

Psychological Symptoms Among Obstetric Fistula Patients Compared to Gynecology Outpatients in Tanzania

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Abstract

Background Obstetric fistula is a childbirth injury prevalent in sub-Saharan Africa that causes uncontrollable leaking of urine and/or feces. Research has documented the social and psychological sequelae of obstetric fistula, including mental health dysfunction and social isolation.

Purpose This cross-sectional study sought to quantify the psychological symptoms and social support in obstetric fistula patients, compared with a patient population of women without obstetric fistula.

Method Participants were gynecology patients ($N=144$) at the Kilimanjaro Christian Medical Center in Moshi, Tanzania, recruited from the Fistula Ward ($n=54$) as well as gynecology outpatient clinics ($n=90$). Measures included previously validated psychometric questionnaires, administered orally by Tanzanian nurses. Outcome variables were compared between obstetric fistula patients and gynecology outpatients, controlling for background demographic variables and multiple comparisons.

Results Compared to gynecology outpatients, obstetric fistula patients reported significantly higher symptoms of depression, post-traumatic stress disorder, somatic complaints, and maladaptive coping. They also reported significantly lower social support.

Conclusion Obstetric fistula patients present for repair surgery with more severe psychological distress than gynecology

outpatients. In order to address these mental health concerns, clinicians should engage obstetric fistula patients with targeted mental health interventions.

Keywords Obstetric fistula · Vesicovaginal fistula (VVF) · Women's health · Depression · PTSD · Global mental health

Introduction

Obstetric fistula is a devastating maternal morbidity that results from complications during childbirth, when prolonged obstructed labor is not relieved by Cesarean section. During obstructed labor, the fetus cannot pass through the birth canal due to malrotation or small maternal pelvis size. The fetal pressure on the birth canal musculature lasts up to days, causing excruciating pain, cutting off blood flow to delicate vaginal tissue, and ultimately causing cell death (pressure necrosis) [1]. Following labor, the necrotic vaginal tissue disintegrates, leaving a fistula—or hole—between the bladder and rectum and the vagina; this results in uncontrollable leaking of urine and/or feces through the vagina. Fetal/early neonatal death occurs in the majority of obstetric fistula cases, and maternal clinical complications may include hemorrhage, infection, and infertility [2]. Women who develop a fistula during childbirth frequently face stigma, social ostracism, and isolation due to the odor of urine/feces leaking from the vagina [3–8]. Given this high level of stigma and isolation, women with obstetric fistulae report high rates of general mental health impairment, depression, low self-esteem, and low quality of life [9–14].

It has been argued that obstetric fistula is largely the result of poverty, gender inequality, and poor access to maternal health care [1, 15]. The women and girls at highest risk for developing obstetric fistulae during childbirth are young,

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uneducated, poor, and live in rural areas [16]. Indeed, early childbearing age, small stature, poverty, and lack of access to contraception, prenatal care, and emergency obstetric services are primary factors contributing to obstructed labor and subsequent fistula [17, 18]. Almost 2 million women worldwide live with unrepaired obstetric fistulae, almost exclusively in low-income countries, and most predominantly in sub-Saharan African countries [2, 19]. In Tanzania, approximately 46,000 women are living with an unrepaired fistula [20]. Based on Tanzania's population size, fistula incidence, and annual birth rate, there may be up to 1,800 new cases per year [20–22]. Given the continuing presence of this significant maternal health morbidity, the impact of obstetric fistula on the lives of women warrants close inspection.

Surgical repair of obstetric fistula is possible, although women often face barriers to accessing care. In Tanzania, efforts by the Ministry of Health and Social Welfare and non-governmental organizations (NGOs) have attempted to directly address the barriers to care. Tanzania has mandated free surgical repair of obstetric fistula and an NGO-led effort has implemented a national community-based referral system [23]. Surgical fistula repair has up to a 90 % success rate [24, 25].

