.000**	2.965	1.618	5.433
First degree Relative with DDH (Yes)	1.119	**0.001**	3.062	1.592	5.888
Your Child Examined for DDH	0.154	0.560	1.167	.695	1.959
Constant	-1.41	0.387	0.243	---	

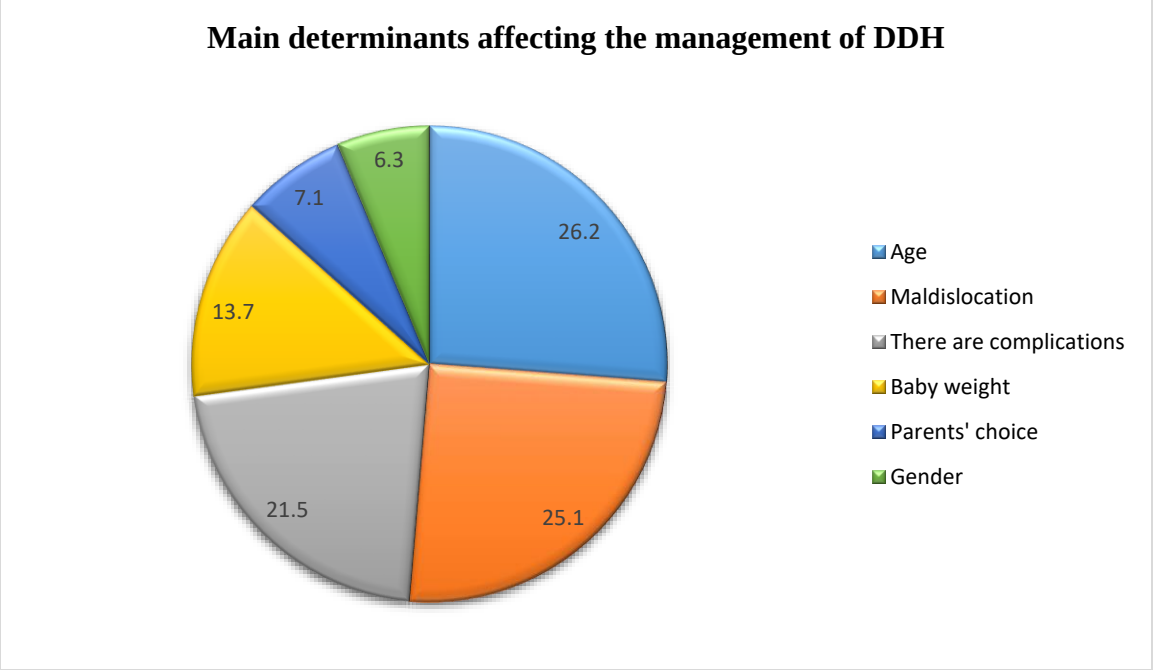

Figure 1: Main determinants which affect the management of DDH (N=386).

