



BMJ Open is committed to open peer review. As part of this commitment we make the peer review history of every article we publish publicly available.

When an article is published we post the peer reviewers' comments and the authors' responses online. We also post the versions of the paper that were used during peer review. These are the versions that the peer review comments apply to.

The versions of the paper that follow are the versions that were submitted during the peer review process. They are not the versions of record or the final published versions. They should not be cited or distributed as the published version of this manuscript.

BMJ Open is an open access journal and the full, final, typeset and author-corrected version of record of the manuscript is available on our site with no access controls, subscription charges or pay-per-view fees (<http://bmjopen.bmj.com>).

If you have any questions on BMJ Open's open peer review process please email [info.bmjopen@bmj.com](mailto:info.bmjopen@bmj.com)

# BMJ Open

## Investigating biographical post-bariatric surgery uncertainties in the light of changes in bodily practices: a mixed-method, multicentric and longitudinal research protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2025-101199
Article Type:	Protocol
Date Submitted by the Author:	27-Feb-2025
Complete List of Authors:	Ferez, Sylvain; Montpellier University, Santesih (UM211) Bouchet-Mayer, Cyriac; Montpellier University, Santesih (UM211) Charissou-Pujol, Lise; University of Toulouse, CRESCO Terral, Philippe; University of Toulouse, CRESCO Couvry, Camille; Max Weber Centre Issanchou, Damien; Université Claude Bernard Lyon 1, Laboratoire L-VIS (STAPS) Julien, Marie-Pierre; University of Lorraine, TETRAS Perrin, Claire; Université Claude Bernard Lyon 1, Laboratoire L-VIS (STAPS) Oppert, Jean-Michel; Sorbonne University, Department of Nutrition, Pitie-Salpêtrière hospital (AP-HP) Ritz, Patrick; CHU Toulouse, CERPOP Disse, Emmanuel; University Claude Bernard Lyon 1, Hospices Civils de Lyon Study group, Members; Université de Montpellier
Keywords:	Bariatric Surgery, Obesity, Physical Fitness, Quality of Life, Life Change Events

SCHOLARONE™  
Manuscripts

**Investigating biographical post-bariatric surgery uncertainties in the light of changes in bodily practices: a mixed-method, multicentric and longitudinal research protocol**

**I- INTRODUCTION**

The health benefits of bariatric surgery have been extensively studied. Although maintaining these benefits requires a lasting change in those lifestyle habits considered to be at the origin of morbid obesity, few studies have questioned the conditions for such a change.

**1- Health and quality of life impacts**

Medical literature positively assesses the benefit/risk ratio of bariatric surgery by comparing metabolic improvements due to weight loss and the risks of death or side effects related to the surgery (Saux *et al.* 2023). Complications and dietary constraints (in particular to limit gastroesophageal reflux and avoid nutritional deficiencies) following the surgery are well documented (Lent *et al.* 2019, Yue *et al.* 2022). However, Correy's (2020) sociological approach points to the effort of redefining the physiological symptoms experienced by patients after surgery. Indeed, the latter perceive these symptoms rather as a tool for strengthening self-control, or as signs of weight loss synonymous with health gain, than from the perspective of illness or disability.

Surgery is also a source of stress and anxiety, before and after the operation. Measured using psychometric scales, these emotional difficulties expose patients to addictive behaviours and eating disorders (Beck *et al.* 2012, de Man Lapidoth *et al.* 2011, de Zwaan *et al.* 2010). They can also lead to depressive symptoms related to the feeling of not being able to follow medical recommendations (Strain *et al.* 2014, White *et al.* 2015, Woods 2022). Post-surgery quality of life is studied using specific scales<sup>1</sup>, which consider the impact of the operation in terms of: 1) reduction or disappearance of adverse effects or medical treatments; 2) reduction of functional limitations and increase of physical activity (Miras *et al.* 2018, Oppert *et al.* 2021) ; 3) reduction of emotional difficulties. By influencing these aspects, bariatric surgery can also impact family, friendship and sexual relationship dynamics (Arolfo *et al.* 2020, Conason *et al.* 2017, Treacy *et al.* 2019).

However, social dimensions are not integrated into quality of life measurement tools, but are designed as distinct variables impacted by quality of life (Kantarovich *et al.* 2019, Mancini *et al.* 2018, Sockalingam *et al.* 2015) or impacting it themselves (Griauzde *et al.* 2018, Lin & Tsao 2018, Natvik *et al.* 2013). Social variables are therefore not completely absent from studies on the health impact of bariatric surgery (or on the predictors of its success on an anthropometric level<sup>2</sup>). Nevertheless, sociological approaches to the latter remain rare. They aim to shed light on the processes involved in the maintenance or evolution of lifestyle habits following surgery, rather than measuring the positive or negative effects of the operation on health within the broader spectrum of quality of life. These sociological processes are very different from psychological predictors. They involve taking into account the influence of living environments and social interactions on individual experiences.

**2- Living environment, social participation and stigmatization**

<sup>1</sup> Bariatric Quality of Life-BQL (Weiner *et al.* 2005) or Bariatric Analysis Reporting Outcome System-BAROS (Nicareta *et al.* 2015).

<sup>2</sup> That is to say, in terms of weight loss or lowering of BMI.

Studies on the impact of social representations of obesity and the use of surgery show that it is a means of escaping discrimination in educational environments (Crosnoe & Muller 2004, Karnehed *et al.* 2006), work (Brunello & d'Ohombres 2007, Cawley 2004) and sex life (Bajos *et al.* 2010). However, the use of bariatric surgery runs the risk of confirming the weakness of character often considered to be at the root of obesity (Hansen & Dye 2018, Beldame *et al.* 2024) and contributes to stigmatization on the part of health professionals themselves (O'Reilly 2016, López-Lara *et al.* 2024). Verhaak *et al.* (2022) show that, when weight-related biases are internalized, they affect the clinical attrition of patients engaged in a medicalized path to weight loss. A recent literature review on the stigma of bariatric surgery (Garcia *et al.* 2023) points out the methodological shortcomings of existing studies, all of which were carried out in the general population or with health professionals. The authors regret the failure to take into account the patient's point of view when studying the effects of surgery and the exploration of the socio-cultural foundations of its stigmatization. To compensate for this lack of data, they propose a comparative survey (the results of which are not yet available) between the Netherlands, France and the United Kingdom, questioning people who have undergone surgery, as well as health professionals and the general public (Garcia *et al.* 2022).

