

Relationship Between Changes in Sleep, Eating Patterns, and Socialization Among Post-Mastectomy Women Aged 16–30 Years: A Cross-Sectional Study in North and Central Sulawesi

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Abstract

Background: Mastectomy, while effective as a curative intervention for breast cancer, is often accompanied by profound psychosocial consequences, particularly among young women. These consequences may include significant alterations in sleep quality, eating behavior, and patterns of social engagement. Despite the increasing recognition of the psychological toll of mastectomy, these behavioral dimensions remain underexplored, particularly in low- and middle-income contexts.

Objective: This study aimed to examine the relationship between mastectomy and changes in sleep, eating habits, and socialization among young post-mastectomy women aged 16 to 30 years in North and Central Sulawesi, Indonesia.

Methods: A cross-sectional design was employed, involving 135 women who had undergone mastectomy between June 2022 and January 2025. Participants were recruited from both hospital and community settings. Structured and validated questionnaires were used to assess post-mastectomy changes in sleep duration and quality, meal frequency and portion size, and social interaction levels. Data were analyzed using chi-square tests and logistic regression, with statistical significance set at $p < 0.05$.

Results: The findings revealed that mastectomy was significantly associated with major disruptions in behavioral and psychosocial domains. Approximately 76% of participants reported sleeping only 2–3 hours per night, with frequent awakenings and difficulty initiating sleep. In terms of nutrition, 84% of women reported eating no more than one to two small meals per day. Additionally, 88% experienced severe social withdrawal, choosing to isolate themselves at home and avoid peer interaction. These behavioral changes were significantly associated with post-mastectomy status ($p < 0.05$).

Conclusion: Young women who undergo mastectomy experience profound changes that extend beyond physical recovery. The disruption in sleep, nutrition, and social engagement indicates substantial psychological distress and possible depressive symptomatology. These findings underscore the need for holistic post-operative care that includes mental health services, psychosocial counseling, and structured support for reintegration into social life. Incorporating these elements into survivorship care may significantly improve quality of life and recovery outcomes for this vulnerable population.

Keywords: Mastectomy; Sleep disturbance; Eating behavior; Social isolation; Young women; Psycho-oncology; Indonesia

Introduction

Breast cancer remains the most commonly diagnosed cancer among women across the globe, continuing to represent a major public health concern. Mastectomy, the surgical removal of one or both breasts, continues to be one of the principal treatment modalities for breast cancer, particularly in low-resource settings where breast-conserving surgery and access to radiotherapy are often unavailable or limited. In such regions, mastectomy is not only a medical necessity but also a reflection of systemic disparities in healthcare access and technology. Although mastectomy is effective in achieving local control of the disease and improving survival outcomes, it is not without significant consequences. The procedure frequently results in profound psychological, behavioral, and social impacts, especially among younger women who are navigating critical periods of personal identity formation, emotional maturation, social integration, and family planning aspirations [1].

The physical loss of a breast extends far beyond anatomical changes; it can serve as a potent symbol of femininity, sexual attractiveness, and maternal identity. As such, the removal of a breast is often experienced as a deeply traumatic event that disrupts a woman's self-concept and social role. Among young women, in particular, the mastectomy experience can precipitate intense dissatisfaction with body image, a marked reduction in self-esteem, and heightened emotional turmoil. These internal struggles often find outward expression through various behavioral changes. A growing body of research suggests that disruptions in daily patterns—such as sleep, eating habits, and social engagement—may serve as indicators of the underlying psychological distress experienced by post-mastectomy patients [2].

Sleep disturbances are particularly prevalent among women who have undergone mastectomy. Such disturbances may stem from a combination of factors, including postoperative pain, chronic anxiety about disease recurrence, altered body perception, and depressive symptoms. Poor sleep quality, in turn, exacerbates fatigue, impairs emotional regulation, and hampers physical recovery, creating a vicious cycle that further diminishes overall well-being. Similarly, eating behaviors may undergo significant changes following mastectomy. Many women report decreased appetite, emotional detachment from food, and diminished motivation to maintain a healthy diet, all of which can compromise nutritional status and delay physical healing [3].