A number of features of obstetric fistula may increase the likelihood of developing psychological disorders, including a traumatic birth experience, loss of a child, chronic disease and pain, divorce, stigma, and social isolation [3, 7, 8, 12, 26, 27]. Quantitative studies of psychopathology in fistula patients have generally documented high levels of psychiatric morbidity, including higher levels of depression and a more external locus of control compared to healthy controls [9]. In one sample, 73 % of fistula patients met study criteria for depression and 17 % endorsed suicidal ideation [13]. Compared to female health care workers, fistula patients in Ethiopia and Bangladesh had a higher rate of general mental health dysfunction [11]. Additionally, several qualitative studies have indicated prominent themes related to sadness, grief, shame, and worrying [7, 12, 27–29].

Limitations in the methodology of previous studies necessitate further investigation of the psychological sequelae of obstetric fistula. Most studies of obstetric fistula and mental health are either qualitative in nature or do not include a comparison group [7, 12, 13, 27, 28]. These types of study designs limit the extent to which researchers can conclude that fistula is associated with heightened prevalence of psychological distress. Two studies to date have compared fistula patients to healthy controls [9, 11]. However, given that individuals with chronic or newly diagnosed illness generally report higher levels of psychological distress [30, 31], it is unlikely that documented elevations in psychological dysfunction are wholly attributable to fistula-specific experience. It is possible that for fistula patients, some distress could be accounted for by poor health more generally. Thus, clinic or hospital patients would serve as the most appropriate control group.

The purpose of the current study was to investigate the mental health of women with obstetric fistulae in Tanzania. To accomplish this objective, the study had two aims: (1) to compare the severity of depression and PTSD in women admitted for obstetric fistula repair and a comparison group of gynecology outpatients and (2) to compare secondary psychosocial variables (somatic symptoms, coping styles, and social support) in these two groups. The results of this study can add to our understanding of the mental health of obstetric fistula patients and identify opportunities for support and treatment for this population.

Methods

Study Site

The study was conducted in the Department of Obstetrics and Gynecology at the Kilimanjaro Christian Medical Center (KCMC-OG) in Moshi, Tanzania. KCMC-OG treats patients presenting for a variety of inpatient and outpatient women's health needs. Through the support of governmental legislation and NGO funding, KCMC-OG provides free surgical repair of obstetric fistula and has a dedicated Fistula Ward. Once admitted to the Fistula Ward, patients generally undergo reparative surgery within 2 weeks and remain on the ward up to 4 weeks.

Participants

Two types of participants were enrolled: obstetric fistula inpatients and gynecology outpatients. Exclusion criteria for both groups included current age less than 18 years and past-only obstetric fistula (i.e., the fistula was previously successfully repaired).

Obstetric fistula group Participants in the obstetric fistula group were recruited from the KCMC-OG Fistula Ward. Patients were eligible for participation if they were admitted for surgical repair of a fistula from an obstetric cause. Fistula patients were recruited prior to surgery, within 7 days of admission on the Fistula Ward. Between August 2010 and February 2012, a total of 54 fistula patients were approached and enrolled. No potential participants refused enrolment in the study.

Outpatient gynecology comparison group A comparison group of gynecology outpatients was recruited from the Cervical Cancer Screening Clinic and the Post-Natal Care Clinic of KCMC-OG. These comparison groups were chosen for distinct reasons. Women often present to outpatient gynecology clinics with significant physical health problems [32], which makes the physical health distress of patients in the

Cervical Cancer Screening Clinic comparable to that of fistula patients. In East Africa, nearly half of postpartum mothers screen positive for postpartum depression [33], making the Post-Natal Care Clinic a relevant comparison group. Patients were eligible for participation if they presented for care at the clinics and had a history of childbirth. Given the demographic distinctiveness of obstetric fistula patients, women with similar age and parity to the fistula group were recruited for the comparison group. On recruitment days, the study data collector made a study announcement in the waiting area for one of the two recruitment clinics. Between April 2011 and March 2013, a total of 92 patients were approached, and all potential participants enrolled. Due to participant time constraints, two consented participants were unable to complete data collection, yielding a final comparison group size of 90.

Procedure

All data were collected by two study staff members, both of whom were nurses of Tanzanian nationality. For participants in the obstetric fistula group, a data collector scheduled an appointment for administration of all study measures within 1 week of the participant's admission to the Fistula Ward. For comparison group participants, the data collectors completed all study procedures on the day of the patient's enrolment in the study. Informed consent was obtained from all participants before completing the interviewer-administered survey. Participants were compensated 3,000 Tanzanian Shillings (approximately equivalent to \$2); this amount was intended to provide adequate reimbursement for time and effort without being coercive.