### 3- Supporting the evolution of lifestyle habits in the face of uncertainty

The effects of prejudice and stigmatization of bariatric surgery are investigated in the few sociological (Beldame *et al.* 2021, 2024, Corey 2020, Park 2015) or psychology studies (Grimaldi & Van Etten 2010) studying the social experience of post-surgery body modifications. This experience is marked by a disruption in lifestyle habits, in terms of food intake and hydration, but also in the practice of physical activity (Oppert *et al.* 2021). After a few weeks or months, the gradual experimentation of increased mobility abilities sometimes produces the feeling of being "un-disabled" (Troisoeufs 2020). The rapid weight loss is then often referred to as a "rebirth" (Throsby 2008, 2012). In some cases, identity reconfigurations associated with body changes are described as being more traumatic. Working on oneself is then necessary in order to find a medical (Corey 2020), aesthetic (Park 2015) or moral (Beldame *et al.* 2024) meaning to the changes experienced. This work of appropriating one's "new" body is done under the public eye, by being confronted with the fears to which social interactions expose. All these elements are not included in quantitative studies that seek to assess the impact of surgery on social interactions, based on the comparison of questionnaires administered before and after the operation (Pfabigan *et al.* 2023). These descriptive approaches struggle to grasp the processes behind the changes measured, or how they can affect lifestyle habits. However, while bariatric surgery affects social participation and any attempt to adopt new lifestyle habits (Ivezaj & Grilo 2018, Marek *et al.* 2021, Mirijello *et al.* 2015), its long-term effectiveness depends on lasting changes to these habits (Lin & Tsao 2018).

### 4- Social dynamics of lifestyle change and medium-term impact

Social processes follow temporal dynamics. A few months after surgery, when their weight stabilizes, the patients who have undergone surgery often find that the amount lost is insufficient (Throsby 2008, 2012). Over time, regaining weight can also occur (Rudolph & Hibert 2013). In addition to the threat to their attained silhouette (Aguilera 2014, Jensen *et al.* 2014, Sarwer *et al.* 2010), there is also the risk of losing the social relationships established as a result of weight loss – particularly in relationships of seduction (Assimakopoulos *et al.* 2011). In this situation, social pressure is strong, as is the fear of returning to a "fat" body, a stigma associated with a lack of self-control (Beldame *et al.* 2024).

Bariatric surgery produces multiple and variable effects on the body such as it is perceived over the weeks and months following the operation, and involves managing these effects within the social environments (family, medical, professional) frequented. The rare sociological studies that have studied the articulation of these elements used qualitative data from the retrospective narratives of a small number of patients recruited in a single hospital (Corey 2020, Natvik *et al.* 2013, Troisoeufs 2020), or repeated interviews within a timeframe not exceeding 12 months after the operation (Beldame *et al.* 2021, 2024).

Longitudinal approaches that include more patients and which repeat measurements over time focus on the impact of bariatric surgery on mental health or quality of life in the medium term (Devlin *et al.* 2018), psychological predictors (mental health, eating disorders) of the success of the surgery (Marchitelli *et al.* 2022), or the effects of feelings of self-efficacy and health competence on changes in post-surgery quality of life (Jaensson *et al.* 2019, deMeireles *et al.* 2020). When, exceptionally, a study focuses on the evolution of behaviours, medical and psychological variables remain decisive. The examination of physical activity (as it promotes weight loss, health and quality of life) leads to the observation that none of the psychological determinants measured (pleasure, self-efficacy, social support) explain the level of physical practice (Imhagen *et al.* 2023).

II- STUDY AIMS AND HYPOTHESIS

This article details the protocol of the ChiBarAPS study, which examines the evolution of physical and dietary practices in relation to the overall body experience, within the social environments frequented by the individual, over a period of 24 months after surgery. This protocol aims to shed light on the social factors that weigh on the reorganization of lifestyle habits following the disruption caused by surgery. ChiBarAPS has three main objectives:

OBJECTIVE 1

The first objective is to document the work undertaken by patients on themselves in order to identify and measure the evolutionary effects of surgery (bodily transformations, pain, discomfort, fatigue, etc.), as well as to adapt to them (transformation of lifestyle, dietary, and intake habits, etc.).

OBJECTIVE 2

The second objective is to provide information on the experience of the use of pre- and post-surgery information and support systems (medical devices and non-medical, associative or community networks), and to evaluate their effects on the agency of the people who have undergone surgery.

OBJECTIVE 3

The third objective concerns the study of the evolution of the forms of social participation and lifestyle habits based on the Human Development Model – Disability Creation Process (HDM-DCP, Alflen *et al.* 2024) in order to identify processes for reducing situations of disability (e.g. by improving physical capacities) or, on the contrary, social participation (due to pain, discomfort, stigma, etc.).

The research is based on two hypotheses:

Hypothesis 1

The period of 6 to 24 months following surgery is a pivotal period, marked by a high degree of biographical uncertainty, during which the success or otherwise of escaping obesity in the

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Enseignement Supérieur (ABES).

longer term is at stake, depending on the ability of individuals to engage in work on themselves and to change their lifestyle in the long term.

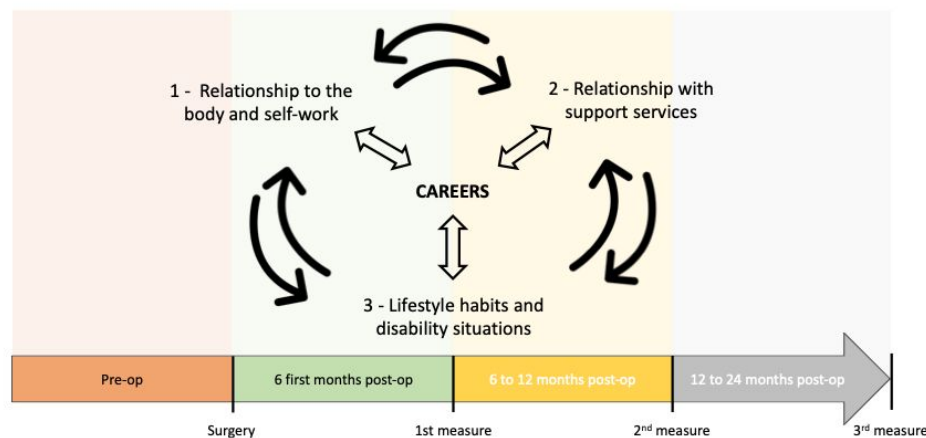
## Hypothesis 2

"Escaping" from obesity is not solely the symbolic passage below a certain weight threshold, but implies a transformation of oneself under the gaze of others, in particular to escape the stigma of obesity; a stigma that the use of surgery can reinforce despite weight loss.

## III- METHOD

### 1- Theoretical approach

This research focuses on the transformations of the body, lifestyles and social practices (physical activities, diet, sexuality, body care, clothing uses, etc.) following surgery. Post-surgery obesity is understood as a "combined in action" (Corbin 1991) everyday work, that takes place in different environments (health, sports, professional, family, etc.). The sociological concept of *career* (Becker 1985, Darmon 2008) makes it possible to articulate, based on attention to the different forms of work that the individual deploys, the three objectives mentioned above. It is thus the dynamics of the interactions between the three dimensions associated with these objectives (self-perception, experience of information and support systems, social participation) that should make it possible to model the evolution of careers related to obesity (Figure 1). By focusing on the relationships that individuals establish with their social environments, the concept of *career* aims here to shed light on the social conditions of the transformations identified or "the social space of the transformation of the self" (Darmon 2014).



