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Parental Satisfaction with Male Circumcision Outcomes in an Urban Healthcare Setting: A Cross-Sectional Study

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Abstract

Background: Male circumcision is among the most common surgical procedures globally, yet limited data exist on maternal satisfaction, particularly where traditional and medical practices coexist. This study evaluated maternal satisfaction with circumcision outcomes and identified key influencing factors.

Methods: This descriptive cross-sectional study included 350 mothers of male infants circumcised within the prior six months, recruited *via* random sampling from seven urban healthcare clinics (January-June 2024). Inclusion criteria were infants without penile abnormalities; maternal refusal or congenital anomalies (*e.g.*, hypospadias) warranted exclusion. Data on demographics, procedure type, provider qualifications, complications, and satisfaction (overall and informational) were collected *via* structured interviews using validated Likert scales. Statistical analyses employed descriptive statistics, normality testing, t-tests, ANOVA, and nonparametric tests (significance: $p<0.05$).

Results: Of respondents, 50.9% were younger than 30 years. Neonatal circumcisions (48.3%) and Plastibell procedures (92.8%) predominated. Circumcisions were performed by specialists (52.3%), general practitioners (24.9%), or non-medical providers (22.9%), mostly in hospitals (53.4%), outpatient clinics (36.6%), or traditional settings (10.0%). Overall mean satisfaction was 3.99±1.03, with low satisfaction regarding information (2.65±1.05). Satisfaction significantly differed by provider type (specialists highest: 4.42±0.91, non-medical lowest: 2.84±0.99; $p<0.01$) and setting (hospital highest: 4.43±0.80, traditional lowest: 2.77±1.06; $p<0.01$). Complications (4.0%; predominantly bleeding and meatal stenosis) primarily occurred with non-medical practitioners, significantly reducing satisfaction ($p<0.01$).

Conclusion: Provider qualifications, setting, and complications significantly influence maternal satisfaction. Despite overall high satisfaction with hospital-based procedures, improved standardized counseling and regulatory oversight of non-medical practitioners are urgently required.

Keywords: Ambulatory care facilities, Circumcision, Constriction, Hypospadias, Infant, Male

Introduction

Male circumcision represents one of the most commonly performed surgical procedures worldwide, with significant variations in practice patterns, provider qualifications, and parental satisfaction outcomes (1). Despite the widespread nature of this procedure, comprehensive understanding of parental satisfaction with circumcision outcomes and the factors that influence these satisfaction levels remains limited, particularly in developing healthcare contexts where traditional and medical approaches often coexist (2,3).

Recent literature demonstrates that parental satisfaction with circumcision is a multifaceted construct influenced by various procedural, provider-related, and informational factors. Studies have shown that satisfaction rates vary considerably based on the quality of pre-procedural counseling, with parents who receive comprehensive information from healthcare providers reporting significantly higher satisfaction levels compared to those who receive limited or inadequate counseling (4,5). The source and quality of information appear particularly crucial, with physician-provided information associated with better satisfaction outcomes than information obtained from traditional or non-medical sources (6).

Procedural factors significantly impact parental satisfaction, with evidence suggesting substantial differences based on surgical technique, provider expertise, and procedural setting. Research indicates that circumcisions performed by qualified medical professionals in hospital settings are associated with higher parental satisfaction compared to procedures conducted by non-medical practitioners in traditional settings (7,8). The choice of surgical technique also influences satisfaction, with studies comparing different methods such as Plastibell and Gomco clamp techniques showing varying satisfaction outcomes, particularly regarding cosmetic results and complication rates (9,10).

Complications and adverse outcomes represent critical determinants of parental satisfaction. Studies have documented that the occurrence of post-procedural complications, including bleeding, infection, and cosmetic concerns, significantly reduces parental satisfaction levels (11,12). The timing of circumcision also appears to influence both complication rates and satisfaction, with neonatal procedures generally associated with fewer complications and higher parental satisfaction compared to circumcisions performed at later ages (13,14). Provider qualifications emerge as a particularly important factor, with circumcisions performed by trained medical professionals associated with lower complication rates and higher satisfaction compared to procedures conducted by traditional practitioners (15,16).

