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Original Research Article

Normative Metrics for Evaluating Quality of Life Among Plastic Surgery Adolescents: A Cross-Sectional Study

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Conflict of interest: Nil

Abstract:

Background: The increasing prevalence of plastic surgery among adolescents for both aesthetic and reconstructive reasons highlight the need for effective quality of life (QoL) assessment tools in this demographic. Quality of life in adolescent plastic surgery encompasses a multidimensional approach, including physical, psychological, social, and functional aspects.

Methods: This cross-sectional prospective study was conducted at a specific institute over a set period. 120 cisgender individuals aged 12 to 21 years undergoing non-aesthetic medical procedures were included, excluding those with benign breast conditions or psychiatric disorders. The study focused on variables like gender, BMI, and racial/ethnic identity, using tools like SF-36, RSES, EAT-26, and BRSQ for data collection. SPSS software was utilized for statistical analysis, adhering to ethical considerations including informed consent and data confidentiality.

Results: The study found significant gender and BMI-related differences in HRQoL. Females showed lower vitality, mental health, and self-esteem at baseline, with these disparities more pronounced in overweight or obese females. Follow-up data revealed persistent lower scores in females in several SF-36 domains and RSES, with higher EAT-26 scores. Males demonstrated stability in HRQoL scores across BMI categories.

Conclusion: The research highlights notable gender and BMI-related disparities in health-related quality of life among adolescents and young adults. These disparities, particularly evident in females and those with higher BMI, underline the need for focused health interventions and support.

Recommendation: Targeted health interventions and support for females and individuals with higher BMI are crucial. Continuous assessment and refinement of QoL metrics are recommended to cater to the unique needs of adolescents undergoing plastic surgery.

Keywords: Adolescent Plastic Surgery, Health-Related Quality of Life, Gender Disparities, Body Mass Index.

Introduction

The pursuit of plastic surgery among adolescents has witnessed a notable upsurge, primarily driven by factors ranging from aesthetic desires to the necessity for reconstructive procedures due to congenital anomalies, trauma, or disease [1]. This demographic shift accentuates the imperative for a robust framework to evaluate the quality of life (QoL) in these young patients. Establishing normative metrics for QoL assessment in adolescent plastic surgery patients is not only pivotal for clinical decision-making but also for gauging postoperative satisfaction and psychosocial outcomes [2]. Quality of life, as a multidimensional construct, encapsulates physical, psychological, social, and functional well-being [3]. In the context of adolescent plastic surgery, it extends beyond the immediate surgical outcomes to include long-term psychosocial adjustments, self-esteem, and social integration [4].

Consequently, the need for standardized, age-appropriate, and condition-specific QoL instruments is evident. Such tools are instrumental in capturing the unique concerns and experiences of adolescents undergoing plastic surgery.

In this cohort study, differences in the HRQoL of healthy boys and girls during the adolescent and young adult periods were prospectively measured.

Methodology

Study design: A cross-sectional prospective study.

Study setting: The research was carried out at 'S.K.M.C.H.' spanning from '2022- 2023'.

Participants: A total of 120 participants were selected after meeting all the criterias.

Inclusion Criteria: The study focused on cisgender individuals aged 12 to 21 years, in sound health, and receiving non-aesthetic medical procedures.

Exclusion Criteria: Individuals with a background of benign breast conditions or psychiatric disorders were not included in the study.

Bias: The study aimed to reduce selection bias by incorporating a diverse age range and treatment types. Nonetheless, excluding specific groups may introduce a certain level of bias.

Variables: Essential variables included the participants' sex assigned at birth, gender identity, body mass index (BMI) classification, racial/ethnic identification, and outcomes from multiple surveys.

Collection of Data: Baseline data encompassed clinical metrics like height, weight, and BMI, categorized according to the Centers for Disease Control and Prevention standards, along with self-reported race/ethnicity. The study also involved collecting data from surveys at baseline and subsequent intervals (6 months, 1, 3, 5, 7, and 9 years).

Measurement Instruments: SF-36 (Short-Form 36v2): This tool evaluates life quality across eight different areas.

Rosenberg Self-Esteem Scale (RSES): A measure of self-esteem.

Eating Attitudes Test-26 (EAT-26): A survey to assess attitudes and behaviors related to eating disorders.