**Figure 1** Theoretical frame of the ChiBarAPS study, France. Study of the evolution of interactions between three dimensions of the social experience of obesity, articulated through the sociological concept of career, in the 24 months following bariatric surgery

### 2- Study population

The participants in this study have undergone a sleeve procedure, are in employment or of working age (excluding students and retirees), and do not have an illness involving too heavy a treatment likely to have a strong impact on their post-surgery life experience (e.g. cancer, multiple sclerosis, Parkinson's disease). Participants were recruited from within the active lists of the study's partner hospital departments with the aim of achieving the greatest possible diversity in terms of gender, social origin, pre- and post-operative weight trajectory, etc. Attention was paid to the recruitment of men, who are not well represented in studies on



bariatric surgery. In the event that these sampling diversity objectives were not achieved, recruitment could occasionally take place through patient associations or social networks.

3- Design of the study

ChiBarAPS is a multicenter longitudinal study conducted by sociologist researchers from Montpellier, Toulouse, Lyon 1, Lorraine, Paris Sorbonne and Saint-Etienne universities, comprising three components: qualitative, quantitative, literature and data review. The qualitative component of the study aims to carry out semi-structured interviews of the life story and practice type, repeated at 6, 12 and 24 months after surgery with 30 patients. The relationship of trust established over the course of these meetings should make it possible to document the bodily experience (obj. 1), the interactions with the actors of the specialized services (obj. 2), as well as lifestyle habits (obj. 3) during this pivotal period of the first two years post-surgery. The recruitment is carried out in partnership with the bariatric surgery departments of the public hospitals of Montpellier, Toulouse and Lyon. It began in May 2024 and will end in March 2026. The quantitative component, using questionnaires, targets a minimum of 200 patients, recruited 6 months after surgery and recontacted at 12, then 24 months. This part of the study involves the same partners as for the qualitative study, with the addition of clinics from the same cities, as well as public and private partners from other French cities such as Nancy, Paris and Pau (which vary in size, territorial location and proximity to the rural world). Initiated 12 months after the start of the qualitative component, it will run from May 2025 to March 2027. In parallel, a review of the literature and existing databases was undertaken during the first year of the project. The systematic review of the literature on bariatric surgery and the theoretical currents and notions used (see dedicated section above) led to the design of the interview guide and a first version of the questionnaire. The latter will need to be complemented by the analysis of the 6-month interviews, a review of existing quantitative databases on obesity (in order to include a certain number of items for comparative purposes) and a test phase. Figure 2 shows how the different components of the study interact.

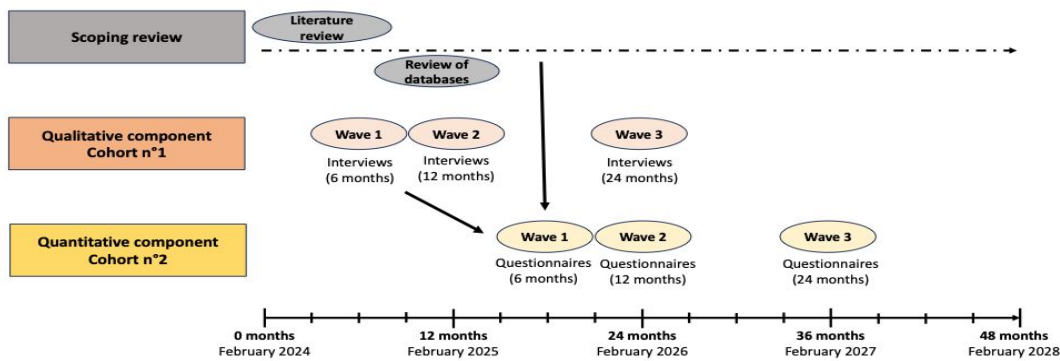


Figure 2 Flowchart of the ChiBarAPS study, France. Sociological study of post-bariatric surgery biographical uncertainties (6-24 months) through the prism of changes in bodily practices.

4- Data collection

Systematic reviews of literature and available data are a crucial step in refining our data collection tools. An equation was applied to various bibliographic search engines such as

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Enregistrement Supérieur (ABES).

Isidore, Cairn, Psycinfo, Cochrane, Open Edition, Érudit<sup>3</sup>, and then adjusted for Jstor and PubMed to rule out the many results that were not related to bariatric surgery<sup>4</sup>. It identified 8.3k articles. A sorting by title then led to the elimination of articles unrelated to bariatric surgery, reducing the number of references under consideration to 288. This systematic review of the literature, which is mainly composed of works from the medical field, was finally supplemented by publications developing the sociological theoretical frameworks associated with the project. The review also took into account an analysis of databases, including national portals (such as the French Open Data Portal and DataIned) and international portals (Jstor, PubMed), as well as medical (SNDS) and university (CENHTOR) databases, including the Quêtelet-Progedo-Diffusion network specializing in social sciences. The latter review has four objectives: (1) to establish an inventory of current research, (2) to collect data for comparative analyses, (3) to examine research methodologies for the study of lifestyle habits, and (4) to develop a coherent framework for the questionnaire. Based on these reviews, the interview guide and questionnaire were developed.

Qualitative interviews, lasting approximately 2 hours, are conducted with consenting patients. They take place in a location of the patient's choice, in order to minimize the constraints on discourse production, and are fully recorded. Participants are contacted by telephone at 12 and 24 months after surgery for the second and third interviews.

The questionnaires, which take about 30 minutes to complete, are administered to a new sample one year after the start of the interviews. One week before their 6-month post-operative follow-up consultation, patients receive a detailed invitation by email, including an informed consent form, to take the online questionnaire. If patients have not participated prior to the consultation, assistance is offered, including a physical appointment or help over the phone, in order to facilitate their participation and bridge the digital divide. After the first questionnaire at 6 months, participants are invited by email to complete the follow-up questionnaires at 12 and 24 months. Those who do not respond are contacted to assess their need for support or to document the reasons for their possible withdrawal from the study.