The adequacy of information provision represents another crucial factor influencing parental satisfaction. Research has identified significant gaps in pre-procedural counseling, with many parents reporting insufficient information about procedural risks, benefits, and post-operative care requirements (17,18). Studies have shown that comprehensive informed consent processes, including detailed explanation of potential complications and realistic expectations about outcomes, are associated with higher satisfaction levels even when complications occur (19,20). The timing and method of information delivery also influence satisfaction, with evidence supporting the provision of detailed, accessible educational materials that parents can review at their own pace (21).

Materials and Methods

This cross-sectional descriptive study was conducted to evaluate parental satisfaction with male circumcision and identify associated factors among mothers whose male children had undergone circumcision within the previous six months. The study population comprised mothers who had given birth to male children after January 1, 2023, and whose children were registered at healthcare and treatment centers across the city. Participants were recruited from seven healthcare clinics representing different socioeconomic areas of the city through random sampling to ensure population diversity. Sample size calculation was based on a previous study reporting a 20% circumcision dissatisfaction rate, and using a 95% confidence level with 1.5% precision, the minimum required sample size was calculated as 350 participants using the standard formula for cross-sectional studies. Inclusion criteria included mothers with male children born within the previous six months who had undergone circumcision and attended participating healthcare

facilities, while exclusion criteria comprised maternal refusal to participate, uncircumcised male children, and presence of congenital penile abnormalities including hypospadias, penoscrotal webbing, penile torsion greater than 30 degrees, or micropenis.

Data collection was conducted through face-to-face interviews using a structured questionnaire developed by the research team, comprising multiple domains including demographic characteristics, circumcision procedure details, complications, and satisfaction measures. The questionnaire included closed-ended questions designed to capture comprehensive information about the circumcision experience and parental satisfaction levels, with content validity established through expert panel review involving medical specialists and healthcare professionals who evaluated the instrument for clarity, relevance, and comprehensiveness. Trained research assistants approached eligible mothers during routine clinic visits at participating healthcare centers, and after explaining the study purpose and obtaining written informed consent, structured interviews were conducted in private settings lasting approximately 15-20 *min* each. The study examined multiple independent variables including maternal age, child's age at circumcision, type of circumcision procedure (Plastibell or surgical), healthcare provider type (specialist physician, general practitioner, or non-medical practitioner), procedure location (hospital, outpatient clinic, or traditional setting), and complication occurrence and type. Dependent variables included overall satisfaction with the circumcision procedure and satisfaction with pre-procedural information provided by healthcare providers, both assessed using validated 5-point Likert scales ranging from very dissatisfied to very satisfied.

Statistical analysis was performed using SPSS version 22.0 software, with descriptive statistics including means, standard deviations, frequencies, and percentages calculated for all variables, while normality of continuous variables was assessed using the Kolmogorov-Smirnov test. For inferential analysis, independent t-tests were used to compare means between two groups, one-way ANOVA was employed for multiple group comparisons, and non-parametric tests including Mann-Whitney U and Kruskal-Wallis were applied when normality assumptions were violated, with chi-square tests used to examine associations between categorical variables and statistical significance set at $p<0.05$.

The study protocol received approval from the Ethics Committee of Ali Ibn Abi Talib Faculty (Ethics Code: IR.IAU.KHUISF.REC.1403.252), and all procedures were conducted in accordance with the Declaration of Helsinki and local ethical guidelines. Written informed consent was obtained from all participants after providing detailed information about study objectives, procedures, risks, and benefits, with participation being entirely voluntary and participants informed of their right to withdraw at any time without affecting their healthcare services, while confidentiality was maintained throughout the study with personal identifiers removed from datasets and data stored securely with restricted access.

