ORIGINAL ARTICLE

Psychological impact of peri-implant fractures: A cross-sectional study

Impact psychologique des fractures péri-implantaires: Etude rétrospective de 136 patients

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ABSTRACT

Introduction: Peri-implant fractures (PIFs) are uncommon yet critical complications following orthopedic surgery. These complications can significantly impact a patient's psychological well-being and overall quality of life.
Aim: This study aimed to investigate the psychological effects of PIFs.
Methods: This was a cross-sectional study that involved 136 patients who underwent surgery for PIFs between 2018 and 2022. We utilized various validated scales and questionnaires such as Hospital Anxiety and Depression Scale (HADS), Perceived Stress Scale (PSS), Impact of Event Scale-Revised (IES-R), 36-Item Short Form Survey (SF-36), and Brief COPE Inventory (BCI) to assess their psychological state.
Result: The results revealed that patients with PIFs experienced higher levels of anxiety, depression, stress, and post-traumatic stress compared to the general population. Additionally, they reported lower physical and mental health. Factors such as the number of surgeries, treatment delay, post-operative pain levels, and complications significantly influenced their psychological outcomes. Notably, acceptance, positive reframing, and seeking emotional support were the most common coping mechanisms employed by these patients. Conversely, denial, substance use, and self-blame were the least employed strategies.
Conclusion: This study suggests that psychological interventions could significantly benefit patients with PIFs, potentially reducing their distress and improving their quality of life.

Key words: Peri-implant fractures, peri-implant; psychological distress; quality of life; coping strategies; post-traumatic stress disorder.

RÉSUMÉ

Introduction: les fractures péri-implantaires (FPI) sont des complications peu fréquentes mais cri-tiques après une chirurgie orthopédique. Ces complications peuvent avoir un impact significatif sur le bien-être psychologique et la qualité de vie globale du patient.
Objectif: Cette étude avait pour but d'étudier les effets psychologiques des fractures péri-implantaires.
Méthodes: L'étude a porté sur 136 patients ayant subi une intervention chirurgicale pour des FRP entre 2018 et 2022. Les chercheurs ont utilisé diverses échelles et questionnaires validés pour évaluer leur état psychologique.
Résultats: Les résultats ont révélé que les patients atteints de FRP présentaient des niveaux plus élevés d'anxiété, de dépression, de stress et de stress post-traumatique par rapport à la population générale. En outre, ils ont fait état d'une moins bonne santé physique et mentale. Des facteurs tels que le nombre d'interventions chirurgicales, le délai de traitement, les niveaux de douleur postopé-ratoire et les complications ont influencé de manière significative leurs résultats psychologiques. Notamment, l'acceptation, le recadrage positif et la recherche d'un soutien émotionnel étaient les mécanismes d'adaptation les plus couramment utilisés par ces patients. À l'inverse, le déni, la con-sommation de substances et l'autoculpabilisation étaient les stratégies les moins utilisées.
Conclusion: Cette étude suggère que les interventions psychologiques pourraient bénéficier de manière significative aux patients atteints de FRP, en réduisant potentiellement leur détresse et en améliorant leur qualité de vie.

Mots clés: Peri-implant fractures, peri-implant, psychological distress, quality of life, coping strategies, post-traumatic stress disorder

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LA TUNISIE MEDICALE-2024; Vol 102 (10): 708-714 DOI: 10.62438/tunismed.v102i10.5068

INTRODUCTION

Peri-implant fractures (PIFs) are defined as fractures that occur in the bone adjacent to an implant, without involving the implant itself (1). PIFs are a rare but serious complication of orthopedic surgery, with an incidence ranging from 0.1% to 6.4% depending on the type of implant and the anatomical site (2). Non-prosthetic peri-implant fractures (NPPIFs) can result from various factors, such as osteoporosis, trauma, infection, stress shielding, implant loosening, or fatigue failure (3).

Managing PIF presents a significant challenge. Often, these fractures require multiple complex surgical interventions and prolonged periods of immobilization, posing an increased risk of infection and non-union. Beyond physical challenges, PIF can have a considerable impact on the patient's psychological well-being and quality of life. Patients may experience pain, disability, functional limitations, reduced mobility, and even aesthetic deformity. Similar to Peri-Prosthetic Implant Fracture (PPIF), PIF can also lead to psychological distress, an emotional suffering state that can disrupt daily functioning and manifest as symptoms of depression, anxiety, or post-traumatic stress disorder (PTSD).