Measures

Study measures were translated by a Masters-level Tanzanian translator into Swahili, the predominant language in Tanzania. Following initial translation, measures were reviewed by the site principal investigator and by data collectors, for whom Swahili was a first language. Any irregularities were discussed and re-translated. Following this procedure, the measures were then back-translated. Following back-translation into English, irregularities were discussed and re-translated.

All study measures were administered to both study groups orally, given the documented low literacy of obstetric fistula patients [34]. Since most measures used Likert scales for response options, a visual representation of the scaled response options was devised [35].

Demographics and obstetric history Background demographic information was collected from participants. A brief obstetric history was also collected. For fistula patients, additional questions specific to fistula development and treatment were included.

Depression symptoms The Center for Epidemiologic Studies Depression Scale (CES-D) is a 20-item scale used to assess depression symptoms in epidemiologic settings and has previously been validated in a South African patient population [36, 37]. Participants reported depression symptoms in the past week on a 4-point Likert scale (0 to 3). The measure yielded a continuous depression severity score (0 to 60), with high reliability ($\alpha=0.93$).

PTSD symptoms The PTSD Checklist-Civilian Version (PCL-C) is a 17-item measure of PTSD symptoms [38]. Participants were asked to endorse past-month general PTSD symptoms irrespective of a specific trauma, with level of distress assessed on a 5-point Likert scale. The PCL-C has been previously used in East African traumatized populations [39, 40]. The measure yielded a continuous PTSD symptom score (17 to 85), with high reliability ($\alpha=0.93$).

Potentially traumatic events The Traumatic Life Events Questionnaire (TLEQ) [41] is a 21-item inventory of potentially traumatic life events. It includes a 7-point frequency scale (0=never to 6=more than 5 times) for a variety of events, such as natural disaster or assault. The TLEQ was adapted for use in the study sample: motor vehicle accidents and other accidents were combined into a single item; childhood sexual abuse was assessed with a single item; and questions regarding stillbirth, infant mortality, and child mortality were added. A total score of approximate number of potentially traumatic life events (0 to 126) was yielded from the scale.

Perceived social support The Duke-UNC Functional Social Support Questionnaire (FSSQ) measured current perceived social support [42, 43]. The FSSQ was previously culturally adapted to measure social support in Tanzanian women [42]. The adapted FSSQ has 10 items, each measured on a 5-point Likert scale. All items on the FSSQ were averaged to yield a continuous perceived social support score (1 to 5), with high reliability ($\alpha=0.92$).

Coping The Brief COPE measures personal styles of managing stress [44] and has previously been used in South African populations [45–47]. In the current study, fistula patients were asked to rate the extent to which they use various strategies to deal with their fistula. For participants in the comparison group, they were asked how they deal with either a medical condition (when applicable) or with general stress. An exploratory factor analysis yielded five subscales: active coping ($\alpha=0.75$; e.g., "I've been taking action to try to make the situation better"), social support coping ($\alpha=0.81$; e.g., "I've been getting help and advice from other people"), substance use coping ($\alpha=0.98$, e.g., "I've been using alcohol or other drugs to help me get through it"), avoidant coping ($\alpha=0.87$, e.g., "I've

been criticizing myself”), and resignation coping ($\alpha=0.79$, e.g., “I’ve been giving up the attempt to cope”).

Somatic symptoms The Bradford Somatic Inventory was developed as a cross-cultural measure of somatic symptoms [48] and has been validated in a West African population [49]. Six items potentially attributable to fistula symptoms were omitted, leaving 38 somatic symptoms. Past-month symptom frequency was categorized by the number of days each symptom was present (0=Never, 1=1–15 days, 2=16–30 days). An overall severity score was yielded from the scale (0–76), with high reliability ($\alpha=0.92$).

Analysis

For all outcome analyses, the dichotomous main predictor variable was group (obstetric fistula versus gynecology outpatient). Group differences were assessed for demographic variables to identify control variables for multivariate analysis, and for psychological outcome variables. Interviewer effects were assessed, including main effects on outcome variables, as well as the moderating effect of interviewer on the association between group and outcome variables.

