The Impact of Surgical Wound Dehiscence on Body Image

Edson Luiz de Lima, MD, MS; Maria José Azevedo de Brito, PhD; João Batista da Cunha, MS, RN; Maria Fernanda Pereira Duarte, BSN; Nely Flávia Machado Corrêa, BSN; Margarida Maria de Carvalho Resende, PhD, RN; and Lydia Masako Ferreira, MD, PhD

ABSTRACT

OBJECTIVE: To identify changes in body image in patients with surgical wound dehiscence.

DESIGN AND SETTING: This cross-sectional, descriptive, analytical study was conducted in a university hospital and nursing care center in Brazil.

PATIENTS AND INTERVENTION: Sixty-one adult surgical patients of both genders from different inpatient wards or receiving outpatient care were selected. Forty-one participants had surgical wound dehiscence, and 20 had achieved complete wound healing (controls).

MAIN OUTCOME MEASURE: The Body Dysmorphic Disorder Examination (BDDE), Body Investment Scale (BIS), and a questionnaire assessing clinical and sociodemographic characteristics of patients were used for data collection.

MAIN RESULTS: Surgical wound dehiscence defects were 0.5 to 30 cm in length, located on the arms, legs, and chest. They were significantly associated with being white ($P = .048$), number of children ($P = .024$), and presence of comorbid conditions ($P = .01$). Overall, men reported higher BIS scores (positive feelings about the body) than women ($P = .035$). Patients with wound dehiscence had higher BDDE scores (negative body image) than controls ($P = .013$). The BDDE scores were associated with presence of surgical wound dehiscence ($P = .013$), number of children ($P = .009$), and wound length ($P = .02$). There were significant correlations between BIS scores in men with wound dehiscence ($P = .042$), number of children ($P < .001$), and BDDE scores ($P < .001$) and between BDDE scores and number of children ($P = .031$), wound length ($P = .028$), and BIS scores ($P < .001$).

CONCLUSION: Surgical wound dehiscence had a negative impact on body image.

KEYWORDS: Body Dysmorphic Disorder Examination, body image, Body Investment Scale, quality of life, mental health, surgical wound dehiscence, wound care

ADV SKIN WOUND CARE 2018;31:470–7.

INTRODUCTION

Body image is an important aspect of psychosocial development. It is a multidimensional construct, including perceptions and attitudes particularly related to the body, but not limited to the physical appearance.[1–4] Body image affects thoughts, emotions, and behaviors, influencing affective and social relationships.[1] The concept is broader and more complex than the simple picture of our own body that we have in our minds and is influenced by medical conditions that cause changes in physical appearance and functioning, such as surgical wounds.[4,5]

Although changes in appearance, physical integrity, and functioning may occur in the wake of a disease and its treatment,[6,7] body image in patients with wounds has not been assessed in quality-of-life studies. However, changes in physical appearance and functioning are associated with changes in body image, showing its dynamic aspect, and may significantly affect the quality of life of patients. Body image perception may vary, depending on the characteristics of the medical condition, as in cases of surgical wound dehiscence.[8,9]

Surgical wounds are classified as acute wounds, and because of their intentional nature, they are planned to minimize the risk of complications. Wounds are expected to heal completely within a certain period. However, surgical wounds may become complex because of complications during the healing process or chronic because of delayed wound healing.[10] Several factors may affect the healing process, including the general health status of the patient, type of surgical disease, type of surgical procedure, and local and systemic complications that may arise requiring specific care. The most common postoperative complications are hematoma, seroma formation, infection, and wound dehiscence.[10]

Surgical wound dehiscence is a serious postoperative complication associated with high mortality. It is characterized by a failure of the normal wound healing process preventing wound closure and may be caused by multiple factors such as anemia,

In Brazil, Edson Luiz de Lima, MD, MS, is a Physician, Federal Institute for Education, Science and Technology of Southern Minas, Pouso Alegre, Minas Gerais; Maria José Azevedo de Brito, PhD, is Affiliate Professor, Master's Degree Program in Sciences Applied to Health, Sapucai Valley University (UNIVAS), Pouso Alegre, Minas Gerais and Postdoctoral Fellow, Division of Plastic Surgery, Federal University of São Paulo (UNIFESP); João Batista da Cunha, MS, RN, is Affiliate Professor, Master's Degree Program in Sciences Applied to Health; UNIVAS, Pouso Alegre, Minas Gerais; Maria Fernanda Pereira Duarte, BSN, Nely Flávia Machado Corrêa, BSN, and Margarida Maria de Carvalho Resende, PhD, RN, are Nurses, College of Health Science, UNIVAS, Pouso Alegre, Minas Gerais; and Lydia Masako Ferreira, MD, PhD, is Full Professor and Head, Division of Plastic Surgery, UNIFESP, São Paulo. The authors have disclosed no financial relationships related to this article. Submitted November 29, 2017; accepted in revised form May 14, 2018.

hypoalbuminemia, malnutrition, obesity, diabetes, malignancy, jaundice, cardiovascular disease, lung disease, smoking, steroid use, advanced age, and specific surgical procedures, including colon surgery and emergency laparotomy.[11,12] Wound dehiscence in any part of the body may progress into a chronic condition and negatively affect the psychosocial functioning of patients by causing changes in physical integrity and appearance. Chronic wounds require a prolonged time to heal, during which patients may experience discomfort, pain, wound odor, exudate, and frequent dressing changes, which interfere with their daily routine.[13] The management of this complex problem requires the involvement of a multidisciplinary team composed of professionals with wound care expertise.