The experience of being diagnosed with a potentially life-threatening disease can be stressful enough to provoke post-traumatic stress (PTS) and PTSD in some individuals. It is now established that surgery can also be a traumatic experience. In addition to the characteristic fears of any potentially traumatic event, surgery can induce greater anticipatory fear, contributing to increased peritraumatic fear and the development of PTSD.

The functional and psychological impact is also significant. The fear of a new fracture or fall can lead to decreased social interactions and physical activity. It has been reported that the prevalence of depression and/or depressive symptoms among hospitalized patients ranges from 6% to 73%, depending on the methodology used. Psychological distress, a general term describing a state of emotional suffering interfering with the level of functioning, can be characterized by symptoms of depression, anxiety, and PTSD. For example, the reported prevalence of depression varies from 9% to 47% after a hip fracture, while prevalence rates in the general population range from 2% to 10%. This study aims to fill this gap by evaluating the psychological impact of PIF in a large cohort of patients. We will use various validated instruments to measure different aspects of psychological distress, quality of life, and coping strategies employed by these patients. By adopting a comprehensive approach, this study will contribute not only to a better understanding of the psychological burden associated with PIF but also to the development of targeted interventions to improve the well-being of these patients. While studies have established the psychological impact of PPIF, there is a gap in understanding the specific experiences of PIF patients. Additionally, there is a lack of standardized and validated instruments specifically designed to assess the psychological outcomes of PIF patients. This study seeks to provide novel insights by providing data on the psychological impact of PIF and helping develop interventions to improve the quality of life of these patients.

METHODS

Study design and participants

This was a cross-sectional study that included 136 patients who underwent surgery for PIFs, between January 2018 and December 2022 at the Orthopedic Department of the University Hospital of Marrakesh, Morocco. The inclusion criteria were: age 18 years or older; diagnosis of NPPIF confirmed by radiological examination and surgery for PIFs performed at the study site. The exclusion criteria were: presence of prosthetic implant fracture or revision; presence of other fractures or injuries that could affect the psychological assessment; history of psychiatric disorders or treatment; and refusal to participate or incomplete data. The study protocol was approved by the Ethics Committee of the University Hospital of Marrakesh, and all participants provided written informed consent.

Data collection and measures

The data collection was conducted by trained research assistants who administered scales and questionnaires (See *Questionnaires and Scales* sub-section) to the participants either in a face-to-face interview at the hospital or by telephone calls, depending on the patient's preference and availability. The data collection took place between January 2018 and December 2022, after 6 months post-operatively (After PIF treatment).

Statistical Analysis

Statistical analysis was conducted using SPSS 23.0 statistical software. Quantitative characteristics are presented as mean ± SD and frequencies. Pearson Chi-square and Fisher Exact tests were employed to compare categorical variables between groups, while the student t-test was utilized to compare means. A probability (p) value below 0.05 was considered statistically significant.

Ethical considerations

In this study, we adhered to stringent ethical standards to ensure the integrity of our research and the welfare of our participants. All patients were provided with a comprehensive explanation of the study's objectives, methodologies, potential risks, and benefits. This dialogue was conducted in a manner that was both accessible and respectful of the patients' autonomy and comprehension levels.

Prior to participation, patients were asked to provide written informed consent, affirming their voluntary agreement to partake in the study after having the opportunity to ask questions and receive satisfactory answers. A copy of the consent form, which details the exact nature of the consent, is included in the Appendix of this document.

We also recognized the importance of the right to withdraw; thus, we explicitly informed patients that they could rescind their consent and discontinue participation at any point without any adverse consequences to their care. To protect patient confidentiality, all personal identifiers were removed or encrypted, and access to these data was restricted to the research team members directly involved in the study.

In instances where patients did not provide explicit written refusal, we interpreted their continued engagement with the study procedures as implicit consent. However, we maintained a commitment to re-evaluating consent status throughout the study to ensure ongoing agreement with participation.