To address the study aims, five hierarchical regressions were conducted to predict outcome variables separately. In step 1 of each hierarchical regression, relevant continuous and categorical demographic control variables were entered. In step 2, the fistula group variable was added to assess the effect of fistula group membership on outcome variables above and beyond demographic covariates. The R^2 change statistic was utilized to determine the added predictive power of group on each outcome variable, i.e., what proportion of the variance in depression and PTSD symptoms was accounted for by fistula group.

In order to control for multiple comparisons in statistical analysis, the sequential Holm–Bonferroni step-down procedure was employed [50]. The Holm–Bonferroni procedure reduces the probability of type I error and shows improved versatility and power compared to other multiple comparison procedures [51, 52]. Utilizing the procedure, the p values of all 5 linear regressions were ordered and numbered from 0 (smallest) to 4 (largest). Then, each successive test were compared to an adjusted alpha level, such that for the n th test of C number of total tests (5), the p value criterion was: $< \frac{\alpha}{C-n}$, where $\alpha=0.05$ [50].

Results

Sample Characteristics and Fistula Group Descriptives

The final sample ($N=144$) included 54 obstetric fistula participants and 90 gynecology outpatient participants. On average,

participants were 38.3 years of age ($SD=12.6$), and ranged from 18 to 86 years of age. Most participants were married (76 %), and the mean number of living children was 2.6 ($SD=1.8$). Of all participants, 73 % were Christian and 25 % were Muslim.

Among obstetric fistula patients, 49 (91 %) had a vesicovaginal fistula, 1 (2 %) had a rectovaginal fistula, and 4 (7 %) had both vesico- and rectovaginal fistulae. At the time of fistula development, 34 patients (63 %) had a stillborn infant. Fistula patients reported living with their fistula for an average of 8.69 years ($SD=10.83$; range 0–39), and 39 (72 %) had never before had a fistula surgery before admission to KCMC.

In the comparison group, 70 outpatients (78 %) were recruited from the Cervical Cancer Screening Clinic and 20 patients (22 %) were recruited from the Post-Partum Clinic.

Group Differences

Group differences in demographic factors and psychological outcome variables are shown in Table 1. Compared to gynecology outpatients, obstetric fistula patients were less likely to: have formal education, be currently working, have any income, or have any living children. Fistula patients also had significantly more potentially traumatic events than the comparison group. Traumatic event exposure differed by group (Fig. 1), with women in the obstetric fistula group being more likely to have experienced interpersonal loss (including still-birth) or illness, childhood physical abuse, adult physical violence, and female genital mutilation. Group differences were not detected in marital status, age, number of pregnancies, or number of children. There were unequal proportions of each group interviewed by respective data collectors.

In univariate analyses of main outcome variables, obstetric fistula patients endorsed significantly higher PTSD, depression, and somatic symptoms than gynecology outpatients (Table 2). Fistula patients also reported significantly less social support. Regarding coping strategies, the fistula group utilized significantly more avoidant and resignation coping, as well as less social support coping. There was a high level of correlation between social support coping and perceived social support, $r(144)=0.49$, $p<.001$. Due to this overlap, the social support coping variable was omitted from analysis as an outcome variable. There was also a strong correlation between avoidant and resignation coping subscales, $r(144)=0.60$, $p<.001$. Given the larger group difference in resignation coping, this variable was retained as the only coping outcome variable for the multivariate regression.

Main effects for interviewer were found for all five study outcome variables. There was also a significant interviewer \times group interaction effect for all outcome variables. Data collectors differed in the magnitude of their group effect sizes on outcome variables. Due to these data collector effects,