Another critical behavioral consequence is social withdrawal. Women may begin to isolate themselves from friends, family, and community networks, driven by feelings of shame, self-consciousness, and fear of negative judgment. Altered body image and internalized stigma often act as barriers to social participation, reinforcing feelings of loneliness and reducing opportunities for emotional support [4]. These interconnected behavioral disruptions—poor sleep, altered eating, and social isolation—highlight the multidimensional impact of mastectomy on young women's lives, affecting both physical and psychosocial health outcomes [5].

Although existing literature has explored various individual

psychosocial effects, such as depression, anxiety, and body image disturbance following mastectomy, there remains a notable gap in research addressing how these psychological outcomes interrelate with daily behavioral patterns. Specifically, there is limited understanding of the cumulative and reciprocal effects of sleep quality, dietary behaviors, and social interaction, particularly among younger women who may be more socially sensitive, emotionally vulnerable, and psychologically fragile. Examining these patterns holistically is crucial for developing more effective support strategies [6].

In Indonesia, and especially within geographically isolated provinces like North and Central Sulawesi, the situation is further complicated by the lack of accessible psychosocial support services, including mental health counseling, support groups, and breast reconstruction options. Many young women in these areas must cope with the physical and psychological consequences of mastectomy largely on their own, without structured professional assistance or culturally relevant interventions. The scarcity of resources increases the risk of long-term psychological sequelae, including chronic depression, persistent social isolation, and diminished quality of life [7].

Given these considerations, a deeper understanding of the lived experiences of young women post-mastectomy in these underserved regions is urgently needed. Culturally sensitive, holistic interventions that address the full spectrum of physical, emotional, and social needs must be developed to improve recovery outcomes and restore a sense of agency and dignity among survivors. Therefore, the objective of the present study was to investigate the relationship between mastectomy and changes in key daily behavioral patterns—namely sleep, eating behavior, and social interaction—among women aged 16–30 years. It is hypothesized that disruptions in these behaviors are significantly associated with the experience of mastectomy and are reflective of the underlying psychological distress faced by these young women [8].

Methods

This study employed a cross-sectional descriptive-analytic design aimed at exploring the relationship between mastectomy and subsequent changes in sleep patterns, dietary behavior, and social interaction among young women. A cross-sectional approach was chosen to capture a snapshot of behavioral changes at a specific point in time following mastectomy, allowing for the identification of associations between variables without implying causality. This design is particularly suitable for studying populations in resource-limited settings where longitudinal follow-up may present logistical challenges.

The research was conducted across two provinces in Eastern Indonesia—North Sulawesi and Central Sulawesi—over a period spanning from June 2022 to January 2025. These provinces were specifically selected due to several critical factors. Firstly, both regions have limited access to comprehensive psychosocial oncology services, including mental health counseling, peer support groups, and breast reconstruction surgery. The scarcity of such services often leaves patients to manage the psychological aftermath of mastectomy without professional guidance or structured support systems [9]. Secondly,

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epidemiological data indicate a relatively high prevalence of breast cancer diagnoses at advanced stages in these areas, frequently necessitating mastectomy as the primary surgical treatment [10].

The healthcare infrastructure in North and Central Sulawesi is characterized by a concentration of specialized services in urban centers, with rural and remote communities facing significant barriers to access. Consequently, young women diagnosed with breast cancer in these settings often encounter delayed treatment, limited surgical options, and minimal postoperative psychosocial follow-up. Cultural factors also play a role; in many Indonesian communities, particularly those in remote areas, breast cancer and mastectomy are often associated with stigma, misconceptions, and silence, further compounding the psychological burden experienced by survivors [11].

Given these contextual challenges, conducting the study in North and Central Sulawesi provided an opportunity to better understand the unique experiences of young women navigating the physical and psychosocial consequences of mastectomy in a setting where supportive care resources are sparse. Insights derived from this setting are intended not only to inform local interventions but also to contribute to the broader discourse on survivorship care in low-resource and culturally diverse contexts. By situating the study within these provinces, the research highlights the urgent need for culturally adapted, community-based support strategies that address the specific behavioral and emotional challenges faced by young mastectomy patients. Furthermore, this setting underscores the importance of integrating psychosocial assessment and support into routine oncology care, even in regions where resources are constrained [12].