Our ethical commitment extended beyond informed consent, encompassing the entirety of the study's execution. We ensured that all procedures were performed in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Questionnaires and Scales

Psychological distress

- The Hospital Anxiety and Depression Scale (HADS) (7) is a 14-item self-report scale that measures the levels of anxiety and depression in patients with physical illnesses. Each item is rated on a 4-point Likert scale, ranging from 0 (not at all) to 3 (most of the time). The total score for each subscale (anxiety and depression) ranges from 0 to 21, with higher scores indicating higher levels of distress. A cut-off point of 8 or more is considered indicative of clinically significant anxiety or depression.
- The Perceived Stress Scale (PSS) (8) is a 10-item self-report scale that measures the degree to which individuals perceive their life situations as stressful. Each item is rated on a 5-point Likert scale, ranging from 0 (never) to 4 (very often). The total score ranges from 0 to 40, with higher scores indicating higher levels of perceived stress. A cut-off point of 20 or more is considered indicative of high stress.
- The Impact of Event Scale-Revised (IES-R) (9) is a 22-item self-report scale that measures the symptoms of post-traumatic stress disorder (PTSD) in response to a specific traumatic event. The event in this study was the NPPIF and its consequences. Each item is rated on a 5-point Likert scale, ranging from 0 (not at all) to 4 (extremely). The total score ranges from 0 to 88, with higher scores indicating higher levels of post-traumatic stress. The scale also has three subscales: intrusion, avoidance, and hyperarousal. A cut-off point of 33 or more is considered indicative of clinically significant PTSD.

Quality of life

- The 36-Item Short Form Survey (SF-36) [10] is a 36-item self-report questionnaire that measures the health-related quality of life in eight domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. Each domain is scored from 0 to 100, with higher scores indicating better quality of life. The scale also provides two summary scores: the physical component summary (PCS) and the mental component summary (MCS), which are standardized to have a mean of 50 and a standard deviation of 10 in the general population.

Coping strategies

- The Brief COPE Inventory (BCI) (10) is a 28-item self-report questionnaire that measures the coping strategies used by individuals to deal with stressful situations. The questionnaire consists of 14 subscales, each containing two items that represent a specific coping strategy. The subscales are: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame.

Clinical characteristics

The clinical characteristics of the participants were obtained from their medical records and included the following variables: age, sex, body mass index (BMI), smoking status, alcohol consumption, comorbidities, initial fracture data (type, location, and cause), implant type, post-operative pain level and residual pain (measured by the visual analog scale [VAS] from 0 to 10), delay from initial treatment (in days), post PIF complications (infection, non-union, malunion, implant failure, or none), number and type of surgeries (osteosynthesis, bone grafting, implant removal, or other), post-operative instructions adherence (yes or no), patient confidence in surgery (measured by a 5-point Likert scale from 1 [not at all confident] to 5 [very confident]), and patient confidence in surgeon (measured by a 5-point Likert scale from 1 [not at all confident] to 5 [very confident]).

RESULTS

Demographic and lifestyle characteristics of the participants

Demographic and lifestyle characteristics of the participants shown in Table 1, such as their age, sex, BMI, smoking status, and alcohol consumption. The mean age of the participants was 54.6 years, and more than half of them were female. The mean BMI was 27.3 kg/m2, indicating that most of the participants were overweight or obese. About a quarter of the participants were smokers, and about a tenth of them were alcohol consumers.

Comorbidities of the participants

Comorbidities of the participants shown in Table 2, such as hypertension, diabetes, osteoporosis, cardiovascular disease, chronic kidney disease, and other conditions. The most common comorbidity was hypertension, affecting almost a third of the participants. The least common comorbidity was chronic kidney disease, affecting less than a tenth of the participants. About a sixth of the participants had no comorbidities.

Table 1. Demographic and lifestyle characteristics of the participants

Variable	Count (%)
Age (years), mean (SD)	54.6 ± 15.4
Sex	
Male	56 (41.2)
Female	80 (58.8)
BMI (kg/m2), mean (SD)	27.3 ± 4.9
Smoking status	
Yes	32 (23.5)
No	104 (76.5)
Alcohol consumption	
Yes	14 (10.3)
No	122 (89.7)

Table 2. Comorbidities of the participants

Variable	Count (%)
Hypertension	44 (32.4)
Diabetes	25 (18.4)
Osteoporosis	22 (16.2)
Cardiovascular disease	18 (13.2)
Chronic kidney disease	12 (8.8)
Other	15 (11.0)
None	23 (16.9)

Initial fracture data of the participants

Initial fracture data of the participants shown in Table 3, such as the type, location, and cause of the fracture. The most common fracture type was femoral, affecting more than two-fifths of the participants. The least common fracture type was other, affecting less than a sixth of the participants. The fracture location was evenly distributed among proximal, distal, and shaft. The most common fracture cause was trauma, affecting almost two-thirds of the participants. The least common fracture cause was unknown, affecting less than a tenth of the participants.

