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Research Article

Perception of Parents and Attitude Toward Lumbar Puncture Procedure in Pediatric Care: A Cross-Sectional Study in Jeddah, Saudi Arabia

Wejdan I Alhusaini[1], Yara Alorfi[2]*, Abdullah Alharbi[2], Dareen Bajamaan[2], Fatima Alamri[2], Hamda Altowairqi[2], Shaima Altowiriqi[2] and Ammar Badawi[2]

[1]Pediatric Department, Faculty of Medicine, University of Jeddah, Jeddah, Saudi Arabia

[2]Medical Student, Faculty of Medicine, University of Jeddah, Jeddah, Saudi Arabia

***Corresponding Author:** Yara Alorfi, Medical Student, Faculty of Medicine, University of Jeddah, Jeddah, Saudi Arabia.

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Abstract

Background: Lumbar puncture (LP) is a procedure used to collect cerebrospinal fluid for diagnosing neurological conditions, including meningitis and multiple sclerosis. Globally, acceptance of LP varies, with parental refusal rates influenced by cultural beliefs, fear of complications, and lack of awareness. In Saudi Arabia, concerns such as fear of paralysis and misinformation significantly impact consent, although understanding the procedure's benefits improves acceptance rates.

Methodology: A cross-sectional study, conducted in Jeddah. Data were collected from 494 parents via an online survey, with inclusion criteria focusing on parents of children under 14 who could communicate in Arabic or English. Ethical approval was obtained, and statistical analysis included descriptive statistics and logistic regression to identify factors influencing LP knowledge.

Results: Among 494 parents, most were mothers (66.2%), Saudi nationals (87.7%), and bachelor's degree holders (54.7%). The mean knowledge score was 5 out of 7, with high awareness of lumbar puncture safety and purpose but gaps in understanding anesthesia use (56.3%) and recovery time (62.1%). While 52.9% agreed on the procedure's necessity, concerns about pain (68.2%) and complications (70.4%) were prevalent. Trust in physicians was high (77.8%), but 64.8% were likely to seek second opinions. Refusal was mainly driven by fears of complications (67.2%), pain (56.1%), and insufficient procedural explanations (35.4%). Mothers, individuals aged 36-45, and parents with higher education demonstrated significantly better knowledge.

Conclusion: This study revealed generally good parental understanding of lumbar puncture (LP) in pediatric care but highlighted concerns about pain, complications, and recovery. Higher education and maternal status were linked to better knowledge.

Keywords: *Lumbar Puncture; Pediatric Care; Parents Perception; Parents Attitude*

Abbreviations

LP: Lumbar Puncture; CSF: Cerebrospinal Fluid; ICP: Intracranial Pressure; SD: Standard Deviation; IQR: Interquartile Range

Introduction

A lumbar puncture, also known as a spinal tap, is a medical procedure in which a hollow needle is inserted into the lower part of the spinal column to collect a sample of cerebrospinal fluid (CSF) for diagnostic testing or to therapeutic purposes [1]. Lumbar punctures are commonly used to diagnose and monitor various neurological conditions, such as meningitis, encephalitis, Guillain-Barré syndrome, multiple sclerosis, and certain types of cancer that affect the central nervous system [2].

Globally, the acceptance and attitudes towards lumbar puncture procedures have been found to vary significantly. Some studies have reported high refusal rates, particularly among parents of pediatric patients. For instance, a study in East Asia found that the lumbar puncture refusal rate ranged from 25% to 28% among parents of children with febrile seizures [3,4]. Similarly, a study in the United Arab Emirates reported a refusal rate of 44% among parents [5]. In contrast, refusal rates were much lower in the United States (5% for Lyme disease patients) and Denmark (7% for patients with isolated optic neuritis) [6,7]. These differences suggest that attitudes towards lumbar puncture may be influenced by cultural beliefs, geographical location, and levels of public knowledge and awareness.