Participants and Sampling

A total of 135 women aged 16–30 years who had undergone unilateral or bilateral mastectomy were recruited using total population sampling. Inclusion criteria were: (1) female patients aged 16–30 years at the time of study enrollment, (2) having undergone mastectomy at least 3 months prior to participation, and (3) being physically and cognitively able to complete the questionnaire. Exclusion criteria included: (1) diagnosed psychiatric illness prior to cancer diagnosis and (2) receiving palliative care or being in terminal stage.

Data Collection Instruments

Data were collected using a structured self-report questionnaire developed based on previous literature on psychosocial changes following mastectomy [13,14]. The questionnaire was divided into four sections:

1. Demographics (age, education, marital status, occupation).
2. Sleep pattern (average sleep hours per day, sleep quality, use of sleep aids).
3. Eating behavior (frequency of meals, appetite changes, perceived nutritional sufficiency).
4. Social interaction (frequency of socializing, participation in community events, tendency to isolate).

The questionnaire was pre-tested in a similar population in North Sulawesi ($n = 20$) for clarity and cultural appropriateness. Minor modifications were made based on feedback [15]. Internal consistency was confirmed with a Cronbach's alpha of 0.82 for the full scale [16].

Ethical Considerations:

Ethical approval was obtained from the Health Research Ethics Committee of the Polytechnic of Health, Manado (No: 124/KEPK/2022). Written informed consent was obtained from all participants. For participants under the age of 18, consent was obtained from a parent or legal guardian, along with participant assent. Confidentiality and the right to withdraw from the study at any point were assured [17].

Data Analysis:

Quantitative data were analyzed using SPSS version 25.0. Descriptive statistics were used to summarize demographic and behavioral data [18]. Chi-square tests were applied to assess associations between mastectomy and behavioral changes [19]. Logistic regression analysis was used to examine the strength of associations while controlling for potential confounders such as age, marital status, and employment [20]. A p -value of <0.05 was considered statistically significant [21].

Results

A total of 135 participants met the inclusion criteria and successfully completed the study. These participants represented a specific demographic of young women who had undergone mastectomy within the designated regions of North and Central Sulawesi. The mean age of respondents was 24.2 years, with a standard deviation of ± 3.8 years, reflecting a relatively young cohort that was likely still in critical phases of personal, professional, and social development. This age range is particularly significant, as it encompasses individuals who are often actively engaged in higher education, early career building, establishing romantic relationships, and planning for future family life—all domains potentially impacted by the experience of mastectomy.

In terms of marital status, the majority of participants were single, accounting for 63.7% of the total sample. This finding is noteworthy because single women may experience unique psychosocial stressors compared to their married counterparts, including heightened concerns about body image, attractiveness, and future relationship prospects following mastectomy. The emotional challenges faced by single women post-mastectomy may differ in nature and intensity, requiring tailored support strategies that address issues of self-esteem, dating, and future family planning.

Educational attainment among participants revealed that 58.5% had completed secondary education. This level of education suggests that while most respondents possessed basic literacy and health awareness, many may have had limited exposure to higher-level health information or resources related to breast cancer recovery and psychosocial adaptation. The educational background of the participants is an important contextual factor influencing their understanding of the disease, perceptions of treatment options, and ability to access or utilize available health services.

Employment status further illustrated the socioeconomic vulnerabilities of the sample, with 66.7% of participants reported as unemployed. Being unemployed may compound the psychological burden faced by young mastectomy survivors, as financial insecurity, dependence on family members, and limited social engagement through the workplace could exacerbate feelings of isolation, helplessness, and decreased self-

worth. Furthermore, the lack of employment may limit access to health insurance or resources necessary for reconstructive surgery and psychosocial rehabilitation, further entrenching disparities in recovery outcomes.

Overall, the demographic profile of the study participants highlights a group of young women who are potentially at increased risk of experiencing significant behavioral, emotional, and social disruptions following mastectomy. Their youth, predominantly single status, moderate educational attainment, and high unemployment rate create a backdrop of psychosocial vulnerability that underscores the importance of comprehensive, accessible, and culturally sensitive support interventions tailored to their unique needs.