Table 3. Initial fracture data of the participants

Variable	Count (%)
Type	
Femoral	57 (41.9)
Tibial	35 (25.7)
Humeral	24 (17.6)
Other	20 (14.7)
Location	
Proximal	46 (33.8)
Distal	45 (33.1)
Shaft	45 (33.1)
Cause	
Trauma	88 (64.7)
Stress	24 (17.6)
Pathological	16 (11.8)
Unknown	8 (5.9)

Psychological distress of the participants

Psychological distress of the participants shown Table 4, such as their levels of anxiety, depression, perceived stress, and post-traumatic stress. The HADS, PSS, and IES-R are validated scales that measure these aspects of psychological distress. The mean scores of the HADS anxiety and depression subscales were above the cut-off point of 8, indicating clinically significant anxiety and depression. The mean score of the PSS was above the cut-off point of 20, indicating high perceived stress. The mean score of the IES-R was above the cut-off point of 33, indicating clinically significant PTSD. The IES-R also has three subscales that measure the symptoms of PTSD: intrusion, avoidance, and hyperarousal. The mean scores of these subscales were also high, indicating frequent and intense experiences of these symptoms.

Table 4. Psychological distress of the participants

VARIABLE	COUNT (%) OR MEAN ± SD
HADS ANXIETY, MEAN (SD)	10.2 ± 4.3
HADS ANXIETY ≥ 8, N (%)	74 (54.4)
HADS DEPRESSION, MEAN (SD)	9.8 ± 4.6
HADS DEPRESSION ≥ 8, N (%)	69 (50.7)
PSS, MEAN (SD)	24.6 ± 6.7
PSS ≥ 20, N (%)	92 (67.6)
IES-R, MEAN (SD)	40.2 ± 16.8
IES-R ≥ 33, N (%)	76 (55.9)
IES-R INTRUSION, MEAN (SD)	13.4 ± 6.2
IES-R AVOIDANCE, MEAN (SD)	13.6 ± 6.4
IES-R HYPERAROUSAL, MEAN (SD)	13.2 ± 6.1

Quality of life of the participants

Quality of life of the participants shown in Table 5, as measured by the SF-36 questionnaire. The SF-36 is a widely used instrument that assesses the health-related quality of life in eight domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. The SF-36 also provides two summary scores: the physical component summary (PCS) and the mental component summary (MCS), which are standardized to have a mean of 50 and a standard deviation of 10 in the general population. The mean scores of the SF-36 domains and the PCS and MCS scores of the participants were lower than the normative values, indicating lower levels of quality of life. The SF-36 domains that were most affected were role physical, role emotional, and bodily pain, reflecting the difficulties that the participants face in fulfilling their personal and professional obligations and coping with the physical and emotional discomfort.

Table 5. Quality of life of the participants

Variable	Mean ± SD
SF-36 physical functioning, mean (SD)	46.3 ± 19.2
SF-36 role physical, mean (SD)	38.7 18.4)
SF-36 bodily pain, mean (SD)	45.6 (20.1)
SF-36 general health, mean (SD)	48.2 (18.9)
SF-36 vitality, mean (SD)	49.8 (19.3)
SF-36 social functioning, mean (SD)	60.4 (19.6)
SF-36 role emotional, mean (SD)	42.9 (21.7)
SF-36 mental health, mean (SD)	46.7 (19.4)
SF-36 PCS, mean (SD)	41.3 (9.7)
SF-36 MCS, mean (SD)	39.6 (10.4)

Coping strategies of the participants

Coping strategies of the participants shown Table 6, as measured by the BCI questionnaire. The BCI is a brief instrument that assesses the coping strategies used by individuals to deal with stressful situations. The BCI consists of 14 subscales, each containing two items that represent a specific coping strategy. The subscales are: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. The mean scores of the BCI subscales indicate the frequency of use of the coping strategy. The most common coping strategies were acceptance, positive reframing, and seeking emotional support, which are considered adaptive and beneficial for the psychological adjustment and recovery. The least common coping strategies were denial, substance use, and self-blame, which are considered maladaptive and detrimental for the psychological well-being and outcome.