Whereas healthy, flawless skin improves self-esteem and self-concept,[14] skin deformities may lead to embarrassment, negative body image, depression,[15–17] and other psychological changes.[14,18,19] Tactile stimulation also plays an important role in the development of a healthy body image, contributing to physical contact, affection, and social relationships,[16] but may be limited in patients with deformities or open wounds.

Body dissatisfaction or a negative body image can have devastating effects on physical and mental health. By identifying the extent and impact of physical changes on patients with wounds, it is possible to prevent and alleviate the suffering of individuals whose body image may negatively affect their quality of life. The aim of this study was to identify changes in body image in patients with surgical wound dehiscence.

METHODS

This 1-year study was approved by the Institutional Research Ethics Committee of the University of Vale do Sapucaí and performed in accordance with the ethical standards of the 1964 Declaration of Helsinki and its subsequent amendments. Written informed consent was obtained from all patients prior to their inclusion in the study.

A nonprobability convenience sample of 61 patients was selected from adult patients 18 years or older, of both sexes, who had undergone general, cardiovascular, neurological, gynecological, urological, colorectal, orthopedic, or plastic surgery within 30 to 180 days before their inclusion in the study and were hospitalized in the Samuel Libânio General Hospital or receiving outpatient care at the Nursing Care and Education Center in Pouso Alegre, Minas Gerais, Brazil, from December 2012 to December 2013. The selected patients were invited and voluntarily agreed to participate in the study. Patients with cognitive impairment (as determined by the Mini-Mental State Examination) who could not complete the questionnaires were not included in the study.

Of the 61 subjects, 41 patients who developed surgical wound dehiscence were allocated to the dehiscence group, and 20 patients who achieved complete wound healing without experiencing wound dehiscence were allocated to the control group.

The validated Brazilian versions of the Body Dysmorphic Disorder Examination (BDDE)[20] and Body Investment Scale (BIS),[21] as well as a questionnaire assessing the clinical and sociodemographic characteristics of patients, were used for data collection.

The Body Dysmorphic Disorder Examination

The Brazilian version of the 34-item BDDE is a specific measure of body image. The items are rated on a 0- to 6-point scale, with 0 indicating the absence of negative body image symptoms in the previous 4 weeks. Scores of 1 to 6 represent the frequency (number of days) or intensity (mild to severe) of symptoms. The BDDE total score is obtained by the sum of ratings for all items, except items 1, 2, 3, 22, 33, and 34, which are used for a clinical evaluation by the interviewer.[19] The BDDE total score ranges from 0 to 168; a cutoff score of 66 or higher indicates higher degree of dissatisfaction with appearance.[20] For example, some of the items specifically assess the avoidance of social and public situations, avoidance of physical contact with other people, avoidance of looking at their body into mirrors, and comparing oneself to other people. The instrument was administered in a semistructured interview conducted by an experienced psychologist.

The Body Investment Scale

The Brazilian version of the BIS is a self-report questionnaire assessing emotional investment in the body. It is composed of 20 items grouped into three components: body image (items 5, 10, 13, 16, 17, and 21), body care (items 1, 8, 12, 14, 15, 18, 19, and 24), and body touch (items 2, 6, 9, 11, 20, and 23).[21] The items are rated on a 5-point scale. The BIS total score is calculated as the sum of ratings for the 20 items, with higher scores indicating more positive feelings about the body.[21] The questionnaire was completed by all patients participating in the study.

Statistical Analysis

A χ^2 test was used to test for associations among categorical variables. A Fisher exact test was used for small numbers when the χ^2 test was inappropriate.

A Student *t* test for independent samples was used to compare means between two independent variables. Analyses of variance followed by the post hoc Duncan multiple-range test were applied to compare means from more than two variables.

The Kolmogorov-Smirnov test was performed to test for normality. The nonparametric Mann-Whitney *U* test was conducted for comparison of two variables, and the Kruskal-Wallis test followed by the post hoc Dunn-Bonferroni test was used for comparisons of more than two variables when the normality assumption was not satisfied.

The Levene test was used to determine homogeneity of variance. In cases of a violation of the homoscedasticity assumption, degrees of freedom were corrected using the Brown-Forsythe correction.

Pearson correlation coefficient was used to determine the extent of linearity between two quantitative variables.

A seemingly unrelated regression (SUR) model was constructed to evaluate the effects of surgical wound dehiscence on body image (BIS and BDDE scores), controlling for sociodemographic and clinical characteristics. Because of the possibility that the direction of the BIS measures is inverse to that of BDDE measures, two regression equations were simultaneously solved: (1) an equation with BIS scores as the dependent variable and BDDE scores, sociodemographic characteristics, and clinical characteristics as explanatory variables; and (2) an equation with BDDE scores as the dependent variable and BIS scores, sociodemographic characteristics, and clinical characteristics as explanatory variables.