In Saudi Arabia, a similar pattern of parental attitudes towards LP has been observed. A study in the southern region found that the most common reasons for refusal were relatives' opinions, media influence, and previous negative experiences [5]. Another study in Riyadh reported that fear of complications, particularly paralysis, was the main driver of parental refusal, with 64.2% of parents citing this concern [8]. Lack of awareness about the purpose and necessity of LP was also a significant factor, with 49% of parents believing the procedure was unnecessary [9]. Interestingly, the study found that when the benefits of LP were explained to parents, 78.1% were willing to provide consent, compared to only 21% when the benefits were not clarified [9].

Aim of the Study

The aim of this research is to assess the perceptions and attitudes of parents in Jeddah, Saudi Arabia, towards lumbar puncture procedures in pediatric care. Additionally, the study seeks to evaluate parents' general awareness of the purpose and process of lumbar puncture, examine their perceptions of the risks and benefits, and identify common misconceptions. It also aims to determine the primary sources of information parents rely on, explore how their educational background influences their knowledge and attitudes, and investigate the role of healthcare providers in shaping parental perspectives on lumbar puncture.

Methodology

Study design

In this cross-sectional study, we explored Jeddah city over a three-months duration, from October to December 2024, to examine perceptions, opinions, attitudes, fear, and anxiety through parents in Jeddah, Saudi Arabia toward the lumbar puncture procedure within pediatric care settings.

Study population

The study population consisted of 503 participants within Jeddah, Saudi Arabia, either their first time lumbar puncture and parental consent or children previously experienced lumbar puncture. We employed convenience sampling, allowing participants to join based on their willingness and consent. Initially, 494 individuals were considered, and 9 were excluded for not willing to give consent.

Inclusion criteria

The inclusion criteria for this study specify that participants must be parents residing in Jeddah, Saudi Arabia, who have pediatric patients (children under the age of 14) who may potentially undergo or have already undergone lumbar puncture procedures. Participants must be able to understand and communicate in either Arabic or English, and they must be willing to participate in the study by providing informed consent.

Exclusion criteria

The exclusion criteria exclude parents who do not have a child under the age of 14, those who are unable to understand or communicate in Arabic or English, and parents who either decline to participate or are unable to provide informed consent. Additionally, parents of pediatric patients with significant cognitive or communication impairments that would hinder their ability to answer the questionnaire effectively are also excluded from the study.

Data collection

Data collection was conducted through an online survey distributed via social media platforms and schools. The questionnaire included perception, opinion, and attitude. This comprehensive approach aimed to ensure thorough and inclusive data collection related to the parents' perception and risk factors toward the lumbar puncture in pediatric care.

Ethical consideration

Formal approval from the Research Ethics Committee at the University of Jeddah was received Request No. UJ-REC-218. Informed consent was obtained from all participants. Confidentiality was ensured, and no demographic or personal data, such as the full names of patients, were exposed or distributed.

Statical analysis

Descriptive statistics summarized demographic characteristics and responses to knowledge and attitude questions, presenting frequencies and percentages. Using chi-square tests, bivariate analysis was conducted to examine associations between demographic factors and knowledge levels, with p-values reported to indicate statistical significance. The overall knowledge score was calculated and categorized using the median as a cut-off point. Finally, multivariate logistic regression analysis was performed to identify factors independently associated with sufficient knowledge about lumbar puncture procedures, reporting adjusted odds ratios (aOR) with 95% confidence intervals and p-values. 7 people who did not agree to participate were excluded from the analysis.

Results

The study sample comprised 494 parents of pediatric patients, with mothers representing the majority (66.2%, n = 327) compared to fathers (33.8%, n = 167). Participants' ages were distributed across four categories, with the largest group falling in the 26-35 years range (34.0%, n = 168), followed closely by those aged 36-45 years (31.8%, n = 157). The 18-25 years and over 45 years age groups represented smaller proportions at 18.6% (n = 92) and 15.6% (n = 77), respectively.

The sample was predominantly Saudi nationals (87.7%, n = 433), with non-Saudi participants accounting for 12.3% (n = 61) of the total. Regarding educational attainment, more than half of the participants held a bachelor's degree (54.7%, n = 270), while 21.9% (n = 108) had completed high school, 14.8% (n = 73) held a diploma, and 8.7% (n = 43) had pursued higher education. Notably, the vast majority of participants (88.9%, n = 439) reported that their child had not undergone a lumbar puncture procedure, with only 11.1% (n = 55) indicating prior experience with this medical intervention (Table 1).