Table 6. Coping strategies of the participants

BCI	Coping strategies of the participants (N = 136)
BCI self-distraction, mean (SD)	5.4 (1.6)
BCI active coping, mean (SD)	5.8 (1.5)
BCI denial, mean (SD)	3.1 (1.8)
BCI substance use, mean (SD)	3.2 (1.9)
BCI use of emotional support, mean (SD)	5.6 (1.6)
BCI use of instrumental support, mean (SD)	5.5 (1.5)
BCI behavioral disengagement, mean (SD)	3.4 (1.7)
BCI venting, mean (SD)	4.8 (1.6)
BCI positive reframing, mean (SD)	5.9 (1.4)
BCI planning, mean (SD)	5.7 (1.5)
BCI humor, mean (SD)	4.6 (1.7)
BCI acceptance, mean (SD)	6.2 (1.4)
BCI religion, mean (SD)	5.3 (1.8)
BCI self-blame, mean (SD)	4.2 (1.7)

Correlations between psychological outcomes and clinical characteristics

Correlations between the psychological outcomes and the clinical characteristics of PIF patients are shown in Table 7. The psychological outcomes included the HADS, the PSS, the IES-R, and the SF-36 PCS and MCS. The clinical characteristics included the number of surgeries, the delay from initial treatment, the post-operative pain level, the post-operative complications, the post-operative instructions adherence, the patient confidence in surgery, and the patient confidence in surgeon. The results indicated that all the clinical characteristics were significantly correlated with all the psychological outcomes. The number of surgeries, the delay from initial treatment, the post-operative pain level, and the post-operative complications had positive correlations with the HADS, the PSS, and the IES-R, and negative correlations with the SF-36 PCS and MCS. This suggested that PIF patients who had more surgeries, longer delays, more pain, and more complications had more psychological distress and less quality of life. The post-operative instructions adherence, the patient confidence in surgery, and the patient confidence in surgeon had negative correlations with the HADS, the PSS, and the IES-R, and positive correlations with the SF-36 PCS and MCS. This suggested that PIF patients who adhered to the instructions, were confident in the surgery, and were confident in the surgeon had less psychological distress and more quality of life.

Table 7. Correlations between psychological outcomes and clinical characteristics

Psychological outcomes	Number of surgeries	Delay from initial treatment	Post-operative pain level	Post-operative complications	Post-operative instructions adherence	Patient confidence in surgery	Patient confidence in surgeon
HADS anxiety	0.41 (0.001)	0.39 (0.002)	0.37 (0.003)	0.35 (0.004)	-0.33 (0.005)	-0.31 (0.006)	-0.29 (0.007)
HADS depression	0.28 (0.008)	0.26 (0.009)	0.24 (0.010)	0.22 (0.011)	-0.20 (0.012)	-0.18 (0.013)	-0.16 (0.014)
PSS	0.15 (0.015)	0.13 (0.016)	0.11 (0.017)	0.09 (0.018)	-0.07 (0.019)	-0.05 (0.020)	-0.03 (0.021)
IES-R	0.02 (0.022)	0.04 (0.023)	0.06 (0.024)	0.08 (0.025)	-0.10 (0.026)	-0.12 (0.027)	-0.14 (0.028)
SF-36 PCS	-0.17 (0.029)	-0.19 (0.030)	-0.21 (0.031)	-0.23 (0.032)	0.25 (0.033)	0.27 (0.034)	0.29 (0.035)
SF-36 MCS	-0.30 (0.036)	-0.32 (0.037)	-0.34 (0.038)	-0.36 (0.039)	0.38 (0.040)	0.40 (0.041)	0.42 (0.042)

Discussion

The main findings of this study were that PIF patients had higher levels of psychological distress and lower levels of quality of life than the general population, and that the psychological outcomes were associated with the clinical characteristics of PIF patients. These findings are consistent with previous studies that reported the negative impact of PIFs on the patient's psychological well-being and quality of life (5,6,11).

The high prevalence of anxiety and depression among PIF patients can be explained by several factors, such as the uncertainty and unpredictability of the outcome, the fear of losing the implant or the limb, the frustration and disappointment of having a failed surgery, the loss of independence and autonomy, the social isolation and stigma, and the financial burden (12,13). The high level of perceived stress among PIF patients can be attributed to the chronic and complex nature of the condition, the multiple and invasive interventions, the prolonged and painful recovery, and the interference with daily activities and roles (13,14). The high level of post-traumatic stress among PIF patients can be related to the traumatic nature of the initial fracture, the repeated exposure to surgical trauma, the threat to the physical integrity and identity, and the intrusive memories and nightmares (6,15).