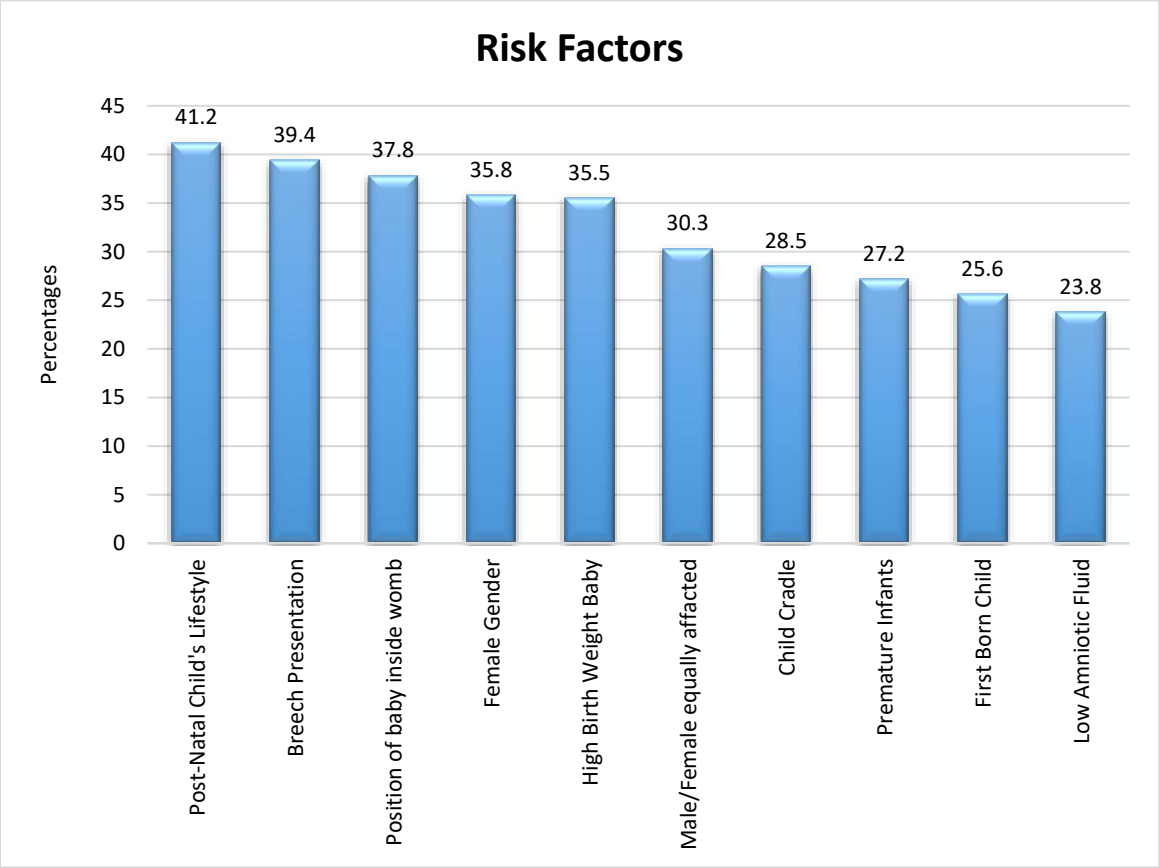

Figure 2: Participants perception about the risk factors of DDH (N=386).

