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The Impact of Bariatric Surgery on Biopsychosocial Wellbeing – A Pilot Investigation of Qualitative Research of Project DigiWELL

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Barbora Kaštovská[1], Marcela Ely[1], Marie Volaříková Pinďáková[1], Steriani Elavsky[1]

[1]University of Ostrava

veronika.horka

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Abstract

Background: Obesity rates are rising.
Bariatric surgery offers treatment for individuals with class ≥ 1 obesity.
While dietary recommendations are clear, psychological support and physical activity are less examined. The study explored bariatric patients' perceptions of their biopsychosocial well-being, focusing on physical activity and digital technology supporting behavioral change.
Purpose: The main aim of the pilot study was to assess the feasibility of a semi-structured interview; the secondary goals were to evaluate topic coverage and develop a preliminary coding framework.
Methods: Semi-structured interviews were conducted with five participants. Discussions were recorded, transcribed, and coded in MAXQDA, using Strauss and Corbin’s open coding. Researchers conducted thematic analysis.
Results: Patients face biopsychosocial challenges post-surgery and benefit from multidisciplinary support. Digital technologies aid behavior monitoring and social connections. Methodological improvements were identified.
Conclusion: The study confirmed the feasibility of the interview format, validated topic relevance, and provided groundwork for the main qualitative study.

Guidelines

Study design

In accordance with the objectives, a qualitative data collection methodology was utilized, employing triangulation of methods and investigators to enhance the validity and depth of the findings [35]. The primary method of data collection consisted of individual semi-structured interviews. Participants were recruited from four projects conducted at a single institution, specifically the University of Ostrava. However, bariatric surgeries were performed at two hospitals: the University Hospital Ostrava and the AGEL Hospital Ostrava-Vitkovice. The cohort consisted of individuals who had undergone various types of BS at different time intervals. The interview focused on their experiences related to preoperative and postoperative status, biopsychosocial well-being, and the use of digital or other assistive technologies. The core interview framework was developed based on existing literature, theoretical foundations, and consultations with experts in the field of medicine, exercise, and aging [36].

The interview was conducted either in person at the office of a researcher, or online with the cameras of everyone involved activated throughout the session.

The interviews were facilitated by a moderator who had prior familiarity with the participants due to their involvement in a preceding quantitative pilot study on physical activity intervention. Additionally, each interview was observed by an independent researcher who documented the participants' non-verbal responses and were appropriate, responded during the interview. The observer had no prior interaction with the participants. A total of three researchers were involved in conducting the semi-structured interviews.

The interview process was recorded and transcribed verbatim utilizing artificial intelligence via MS Teams. Subsequently, researchers verified the transcription against the original recording.

Semi-structured interview scenario

An interview protocol was established, consisting of the following sequential activities: 1) welcoming the participant; 2) expressing appreciation for their participation; 3) providing an overview of the study; 4) informing the participant about the audio recording; 5) introducing the main topics of the interview; 6) ensuring comprehension of the Informed Consent (IC); 7) obtaining the participant's signature on the IC; 8) activating the recording device; 9) conducting the interview; 10) inviting any final comments from the participant and the observer; and 11) concluding with a farewell.

Research sample

The research population was selected using a purposive sampling method to ensure the inclusion of participants with specific relevant experiences and characteristics aligned with the study objectives [37]. More specifically, a heterogeneous purposive sampling method was utilized to select a diverse group of participants within the same context, with the aim of identifying common themes. The inclusion criteria were as follows: a) participants had undergone bariatric surgery in accordance with the International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) guidelines [18] and had participated in a quantitative study conducted at the University of Ostrava; b) the BS had been performed at least one year prior to participation; c) provision of informed consent. Inclusion in the study was not contingent upon age, gender, or participants' satisfaction with their involvement in the study, nor their biopsychosocial status before, during, and after BS. A cohort of N=5

individuals, comprising 3 females and 2 males, with a mean age of 51.2 ± 12.44 years, participated in the study conducted during July-August 2024. The sample size was deemed sufficient, as no new data emerged during subsequent interviews, indicating that data saturation had been reached [38]. For detailed characteristics of the cohort, please refer to Table 1.