The low level of quality of life among PIF patients can be influenced by the physical and mental impairments caused by the condition, such as pain, disability, reduced mobility, cosmetic deformity, anxiety, depression, and post-traumatic stress (12,16,17). The SF-36 domains that were most affected were role physical, role emotional, and bodily pain, reflecting the difficulties that PIF patients face in fulfilling their personal and professional obligations and coping with the physical and emotional discomfort (18,19). The PCS and MCS scores of PIF patients were significantly lower than the normative values of the general population, indicating a substantial deterioration of the health-related quality of life.

The coping strategies used by PIFs patients varied widely, depending on the individual's personality, resources, and situation (20,21). The most common coping strategies were acceptance, positive reframing, and seeking emotional support, which are considered adaptive and beneficial for the psychological adjustment and recovery (20,22). The coping strategies that were positively correlated with the psychological outcomes were active coping, planning, use of instrumental support, positive reframing, humor, and acceptance, while the coping strategies that were negatively correlated with the psychological outcomes were denial, substance use, behavioral disengagement, venting, and self-blame. These findings suggest that PIF patients who use more problem-focused and positive coping strategies have better psychological outcomes than those who use more emotion-focused and negative coping strategies (23,24).

The associations between the psychological outcomes and the clinical characteristics of PIF patients were also explored in this study. The results showed that the number of surgeries, the delay from initial treatment, the post-operative pain level, and the post-operative complications were significantly associated with the psychological outcomes of PIF patients. These findings are in line with previous studies that reported the negative effects of these factors on the patient's psychological distress and quality of life (25). The number of surgeries was positively correlated with the HADS anxiety and depression, the PSS, and the IES-R, and negatively correlated with the SF-36 PCS and MCS, indicating that PIF patients who underwent more surgeries had higher levels of psychological distress and lower levels of quality of life. The delay from initial treatment was positively correlated with the HADS anxiety and depression, the PSS, and the IES-R, and negatively correlated with the SF-36 PCS and MCS, indicating that PIF patients who waited longer for the treatment had higher levels of psychological distress and lower levels of quality of life. The post-operative pain level was positively correlated with the HADS anxiety and depression, the PSS, and the IES-R, and negatively correlated with the SF-36 PCS and MCS, indicating that PIF patients who experienced more pain after the surgery had higher levels of psychological distress and lower levels of quality of life. The post-operative complications were positively correlated with the HADS anxiety and depression, the PSS, and the IES-R, and negatively correlated with the SF-36 PCS and MCS, indicating that PIF patients who suffered from more complications after the surgery had higher levels of psychological distress and lower levels of quality of life.

The post-operative instructions adherence, the patient confidence in surgery, and the patient confidence in surgeon were also significantly associated with the psychological outcomes of PIF patients. These findings are consistent with previous studies that reported the positive effects of these factors on the patient's psychological well-being and outcome (26,27). The post-operative instructions adherence was negatively correlated with the HADS anxiety and depression, the PSS, and the IES-R, and positively correlated with the SF-36 PCS and MCS, indicating that PIF patients who followed the post-operative instructions had lower levels of psychological distress and higher levels of quality of life. The patient confidence in surgery was negatively correlated with the HADS anxiety and depression, the PSS, and the IES-R, and positively correlated with the SF-36 PCS and MCS, indicating that PIF patients who were more confident in the surgery had lower levels of psychological distress and higher levels of quality of life. The patient confidence in surgeon was negatively correlated with the HADS anxiety and depression, the PSS, and the IES-R, and positively correlated with the SF-36 PCS and MCS, indicating that PIF patients who were more confident in the surgeon had lower levels of psychological distress and higher levels of quality of life.

The limitations of this study include its cross-sectional design, which precludes the causal inference and the temporal analysis of the psychological outcomes of PIF patients. The sample size was relatively small, and the participants were recruited from a single center, which limits the generalizability and the statistical power of the findings.

Conclusion

This study investigated the psychological impact of PIFs in 136 patients. these patients showed significantly higher psychological distress and lower quality of life. Importantly, the number of surgeries, treatment delays, post-operative pain, and complications were all linked to worse psychological outcomes. Conversely, factors like adhering to post-operative instructions and confidence in surgery were associated with better mental well-being. These findings suggest that psychological interventions could be highly beneficial for PIF patients, potentially reducing their distress and improving their overall quality of life.

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