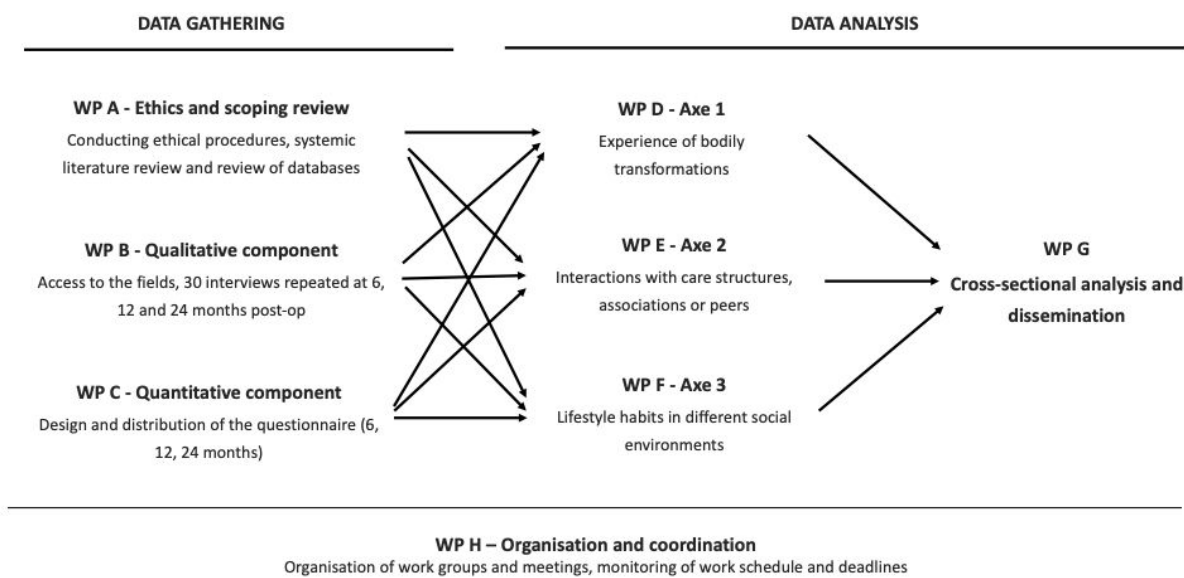
## 5- Analysis

This research project is structured in several work packages, four operational and four analytical ones (see Figure 3). Among the operational packages, one is devoted to the organisation of meetings and working groups, another to ethical and regulatory approaches as well as to the literature review (see dedicated section). The other two focus, respectively, on the constitution of qualitative and quantitative data corpuses (including database analysis).

<sup>3</sup> (Obesit\* OR Fat bod\* OR Overweight OR Fat) AND (Bariatric\* OR Gastrectom\* OR Bypass\*).

<sup>4</sup> Jstor : (Obesit\* OR Overweight OR Fat) AND (Bariatric\* OR Gastrectom\* OR Bypass\*) ; Pubmed : (post OR after) AND (Bariatric\* OR Gastrectom\* OR Bypass\*) AND (soci\* NOT card\*).





**Figure 3** Study framework on work-packages, ChiBarAPS Study, France. Study of the evolution of interactions between three dimensions of the social experience of obesity, articulated through the sociological concept of career, in the 24 months following bariatric surgery.

The scientific references and the results of the qualitative and quantitative components are then analysed in three working groups, one for each objective of the project, namely: (1) experience of bodily transformations, (2) interactions with care structures, associations or peers, (3) lifestyle habits. These are thematic entries aimed at exploring all types of data (literature, transcribed interviews, cleaned databases) to shed light on a specific research axis. Finally, a fourth work package is responsible for carrying out a cross-sectional analysis of the three axes and disseminating the results. It aims to link and ensure coherence between the interpretations and analyses carried out for the different axes.

Once fully transcribed, the interview data is analyzed according to the principles of Grounded Theory (Glaser and Strauss, 1967), in an inductive manner. Individual summary sheets are produced. They will make it possible to readjust the interview grids between the different meetings (6, 12, 24 months) and to carry out case-by-case analyses. At the same time, a transversal thematic analysis grid will record all the verbatims by axis and thematic sub-axes. A first grid will be established, based on the analysis of one case, then completed and reorganized within the framework of collective exchanges between the ten researchers involved in the other cases. Once this grid has been stabilized, the entire corpus of interviews will be coded using the Maxqda software<sup>5</sup>. The quantitative data will be analyzed using the copyright-free statistical software R. This analysis will be carried out per axis within the working groups, then pooled and discussed during wider meetings twice a year.

Each year, during the 48 months of the project, two workshop days will unite all the researchers involved in the study to discuss the data, its analysis and the challenges of presenting and disseminating the results. These days will also include external researchers working on related subjects, but also non-academic partners who are experts in the issues addressed (health professionals, representatives of associations, and patients).

<sup>5</sup> Software made available by the Humanum Digital Research Infrastructure (a support platform for human and social sciences supported by the French Ministry of Higher Education and Research).

## 6- Patient involvement

Patients are involved on several levels. First, in the context of the interviews, by asking for their opinion on the items to be included in the questionnaire for the quantitative part of the study. In addition, interested patients are also invited to participate in the two days organized each year, with their travel expenses covered. Finally, they are asked to participate in the design and dissemination of research results for future patients and their families.

## IV- ETHICS AND DISSEMINATION

### 1- Ethical approvals and consent collection

The protocol of this study was deemed to comply with MR004 by the data protection officer of the University of Montpellier, and approved by the ethics committee of the same university (n°UM 2024-037). The research is funded for a period of 4 years by the French National Research Agency (ANR).

Data protection information is presented to the participants, as well as their rights in terms of access, rectification, erasure or limitation of the information collected, or its portability, in accordance with the Data Protection Act and the European regulations for data protection. An information leaflet is provided to each participant by their doctor during the contact phase. It is signed before the interview, or read and approved before the questionnaire. Each participant is also reminded of the non-compulsory nature of participation, the absence of transfer of personal data to doctors or impact on their follow-up, as well as the absence of remuneration for participation. Participation is however facilitated by the fact that the interviewer comes to them, thus limiting any inconvenience.

### 2- Data processing and analysis

Data management is governed by a data management plan validated by the University of Montpellier's referent on data protection issues. Specifically, this plan provides: 1) the transcription of data based on the Whisper software made available by Humanum-Progedo, 2) the pseudonymization and anonymization of the data, 3) its storage on the Sharedocs server made available by Humanum (digital research infrastructure under the supervision of the French Ministry of Higher Education and Research), to which only researchers involved in data analysis have access, through individual accounts. The questionnaire collects, by design, anonymised information.

### 3- Dissemination

The pseudonymized and anonymized data will be used in a certain number of oral communications at conferences and within articles in journals specializing in sociology or medical health. Material vectors for the dissemination of the study results will be produced for patients and care professionals, with the help of some of the latter in order to produce content that is both adapted and accessible to the target populations. Once the main analyses have been carried out, the quantitative database will be made available to the scientific community on the Quêtelet-Progedo-Diffusion platform, in accordance with the principles of open science.

The project will lead to the production of an awareness guide on the issues of long-term follow-up and monitoring of people who have undergone surgery, which will be aimed primarily at patients and their families. This guide will present meaningful indicators to identify key moments in post-surgical development, and will propose resources or possible support systems

to deal with the difficulties and obstacles encountered in social environments. A book will also be produced for health professionals. It will be possible to use this as support material for the training of individuals responsible for assisting the use of bariatric surgery. It will aim to disseminate the knowledge obtained concerning the processes that can hinder changes in lifestyle habits. This knowledge can be used to adjust existing post-operative information and support systems, or to consider new ones. Co-constructed with the study's associative and hospital partners, this book will be promoted and disseminated in conjunction with them.