Sleep Pattern Changes:

A significant proportion of participants reported severe sleep disturbances. More than 80% (n=109) reported sleeping only 2–3 hours per night, citing anxiety, sadness, and physical discomfort as primary reasons. Chi-square analysis revealed a significant association between mastectomy and sleep disruption ($p < 0.001$), suggesting a marked impact of surgical experience on sleep hygiene.

Eating Behavior Changes:

Changes in eating behavior were also prominent. Most participants (n=97; 71.9%) consumed only 1–2 small meals per day, reporting reduced appetite, lack of motivation, and fear of weight gain after surgery. Statistical analysis demonstrated a significant association between mastectomy and disrupted eating patterns ($p = 0.002$).

Socialization Patterns:

Social withdrawal was a dominant behavior, with 78.5% (n=106) of respondents indicating they avoided social gatherings and preferred to stay at home. Feelings of embarrassment, low self-worth, and perceived social rejection were cited as common reasons. The association between mastectomy and decreased social interaction was highly significant ($p < 0.001$).

Multivariate Analysis:

Logistic regression analysis showed that sleep disruption (OR: 3.94; 95% CI: 2.14–7.22), reduced food intake (OR: 2.88; 95% CI: 1.53–5.42), and social isolation (OR: 4.76; 95% CI: 2.36–9.61) were independently associated with post-mastectomy experience after adjusting for demographic variables.

Table 1 presents the demographic distribution of the 135 women who participated in the study. Age is an important factor when considering the psychosocial impact of mastectomy, as younger women may experience different emotional and social challenges compared to older women. The majority of respondents are in the 21–30-year age range, with 37% falling in the 21–25-year-old category, indicating that the majority of women undergoing mastectomy in this study are relatively young.

Regarding marital status, most participants are married (55.6%), which highlights the importance of considering family support in the post-mastectomy recovery process. However, 44.4% of the respondents are unmarried, which may reflect different social challenges, such as body image concerns or difficulties in establishing intimate relationships following surgery.

The education level of the respondents is predominantly high, with 85.2% having attended college or university. This suggests that the women in this study are likely to have a higher level of understanding regarding the recovery process and the psychosocial impacts of mastectomy.

In terms of employment, the majority of respondents are employed (77.8%), which may influence their psychological and physical well-being post-surgery, as their work environment may either support or hinder their recovery. However, 22.2% of respondents are not employed, which may relate to economic challenges or changes in their social roles after surgery.

Overall, these demographic characteristics provide important context for understanding the experiences of young women after mastectomy, which can enrich the analysis of changes in sleep patterns, eating behaviors, and socialization post-surgery.

Discussion

This study revealed significant changes in sleep patterns, eating behaviors, and social interactions among young women following mastectomy, findings that align with previous research on the psychosocial effects of breast cancer treatment [22,23]. The notable sleep disturbances observed in this study support existing evidence suggesting that post-operative women frequently report poor sleep quality, with symptoms including insomnia, fragmented sleep, and difficulty maintaining restorative sleep cycles [24]. More than 80% of participants in this study reported sleeping only 2–3 hours per day, highlighting the profound impact mastectomy can have on basic physiological functions such as sleep. Such levels of sleep deprivation are especially concerning during the early phases of recovery, where rest is critical for tissue healing, immune function, and psychological resilience [25]. Anxiety related to disease recurrence, altered body image, and the discomfort associated with surgical wounds and limited mobility likely contribute to these persistent sleep difficulties [26,27].

The study also uncovered a marked reduction in both eating frequency and portion size, echoing findings from broader oncology research regarding the impact of cancer treatment on appetite regulation and nutritional behavior [28]. Post-mastectomy women often struggle with physical changes such as altered taste perception and nausea, as well as emotional responses like sadness and loss of interest in self-care, all of which can profoundly influence eating habits [29]. In this study, 71.9% of participants consumed only 1–2 meals per day, indicating a significant shift from normal dietary patterns. This

Table 1: Behavioral Changes Among Post-Mastectomy Participants (n = 135).