healthcare decision-making for families [13]. The concentration in the 18-25 age group (37.3%) underscores the importance of targeting educational interventions toward young adults who may soon become parents. While the high representation of Saudis (97.4%) in the study ensures a homogeneous sample, caution should be exercised in generalizing findings to more diverse populations. Notably, the significant proportion from Sakaka region (65.5%) emphasizes the regional nature of healthcare perceptions, reinforcing the need for tailored awareness campaigns targeting specific geographical regions. Our study revealed a relatively high participants who have heard about DDH (76.2%), with information often sourced from injured relatives (41.1%). Similarly, a study by Alqarni et al., (2021) shows that 65.6% pregnant females knew about DDH with relatives and friends were the most common source for them (50.0%) [14]. Moreover, internet/social media (25.6%) is the second most common source of information for our participants for DDH awareness. This aligns with contemporary trends where digital platforms play a crucial role in disseminating health information as stated by Jeyaraman et al., (2023) that social media vital in healthcare for information [15]. However, it is essential to monitor the quality and accuracy of information from these sources. Definitions of DDH varied, with 39.4% describing it as the sliding of the femoral head. This highlights a knowledge gap that could be addressed through targeted educational initiatives. Moreover, previous study by Musielak et al., (2015) shows that there is no consensus on the definition of dysplasia of the hip (DH) [16]. The recognition of the diagnostic timeframe from birth to six months by 60.1% of participants is encouraging, emphasizing the potential for early intervention. However, Agostiniani et al., (2020) shows that the optimal timeframe for the diagnosis and treatment of DDH identified as within the first six weeks of life. [17]. However, efforts should be directed at further increasing awareness, particularly in older age groups. Moreover, our study identified variations in treatment preferences based on age groups. Conservative approaches with Hip Belt/Brace were popular for infants (47.2%), aligning with the medical consensus for milder cases [18]. Surgical interventions gained prominence for older children (56.2%), indicating a perceived necessity for more severe cases. The belief in early therapeutic intervention "As soon as possible" (67.4%) resonates with the medical community's emphasis on early detection and intervention. The acknowledgment of complications, particularly walking problems (80.3%) and leg length differences (62.6%), underlines the participants' understanding of the potential consequences of untreated DDH. Similarly, Nandhagopal et al., (2022) shows that untreated DDH risks disability, hip pain, osteoarthritis; severe cases may end with avascular necrosis of the femoral head (0-5%) [12]. Moreover, there are diverse determinants affecting DDH management, with age (26.2%) and mal-dislocation (25.1%) standing out. These findings emphasize the multifactorial nature of decision-making processes, incorporating medical, social, and personal considerations. There are various perceived risk factors which align with existing literature, emphasizing the significance of post-natal child lifestyle, breech presentation, and the position of the baby inside the womb. Notably, the perception that Male/Female are equally affected (30.5%) contrasts with the documented higher prevalence in females, indicating a potential misinformation or awareness gap that warrants targeted intervention. Similarly, Xiao et al., (2022) shows various risk factors as there is a significant correlation has been established between DDH and factors such as a family history of DDH, breech presentation, swaddling practices, and congenital foot deformities [19]. Moreover, there are various predictors of high-level awareness about DDH, awareness of risk factors, and beliefs about complications if left untreated. Significant predictors included gender, residence, nationality, educational level, field specialization, and having a first-degree relative with DDH. These findings match with the existing literature, emphasizing the influence of sociodemographic factors on health awareness. Similarly, Alkouz et al., (2023) shows that no gender or residence correlation with awareness level, and significant associations found with age, education, career, marital status, and parity ($p < 0.001$) [20]. However, the non-significant predictors in some models, such as marital status and having children, indicate that awareness might not be uniformly influenced by these factors. Tailored interventions considering these nuances could further enhance awareness.

Limitations: Several limitations of our study include potential recall bias as data relies on participant memory. The study's cross-sectional nature restricts causal inferences. The sample's regional specificity limits generalizability, and self-reported data might introduce social desirability bias. Implication And Future Direction: There are several implications of our study like planning of enhancing DDH awareness campaigns, tailoring interventions based on demographics, and improving information

dissemination channels. While future studies should investigate the impact of targeted educational interventions on awareness and explore regional variations in DDH knowledge and beliefs.

Conclusion

Our study provides a comprehensive overview of DDH awareness in the Al Jouf region. The findings offer valuable insights for tailoring healthcare strategies, with a particular emphasis on accurate information dissemination, targeted interventions for specific demographics, and addressing regional variations. The study contributes to the growing body of literature on DDH awareness, paving the way for enhanced preventive measures and informed healthcare decision-making in the Al Jouf region.

Conflict of Interest

None

Funding

None

References

1. Thiagarajan N, De Cicco FL. Developmental dysplasia of the hip. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Oct [cited 2025 Apr 10]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK499836/

2. Manoukian D, Rehm A. Oligohydramnios: should it be considered a risk factor for developmental dysplasia of the hip. J Pediatr Orthop B. 2019 Sep;28(5):442–5.

3. Al-Mohrej O, Alsarhani W, Al-Ayedh N, Al-Ghamdi A, Masudi E, Al-Saif S. Characteristics of developmental dysplasia of the hip at a tertiary hospital in Riyadh. J Health Spec. 2017 Apr;5(2):87.

4. Alqarni MM, Shati AA, Al-Qahtani YA, Alhifzi WS, Alhifzi WS, Al Saleh RS, et al. Perception and awareness about developmental dysplasia of the hip in children among pregnant ladies in the Aseer region, Southwestern Saudi Arabia. Healthcare (Basel). 2021 Oct;9(10):1384.