Breast-Related Symptoms Questionnaire (BRSQ): Specific to female participants, this questionnaire evaluates symptoms and issues related to breasts.

Clinical Measurements: At the initial evaluation, clinical personnel recorded each participant's height and weight. These measurements were used to determine the BMI category, following CDC guidelines. The study also considered the participants' self-identified race and ethnicity.

Statistical Techniques: The study used SPSS software version 24.0. Survey data with up to 20% missing responses were included in the analysis, with a significance threshold set at a P-value of less than 0.05.

Ethical Considerations: Participants and, for minors, their parents or guardians, provided written consent.

The study strictly adhered to ethical standards concerning data confidentiality and participant privacy.

Result

Table 1: Cohort Demographics

Demographic	Female (N = 89)	Male (N = 31)	P value
Median (IQR, range) baseline age, years	16.1 (5.1, 12.1–21.8)	15.5 (3.6, 12.0–21.8)	0.08
Baseline BMI category, N (%)			
Underweight	1 (1.1%)	1 (3.2%)	0.42
Healthy	64 (71.9%)	29 (93.5%)	
Overweight	13 (14.6%)	1 (3.2%)	
Obese	11 (12.4%)	0 (0%)	
Survey response rate, N (%)			
Baseline	89/89 (100%)	31/31 (100%)	
6 months	55/89 (61.8%)	19/31 (61.3%)	
1 year	64/86 (74.4%)	23/31 (74.2%)	
3 years	50/81 (61.7%)	16/28 (57.1%)	
5 years	32/67 (47.8%)	9/37 (24 .3%)	
7 years	17/55 (30.9%)	6/24 (25.0%)	
9 years	4/15 (26.7%)	0/7 (0%)	

In this study, 89 female and 31 male participants successfully completed both the initial and subsequent follow-up surveys as outlined in Table 1. The age range for participants at the start of the study was between 12 and 21 years, with a similar age distribution across both cohorts (P = 0.08). A healthy baseline Body Mass Index (BMI) was recorded for the majority of participants, with 72 indi-

viduals (60%) falling into this category. Recruitment for the study was primarily from patients undergoing skin lesion excision, accounting for 67.7% of the total. The remaining participants were seen for various reasons including routine and sick visits to their primary care physicians (10.2%), treatments for hand injuries (5.1%), lacerations (3.8%), and other non-aesthetic surgical procedures (7%).

Table 2: Comparisons of Baseline Survey Scores by Cohort

Survey	Female Mean ± SD Baseline Score	Male Mean ± SD Baseline Score	P value
SF-36 domains			
Physical functioning	91.9 ± 19.3	90.9 ± 23.4	0.73
Role—physical	90.2 ± 16.7	91.6 ± 13.7	0.54
Bodily pain	76.9 ± 16.1	73.6 ± 18.5	0.20
General health	80.7 ± 16.8	84.9 ± 14.0	0.07
Vitality	52.1 ± 14.0	59.3 ± 12.5	<0.001
Social functioning	86.0 ± 19.2	90.0 ± 18.5	0.13
Role—emotional	88.2 ± 16.0	92.5 ± 19.3	0.07
Mental health	76.5 ± 16.5	81.1 ± 14.3	0.04
RSES	34.0 ± 5.4	35.8 ± 4.9	0.02
EAT-26	5.6 ± 5.9	3.7 ± 3.6	0.004

At the baseline, female participants demonstrated lower scores in the vitality and mental health domains of the SF-36, as well as on the Rosenberg Self-Esteem Scale (RSES), while their scores on the Eating Attitudes Test-26 (EAT-26) were higher, compared to their male counterparts ($P < 0.05$ for all, as per Table 2). However, in the other six domains of the SF-36 survey (encompassing physical functioning, role-physical, bodily pain, general health, social functioning, and role-emotional), there was no significant difference between the two groups ($P > 0.05$ for all). The baseline Health-Related Quality of Life (HRQoL) survey scores for boys did not show significant variation across different BMI categories ($P > 0.05$ for all). On the other hand, girls who were overweight or obese had markedly lower scores in four domains of the SF-36 (including physical functioning, role-physical, social functioning, and mental health) and on the Breast-Related Symptoms Questionnaire (BRSQ), with their scores on the EAT-26 being higher when compared to females of a healthy weight ($P < 0.05$ for all).