		N	N%
Relation to the patient	Father	167	33.8%
	Mother	327	66.2%
Age	18-25	92	18.6%
	26-35	168	34.0%
	36-45	157	31.8%
	> 45	77	15.6%
Nationality	Saudi	433	87.7%
	Non-Saudi	61	12.3%
Educational level	High School	108	21.9%
	Diploma	73	14.8%
	Bachelor's	270	54.7%
	Higher education	43	8.7%
Has your child had a lumbar puncture (back biopsy)?	No	439	88.9%
	Yes	55	11.1%

Table 1: *Demographic characteristics of participants.*

The study assessed parental knowledge and perceptions of lumbar puncture procedures using a series of seven questions, with each correct response awarded one point. The maximum achievable score was 7, and the median score was used as the cut-off to categorize participants as having sufficient or insufficient knowledge.

A high percentage of parents (91.3%, n = 451) correctly identified that lumbar puncture involves inserting a needle into the lower back to access the spinal canal. Similarly, 84.4% (n = 417) accurately recognized the procedure's diagnostic and therapeutic applications. Most participants (81.4%, n = 402) were aware that the procedure involves removing a small amount of spinal fluid for testing. However, there was less certainty regarding the procedure's comfort level, with only 56.3% (n = 278) correctly identifying that it usually requires anesthesia or sedation.

A majority (84.2%, n = 416) understood that the procedure is generally safe when performed by trained professionals. There was some misunderstanding about recovery time, with 62.1% (n = 307) correctly noting that it does not typically require an extensive hospital stay. Most parents (85.6%, n = 423) were aware that concerns often include fear of long-term complications.

Overall, the mean knowledge score was 5 out of 7 (SD = 1), with a range of 1-7 and a median of 6 (IQR = 5-6), indicating generally good understanding among the participants, with room for improvement in certain areas (Table 2).

		N (N%) (Correct)
Lumbar puncture (CSF tapping) procedures involve inserting a needle into the lower back to access the spinal canal.		451 (91.3)
Lumbar puncture (CSF tapping) procedures are used to diagnose diseases such as meningitis and multiple sclerosis, as well as to administer medications into the spinal fluid.		417 (84.4)
Lumbar puncture (CSF tapping) involves removing a small amount of spinal fluid for testing.		402 (81.4)
A lumbar puncture (CSF tapping) procedure is usually painless and does not require any type of anesthesia or sedation.		278 (56.3)
Lumbar puncture (CSF tapping) is usually safe when performed by trained professionals.		416 (84.2)
Recovery time after a lumbar puncture (CSF tapping) is usually long and requires an extensive hospital stay.		307 (62.1)
Parents' concerns about a lumbar puncture (CSF tapping) often include fear of long-term complications for their child.		423 (85.6)
Overall Score, Mean (SD)/ Range, Median (IQR)	5(1)/1-7	6 (5-6)
*CSF: Cerebrospinal Fluid, SD: Standard Deviation, IQR: Interquartile Range.		

Table 2: *Parental knowledge and perceptions of lumbar puncture procedures in pediatric care.*

Regarding the necessity of the procedure, 52.9% of parents either agreed or strongly agreed that lumbar puncture is necessary for diagnosing serious medical conditions in children, while 15.2% disagreed or strongly disagreed, and 32.0% remained neutral. When asked about their comfort level with their child undergoing the procedure based on a doctor's recommendation, responses were more varied: 33.0% agreed or strongly agreed, 33.0% disagreed or strongly disagreed, and 34.0% were neutral.

Trust in medical staff's skills and experience was relatively high, with 57.5% agreeing or strongly agreeing, 14.0% disagreeing or strongly disagreeing, and 28.5% remaining neutral. Concerns about potential pain during the procedure were prevalent, with 68.2% of parents agreeing or strongly agreeing, compared to 11.7% who disagreed or strongly disagreed, and 20.0% who were neutral. Similarly, concerns about potential complications or side effects were high, with 70.4% agreeing or strongly agreeing, 9.5% disagreeing or strongly disagreeing, and 20.0% neutral.