All variables whose associations with BIS or BDDE scores were significant at $P < .1$ were included in the SUR model, except for gender, presence of dehiscence, and dehiscence-by-gender interaction, which were included in the initial model regardless of statistical significance. A backward stepwise procedure was used to sequentially remove nonsignificant variables until only significant variables remained.

All statistical tests were performed at a significance level of .05 ($P < .05$).

Statistical analysis was carried out using the Statistical Package for the Social Sciences for Windows (version 20.0; SPSS Inc, Chicago, Illinois) and Stata 12 (StataCorp, College Station, Texas) softwares.

RESULTS

In total, 104 patients with wound dehiscence were identified in the participating institutions. However, 10 of them died before the interview was scheduled, 11 were cognitively impaired, 10 could not be contacted, 7 declined to participate, and 25 missed the scheduled interview; the remaining 41 patients were included in the dehiscence group. Twenty-five patients (61%) with dehiscence were women. Surgical wound dehiscence defects ranged from 0.5 to 30 cm in length and 0.5 to 7 cm in depth and were located on the arms, legs, or chest.

Twenty patients who achieved complete wound healing were allocated to the control group; 12 (60%) of them were women.

The mean age of the participants was 50.5 ± 16.7 years (median, 53 years; range, 18–82 years). Overall, most participants (60.7%) were women, 85.2% were white, 67.2% had a stable marital relationship, 72.1% were Catholic, 42.6% were illiterate or had elementary education, and 39.3% were a parent of either gender with two children. In addition, 58.3% of patients had comorbidities (eg, hypertension and diabetes mellitus), and general surgery has been performed in 26.2% of cases.

Among patients with wound dehiscence, 51.2% (21/41) had wounds located on their abdomen, 61% (25/41) had wounds 5 cm or smaller in length, and 73.2% (30/41) had wound dehiscence for more than 30 days.

Wound dehiscence development was significantly associated with being white ($P = .048$), having two children or more ($P = .024$), comorbid conditions ($P = .01$), systemic arterial hypertension ($P = .006$), and diabetes mellitus ($P = .001$) and inversely related to having only one child ($P = .024$), as shown in Table 1.

A significant difference in mean BIS scores was found between genders, but not for other variables. Overall, men reported higher BIS scores than women, regardless of the type surgery, showing more positive feelings about the body (Table 2). No significant differences in BIS scores were observed for wound location ($P = .261$), type of surgery ($P = .436$), and other variables (Table 2).

Patients in the dehiscence group reported higher BDDE scores (negative body image) than controls ($P = .013$). Significant differences in mean BDDE scores were associated with number of children ($P = .009$) and wound length ($P = .02$), as seen in Table 3. No significant differences in BDDE scores were detected for wound location ($P = .293$), type of surgery ($P = .199$), and other variables (Table 3).

A moderate negative correlation was observed between BIS and BDDE scores ($r = -0.374$, $P = .003$). The higher the BDDE score, the lower the BIS score.

The final SUR model had seven variables with a ratio of just over eight cases per variable. The significant variables that remained in the final SUR model for BIS scores were men with wound dehiscence ($P = .042$) and BDDE scores ($P < .001$), and those for the BDDE scores were number of children ($P = .031$), wound length ($P = .028$), and BIS scores ($P < .001$), as listed in Table 4.

Men with dehiscence reported a mean BIS score 4.54 points higher than those reported by women (with and without wound dehiscence) and men without wound dehiscence, when BDDE scores were controlled. For every 1-point increase in BDDE scores, there was an average reduction of 0.20 in BIS scores (Table 4).

The mean BDDE score for patients with only one child was 17.84 points lower (positive body image) than those for patients without children or who had two or more children, when the other variables were controlled. It was also observed that the mean BDDE score was 13.94 points higher (negative body image) for patients with wound dehiscence 1 to 5 cm in length than for those who had wound dehiscence of greater than 5 cm in length

Table 1.