V- DISCUSSION

The ChiBarAPS study analyzes the transformations faced by people who have undergone bariatric surgery and their management during the two years following surgery. Funded by the ANR (France), it has the particularity of adopting a sociological perspective and relying on a research protocol that is both multicenter, through mixed methods, and longitudinal. For the time being, the vast majority of studies on the effects of bariatric surgery – whether qualitative or quantitative – focus on patients in a hospital centre. Multi-centrism can shed light on variations related to post-operative support depending on the center involved. However, it will be necessary to ensure that the study includes people who were operated on in centers with very different characteristics (e.g. public/private, integrated obesity center/surgery department, large city/medium-sized city, etc.), as well as being attentive to the diversity of the interindividual characteristics of the people operated on (e.g. gender, level of education, social origin, rural/urban, etc.).

The choice of a mixed research method should make it possible both to quantify and qualify the changes identified. Quantitative approaches dominate in bariatric surgery research. However, they sometimes struggle to go beyond a descriptive reading to identify the sequence of events and processes underlying the transformations observed. Qualitative methods can, in this instance, help to identify processes that are difficult to objectify. The back and forth between the two parts of the study should help to overcome the limitations of the two approaches taken separately. Regarding the interview approach, 30 people constitutes a large cohort. Particular attention should be paid to building and maintaining relationships of trust so as not to lose individuals over the course of the interviews. Another challenge will be related to the ability to adjust the interview grids from one meeting to the next, in order to renew the questions in a way that is adapted to each individual.

This leads us to the third specificity of the study, its longitudinal dimension. No qualitative study on bariatric surgery has so far offered repeated interviews over such a long period, up to 24 months after the operation, in a longitudinal (and not retrospective) perspective. Longitudinal follow-up of cohorts using quantitative approaches, on the other hand, is common. However, the approaches deployed are often very descriptive and aim, through a before/after comparison, to measure the impact of surgery on quality of life (in the more or less long term) or to identify psychological predictors of the surgery's success. Oriented by their evaluative purposes, these medical or medico-psychological studies struggle to penetrate the understanding of the social processes underlying the statistical links identified.

The last particularity of the study is linked to its theoretical anchoring, which leads it to go beyond the usual questions concerning the surgery technique and its anthropometric, physiological and psychological effects, to introduce hypotheses stemming from the fields of sociology of the body, health and disability. The approach adopted here places the individual at the centre of the analysis, without seeking to make the postoperative experience a means of evaluating his or her success or failure. Beyond measurable or perceived changes (weight, side effects, etc.), it will be a question of looking at the social interactions of individuals within the care structures as well as in their daily environments, paying close attention to the effects of

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Enseignement Supérieur (ABES).

these interactions on lifestyle habits and social participation. These interactions will thus be apprehended both in terms of bodily transformations (objectified by measurement indicators used in other studies, but also considered as they are subjectively felt by the patient) and the support of the care team that can contribute to giving them meaning.

We believe that these different components of the protocol, and the unprecedented results it will bring by shedding light on the situations experienced by individuals, will be equally of interest to sociologists and to the hospital doctors, associations and expert patients who are partners in the project.

## REFERENCES

1. Aguilera, M. Post-surgery support and the long-term success of bariatric surgery. *Practice Nursing*. 2014; 25(9): 455-459.
2. Alflen, V. E. V., Pereira, G. S., Condé, M. D. S., Andrade, F. G. D., Fougeyrollas, P., & Silva, S. M. Content analysis of the Measure of the Quality of the Environment by linkage with the International Classification of Functioning, Disability and Health. *Physiotherapy Research International*. 2024; e2089. <https://doi.org/10.1002/pri.2089>
3. Arolfo, S., Scozzari, G., Di Benedetto, G., Vergine, V., & Morino, M. Surgically induced weight loss effects on sexual quality of life of obese men: A prospective evaluation. *Surgical Endoscopy*. 2020; 34(12): 5558-5565. <https://doi.org/10.1007/s00464-019-07356-y>
4. Assimakopoulos, K., Karaivazoglou, K., Panayiotopoulos, S., Hyphantis, T., Iconomou, G., Kalfarentzos, F. Bariatric surgery is associated with reduced depressive symptoms and better sexual function in obese female patients: A one-year follow-up study. *Obesity Surgery*. 2011; 21(3): 362-366.
5. Bajos, N., Wellings, K., Laborde, C., Moreau, C. Sexuality and obesity, a gender perspective: Results from French national random probability survey of sexual behaviours. *BMJ*. 2010; 340.
6. Beck, N. N., Mehlsen, M., & Støving, R. K. Psychological characteristics and associations with weight outcomes two years after gastric bypass surgery: Postoperative eating disorder symptoms are associated with weight loss outcomes. *Eating Behaviors*. 2012; 13(4): 394-397. <https://doi.org/10.1016/j.eatbeh.2012.06.001>
7. Becker, H. *Outsiders. Etudes de sociologie de la déviance*. Paris: Métailié; 1985.
8. Beldame, Y., Ferez, S., Perera, E., Gallenga, G., Nocca, D. Opération du poids et poids de l'opération. *Sciences sociales et santé*. 2021; 39(3): 41-67.
9. Beldame, Y., Ferez, S., Marcellini, A., Paccaud, L. La chirurgie de l'obésité: Continuité du stigmate ou déstigmatisation durable?. *Déviance et sociétés*. 2024; 48(2): 211-242.
10. Brunello, G., d'Hombres, B. Does body weight affect wages?: Evidence from Europe. *Economics & Human Biology*. 2007; 5(1): 1-19.
11. Cawley, J. The impact of obesity on wages. *Journal of Human Resources*. 2004; 39(2): 451-474.
12. Conason, A., McClure Brenchley, K. J., Pratt, A., & Geliebter, A. Sexual life after weight loss surgery. *Surgery for Obesity and Related Diseases: Official Journal of the American Society for Bariatric Surgery*. 2017; 13(5): 855-861. <https://doi.org/10.1016/j.soard.2017.01.014>
13. Corbin, J. *Trajectory as an analytic tool*. San Francisco: University of California Press; 1991.
14. Corey, S. Sick but Healthy: Bariatric Patients and the Social Construction of Illness and Disability. *Sociology of Health & Illness*. 2020; 42(4): 907-924. <https://doi.org/10.1111/1467-9566.13074>
15. Crosnoe, R., Muller, C. Body mass index, academic achievement, and school context: Examining the educational experiences of adolescents at risk of obesity. *Journal of Health and Social Behavior*. 2004; 45(4): 393-407.
16. Darmon, M. La notion de carrière: un instrument interactionniste d'objectivation. *Politix*. 2008; 82(2): 149-167.
17. Darmon, M. *Devenir anorexique: une approche sociologique*. Paris: La découverte; 2014.
18. de Man Lapidoth, J., Ghaderi, A., & Norring, C. Binge eating in surgical weight-loss treatments: Long-term associations with weight loss, health-related quality of life (HRQL), and psychopathology. *Eating and Weight Disorders: EWD*. 2011; 16(4): e263-269. <https://doi.org/10.1007/BF03327470>
19. de Meireles, A. J., Carlin, A. M., Bonham, A. J., Cassidy, R., Ross, R., Stricklen, A., Finks, J., Ghaferi, A. A. A Longitudinal Analysis of Variation in Psychological Well-Being and Body Image in Patients Before and After Bariatric Surgery. *Annals of Surgery*. 2020; 271(5): 885-890. <https://doi.org/10.1097/SLA.0000000000003146>
20. Devlin, M. J., King, W. C., Kalarchian, M. A., Hinerman, A., Marcus, M. D., Yanovski, S. Z., Mitchell, J. E. Eating Pathology and Associations with Long-Term Changes in Weight and Quality of Life in the