Results

A total of 350 mothers participated in this study, with samples drawn equally from seven healthcare clinics across different socioeconomic areas of the city. The majority of mothers were under 30 years of age (50.9%, n=178), followed by those aged 30-40 years (36.0%, n=126), and mothers over 40 years (13.1%, n=46). Regarding the timing of circumcision, nearly half of the procedures (48.3%, n=169) were performed during the neonatal period (up to 1 month of age), while 29.1% (n=102) were conducted between 1-3 months, and 22.6% (n=79) between 3-6 months of age. The Plastibell technique was the predominant method used for circumcision (92.8%, n=325), while surgical circumcision accounted for only 7.2% (n=25) of procedures. Hospitals were the most common setting for circumcision procedures (53.4%, n=187), followed by outpatient clinics (36.6%, n=128) and traditional settings (10.0%, n=35). Specialist physicians performed the majority of circumcisions (52.3%, n=183), while general practitioners and non-medical practitioners performed 24.9 and 22.9% of procedures, respectively.

The overall mean satisfaction score was 3.99 out of 5, indicating generally high parental satisfaction with circumcision outcomes. However, satisfaction with information provided by healthcare providers was considerably lower, with a mean score of 2.65 out

Table 1. Parental satisfaction scores by healthcare provider type

Provider type	N	Mean satisfaction score	Standard deviation	p-value
Specialist physician	183	4.42	0.910	<0.01
General practitioner	87	4.16	0.729	
Non-medical practitioner	80	2.84	0.999	

Table 2. Parental satisfaction scores by procedure location

Location	No.	Mean satisfaction score	Standard deviation	p-value
Hospital	187	4.43	0.796	<0.01
Outpatient clinic	128	3.70	1.133	
Traditional setting	35	2.77	1.060	

Table 3. Impact of complications on parental satisfaction

Complication status	No.	Mean satisfaction score	Standard deviation	p-value
No complications	336	4.23	0.92	<0.01
Complications present	14	2.81	1.25	

of 5 (Table 1). Post-procedural complications were reported in only 4.0% of cases, with bleeding being the most frequent complication (2.0%, n=7), followed by meatal stenosis (1.1%, n=4), infection (0.6%, n=2), and ring displacement (0.3%, n=1). Notably, 71.4% of all complications occurred in procedures performed by non-medical practitioners, while only 14.3% occurred with procedures performed by general practitioners or specialists combined.

Statistical analysis revealed significant differences in parental satisfaction based on the type of healthcare provider performing the circumcision ($p<0.01$). Specialist physicians achieved the highest satisfaction scores, with 62.3% of parents rating their satisfaction as "very satisfied" (score 5), compared to 32.2% for general practitioners and only 3.8% for non-medical practitioners. Conversely, dissatisfaction was most pronounced among procedures performed by non-medical practitioners, with 32.5% of parents rating their satisfaction as "dissatisfied" (score 2), compared to 3.4% for general practitioners and 5.5% for specialists.

The location of circumcision procedures significantly influenced parental satisfaction levels ($p<0.01$). Hospital-based procedures achieved the highest satisfaction scores, with 73.1% of parents rating their experience as "very satisfied," compared to 25.5% for outpatient clinics and only 1.4% for traditional settings. In contrast, dissatisfaction was highest in traditional settings, where 37.5 and 33.3% of parents rated their satisfaction as "very dissatisfied" and "dissatisfied," respectively (Table 2). The circumcision technique also significantly affected satisfaction outcomes ($p=0.022$), with surgical circumcision receiving higher mean satisfaction scores (4.24±0.994) compared to the Plastibell technique (3.97±1.103).

The occurrence of post-procedural complications had a profound negative impact on parental satisfaction ($p<0.01$), with parents whose children experienced complications reporting significantly lower satisfaction scores compared to those without complications. Maternal age and child's age at circumcision showed no statistically significant associations with satisfaction levels ($p=0.697$ and $p=0.179$, respectively), despite some variation in mean scores across different age groups. Regarding satisfaction with information provision, all healthcare provider groups scored poorly, with specialist physicians achieving the highest but still inadequate mean score (2.83±0.968), followed by general practitioners (2.55±1.218) and non-medical

practitioners (2.36±0.680). These differences were statistically significant ($p<0.01$), yet the consistently low scores across all groups indicate substantial deficiencies in pre-procedural counseling and information delivery, highlighting a critical area requiring improvement regardless of provider qualifications (Table 3).