FREQUENCY DISTRIBUTION OF PATIENT CHARACTERISTICS FOR BOTH GROUPS

	Groups					
	Dehiscence		Control		Total	
Variables	n	%	n	%	n	%
Gender	41	100	20	100	61	100
Men	16	39.0	8	40.0	24	39.3
Women	25	61.0	12	60.0	37	60.7
$\chi^2_1 = 0.01$, $P = .942$						
Ethnicity	41	100	20	100	61	100
White	38	92.7	14	70.0	52	85.2
Mixed race	3	7.3	6	30.0	9	14.8
Fisher exact test, $P = .048$[a]						
Marital status	41	100	20	100	61	100
Single	9	22.0	4	20.0	13	21.3
Unstable partnership	5	12.2	2	10.0	7	11.5
Stable partnership	27	65.9	14	70.0	41	67.2
Fisher exact test, $P = 1.000$						
No. of children	41	100	20	100	61	100
None	6	14.6	3	15.0	9	14.8
1	3	7.3	6	30.0	9	14.8
2	15	36.6	9	45.0	24	39.3
≥3	17	41.5	2	10.0	19	31.1
Fisher exact test, $P = .024$[a]						
Education level	41	100	20	100	61	100
Illiterate/elementary education	20	48.8	6	30.0	26	42.6
Primary education	11	26.8	4	20.0	15	24.6
High school/college education	10	24.4	10	50.0	20	32.8
$\chi^2_2 = 4.06$, $P = .132$						
Religion	41	100	20	100	61	100
Catholic	30	73.2	14	70.0	44	72.1
Other	11	26.8	6	30.0	17	27.9
$\chi^2_1 = 0.70$, $P = .795$						
Comorbid conditions	40	100	20	100	60	100
No	12	30.0	13	65.0	25	41.7
Yes	28	70.0	7	35.0	35	58.3
$\chi^2_1 = 6.72$, $P = .010$[a]						
Hypertension	38	100	20	100	58	100
No	14	36.8	15	75.0	29	50.0
Yes	24	63.2	5	25.0	29	50.0
$\chi^2_1 = 7.63$, $P = .006$[a]						
Diabetes mellitus	38	100	20	100	58	100
No	23	60.5	20	100	43	74.1
Yes	15	39.5	0	0.0	15	25.9
$\chi^2_1 = 10.64$, $P = .001$[a]						
Other comorbid conditions	38	100	20	100	58	100
No	30	78.9	16	80.0	46	79.3
Yes	8	21.1	4	20.0	12	20.7
Fisher exact test, $P = 1.000$						
Type of surgery	41	100	20	100	61	100
General	11	26.8	5	25.0	16	26.2
Orthopedic	7	17.1	4	20.0	11	18.0
Obstetric/gynecologic	6	14.6	5	25.0	11	18.0
Cardiovascular	7	17.1	1	5.0	8	13.1
Other	10	24.4	5	25.0	15	24.6
Fisher exact test, $P = .710$						
Wound location	41	100	20	100	61	100
Limbs	10	24.4	5	25.0	15	24.6
Chest	10	24.4	3	15.0	13	21.3
Abdomen	21	51.2	12	60.0	33	54.1
Fisher exact test, $P = .715$						

[a]Statistical significance ($P < .05$).

Table 2.

BIS SCORES BY PATIENT CHARACTERISTIC

Variables	Mean	SD	Median	Min	Max	n
Dehiscence	82.5	9.2	83.0	59.0	100.0	61
Yes (dehiscence group)	81.8	10.6	82.0	59.0	100.0	41
No (control group)	84.0	5.3	83.0	74.0	96.0	20
$t_{59} = 0.84$, $P = .302$						
Gender	82.5	9.2	83.0	59.0	100.0	61
Men	85.6	7.8	85.0	67.0	100.0	24
Women	80.5	9.6	82.0	59.0	94.0	37
$t_{59} = 2.16$, $P = .035$[a]						
Ethnicity	82.5	9.2	83.0	59.0	100.0	61
White	82.6	9.9	84.0	59.0	100.0	52
Mixed race	82.0	2.8	82.0	77.0	87.0	9
$t_{46} = 0.37$, $P = .714$						
Marital status	82.5	9.2	83.0	59.0	100.0	61
Single	81.2	9.1	84.0	63.0	94.0	13
Unstable partnership	82.4	13.0	82.0	60.0	100.0	7
Stable partnership	83.0	8.7	83.0	59.0	97.0	41
$F_{2,58} = 0.19$, $P = .828$						
No. of children	82.5	9.2	83.0	59.0	100.0	61
None	78.4	9.0	81.0	60.0	88.0	9
1	89.1	5.8	90.0	80.0	100.0	9
2	82.3	9.1	82.5	61.0	97.0	24
≥ 3	81.6	9.7	82.0	59.0	94.0	19
$F_{3,57} = 2.34$, $P = .083$						
Education level	82.5	9.2	83.0	59.0	100.0	61
Illiterate/elementary	82.5	8.3	83.0	63.0	94.0	26
Primary	83.6	9.7	83.0	61.0	100.0	15
High school/college	81.8	10.2	82.5	59.0	97.0	20
$F_{2,58} = 0.17$, $P = .845$						
Religion	82.5	9.2	83.0	59.0	100.0	61
Catholic	82.1	9.0	82.0	60.0	100.0	44
Other	83.7	9.8	86.0	59.0	96.0	17
$t_{59} = -0.62$, $P = .537$						
Comorbid conditions	82.5	9.1	83.0	59.0	100.0	61
No	85.1	9.3	87.0	60.0	100.0	25
Yes	81.1	8.7	82.0	59.0	94.0	36
t58 = 1.71, $P = .092$						
Hypertension	82.5	8.7	83.5	60.0	100.0	61
No	84.8	8.9	83.0	60.0	100.0	31
Yes	81.7	8.3	84.0	61.0	94.0	30
$t_{56} = 1.37$, $P = .174$						
Diabetes mellitus	82.5	8.7	83.5	60.0	100.0	61
No	84.0	8.2	84.0	60.0	100.0	44
Yes	81.2	9.8	82.0	61.0	94.0	17
$t_{56} = 1.08$, $P = .285$						
Other comorbid conditions	82.5	8.7	83.5	60.0	100.0	61
No	83.1	9.4	83.0	60.0	100.0	48
Yes	83.9	5.1	84.0	72.0	92.0	13
$t_{33} = -0.40$, $P = .692$						
Wound location	82.5	9.2	83.0	59.0	100.0	61
Limbs	85.4	6.2	85.0	74.0	97.0	15
Chest	79.7	9.4	80.0	61.0	96.0	13
Abdomen	82.3	10.1	84.0	59.0	100.0	33
$F_{2,58} = 1.38$, $P = .261$						
Type of surgery	82.5	9.2	83.0	59.0	100.0	61
General	83.1	10.3	86.5	60.0	100.0	16
Orthopedic	85.2	5.4	85.0	79.0	97.0	11
Obstetric/gynecologic	80.0	10.6	82.0	59.0	94.0	11
Cardiovascular	78.4	9.9	78.5	61.0	94.0	8
Other	84.1	8.7	84.0	70.0	96.0	15

(continues)

Table 2.