Table 1: Characteristics of the population
N: 5 (♀3, ♂2)
Age (years) mean ± SD: 51.2 ± 12.44
Type of BS: 2 JCD, 2 EJID, 1 JID, 1 LSG
Years after the surgery: 7.6 ± 1.73
Reduced weight (kg) mean ± SD: 33.2 ± 12.73
Excess Weight Loss (%) mean ± SD: 81.1 ± 35.8
Actual BMI [kg/m^2] mean ± SD: 28.2 ± 5.0
N = number of participants; SD = standard deviation; BS = bariatric surgery; kg = kilograms; BMI = body mass index; ♀ = female; ♂ = male; LSG = laparoscopic sleeve gastrectomy; JID = surgical jejuno-ileal diversion; JCD = surgical jejuno-colic diversion; EJID = endoscopic partial jejuno-ileal diversion

Two participants initially underwent endoscopic partial jejunal diversion utilizing an incision-less magnetic anastomosis system. In one instance, the procedure demonstrated significant efficacy, necessitating an additional BS approximately three years later, specifically a surgical jejunal-colic diversion. Another participant also underwent a jejuno-colic diversion. One participant received a surgical jejuno-ileal diversion, while the final participant underwent a laparoscopic sleeve gastrectomy. Taken together, this pilot study focused on participants who had undergone four distinct types of BS. Among these, three were surgical procedures, while one was endoscopic. Three of the BS were classified as experimental or non-standard, and one was considered standard. The following provides a detailed description.

EJID = Non-standard/experimental type of bariatric surgery: endoscopic partial jejuno-ileal diversion

This procedure constitutes an endoscopic bariatric intervention that induces a metabolic effect on the lower intestine without necessitating gastric restriction. The technique entails the endoscopic performance of a partial jejunal-ileal diversion, employing both gastroscopy and colonoscopy, to create a diversion between the jejunum and ileum using two magnets. These procedures were conducted during the period 2014-2015 [39], [40], [41], [42].

JID = *Non-standard/experimental type of bariatric surgery: surgical partial jejuno-ileal diversion*
The surgical procedure is a metabolic intervention targeting the lower intestine, executed without the implementation of gastric restriction. This involves a partial jejunal-ileal diversion, surgically performed between the jejunum and ileum. These procedures were carried out from 2016 to 2019.

JCD = *Non-standard/experimental type of bariatric surgery: surgical partial jejuno-colic diversion*
The procedure constitutes a surgical intervention with metabolic effects on the lower intestine, accomplished without gastric restriction. It entails the surgical creation of a partial jejuno-colic diversion between the jejunum

and colon. These operations were performed during the period from 2017 to 2019 [43].

LSG = *Standard type of bariatric surgery: sleeve gastric resection*
The procedure constitutes a restrictive form of bariatric surgery, in which 80-90% of the patient's stomach volume is excised vertically using a scalpel. The residual stomach volume is approximately 100-150 ml. This operation was performed in 2018 [44], [45].

The practical feasibility of the interview process, the formulation of questions, and the participants' non-verbal responses were evaluated through collaborative discussions, employing investigator triangulation.

A reflexive thematic analysis was employed to evaluate data quality and discern themes pertinent to the research topic [38]. This approach is grounded in 'reflexive practices,' in which the research implementation is non-linear and necessitates the reflexive engagement of the researcher throughout the process. Researchers are influenced not only by the entirety of the research process, including the participants and setting, but also by their observations, auditory experiences, and encounters during the research, as well as their prior experiences [46]. The analytical process was both collaborative and reflexive, aiming to develop a more comprehensive and nuanced interpretation of the data [47]. Four researchers engaged in the analysis utilizing MAXQDA qualitative data processing software. The data were coded and categorized into major themes and sub-themes based on their thematic content.