Table 1 Sample characteristics

	Obstetric fistula patients (<i>n</i> =54) N (%) / M (SD)	Gynecology outpatients (<i>n</i> =90) N (%) / M (SD)	Group difference
Age	37.9 (14.5)	38.6 (11.5)	<i>t</i> (142)=0.32
Number of pregnancies	3.9 (2.3)	3.2 (1.9)	<i>t</i> (142)=-1.86
Number of children	2.2 (2.0)	2.8 (1.7)	<i>t</i> (142)=1.97
Any living children	38 (70 %)	90 (100 %)	χ^2 (1)=30.0***
Married	37 (69 %)	72 (80 %)	χ^2 (1)=2.42
Completed primary school	30 (57 %)	84 (93 %)	χ^2 (1)=27.08***
Currently working	7 (13 %)	51 (57 %)	χ^2 (1)=26.8***
Any income reported	10 (19 %)	55 (61 %)	χ^2 (1)=24.72***
Religion			
Christian	37 (70 %)	68 (76 %)	χ^2 (2)=0.62
Muslim	15 (28 %)	21 (23 %)	
Other/none	2 (1 %)	1 (1 %)	
Number of traumatic events	12.2 (7.4)	7.3 (7.4)	<i>t</i> (142)=-3.82***
Data collection			
Interviewer A	43 (80 %)	34 (38 %)	χ^2 (1)=23.76***

p*<.05; *p*<.01; ****p*<.001

interviewer was included as a control variable in multivariate analyses.

Group Effects within Hierarchical Linear Regressions

Results from hierarchical linear regressions are shown in Table 3, which displays *R*² change for Step 2 analyses (adding group as a predictor of all outcome variables). Control variables entered in step 1 included interviewer, primary education, any income, and traumatic events. Currently working and any living children were not included as control variables due to high overlap with any income ($\varphi^2=0.91$) and fistula group ($\varphi^2=0.46$), respectively.

After entering control variables in step 1 of each analysis, fistula group significantly added predictive power for all outcome variables. This means that above and beyond the effects of lifetime traumatic events, education, household income,

and study interviewer, patients with fistula had significantly higher symptoms of: depression, PTSD, somatic complaints, and resignation coping. Patients with fistula also had significantly less social support than outpatient gynecologic patients, above and beyond the effects of control variables.

Given the low values for *R*² change in the analysis (all<.1), effects for step 2 control variables were probed for each outcome variable. For all outcome variables except for somatic symptoms, there was a consistent interviewer effect, with one interviewer consistently yielding significantly lower scores across psychosocial measures after controlling for covariates. Despite this interviewer effect, the psychosocial differences between groups remained robust. Additionally, a higher number of lifetime traumatic events was significantly associated with more depression symptoms ($\beta=0.29$), PTSD symptoms ($\beta=0.38$), and resignation coping ($\beta=0.26$), after controlling for covariates.

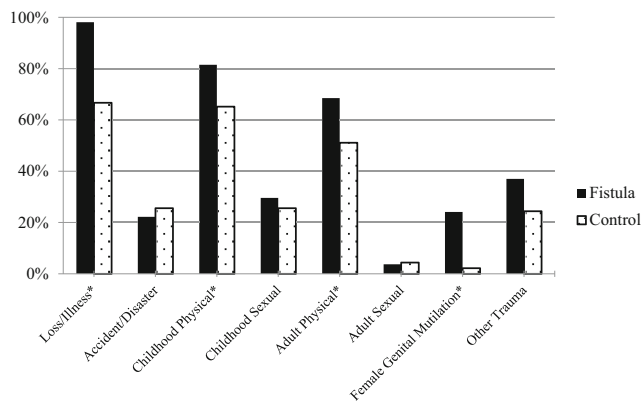


Fig. 1 Traumatic life event exposures by group. **p*<.05 in χ^2 difference test

Discussion

The overall purpose of this study was to compare mental health and social functioning in women with obstetric fistula to a comparison group of gynecology patients. Study results showed that above and beyond the effects of demographic variables and trauma exposure, obstetric fistula patients had significantly higher depression and PTSD symptoms compared to gynecology outpatients. It was also found that after controlling for covariates, fistula patients reported higher somatic symptoms, more resignation coping, and lower social support. Results add to existing literature documenting prevalent mental health concerns of obstetric fistula patients.