BIS SCORE BY PATIENT CHARACTERISTIC, CONTINUED

Variables	Mean	SD	Median	Min	Max	n
$F_{4,56}$ = 0.96, P = .436						
Wound length	82.5	9.2	83.0	59.0	100.0	61
0	84.0	5.3	83.0	74.0	96.0	20
1–5 cm	81.2	10.6	82.0	59.0	96.0	25
>5 cm	82.8	10.8	83.0	60.0	100.0	16
$F_{2,42}$ = 0.50, P = .609						
Wound duration, d	82.5	9.2	83.0	59.0	100.0	61
0	84.0	5.3	83.0	74.0	96.0	20
1–30	81.9	8.3	84.0	59.0	90.0	11
31–90	82.1	11.7	87.0	60.0	94.0	15
>90	81.5	11.5	79.0	61.0	100.0	15
$F_{3,43}$ = 0.23, P = .879						

[a]Statistical significance ($P < .05$).
Abbreviation: BIS, Body Investment Scale.

Table 3.

BDDE SCORE BY PATIENT CHARACTERISTIC

Variables	Mean	SD	Median	Min	Max	n
Dehiscence	42.2	27.5	38.0	4.0	110.0	61
Yes (dehiscence group)	48.3	26.6	41.0	7.0	110.0	41
No (control group)	29.9	25.9	18.5	4.0	100.0	20
t_{59} = −2.57, P = .013[a]						
Gender	42.2	27.5	38.0	4.0	110.0	61
Men	39.3	25.7	38.0	7.0	92.0	24
Women	44.1	28.8	38.0	4.0	110.0	37
t_{59} = −0.66, P = .511						
Ethnicity	42.2	27.5	38.0	4.0	110.0	61
White	41.5	26.6	37.0	4.0	101.0	52
Mixed race	46.6	34.0	43.0	12.0	110.0	9
Mann-Whitney U test, P = .618						
Marital status	42.2	27.5	38.0	4.0	110.0	61
Single	45.9	31.1	35.0	8.0	101.0	13
Unstable partnership	51.3	35.1	46.0	7.0	90.0	7
Stable partnership	39.5	25.2	38.0	4.0	110.0	41
$F_{2,58}$ = 0.68, P = 0.509						
No. of children	42.2	27.5	38.0	4.0	110.0	61
None	50.3[b]	27.0	46.0	8.0	90.0	9
1	17.6[c]	13.0	14.0	4.0	41.0	9
2	44.6[b]	29.2	39.0	8.0	100.0	24
≥3	47.1[b]	25.8	40.0	8.0	110.0	19
Kruskal-Wallis test, P = .009[a]						
Education level	42.2	27.5	38.0	4.0	110.0	61
Illiterate/elementary	50.5	30.2	39.0	8.0	110.0	26
Primary	36.3	20.7	41.0	7.0	93.0	15
High school/college	36.1	26.8	36.0	4.0	90.0	20
$F_{2,58}$ = 2.09, P = .133						
Religion	42.2	27.5	38.0	4.0	110.0	61
Catholic	42.9	28.6	37.0	4.0	110.0	44
Other	40.6	25.3	40.0	8.0	93.0	17

(continues)

Table 3.

BDDE SCORE BY PATIENT CHARACTERISTIC, CONTINUED

Variables	Mean	SD	Median	Min	Max	n
t_{59} = 0.29, P = .773						
Comorbid conditions	42.5	27.2	38.0	4.0	110.0	61
No	34.3	25.5	34.0	4.0	90.0	26
Yes	46.7	27.6	38.0	8.0	110.0	35
t_{58} = 1.78, P = .08						
Hypertension	42.5	27.7	38.0	4.0	110.0	61
No	34.9	25.6	34.0	4.0	90.0	31
Yes	48.3	28.5	40.0	8.0	110.0	30
t_{56} = −1.89, P = .064						
Diabetes mellitus	42.5	27.7	38.0	4.0	110.0	61
No	40.3	28.3	36.0	4.0	110.0	44
Yes	45.4	26.5	40.0	8.0	93.0	17
t_{56} = −0.61, P = .544						
Other comorbid conditions	42.5	27.7	38.0	4.0	110.0	61
No	39.7	24.7	40.0	4.0	93.0	48
Yes	49.0	37.5	32.0	8.0	110.0	13
t_{14} = −0.81, P = .430						
Wound location	42.2	27.5	38.0	4.0	110.0	61
Limbs	49.0	27.5	44.0	8.0	100.0	15
Chest	40.1	19.8	38.0	17.0	93.0	13
Abdomen	40.0	30.3	34.0	4.0	110.0	33
Kruskal-Wallis test, P = .293						
Type of surgery	42.2	27.5	38.0	4.0	110.0	61
General	33.8	26.5	26.0	7.0	84.0	16
Orthopedic	50.0	26.7	44.0	14.0	100.0	11
Obstetric/gynecologic	34.2	24.9	33.0	4.0	89.0	11
Cardiovascular	38.5	23.4	35.0	18.0	93.0	8
Other	53.5	30.8	46.0	8.0	110.0	15
$F_{4,56}$ = 0.96, P = .199						
Wound length, cm	42.2	27.5	38.0	4.0	110.0	61
No wound	29.9[d]	25.9	18.5	4.0	100.0	20
0.5 to 5	44.0	24.4	41.0	8.0	93.0	25
>5	55.0[e]	29.2	44.0	7.0	110.0	16
$F_{2,58}$ = 4.20, P = .02[a]						
Wound duration, d	42.2	27.5	38.0	4.0	110.0	61
0	29.9	25.9	18.5	4.0	100.0	20
1–30	42.0	32.5	35.0	8.0	110.0	11
31–90	52.0	24.5	41.0	24.0	101.0	15
>90	49.2	24.9	47.0	7.0	93.0	15
$F_{3,57}$ = 2.46, P = .072						