Troubleshooting

Study design

1 Conduct individual semi-structured interviews with participants recruited from four projects at the University of Ostrava. Bariatric surgeries were performed at University Hospital Ostrava and AGEL Hospital Ostrava-Vitkovice. The cohort should include individuals who have undergone various types of bariatric surgery (BS) at different time intervals. Focus the interview on experiences related to preoperative and postoperative status, biopsychosocial well-being, and the use of digital or other assistive technologies. Develop the core interview framework based on existing literature, theoretical foundations, and consultations with experts in medicine, exercise, and aging.

2 Conduct the interview either in person at the office of a researcher or online, ensuring that the cameras of all participants are activated throughout the session.

3 Facilitate the interviews with a moderator who has prior familiarity with the participants due to their involvement in a preceding quantitative pilot study on physical activity intervention.

4 Assign an independent researcher to observe each interview, document participants' non-verbal responses, and respond during the interview if appropriate. The observer should have no prior interaction with the participants.

5 Ensure that a total of three researchers are involved in conducting the semi-structured interviews.

6 Record and transcribe the interview process verbatim using artificial intelligence via MS Teams. Researchers should subsequently verify the transcription against the original recording.

Semi-structured interview scenario

7 Establish and follow an interview protocol consisting of the following sequential activities: welcoming the participant; expressing appreciation for their participation; providing an overview of the study; informing the participant about the audio recording; introducing the main topics of the interview; ensuring comprehension of the Informed Consent (IC); obtaining the participant's signature on the IC; activating the recording device; conducting the interview; inviting any final comments from the participant and the observer; and concluding with a farewell.

Research sample

8 Select the research population using a purposive sampling method to ensure inclusion of participants with specific relevant experiences and characteristics aligned with the study

objectives. Use a heterogeneous purposive sampling method to select a diverse group of participants within the same context, aiming to identify common themes. Apply the following inclusion criteria: a) participants must have undergone bariatric surgery in accordance with International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) guidelines and participated in a quantitative study at the University of Ostrava; b) bariatric surgery must have been performed at least one year prior to participation; c) participants must provide informed consent. Do not restrict inclusion based on age, gender, satisfaction with study involvement, or biopsychosocial status before, during, or after bariatric surgery.

9 Recruit a cohort of N=5 individuals (3 females, 2 males) with a mean age of 51.2 ± 12.44 years for the study, conducted during July-August 2024. Ensure the sample size is sufficient to reach data saturation, as determined by the absence of new data in subsequent interviews.

10

Age (years) mean ± SD	51,2 ± 12,44
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The procedure constitutes a restrictive form of bariatric surgery, in which 80-90% of the patient's stomach volume is excised vertically using a scalpel. The residual stomach volume is approximately 100-150 ml. This operation was performed in 2018.

16 Evaluate the practical feasibility of the interview process, the formulation of questions, and the participants' non-verbal responses through collaborative discussions, employing investigator triangulation.

Data analysis

17 Employ a reflexive thematic analysis to evaluate data quality and discern themes pertinent to the research topic. This approach is grounded in 'reflexive practices,' in which the research implementation is non-linear and necessitates the reflexive engagement of the researcher throughout the process. Researchers are influenced not only by the entirety of the research process, including the participants and setting, but also by their observations, auditory experiences, and encounters during the research, as well as their prior experiences. The analytical process should be both collaborative and reflexive, aiming to develop a more comprehensive and nuanced interpretation of the data. Four researchers should engage in the analysis utilizing MAXQDA qualitative data processing software. Code and categorize the data into major themes and sub-themes based on their thematic content.

Statement of ethical approval

18 Ensure the study receives approval from the Ethics Committee of the OU under the reference number OU-137259/45-2024 and adheres to the principles outlined in the Declaration of Helsinki. Fully inform all participants about the study and obtain their informed consent to participate.