In terms of follow-up duration, males were tracked for a median of 2.3 years (interquartile range [IQR] of 2.8 years, ranging from 6 months to 6.7 years), whereas females had a slightly longer median follow-up of 2.6 years (IQR of 3.1 years, ranging from 6 months to 7.1 years; $P = 0.19$). Most participants completed follow-up surveys at 6 months, 1 year, and 3 years, as indicated in Table 1. During the most recent follow-up, female participants consistently scored lower than males in five domains of the SF-36 (specifically physical functioning, general health, vitality, social functioning, and mental health) and on the RSES, while their EAT-26 scores remained higher ($P < 0.05$ for all). However, in the remaining three SF-36 domains (role-physical, bodily pain, and role-emotional), scores between the two cohorts were similar, showing no significant differences ($P > 0.05$ for all).

When analyzing the data based on the initial BMI category, the survey scores for both cohorts demonstrated consistency over the course of the study. Males who were not overweight or obese exhibited a notable increase in their SF-36 bodily pain scores ($P = 0.02$). Conversely, females in the same BMI category displayed significant decreases in five SF-36 domains, alongside the RSES and BRSQ, coupled with an increase in EAT-26 scores ($P < 0.05$ for all). Meanwhile, female participants classified as overweight or obese experienced a significant improvement in their SF-36 role-physical scores ($P = 0.02$) but showed a decrease in their BRSQ scores ($P = 0.007$).

Discussion

The study involving 120 adolescents and young adults revealed significant gender and BMI-related disparities in health-related quality of life and psychological well-being. Females generally exhibited lower vitality, mental health, and self-esteem levels, alongside higher disordered eating attitudes at baseline, compared to males. These differences were more pronounced in overweight or obese females, who also faced challenges in physical and social functioning. Over time, these trends persisted, particularly in non-overweight/obese girls, who showed evolving health and well-being challenges. The data underscores the importance of targeted health interventions, especially for females and those with higher BMI, highlighting the need for ongoing support to address these persistent disparities.

The complexity of assessing QoL in this demographic is highlighted in a longitudinal study by Nuzziet al. [5], which examines changes in health related QoL for adolescents undergoing plastic surgery. This study particularly explores the psychoso-

cial deficits that may develop in adolescent girls and how these deficits can evolve over time. Similarly, the impact of specific surgical procedures, like reduction mammaplasty, on physical and psychosocial health has been examined, suggesting that adolescents experience significant benefits regardless of the extent of their surgeries, challenging current paradigms for third-party payor coverage [6].

Furthermore, the role of rehabilitation programs in enhancing QoL post-surgery is evident in the study by Abdallahet al. [7], focusing on adolescents with second-degree burn injuries. Their research underscores the necessity of comprehensive postoperative care in improving overall QoL. The importance of access to care and postoperative outcomes, particularly in the context of gender-affirming surgeries like masculinizing chest reconstruction, has also been noted. Studies by Diaddigoet al. [8, 9] highlight disparities in access and the need for tailored care in these unique patient populations.

Overall, the evolving landscape of adolescent plastic surgery calls for a nuanced approach to QoL assessment, encompassing a broad range of physical, psychological, and social dimensions. The continuous refinement of normative metrics and the integration of patient-centered care models are essential to ensure the holistic well-being of these young patients.

Conclusion

The study provides compelling evidence of gender and BMI-related differences in health-related quality of life among adolescents and young adults. It underscores the need for targeted interventions and support mechanisms, particularly for females and those with higher BMI, to address the specific health and psychological challenges they face.

The longitudinal nature of the study adds depth to these findings, highlighting the evolving nature of these challenges over time.

Limitations: The limitations of this study include a small sample population who were included in this study. The findings of this study cannot be generalized for a larger sample population. Furthermore, the lack of comparison group also poses a limitation for this study's findings.

Recommendation: Targeted health interventions and support for females and individuals with higher BMI are crucial. Continuous assessment and refinement of QoL metrics are recommended to cater to the unique needs of adolescents undergoing plastic surgery.

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List of abbreviations

QoL - Quality of Life
HRQoL - Health-Related Quality of Life
SF-36 - Short Form-36 Health Survey
RSES - Rosenberg Self-Esteem Scale
EAT-26 - Eating Attitudes Test-26
BRSQ - Breast-Related Symptoms Questionnaire
BMI - Body Mass Index
IQR - Interquartile Range

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