[a]Statistical significance ($P < 0.05$).
[b,c]$P < .05$, Dunn-Bonferroni test
[d,e]$P < .05$, Duncan multiple-range test
Abbreviation: BDDE, Body Dysmorphic Disorder Examination.

and controls. For every 1-point increase in BIS scores, there was an average reduction of 1.61 in BDDE scores (Table 4).

DISCUSSION

Surgical wound dehiscence, number of children, and wound length had a negative impact on body image. Patients with wound dehiscence, without children or with two or more children, and wounds 1 to 5 cm in length had greater dissatisfaction and more negative body image. These patients reported higher

Table 4.

FINAL SUR MODEL

Variables	Coefficient	SE	Z	P
SUR model for BIS scores				
Men with wound dehiscence	4.54	2.24	2.03	.042
BDDE scores	−0.20	0.04	−5.59	<.001
Constant	89.94	1.93	46.55	<.001
SUR model for BDDE scores				
No. of children				
None (reference)	0.00	—	—	—
1	−17.84	8.25	−2.16	.031
2	—	—	—	NS
≥3	—	—	—	NS
Wound length				
0 (reference)	0.00	—	—	—
1–5 cm	13.94	6.34	2.20	.028
>5 cm	—	—	—	NS
BIS scores	−1.61	0.32	−4.99	<.001
Constant	173.84	26.41	6.58	<.001
R^2 (BIS) = 15.35%; R^2 (BDDE) = 23.47%.				
Kolmogorov-Smirnov test (BIS scores, $P = .695$; BDDE scores, $P = .828$)				

Abbreviations: BDDE, Body Dysmorphic Disorder Examination; BIS, Body Investment Scale; NS, not significant; SE, standard error; SUR, seemingly unrelated regression.

BDDE and lower BIS scores, showing less emotional investment in the domains of body care, body touch, and body image.

Open wounds are associated with pain, exudate, odor, and physical and emotional discomfort, all of which have an important impact on self-esteem and body image. These factors may translate into avoidant behaviors, such as avoiding mirrors, and decreased body touch, especially among women.

Women expressed more body dissatisfaction than men, indicating a possible influence of sociocultural factors responsible for defining standards of beauty.[2,22,23] In general, women are more pressured and influenced by socially accepted standards of beauty. In the face of changes in physical appearance and function, a need to comply with standards of beauty increases vulnerability, affects one's perception of one's body, and may cause body image dissatisfaction.

Gender differences in body satisfaction may be attributed to the influence of cultural factors on body image perception.[23] However, standards of beauty have been globalized. The results of this study may be repeated in different countries, but the authors of the present study believe these findings do not reflect the cultural values of a given society; rather, they are a product of the suffering caused by real and apparent deformities related to surgical wound dehiscence.

A previous study indicated that despite many difficulties and clinically significant distress many individuals who suffered severe wounds found healthy and effective coping strategies.[24] The authors added that there is no formula to explain how some people with deformities develop and maintain a positive body image and good self-esteem, whereas others suffer from persistent problems.[24,25] Changes in appearance are particularly traumatic when combined with functional and sensory impairment.[26] Chronic wounds may be associated with acute stress and cause permanent changes in body image from the occurrence of scars, loss of function, or discomfort in intimate situations.[18,24,26]

The study sample comprised patients who had undergone general, cardiovascular, neurological, gynecological, urological, colorectal, orthopedic, or plastic surgery. The results showed that the type of surgery and location of the surgical wound were not as important as the impact of changes in physical appearance and physical functioning on each individual, in agreement with other studies.[27–29] In this context, each patient was assessed for emotional investment in their own body and for the presence or absence of a negative body image.