Longitudinal Assessment of Bariatric Surgery Study. *The International Journal of Eating Disorders*. 2018; 51(12): 1322-1330. <https://doi.org/10.1002/eat.22979>

21. de Zwaan, M., Hilbert, A., Swan-Kremeier, L., Simonich, H., Lancaster, K., Howell, L. M., Monson, T., Crosby, R. D., & Mitchell, J. E. (2010). Comprehensive interview assessment of eating behavior 18-35 months after gastric bypass surgery for morbid obesity. *Surgery for Obesity and Related Diseases: Official Journal of the American Society for Bariatric Surgery*, 6(1), 79-85. <https://doi.org/10.1016/j.soard.2009.08.011>

22. Garcia, Franshelis K., Bob C. Mulder, Eric J. Hazebroek, Maria A. Koelen, Esther J. Veen, et Kirsten T. Verkooijen. (2023). Bariatric Surgery Stigma from the Perspective of Patients: A Scoping Review. *Journal of Advanced Nursing*. <https://doi.org/10.1111/jan.15994>

23. Garcia, Franshelis K., Kirsten T. Verkooijen, Esther J. Veen, Bob C. Mulder, Maria A. Koelen, et Eric J. Hazebroek. (2022). Stigma Toward Bariatric Surgery in the Netherlands, France, and the United Kingdom: Protocol for a Cross-Cultural Mixed Methods Study. *JMIR Research Protocols*, 11(4), e36753. <https://doi.org/10.2196/36753>

24. Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory. Strategies for Qualitative Research*. Chicago: Aldine.

25. Griaude, D. H., Ibrahim, A. M., Fisher, N., Stricklen, A., Ross, R., & Ghaferi, A. A. (2018). Understanding the psychosocial impact of weight loss following bariatric surgery: A qualitative study. *BMC Obesity*, 5, 38. <https://doi.org/10.1186/s40608-018-0215-3>

26. Grimaldi, D., & Van Etten, D. (2010). Psychosocial adjustments following weight loss surgery. *Journal of Psychosocial Nursing and Mental Health Services*, 48(3), 24-29.

27. Hansen, B., & Dye, M. H. (2018). Damned if You Do, Damned if You Don't: The Stigma of Weight Loss Surgery. *Deviant Behavior*, 39(2), 137-147.

28. Imhagen, A., Karlsson, J., Ohlsson-Nevo, E., Stenberg, E., Jansson, S., & Hagberg, L. (2023). Levels of Physical Activity, Enjoyment, Self-Efficacy for Exercise, and Social Support Before and After Metabolic and Bariatric Surgery: A Longitudinal Prospective Observational Study. *Obesity Surgery*, 33(12), 3899-3906. <https://doi.org/10.1007/s11695-023-06887-7>

29. Ivezaj, V., & Grilo, C. M. (2018). The complexity of body image following bariatric surgery: A systematic review of the literature. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 19(8), 1116-1140. <https://doi.org/10.1111/obr.12685>

30. Jaensson, M., Dahlberg, K., Nilsson, U., & Stenberg, E. (2019). The Impact of Self-Efficacy and Health Literacy on Outcome after Bariatric Surgery in Sweden: A Protocol for a Prospective, Longitudinal Mixed-Methods Study. *BMJ Open*, 9(5), e027272. <https://doi.org/10.1136/bmjopen-2018-027272>

31. Jensen, J. F., Petersen, M. H., Larsen, T. B., Jørgensen, D. G., Grønbaek, H. N., & Midtgaard, J. (2014). Young adult women's experiences of body image after bariatric surgery: A descriptive phenomenological study. *Journal of Advanced Nursing*, 70(5), 1138-1149.

32. Kantarovich, K., Wnuk, S., Cassin, S., Hawa, R., & Sockalingam, S. (2019). Employment Outcomes 2 Years After Bariatric Surgery: Relationship to Quality of Life and Psychosocial Predictors. *Obesity Surgery*, 29(9), 2854-2861. <https://doi.org/10.1007/s11695-019-03905-5>

33. Karnehed, N., Rasmussen, F., Hemmingsson, T., & Tynelius, P. (2006). Obesity and attained education: Cohort study of more than 700,000 Swedish men. *Obesity*, 14(8), 1421-1428.

34. Lent, M. R., Campbell, L. K., Kelly, M. C., Lawson, J. L., Murakami, J. M., Gorrell, S., Wood, G. C., Yohn, M. M., Ranck, S., Petrick, A. T., Cunningham, K., LaMotte, M. E., & Still, C. D. (2019). The feasibility of a behavioral group intervention after weight-loss surgery: A randomized pilot trial. *PloS One*, 14(10), e0223885. <https://doi.org/10.1371/journal.pone.0223885>

35. Lin, H.-C., & Tsao, L.-I. (2018). Living with my small stomach: The experiences of post-bariatric surgery patients within 1 year after discharge. *Journal of Clinical Nursing*, 27(23-24), 4279-4289. <https://doi.org/10.1111/jocn.14616>

36. López-Lara, K. M., Cruz Millán, A. C., Barrera-Hernandez, L. F., Valbuena-Gregorio, E., Ayala-Burboa, M. O., Hernández-Lepe, M. A., Olivas-Aguirre, F. J. (2024). Mitigating Weight Stigma: A Randomized Controlled Trial Addressing Obesity Prejudice through Education among Healthcare Undergraduates. *Obesities*, 4, 73-84. <https://doi.org/10.3390/obesities4020008>

37. Mancini, A., Borel, A.-L., Coumes, S., Wion, N., Arvieux, C., & Reche, F. (2018). Bariatric surgery improves the employment rate in people with obesity: 2-year analysis. *Surgery for Obesity and Related Diseases*, 14(11), 1700-1704. <https://doi.org/10.1016/j.soard.2018.04.001>

38. Marchitelli, S., Ricci, E., Mazza, C., Roma, P., Tambelli, R., Casella, G., Gnessi, L., & Lenzi, A. (2022). Obesity and Psychological Factors Associated with Weight Loss after Bariatric Surgery: A Longitudinal Study. *Nutrients*, 14(13), 2690. <https://doi.org/10.3390/nu14132690>

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Ensignement Supérieur (ABES).