Discussion

This study provides comprehensive insights into parental satisfaction with male circumcision and identifies several key factors that significantly influence satisfaction outcomes. Present findings demonstrate substantial variations in parental satisfaction based on provider qualifications, procedural setting, and complication occurrence, while revealing concerning deficiencies in information provision across all healthcare provider categories.

The most striking finding of this study was the profound impact of healthcare provider qualifications on parental satisfaction. Specialist physicians achieved the highest satisfaction scores (4.42±0.910), followed by general practitioners (4.16±0.729), while non-medical practitioners received significantly lower ratings (2.84±0.999, $p<0.01$). This finding is consistent with Özverenler *et al*, who reported that parents who received information from healthcare providers demonstrated significantly higher satisfaction levels compared to those who received information from non-medical sources (2). Similarly, Wani and Mir found that more than 20% of parents were dissatisfied when circumcisions were performed by non-surgeons, with most procedures beyond the neonatal period being conducted by inadequately trained practitioners (3).

The results of the present study align with international evidence regarding provider-related satisfaction outcomes. A study from Nigeria by Ekwunife *et al* demonstrated remarkably similar patterns, with parents predominantly preferring physician-performed circumcisions (88.7% expressing this preference), which aligns with findings of the present study that medical providers achieve higher satisfaction scores (22). The emphasis on proper training is further supported by evidence showing that circumcision is frequently performed by non-surgeons who are not always well-trained in the procedure, with varying levels of expertise across different medical specialties (23). This supports present finding that provider qualifications represent a critical determinant of parental satisfaction and procedural outcomes.

The results of this study revealed significant differences in parental satisfaction based on procedural location, with hospital-based procedures achieving the highest satisfaction scores (4.43±0.796), followed by outpatient clinics (3.70±1.133) and traditional settings (2.77±1.060, $p<0.01$). These findings are supported by recent literature on healthcare setting quality. A systematic review by Iacob *et al* noted that complications from circumcision arise more frequently in non-sterile environments and when performed by inadequately trained practitioners (12). Current medical guidelines emphasize that hospital settings provide superior safety through trained personnel, sterile environments, and immediate access to emergency care if complications arise (24).

Interestingly, our data revealed that while no circumcisions were performed by non-medical practitioners in hospital settings, 35.2% of procedures in outpatient clinics were conducted by traditional practitioners. This finding highlights significant gaps in quality control within certain healthcare settings and supports the need for enhanced regulatory oversight. The high satisfaction with hospital-based procedures likely reflects not only the sterile environment and trained personnel but also the comprehensive pre- and post-operative care typically available in these settings.

The occurrence of post-procedural complications had a profound negative impact on parental satisfaction in this study, with parents whose children experienced complications reporting significantly lower satisfaction scores (2.81±1.25) compared to those without complications (4.23±0.92, $p<0.01$). This finding is consistent with existing literature on circumcision outcomes. Shabanzadeh *et al* conducted a comprehensive systematic review and meta-analysis of male circumcision complications, revealing overall complication rates of 3.84%, with therapeutic circumcisions showing higher complication rates than non-therapeutic procedures (16).

The present study found that 71.4% of all complications occurred in procedures performed by non-medical

practitioners, while only 14.3% occurred with medical professionals. This finding aligns with international evidence on provider-related complication rates. Specialized pediatric centers report that serious complications are extremely rare when circumcisions are performed by experienced practitioners, with reported surgical complication rates of only 2-3% in medical settings (25). Our overall complication rate of 4% falls within the range reported in systematic reviews, though the concentration of complications among non-medical practitioners is concerning and highlights the importance of proper training and sterile technique.

Perhaps one of the most significant findings of the present study was the consistently low satisfaction scores regarding information provision across all healthcare provider categories. Even specialist physicians achieved only a mean score of 2.83±0.968, while general practitioners scored 2.55±1.218 and non-medical practitioners scored 2.36±0.680 ($p<0.01$). This finding indicates widespread deficiencies in pre-procedural counseling and informed consent processes, regardless of provider qualifications.