Regarding the risk-benefit assessment, 46.4% agreed or strongly agreed that the benefits outweigh the risks, while 14.7% disagreed or strongly disagreed, and 38.9% were neutral. On the topic of informed decision-making, 34.5% of parents felt they had enough information, 26.9% disagreed, and 38.7% were neutral. Lastly, a majority of parents (52.6%) indicated they would seek a second opinion if a lumbar puncture was recommended for their child, while 16.8% would not, and 30.6% were neutral (Table 3).

		N	N%
I believe that a lumbar puncture (CSF tapping) is a necessary procedure to diagnose serious medical conditions in children.	Strongly disagree	37	7.5%
	Disagree	38	7.7%
	Neutral	158	32.0%
	Agree	152	30.8%
	Strongly agree	109	22.1%
I feel comfortable having my child have a lumbar puncture (CSF tapping) if the doctor recommends it.	Strongly disagree	67	13.6%
	Disagree	96	19.4%
	Neutral	168	34.0%
	Agree	101	20.4%
	Strongly agree	62	12.6%
I trust that the medical staff performing the lumbar puncture (CSF tapping) has the necessary skills and experience.	Strongly disagree	24	4.9%
	Disagree	45	9.1%
	Neutral	141	28.5%
	Agree	171	34.6%
	Strongly agree	113	22.9%
I am concerned about the potential pain my child may experience during a lumbar puncture (CSF tapping).	Strongly disagree	18	3.6%
	Disagree	40	8.1%
	Neutral	99	20.0%
	Agree	162	32.8%
	Strongly agree	175	35.4%
I am concerned about the potential complications or side effects of a lumbar puncture (CSF tapping) on my child.	Strongly disagree	16	3.2%
	Disagree	31	6.3%
	Neutral	99	20.0%
	Agree	173	35.0%
	Strongly agree	175	35.4%
I believe the benefits of a lumbar puncture (CSF tapping) outweigh the risks for my child.	Strongly disagree	20	4.0%
	Disagree	53	10.7%
	Neutral	192	38.9%
	Agree	149	30.2%
	Strongly agree	80	16.2%
I feel I have enough information about the lumbar puncture procedure to make an informed decision about my child.	Strongly disagree	49	9.9%
	Disagree	84	17.0%
	Neutral	191	38.7%
	Agree	103	20.9%
	Strongly agree	67	13.6%

I would seek a second opinion if a lumbar puncture (CSF tapping) is recommended for my child.	Strongly disagree	35	7.1%
	Disagree	48	9.7%
	Neutral	151	30.6%
	Agree	159	32.2%
	Strongly agree	101	20.4%
*CSF: Cerebrospinal Fluid			

Table 3: *Parental attitudes and concerns regarding lumbar puncture procedures in pediatrics care.*

Regarding the effectiveness of physicians in providing information about the procedure, a majority of parents (77.8%) found physicians to be either effective (22.7%, n = 112) or very effective (55.1%, n = 272). Only a small proportion (5.9%) considered physicians ineffective (4.7%, n = 23) or very ineffective (1.2%, n = 6), while 16.4% (n = 81) remained neutral. These findings suggest that most parents perceive physicians as competent in explaining the lumbar puncture procedure.

When asked about the influence of previous medical experiences on their attitude toward lumbar puncture, half of the respondents (50.4%, n = 249) reported no influence. Among those who acknowledged an impact, more parents reported a positive influence (36.0%, n = 178) compared to a negative one (13.6%, n = 67). This indicates that prior medical experiences generally either positively shape or do not affect parents' attitudes towards the procedure.

Concerning the likelihood of seeking a second opinion before consenting to a lumbar puncture for their child, a substantial majority of parents (64.8%) indicated they were either likely (21.9%, n = 108) or highly likely (42.9%, n = 212) to do so. Only 11.9% of parents were unlikely (7.9%, n = 39) or highly unlikely (4.0%, n = 20) to seek a second opinion, while 23.3% (n = 115) remained neutral (Table 4).