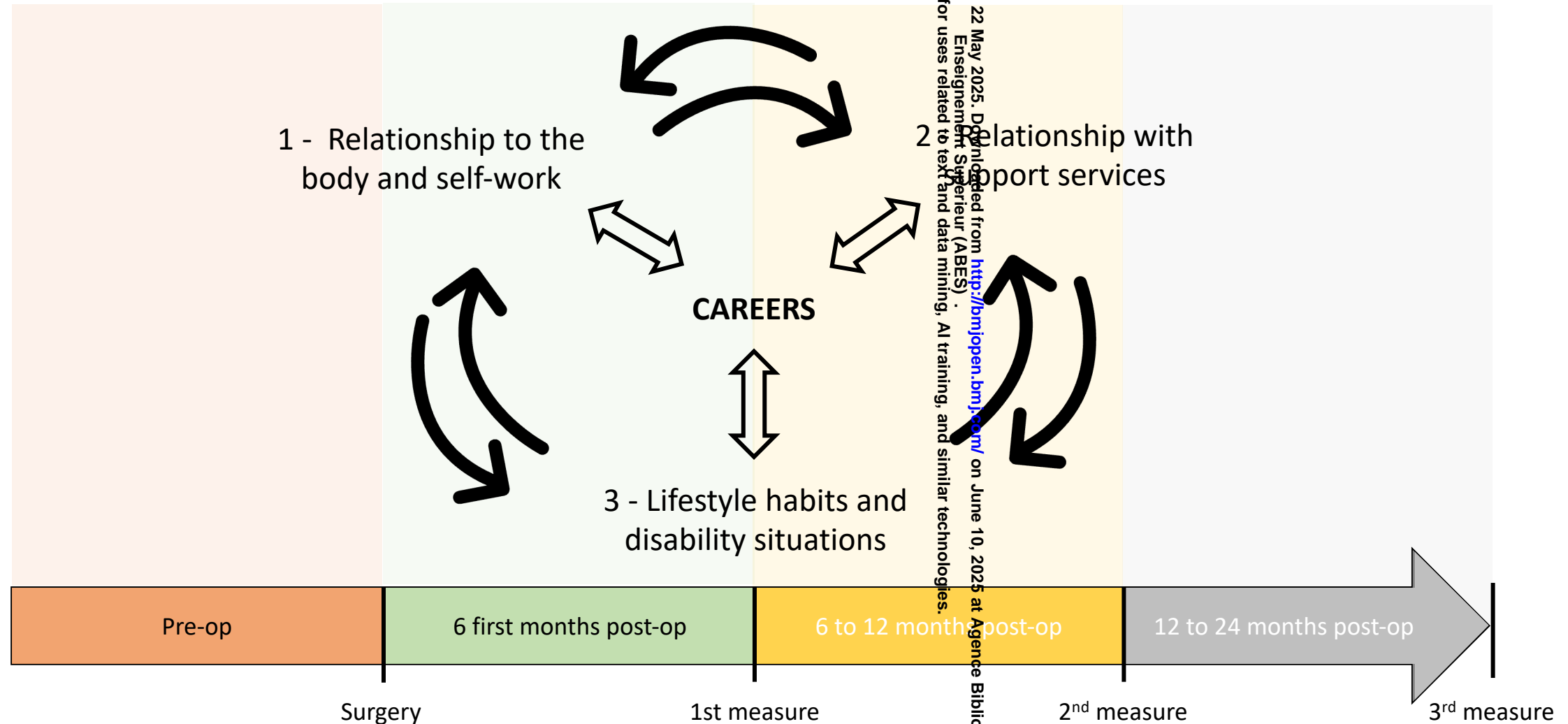
39. Marek, R. J., Martin-Fernandez, K., Ben-Porath, Y. S., & Heinberg, L. J. (2021). Psychosocial Functioning of Bariatric Surgery Patients 6-Years Postoperative. *Obesity Surgery*, 31(2), 712-724. <https://doi.org/10.1007/s11695-020-05025-x>
40. Miras, A. D., Kamocka, A., Patel, D., Dexter, S., Finlay, I., Hopkins, J. C., Khan, O., Reddy, M., Sedman, P., Small, P., Somers, S., Cro, S., Walton, P., le Roux, C. W., & Welbourn, R. (2018). Obesity surgery makes patients healthier and more functional: Real world results from the United Kingdom National Bariatric Surgery Registry. *Surgery for Obesity and Related Diseases*, 14(7), 1033-1040. <https://doi.org/10.1016/j.soard.2018.02.012>
41. Mirijello, A., D'Angelo, C., Iaconelli, A., Capristo, E., Ferrulli, A., Leccesi, L., Cossari, A., Landolfi, R., & Addolorato, G. (2015). Social phobia and quality of life in morbidly obese patients before and after bariatric surgery. *Journal of Affective Disorders*, 179, 95-100. <https://doi.org/10.1016/j.jad.2015.03.030>
42. Natvik, E., Gjengedal, E., & Råheim, M. (2013). Totally changed, yet still the same: Patients' lived experiences 5 years beyond bariatric surgery. *Qualitative Health Research*, 23(9), 1202-1214. <https://doi.org/10.1177/1049732313501888>
43. Nicareta, J. R., de Freitas, A. C. T., Nicareta, S. M., Nicareta, C., Campos, A. C. L., Nassif, P. A. N., & Marchesini, J. B. (2015). BAROS METHOD CRITICAL ANALYSIS (BARIATRIC ANALYSIS AND REPORTING SYSTEM). *Arquivos Brasileiros de Cirurgia Digestiva: ABCD = Brazilian Archives of Digestive Surgery*, 28 Suppl 1(Suppl 1), 73-78. <https://doi.org/10.1590/S0102-6720201500S100020>
44. Oppert, J.-M., Bellicha, A., & Ciangura, C. (2021). Physical activity in management of persons with obesity. *European Journal of Internal Medicine*, 93, 8-12. <https://doi.org/10.1016/j.ejim.2021.04.028>
45. O'Reilly, C. (2016). Nineteen: Mitigating Weight Stigma Through Health Professional Education. *Counterpoints*, 467, 189-197.
46. Park, J. (2015). The meanings of physical appearance in patients seeking bariatric surgery. *Health Sociology Review*, 24(3), 242-255.
47. Pfabigan, D. M., Hertel, J. K., Svanevik, M., Lindberg, M., Sailer, U., & Hjelmæsæth, J. (2023). Single-Centre, Non-Randomised Clinical Trial at a Tertiary Care Centre to Investigate 1-Year Changes in Social Experiences and Biomarkers of Well-Being after Bariatric Surgery in Individuals with Severe Obesity: Protocol for the Bariatric Surgery and Social Experiences (BaSES) Study. *BMJ Open*, 13(8), e071332. <https://doi.org/10.1136/bmjopen-2022-071332>
48. Rudolph, A., & Hilbert, A. (2013). Post-operative behavioural management in bariatric surgery: A systematic review and meta-analysis of randomized controlled trials. *Obesity Reviews*, 14(4), 292-302.
49. Sarwer, D. B., Wadden, T. A., Moore, R. H., Eisenberg, M. H., Raper, S. E., Williams, N. N. (2010). Changes in quality of life and body image after gastric bypass surgery. *Surgery for Obesity and Related Diseases*, 6(6), 608-614.
50. Saux, P., et al. (2023). Development and validation of an interpretable machine learning-based calculator for predicting 5-year weight trajectories after bariatric surgery: A multinational retrospective cohort SOPHIA study. *The Lancet Digital Health*, 5(10), e692-e702. [https://doi.org/10.1016/S2589-7500\(23\)00135-8](https://doi.org/10.1016/S2589-7500(23)00135-8)
51. Sockalingam, S., Wnuk, S., Kantarovich, K., Meaney, C., Okrainec, A., Hawa, R., & Cassin, S. (2015). Employment outcomes one year after bariatric surgery: The role of patient and psychosocial factors. *Obesity Surgery*, 25(3), 514-522. <https://doi.org/10.1007/s11695-014-1443-3>
52. Strain, G. W., Kolotkin, R. L., Dakin, G. F., Gagner, M., Inabnet, W. B., Christos, P., Saif, T., Crosby, R., & Pomp, A. (2014). The effects of weight loss after bariatric surgery on health-related quality of life and depression. *Nutrition & Diabetes*, 4(9), e132. <https://doi.org/10.1038/nutd.2014.29>
53. Throsby, K. (2008). Happy re-birthday: Weight loss surgery and the new me. *Body & Society*, 14(1), 117-133.
54. Throsby, K. (2012). Obesity surgery and the management of excess: exploring the body multiple. *Sociology of Health & Illness*, 34(1), 1-15.
55. Treacy, P.-J., Mazoyer, C., Falagario, U., & Iannelli, A. (2019). Sexual Activity After Bariatric Surgery: A Prospective Monocentric Study Using the PISQ-IR Questionnaire. *The Journal of Sexual Medicine*, 16(12), 1930-1937. <https://doi.org/10.1016/j.jsxm.2019.09.004>
56. Troisoeufs, A. (2020). "Je me sens dés handicapée": Approche anthropologique de la chirurgie de l'obésité et des situations de sortie de handicap. *Alter*, 14(1), 13-26.
57. Verhaak, A. M. S., Ferrand, J., Puhl, R. M., Tishler, D. S., Papasavas, P. K., & Umashanker, D. (2022). Experienced Weight Stigma, Internalized Weight Bias, and Clinical Attrition in a Medical Weight Loss Patient Sample. *International Journal of Obesity (2005)*, 46(6), 1241-1243. <https://doi.org/10.1038/s41366-022-01087-2>