The results showed that dehiscence was associated with ethnicity, number of children, and comorbid conditions, including hypertension and diabetes, which is consistent with the findings of previous studies.[27–29] Hypertension was the most frequent condition reported in the study population, with a higher prevalence among those older than 50 years and in women. Negative body image was inversely related to having only one child (Table 3). In this study, patients with only one child tended to be younger than the other participants and lived in a family group. Patients without children or with two or more children were older; it was more likely that their children were married and had left home. This may have predisposed these individuals to vulnerability to health risks and changes in health-related behavior and self-care, resulting in poor recovery and increased risk of complications. In other words, familial relationships may help patients cope with disease.[30]

Although 61% of the open wounds were 5 cm or less in length, 73% of patients with wound dehiscence had the condition for more than 30 days, showing that despite the relatively small size of the wounds, the healing process was delayed, increasing chronicity and impairing quality of life. Patients who underwent general surgery showed higher rates of wound dehiscence compared with those who had undergone other types of surgery. Most surgical wound dehiscence defects occurred in the abdomen. A study reported that abdominal wound dehiscence occurred in 25% of cases;[31] other authors noted that patients with abdominal wound dehiscence had lower quality of life.[32] A previous investigation emphasized the importance of the abdomen in the assessment of body image and its impact on mental health.[1]

An incidence of surgical wound dehiscence of up to 22.7% was found in renal patients.[33] It was estimated that the incidence of deep wound infections ranges from 0.4% to 0.5% after cardiovascular operations.[34] Other authors have highlighted that complications resulting from surgical wound dehiscence are directly related to

the surgical procedure and are also the main causes of morbidity after kidney transplantation.[35] One study indicated that the course and complications of the condition may negatively affect the quality of life of patients.[36] In this study, patients developed deep surgical wound dehiscence after cardiovascular and kidney surgeries.

The dynamic aspect of body image is closely related to the psychosocial development of each person. Changes in physical appearance and function, including those associated with wound dehiscence, may adversely impact body image, affecting patients' perception of their body and their relationship with others (Figures 1–3).[1,6,32] Health professionals, including doctors, nurses, physical therapists, occupational therapists, and dietitians, should be alert to patient self-perception and body image, which may negatively affect mental health, adherence to treatment, and patient recovery.[1,6,32] This awareness could contribute to the development of health strategies by a multidisciplinary team, focusing on the assistance provided by nurses and psychologists to promote healthy and effective coping strategies. Awareness of deformity and consequent suffering may lead to severe body image disturbance, which may discourage individuals from carrying out activities of daily living and complying with good health practices, significantly impairing their quality of life.

Figure 1.
STUDY PARTICIPANT WITH SURGICAL WOUND DEHISCENCE 30 DAYS AFTER SURGERY

Figure 2.
STUDY PARTICIPANT WITH SURGICAL WOUND DEHISCENCE 30 DAYS POSTOPERATION

The small sample size was the major limitation of this study. Further studies with a larger number of surgical patients are necessary to extrapolate the results.

CONCLUSIONS

These results show that wound dehiscence had a negative impact on body image. The results also revealed the influence of emotional body investment (translated as body care and body touch) on body image. Deficits in body investment were related to dissatisfaction and negative feelings about the body.

It is essential that health professionals treat the patient with a wound, whether acute or chronic, as a whole person by assisting and providing the necessary support, especially to those who are emotionally vulnerable and depressed and/or have a negative body image. By identifying the breadth and depth of the emotional and physical experiences of patients, it is possible to

Figure 3.
STUDY PARTICIPANT SHOWING PROPER HEALING OF THE SURGICAL WOUND 30 DAYS AFTER SURGERY

prevent or alleviate the suffering of individuals whose body image may negatively impact their quality of life.[6,30]