		N	N%
How effective is the physician in providing information about the lumbar puncture (CSF tapping) procedure?	Very ineffective	6	1.2%
	Ineffective	23	4.7%
	Neutral	81	16.4%
	Effective	112	22.7%
	Very effective	272	55.1%
Have your previous experiences with medical procedures influenced your attitude toward a lumbar puncture (CSF tapping)?	Yes, positively	178	36.0%
	Yes, negatively	67	13.6%
	No	249	50.4%
How likely are you to seek a second opinion before agreeing to a lumbar puncture (CSF tapping) for your child?	Highly unlikely	20	4.0%
	Unlikely	39	7.9%
	Neutral	115	23.3%
	Likely	108	21.9%
	Highly likely	212	42.9%
*CSF: Cerebrospinal Fluid			

Table 4: *Physician effectiveness, prior experiences, and second opinion seeking behavior.*

Regarding reasons for refusing a lumbar puncture due to doctor's behavior, lack of explanation of the procedure was the most prevalent concern (35.4%, n = 175), followed by urgency in consultation (28.5%, n = 141). Ignoring parental fears (18.4%, n = 91) and lack of empathy and understanding (14.8%, n = 73) were also significant factors, while language barriers were a minor concern (2.8%, n = 14) (Table 5a).

What is the main reason that makes you refuse a lumbar puncture due to the doctor's behavior?	N	N%
Ignore my fears	91	18.4%
Inability to communicate effectively due to language barrier	14	2.8%
Lack of empathy and understanding	73	14.8%
Lack of explanation of the procedure	175	35.4%
Urgency in consultation	141	28.5%

Table 5a: *Factors influencing parental decision-making.*

Parents expressed various specific concerns about their child undergoing a lumbar puncture. Long-term complications were the most common worry (56.7%, n = 280), closely followed by severe pain (52.2%, n = 258). Nerve damage was a significant concern for 46.0% (n = 227) of parents. Other notable concerns included infection (33.8%, n = 167), bleeding (31.6%, n = 156), reaction to anesthesia (30.0%, n = 148), headache (28.5%, n = 141), increased intracranial pressure (27.9%, n = 138), and emotional trauma (21.9%, n = 108).

When asked about reasons for potentially refusing a lumbar puncture, fear of complications was the primary factor (67.2%, n = 332), followed by concern about pain or discomfort for the child (56.1%, n = 277). Lack of understanding of the procedure was also a significant factor (31.6%, n = 156), while previous negative experiences (19.6%, n = 97) and advice from friends or family (12.1%, n = 60) were less influential.

Regarding sources of information for medical decision-making, doctors and healthcare providers were the most trusted source (77.5%, n = 383). Medical websites and online resources were also popular (48.4%, n = 239), followed by friends and family (31.2%, n = 154). Social media (16.0%, n = 79) and traditional media (7.7%, n = 38) were less commonly relied upon for medical information (Table 5b).

		N	N%
Specific reasons you have concerns about your child having a lumbar puncture	Infection	167	33.8%
	Bleeding	156	31.6%
	Headache	141	28.5%
	Nerve damage	227	46.0%
	Increased ICP	138	27.9%
	Long term complications	280	56.7%
	Severe pain	258	52.2%
	Reaction to anesthesia	148	30.0%
	Emotional trauma	108	21.9%
Why might you refuse a lumbar puncture for your child	Fear of complications	332	67.2%
	Pain or discomfort for the child	277	56.1%
	Previous negative experience	97	19.6%
	Lack of understanding of the procedure	156	31.6%
	Advice from friends/family	60	12.1%

Source of information you rely upon to make decision about medical procedures	Doctors and healthcare providers	383	77.5%
	Medical websites and online resources	239	48.4%
	Friends and family	154	31.2%
	Social media	79	16.0%
	Traditional media	38	7.7%
*ICP: Intracranial Pressure.			

Table 5b: *Factors influencing parental decision-making.*

Regarding the relationship to the patient, mothers were more likely to have sufficient knowledge (71.1%, n = 194) compared to fathers (28.9%, n = 79). This difference was statistically significant (p = 0.011), suggesting that mothers tend to be better informed about the procedure.