Table 2 Group differences in outcome variables

	Potential range	Obstetric fistula patients (<i>n</i> =54) M (SD)	Gynecology outpatients (<i>n</i> =90) M (SD)	Group difference ^a
PTSD symptoms	17–85	46.9 (14.7)	30.8 (13.1)	<i>t</i> (142)=−6.81***
Depression symptoms	0–60	25.4 (12.1)	9.7 (9.4)	<i>t</i> (91)=−8.15***
Somatic symptoms	0–76	16.2 (11.2)	8.6 (7.4)	<i>t</i> (81)=−4.45***
Social support	1–5	2.7 (1.0)	3.8 (0.7)	<i>t</i> (85)=7.64***
Coping subscales				
Active coping	5–20	15.6 (3.1)	15.5 (2.9)	<i>t</i> (142)=−0.12
Social support coping	5–20	14.4 (3.7)	16.1 (2.6)	<i>t</i> (84)=2.9**
Avoidant coping	9–36	20.4 (6.3)	16.9 (7.0)	<i>t</i> (142)=−3.04**
Resignation coping	3–12	6.6 (2.8)	4.3 (2.3)	<i>t</i> (94)=−5.04***
Substance use coping	2–8	2.3 (2.8)	2.3 (1.0)	<i>t</i> (142)=−0.15

^a For some variables, degrees of freedom were decreased by accounting for unequal variances between groups

p*<.05; *p*<.01; ****p*<.001

It is noteworthy that obstetric fistula patients report greater symptoms of depression and PTSD, even after controlling for underlying risk factors for psychopathology (e.g., low socioeconomic status, lifetime traumatic events, and being a medical patient). Possible mechanisms of the effect of fistula on psychological distress include factors that may occur during childbirth, immediately afterward, or during the months or years following fistula development. Qualitative research has uncovered prominent themes relating to possible mechanisms, including psychological trauma during obstructed labor as well as distress related to stillbirth, childlessness/infertility, stigma and social isolation [27, 28]. The impact of obstetric fistula involves the time-limited trauma of labor in addition to the chronic traumatization of social stigma. It is unclear the degree to which these experiences may independently contribute to depression and PTSD symptoms, and whether chronic traumatization following the initial trauma of childbirth may moderate the development of psychological symptoms.

Study results also highlighted known demographic risk factors linked to obstetric fistula, including low educational attainment and poverty [16, 17], and additionally showed that

women with obstetric fistula had more lifetime traumatic events compared with gynecology outpatients. Given the high levels of poverty and marginalization in those most at risk for developing a fistula, it is likely that fistula is comorbid with high levels of trauma due to a variety of sociocultural factors.

Past research has indicated that fistula patients report social ostracism and isolation [3, 5], but has not compared their level of social support to a comparison sample. In the current study, fistula patients reported significantly less social support compared to gynecology outpatients. Fistula patients' deficit in social support is a possible explanation for elevations in depression and PTSD symptoms. Qualitative research suggests that the development of obstetric fistula and leaking disrupts a woman's place within her family and her wider social circle [6, 7, 29]. In a context in which being a woman is largely defined by motherhood, wifehood, and social connections, it is devastating to lose one's childbearing ability, marital relationship quality, and social interaction. This would suggest that the heightened psychological distress present in the overall fistula sample may be moderated by the level of social interconnectedness during and immediately following

Table 3 Change statistics for fistula group effects, hierarchical regression analyses (*N*=144)

Outcome Variable	Step 1 model statistics ^a			Step 2 model statistics			Fistula group effect statistics ^c			Holm–Bonferroni adjusted α
	<i>F</i>	<i>R</i>	<i>R</i> ²	<i>R</i>	<i>R</i> ²	<i>R</i> ² change ^b	<i>B</i>	<i>SE</i>	β	
Depression symptoms	47.23*	.76	.58	.81	.66*	.08*	9.70	1.71	.36*	.01
PTSD symptoms	55.31*	.78	.61	.81	.65*	.04*	8.10	2.09	.25*	.017
Somatic symptoms	5.02*	.36	.13	.42	.18*	.05*	5.78	1.98	.29*	.025
Resignation coping	21.56*	.62	.38	.64	.41*	.02*	1.10	0.47	.20*	.05
Social support	23.68*	.64	.41	.68	.47*	.06*	−0.65	0.17	−.31*	.013

^a Step 1 included the following covariates: education, interviewer, any household income, and potentially traumatic events

^b The *R*² change statistic depicts the predictive power of adding fistula group to the model

^c Statistics for fistula group effect depict the effect of group membership in the fistula group, controlling for covariates

**p*<adjusted α -level

prolonged labor, such that women with higher interconnectedness may demonstrate increased resilience. Social connection could come in the form of a faithful spouse, supportive family member, friend, or clergy person. If these connections are strong and longstanding, they may endure after fistula development, enabling a higher level of social activity, and protecting against depression and PTSD.