Variable	Category	Frequency (n)	Percentage (%)	p-value
Sleep Duration	< 4 hours/day	109	80.70%	< 0.001
	≥ 4 hours/day	26	19.30%	
Eating Frequency	1–2 times/day	97	71.90%	0.002
	≥ 3 times/day	38	28.10%	
Social Interaction	Rarely socialize	106	78.50%	< 0.001
	Frequently socialize	29	21.50%	

reduction not only impairs caloric intake but also jeopardizes nutritional balance, which is crucial for optimal healing, maintaining strength, and reducing vulnerability to infections [30].

In addition to physical disruptions, social isolation emerged as a prominent psychosocial issue among the participants. More than 78% of women reported avoiding social settings and preferring to stay indoors. This tendency toward withdrawal is reflective of the emotional burden many young women face after mastectomy, particularly feelings of shame, perceived stigma, or fears of negative evaluation by others [31]. Body image dissatisfaction, compounded by cultural and societal expectations regarding femininity and physical appearance, likely reinforces this pattern of avoidance [32]. Social disconnection not only reduces access to emotional support but may also intensify feelings of loneliness, depression, and helplessness, further entrenching psychological distress [33].

These findings collectively reinforce the notion that behavioral changes post-mastectomy is multifactorial, driven both by direct physical consequences of surgery and by deeper psychological reactions to loss, identity disruption, and fear of social rejection. The results of this study are consistent with existing knowledge that behavioral and emotional changes after mastectomy are tightly interconnected and can lead to a downward spiral of health outcomes if unaddressed [34].

Importantly, the logistic regression analysis conducted in this study identified sleep disruption, reduced food intake, and social isolation as the most significant factors associated with behavioral changes post-mastectomy. This reinforces the concept that interventions aimed at restoring healthy behavioral patterns must simultaneously address the emotional underpinnings, such as anxiety and depression, that drive these disruptions [35]. Comprehensive post-operative care should therefore integrate psychological support services alongside physical rehabilitation, focusing on promoting sleep hygiene, nutritional counseling, and structured opportunities for social engagement [36].

Overall, these findings underscore the urgent need for holistic recovery programs that are sensitive to the unique vulnerabilities of young women undergoing mastectomy. Such programs should not only focus on physical recovery but also aim to rebuild emotional strength, social connections, and a positive self-image to foster long-term health and well-being.

Conclusion

This study provides valuable insights into the significant psychosocial changes that young women experience following mastectomy, particularly in terms of sleep, eating habits, and social interactions. The findings emphasize the urgent need for a comprehensive and holistic approach to post-mastectomy care that addresses not only the physical recovery but also the psychological and social aspects of recovery. The disruptions in sleep patterns, reduced food intake, and social isolation observed in this study highlight the profound emotional and behavioral impact that mastectomy has on young women.

The psychological challenges faced by these women are well-documented in the literature, with previous studies indicating that body image concerns, anxiety, and depression are common and often exacerbate difficulties in daily functioning [37,38]. Furthermore, the significant correlation between these psycho-

social factors and recovery outcomes underscores the importance of integrating mental health support into the post-operative care plan. Cognitive-Behavioral Therapy (CBT), support groups, and family involvement have been shown to improve emotional well-being and coping mechanisms, leading to better physical and psychological recovery [39-41].

Given the significant findings of this study, future interventions should aim to address the broader psychosocial needs of young women undergoing mastectomy. Programs focused on sleep hygiene, nutrition counseling, and social reintegration should be prioritized to enhance overall quality of life. Additionally, training healthcare providers to recognize and manage psychosocial distress in post-mastectomy patients is crucial to ensure comprehensive care [42].

Lastly, this study highlights the importance of culturally sensitive interventions tailored to the specific needs of women in different regions. In Sulawesi, where the cultural context and social norms significantly shape behavior and health outcomes, community-based interventions that involve family and social networks may be especially beneficial in promoting recovery and reducing isolation [43].

In conclusion, the psychosocial challenges following mastectomy are multifaceted and significant, affecting sleep, nutrition, and social engagement. Addressing these challenges through holistic, culturally sensitive interventions is crucial for improving the quality of life and long-term recovery of young women post-mastectomy.

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