Age was also significantly associated with knowledge levels (p = 0.036).

The 36-45 age group had the highest proportion of individuals with sufficient knowledge (34.8%, n = 95), followed by the 26-35 age group (30.0%, n = 82). Interestingly, the over 45 age group showed a higher proportion of sufficient knowledge (18.3%, n = 50) compared to insufficient knowledge (12.2%, n = 27).

Nationality did not show a statistically significant association with knowledge levels (p = 0.456), with both Saudi and non-Saudi parents showing similar proportions of sufficient and insufficient knowledge. Educational level demonstrated a highly significant association with knowledge (p < 0.001). Parents with a bachelor's degree were more likely to have sufficient knowledge (63.7%, n = 174) compared to those with lower educational levels.

Similarly, those with higher education showed a greater proportion of sufficient knowledge (11.7%, n = 32) compared to insufficient knowledge (5.0%, n = 11).

Previous experience with lumbar puncture procedures for their child did not show a statistically significant association with knowledge levels (p = 0.121) (Figure 1).

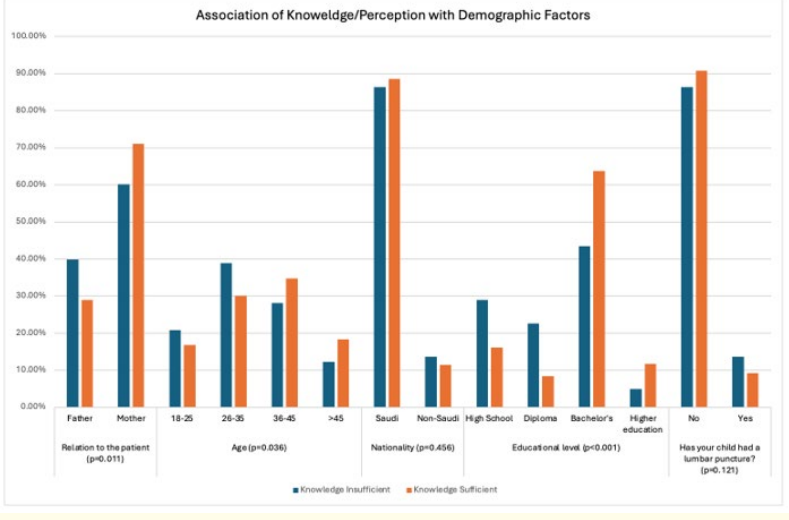

Figure 1: *Association of knowledge with demographic factors.*

Discussion

The findings of this study provide valuable insights into the general awareness and perceptions of parents in Jeddah regarding lumbar puncture (LP) procedures in pediatric care.

The results indicate a generally high level of awareness among parents about the basic purpose and process of the lumbar puncture procedure. However, there were notable gaps in knowledge, particularly regarding the use of anesthesia or sedation during the procedure. Research has shown that parental knowledge and attitudes significantly influence their acceptance of medical procedures for their children [10]. A study by Deng., *et al*. found that improved parental understanding of LP was associated with higher consent rates and reduced anxiety [11].

The study revealed mixed perceptions among parents regarding the risks and benefits of LP. While many recognized its necessity for diagnosing serious conditions, there was considerable concern about pain and potential complications. This aligns with findings from other studies that have identified fear of complications as a primary reason for parental refusal of LP [5].

Interestingly, despite these concerns, most parents expressed trust in the medical staff's skills. This trust could be leveraged to alleviate some anxiety surrounding the procedure. Research by Thakur., *et al*. demonstrated that effective communication from healthcare providers about the procedure's safety and importance can significantly improve parental acceptance [12].

The high proportion of parents indicating they would seek a second opinion before consenting to LP highlights the importance of clear, comprehensive communication between healthcare providers and parents. A study by Onyett., *et al.* found that providing detailed information about the procedure, its risks, and benefits significantly improved parental understanding and acceptance of LP [13].