Obstetric fistula patients also endorsed high levels of somatic symptoms, compared to the comparison group. Since items related to incontinence and vaginal pain were excluded from the measure, results reflect a true difference in perceived physical health. This difference may be due to infection from urine leaking, or to other health effects of obstructed labor that may co-occur with fistula, such as damage to nerves or joints [2]. Since somatic symptoms have been cross-culturally linked to mental health distress [53, 54], it is also possible that long-term stress and psychological dysfunction have increased the physical health complaints of fistula patients.

Given fistula patients' psychological distress, low social support, and physiological complaints, it is not surprising that they reported significantly more maladaptive coping than the comparison group. In the study sample, resignation coping strategies involved giving up and denying the problem, which may be particular to Tanzanian culture. In Tanzania, social relationships and social/organizational hierarchies have relatively high importance [55, 56]. Thus, the act of "giving up" or "denying reality" may characterize acceptance of social isolation. It is possible that the presence of this type of coping could partially explain variability in psychological distress in fistula patients. Furthermore, fistula patients who use resignation coping strategies may be more likely to develop psychopathology.

There were some limitations to the current study with regards to study design. First, these data are cross-sectional, and as such cannot be used to make conclusions about the trajectory of mental health after developing a fistula or after repair surgery. Additionally, the interviewer effect may have diminished the proportion of variance explained by group. In order to control for this limitation, interviewer effect was included in statistical analysis. The use of outpatients from two clinics inflated variability within the comparison group with regards to study outcomes. Finally, data collection procedures (oral surveys by KCMC nurses) may have introduced measurement error related to social desirability bias, interviewer bias, or recall bias. There were also several strengths of the current study. The selection of an appropriate comparison group minimized variability associated with being a medical patient. Furthermore, use of a variety of psychological measures enabled detection of multiple mental health concerns.

The results presented here have significant implications for clinical practice and future research studies. The

trauma history, psychological distress, and low social support of fistula patients indicate the necessity of mental health interventions for this population. Such interventions could be targeted to patients at the time of admission for fistula surgery to facilitate ease of delivery. Mental health treatment should focus on immediately addressing symptoms of depression and PTSD, while also addressing low social support, stigma, and underlying factors (e.g., low education and poverty). A cognitive-behavioral framework could address psychological symptoms, improve adaptive coping, and restore social support. Fistula health care workers (e.g., nurses or lay workers) could be trained in cognitive-behavioral therapy techniques, in order to integrate mental health treatment into clinical care. This type of intervention has the potential to significantly enhance patient care during the fistula repair process and reintegration into one's family and community.

Future research should examine additional factors among obstetric fistula patients that may affect mental health outcomes. First, research should attempt to clarify peritraumatic psychological variables that can affect the likelihood of experiencing clinically significant depression and/or PTSD symptoms after developing a fistula. These peri-traumatic variables may involve cognitions, emotions, or social contexts (e.g., interconnectedness). Additionally, protective factors should be identified that explain resilience and absence of psychological distress in some obstetric fistula patients. Such protective factors might include social support, religious engagement, or self-compassion.

Conclusion

This study revealed that obstetric fistula patients presenting for repair surgery have higher levels of psychological distress compared to other types of gynecology patients. After controlling for demographic covariates, fistula patients had significantly higher depression symptoms, PTSD symptoms, somatic symptoms and resignation coping behaviors. Fistula patients also reported significantly lower social support. Given these pervasive mental health concerns, obstetric fistula clinicians should monitor patients for likely comorbid psychological disorders, and should address psychosocial problems through targeted mental health interventions. Training of nurses or lay workers in psychological interventions could successfully integrate mental health care into the treatment of obstetric fistula patients.

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