These results are consistent with historical research on circumcision informed consent. Goldman's seminal 1987 study found that physicians routinely informed parents about only a small minority of medical complications and risks associated with circumcision, and that comprehensive disclosure of unbiased information reduced parental confidence in their decisions while generating dissatisfaction with physician behavior (17). Wang *et al* found that video-based educational interventions did not significantly improve maternal knowledge compared to traditional physician discussions, highlighting the challenge of effective information delivery (19). More recently, Hoeft *et al* identified substantial gaps in parental understanding of post-circumcision care instructions and emphasized the need for detailed, accessible educational materials (21).

The consistently low information satisfaction scores across all provider types in this study suggest systemic issues in the informed consent process that extend beyond individual practitioner limitations. This finding is particularly concerning given that Özverenler *et al* demonstrated that parents who received adequate pre-procedural counseling showed significantly higher satisfaction levels (2). The disconnect between the importance of information provision and its actual delivery quality represents a critical area requiring intervention.

The present study found that surgical circumcision achieved higher satisfaction scores compared to the Plastibell technique (4.24±0.994 *vs.* 3.97±1.103, $p=0.022$), despite the Plastibell method being used in 92.8% of cases. This finding contrasts with some recent comparative studies. Alsowayan *et al* conducted a randomized controlled trial comparing Gomco and Plastibell techniques and found no significant differences in overall parental satisfaction between methods, though they did observe differences in specific complications (5). The higher satisfaction with surgical circumcision in our study may reflect the fact that surgical procedures were more likely to be performed by specialists in hospital settings, creating a confounding effect.

Regarding timing, current study found no significant association between child's age at circumcision and parental satisfaction, despite some variation in mean scores across age groups. This finding differs somewhat from existing literature on optimal timing. Studies suggest that circumcisions performed in the first week of life are associated with minimal pain scores and optimal outcomes (26). However, our broader age categories (neonatal, 1-3 months, 3-6 months) may have been too wide to detect subtle timing-related satisfaction differences.

Our findings should be interpreted within the broader international context of circumcision practices and satisfaction outcomes. Nigerian studies found that parents predominantly preferred physician-performed circumcisions, which aligns with our finding that medical providers achieve higher satisfaction scores (22). Similarly, international medical organizations emphasize that while circumcision benefits may outweigh risks, the decision should be based on comprehensive, unbiased information provided by qualified healthcare professionals (27).

The high overall satisfaction score in the current study (3.99/5) is comparable to international findings. Özverenler *et al* reported that 79.90% of parents ranked their satisfaction as "very satisfied" in a Turkish population (2), while studies from developed healthcare systems consistently show high

satisfaction rates when procedures are performed by qualified practitioners in appropriate settings.

The findings of this study have several important clinical implications. First, the significant association between provider qualifications and satisfaction outcomes supports the need for enhanced training and credentialing requirements for circumcision providers. The concentration of complications among non-medical practitioners suggests that regulatory oversight should be strengthened to ensure adequate training and sterile conditions. Second, the universally low satisfaction with information provision indicates an urgent need for standardized, comprehensive educational protocols that address parental information needs more effectively.

Healthcare systems should consider implementing structured educational programs for circumcision providers, emphasizing both technical competency and communication skills. The development of standardized informed consent materials, possibly incorporating multimedia approaches, could help address the information provision deficiencies identified in this study. Additionally, quality improvement initiatives should focus on ensuring that all circumcision procedures, regardless of setting, meet minimum standards for sterile technique and provider qualification.

Several limitations should be acknowledged in interpreting these findings. The cross-sectional design limits our ability to establish causal relationships, and recall bias may have influenced parental responses. The concentration of procedures performed by specialist physicians in hospital settings creates potential confounding effects when comparing provider types and locations. Additionally, the relatively small number of complications (n=14) limits the power of analyses related to complication predictors, though the clear association with provider type remained statistically significant.

The present study was conducted in a single geographic region, which may limit the generalizability of findings to other healthcare systems with different training standards and regulatory environments. Cultural factors specific to our population may also influence satisfaction patterns in ways that differ from other contexts. Future research should include larger, multicenter studies with longer follow-up periods to better understand the relationship between provider characteristics, procedural outcomes, and long-term satisfaction.

Conflict of Interest

There was no conflict of interest in this manuscript.

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