Parents in our study shared several concerns about their child undergoing a lumbar puncture. The most common worry was long-term complications (56.7%), followed by severe pain (52.2%) and nerve damage (46.0%). Other concerns included infection (33.8%), bleeding (31.6%), reactions to anesthesia (30.0%), headaches (28.5%), increased intracranial pressure (27.9%), and emotional trauma (21.9%). When considering reasons for refusing the procedure, fear of complications was the leading factor (67.2%), with concerns about pain or discomfort (56.1%) also playing a major role. Additionally, a lack of understanding of the procedure (31.6%) and previous negative experiences (19.6%) were significant, while advice from friends or family (12.1%) was less commonly reported.

Alwahbi., *et al*. reported that many Saudi Arabian parents refuse consent for lumbar puncture in their children due to fears of side effects and lack of awareness about its usefulness [14]. While another study reported that the main reason parents refused lumbar punctures for their children was fear of paralysis, and the informed consent process by the physician significantly influenced parental attitudes [15]. This is aligned with study conducted in Pakistan found that parents frequently refuse lumbar punctures for their children due to fears of complications like paralysis, also death, epilepsy [16].

Regarding the sources of information, the parents in this study for medical decisions, doctors and healthcare providers were the most trusted (77.5%). Medical websites and online resources were also commonly used (48.4%), followed by friends and family (31.2%). Social media (16.0%) and traditional media (7.7%) were less frequently relied upon.

Similarly, Khakshour A observed that the primary source of information for parents regarding lumbar punctures is healthcare providers, as improved information from them can influence parental beliefs and cooperation [17]. These results conflict with Deng., *et al*. which found the main sources of information on lumbar punctures for parents were relatives/friends, and doctors often did not adequately explain the reasons for the procedure [11].

Findings of our study revealed a strong connection between educational background and having adequate knowledge and a positive attitude toward LP. This suggests that education plays a critical role in shaping parental perceptions and readiness to consent to the procedure.

Comparing this to the findings of other studies, some discrepancies emerge. One study suggested that limited knowledge about LP and concerns over complications contribute to parental refusal, regardless of educational background [9]. This contrasts with our findings, as we identified education as a significant factor influencing both knowledge and attitudes. On the other hand, the references' findings in another study indicated that educational level does not impact parents' knowledge or attitudes toward LP [14]. Interestingly, a third study aligned more closely with our findings, showing that parents' educational level does affect their knowledge and attitudes toward LP, leading to a higher likelihood of refusal due to fears and misconceptions [11]. This supports our conclusion that targeted educational interventions may be necessary to address misconceptions and improve acceptance rates.

Conclusion

This cross-sectional study in Jeddah, Saudi Arabia, provides valuable insights into parental perceptions and attitudes towards lumbar puncture procedures in pediatric care. The results indicate generally good understanding among parents, with a mean knowledge score of 5 out of 7. However, there's room for improvement in certain areas, particularly regarding the procedure's comfort level and recovery time. While most parents recognize the necessity and safety of lumbar punctures, significant concerns persist about pain, complications, and long-term effects. Notably, maternal status and higher education levels were associated with better knowledge about the procedure. The study also highlights the critical role of healthcare providers in effectively communicating information about lumbar punctures, as they were identified as the most trusted source of medical information by parents.

Human Ethics

Ethical approval was obtained from the Research Ethics Committee in University of Jeddah, request number HAP-02-J-094 and application number UJ-REC-276, dated September 30, 2024. The participants were assured of the confidentiality and anonymity of the information they provided. No financial benefits were offered to the participants.

Participants' Consent

An informed consent was obtained from every participant in this study.

Availability of Data and Material

The datasets used and analyzed during the study are available from the corresponding author upon reasonable request. However, due to privacy issues, the data are not publicly available. The authors confirm that all figures and tables included in the manuscript are original and created by the authors.

Competing Interest

The authors declare that they have no competing interests.

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Author Contributions

Yara was responsible for the conception of the idea and study design. Abdullah and Hamda contributed to the questionnaire design, all authors handled data collection and entry. Ammar and Fatimah performed data analysis and interpretation, and Shaimaa and Dareen

were responsible for manuscript drafting and writing. Wejdan supervised the entire project. All authors critically revised the manuscript, approved the final version to be published, and agreed to be accountable for all aspects of the work.

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