REFERENCES

1. De Brito MJ, Nahas FX, Barbosa MV, et al. Abdominoplasty and its effect on body image, self-esteem, and mental health. Ann Plast Surg 2010;65:5-10.
2. Cash TF, Morrow JA, Hrabosky JI, Perry AA. How has body image changed? A cross-sectional investigation of college women and men from 1983 to 2001. J Consult Clin Psychol 2004;72: 1081-9.
3. MacGregor FC. Patient dissatisfaction with results of technically satisfactory surgery. Aesthet Plast Surg 1981;5:27-32.
4. Schilder P. The Image and Appearance of the Human Body. London: Trubner and Co; 1935.
5. Phillips KA. Body image and body dysmorphic disorder. In: Cash TF, Pruzinsky T, eds. Body Image: A Handbook of Theory, Research, and Clinical Practice. New York: Guilford Press; 2004.
6. Pruzinsky T, Cash TF. Assessing body image and quality of life in medical settings. In: Cash TF, Pruzinsky T, eds. Body Image. A Handbook of Theory, Research & Clinical Practice. New York: Guilford Press; 2004.
7. Ben-Tovim DI, Walker MK. Body image, disfigurement and disability. J Psychos Res 1995;39: 283-91.
8. Johnson CM. Development of abdominal wound dehiscence after a colectomy: a nursing challenge. Medsurg Nurs 2009;18:96-102.
9. Codner PA, Brasel KJ, Deroon-Cassini TA. Staged abdominal repairs reduce long-term quality of life. Injury 2012;43:1513-6.
10. Kulaylat MN, Dayton MT. Surgical complications. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, eds. Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice. Philadelphia, PA: WB Saunders; 2004.
11. Wagar SH, Malik ZI, Razzag A, Abdullah MT, Shaima A, Zahid MA. Frequency and risk factors for wound dehiscence/burst abdomen in midline laparotomies. J Ayub Med Coll Abbottabad 2005;17:70-3.
12. Spiliotis J, Tsiveriotis K, Datsis AD, et al. Wound dehiscence: is still a problem in the 21th century: a retrospective study. World J Emerg Surg 2009;4:12.
13. L de Lima E, Salomé GM, de Brito Rocha MJ, Ferreira LM. The impact of compression therapy with Unna's boot on the functional status of VLU patients. J Wound Care 2013;22:558-61.
14. Titscher A, Lumenta DB, Kamolz LP, Mittlboeck M, Frey M. Emotional associations with skin: differences between burned and non-burned individuals. Burns 2010;36:759-63.
15. Vahle VJ, Andresen EM, Hagglund KJ. Depression measures in outcomes research. Arch Phys Med Rehabil 2000;81:S53-62.
16. Piccolo MS, Gragnani A, Daher RP, de Tubino Scanavino M, de Brito MJ, Ferreira LM. Burn Sexuality Questionnaire: Brazilian translation, validation and cultural adaptation. Burns 2013; 39:942-9.
17. Salomé GM, Blanes L, Ferreira LM. Assessment of depressive symptoms in people with diabetes mellitus and foot ulcers. Rev Col Bras Cir 2011;38:327-33.
18. Ilechukwu ST. Psychiatry of the medically ill in the burn unit. Psychiatr Clin North Am 2002;25:129-47.
19. Corry N, Pruzinsky T, Rumsey N. Quality of life and psychosocial adjustment to burn injury: social functioning, body image, and health policy perspectives. Int Rev Psychiatry 2009;21: 539-48.
20. Jorge RT, Sabino Neto M, Natour J, Veiga DF, Jones A, Ferreira LM. Brazilian version of the body dysmorphic disorder examination. São Paulo Med J 2008;126:87-95.
21. Gouveia VV, Santos CA, Gouveia RSV, Santos WS, Pronk SL. Escala de Investimento Corporal (BIS): evidências de sua validade fatorial e consistência interna [Body Investment Scale (BIS): evidences of its factor validity and reliability]. Aval Psicol 2008;7:57-66.
22. Swami V, Chamorro-Premuzic T, Bridges S, Furnham A. Acceptance of cosmetic surgery: personality and individual difference predictors. Body Image 2009;6:7-13.
23. Alfano L, Hildebrandt T, Bannon K, Walker C, Walton KE. The impact of gender on the assessment of body checking behavior. Body Image 2011;8:20-5.
24. Pope SJ, Solomons WR, Done DJ, Cohn N, Possamai AM. Body image, mood and quality of life in young burn survivors. Burns 2007;33:747-55.
25. Sadeghi-Bazargani H, Maghsoudi H, Soudmand-Niri M, Ranjbar F, Mashadi-Abdollahi H. Stress disorder and PTSD after burn injuries: a prospective study of predictors of PTSD at Sina Burn Center Iran. Neuropsychiatr Dis Treat 2011;7:425-9.
26. Dolto F. A Imagem Inconsciente do Corpo [The Unconscious Image of the Body]. São Paulo, Brazil: Perspectiva; 2004.
27. Dalman RL, Abruzzese T, Bushnik T, Harris EJ Jr. Open saphenectomy complications following lower extremity revascularization. Cardiovasc Surg 2000;8:51-7.
28. Chalita-Manzur A, Hermosillo-Sandoval JM. Prognostic index in wound infection and abdominal sepsis. Rev Gastroenterol Mex 2001;66:6-13.
29. Van Ramshorst GH, Nieuwenhuizen J, Hop WC, et al. Abdominal wound dehiscence in adults: development and validation of a risk model. World J Surg 2010;34:20-7.
30. Waidman MA, Rocha SC, Correa JL, Brischiliari A, Marcon SS. Daily routines for individuals with a chronic wound and their mental health. Texto Contexto Enferm 2011;20:691-9.
31. Miller RS, Morris JA Jr, Diaz JJ Jr, Herring MB, May AK. Complications after 344 damage-control open celiotomies. J Trauma 2005;59:1365-71; discussion 1371-4.
32. Van Ramshorst GH, Eker HH, van der Voet JA, Jeekel J, Lange JF. Long-term outcome study in patients with abdominal wound dehiscence: a comparative study on quality of life, body image, and incisional hernia. J Gastrointest Surg 2013;17:1477-84.
33. Grim SA, Slover CM, Sankary H, Oberholzer J, Benedetti E, Clark NM. Risk factors for wound healing complications in sirolimus-treated renal transplant recipients. Transplant Proc 2006;38:3520-3.
34. Tiveron MG, Fiorelli AI, Mota EM, et al. Preoperative risk factors for mediastinitis after cardiac surgery: analysis of 2768 patients. Rev Bras Cir Cardiovasc 2012;27:203-10.
35. Humar A, Matas AJ. Surgical complications after kidney transplantation. Semin Dial 2005; 18:505-10.
36. Boer KR, van Ruler O, Reitsma JB, et al. Health related quality of life six months following surgical treatment for secondary peritonitis—using the EQ-5D questionnaire. Health Qual Life Outcomes 2007;5:35.