5. Alanazi MJ, Abokhesheim W, Al Saqer RM, Alasmari R, Alotaibi RM. Assessment of community levels of knowledge about developmental dysplasia of the hip, its risk factors, treatment, and complications in the Riyadh region, Saudi Arabia. Cureus. 2022 Oct;14(10):e30465.

6. Alanazi HM, Alenezi OT, El-Fetoh NM. Pattern of congenital dislocation of the hip in Arar city, Northern Saudi Arabia. J Health Med Nurs. 2017;43:1–5.

7. Zdravkovic N, Ivanov D, Aleksic D, Stojanovic S. Early diagnosis and treatment of congenital dysplasia of the hip. Medicus. 2000;10:1–8.

8. Almahdi HH, Almukhlifi RA, Alahmadi RA, Hetaimish BM. Assessment of the awareness among females in Saudi Arabia about the relationship of swaddling to developmental dysplasia of the hips. J Musculoskelet Surg Res. 2017;1:44–8.

9. Alshahrani KM, Alsiddiky A, Alamro SM, Alqarni AA. Assessing the level of DDH knowledge among parents in Riyadh city in Saudi Arabia. Int Arch Integr Med. 2018;5(2):141–9.

10. Bakarman K, Alsiddiky AM, Zamzam M, Alzain KO, Alhuzaimi FS, Rafiq Z. Developmental dysplasia of the hip (DDH): etiology, diagnosis, and management. Cureus. 2023;15(8):e43207.

11. Sadat-Ali M. Developmental dysplasia of the hip (DDH) in Saudi Arabia: time to wake up. A systematic review (1980–2018). Open J Epidemiol. 2020;10(2):125.

12. Nandhagopal T, De Cicco FL. Developmental dysplasia of the hip. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 [cited 2025 Apr 10]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK499836/

13. Harvard Pilgrim Health Care. When it comes to health care decision-making for the family, women take the lead [Internet]. [cited 2025 Apr 10]. Available from: https://www.harvardpilgrim.org/hapiguide/when-it-comes-to-health-care-decision-making-for-the-family-women-take-the-lead/

14. Alqarni MM, Shati AA, Al-Qahtani YA, Alhifzi WS, Al Saleh RS, Alqahtani NA, et al. Perception and awareness about developmental dysplasia of the hip in children among pregnant ladies in the Aseer region, Southwestern Saudi Arabia. Healthcare (Basel). 2021;9(10):1384.

15. Jeyaraman M, Al Khalaf H, Althwanay A, Alnofaiey YH, Chandran M, Alshamrani A, et al. Multifaceted role of social media in healthcare: opportunities, challenges, and the need for quality control. Cureus. 2023;15(5):e39111.

16. Musielak B, Idzior M, Jóźwiak M. Evolution of the term and definition of dysplasia of the hip – a review of the literature. Arch Med Sci. 2015;11(5):1052–7.

17. Agostiniani R, Boldrini A, Campostrini S, Galli L, Magnani C, Mariani F, et al. Recommendations for early diagnosis of developmental dysplasia of the hip (DDH): working group intersociety consensus document. Ital J Pediatr. 2020;46(1):150.

18. Wahlen R, Zambelli P-Y. Treatment of the developmental dysplasia of the hip with an abduction brace in children up to 6 months old. Adv Orthop. 2015;2015:103580.

19. Xiao H, Tang Y, Su Y. Risk factors of developmental dysplasia of the hip in a single clinical center. Sci Rep. 2022;12(1):19461.

20. Alkouz FH, AlQudah AA, Aleshawi AJ, AlZoubi SA, Almomani MO, Alomari MN, et al. Evaluation of the community's awareness of developmental

dysplasia of the hip: a cross-sectional study in Jordan.
Cureus. 2023;15(10):e47474.