58. Weiner, S., Sauerland, S., Fein, M., Blanco, R., Pomhoff, I., & Weiner, R. A. (2005). The Bariatric Quality of Life index: A measure of well-being in obesity surgery patients. *Obesity Surgery*, 15(4), 538-545. <https://doi.org/10.1381/0960892053723439>

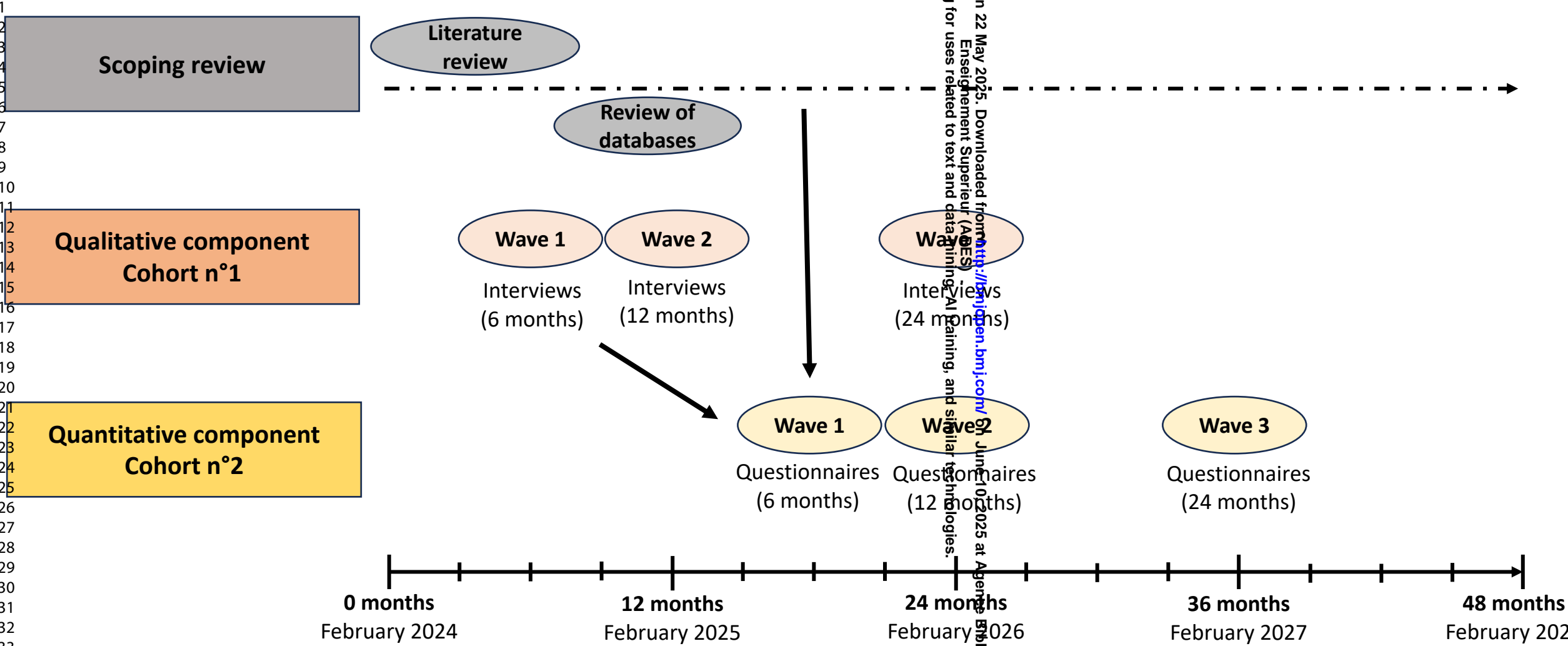
59. White, M. A., Kalarchian, M. A., Levine, M. D., Masheb, R. M., Marcus, M. D., & Grilo, C. M. (2015). Prognostic Significance of Depressive Symptoms on Weight Loss and Psychosocial Outcomes Following Gastric Bypass Surgery: A Prospective 24-Month Follow-Up Study. *Obesity Surgery*, 25(10), 1909-1916. <https://doi.org/10.1007/s11695-015-1631-9>

60. Woods, R. (2022). The evolution of depressive symptoms following bariatric surgery for purposes of substantial weight loss [PhD, Concordia University]. <https://spectrum.library.concordia.ca/id/eprint/991943/>

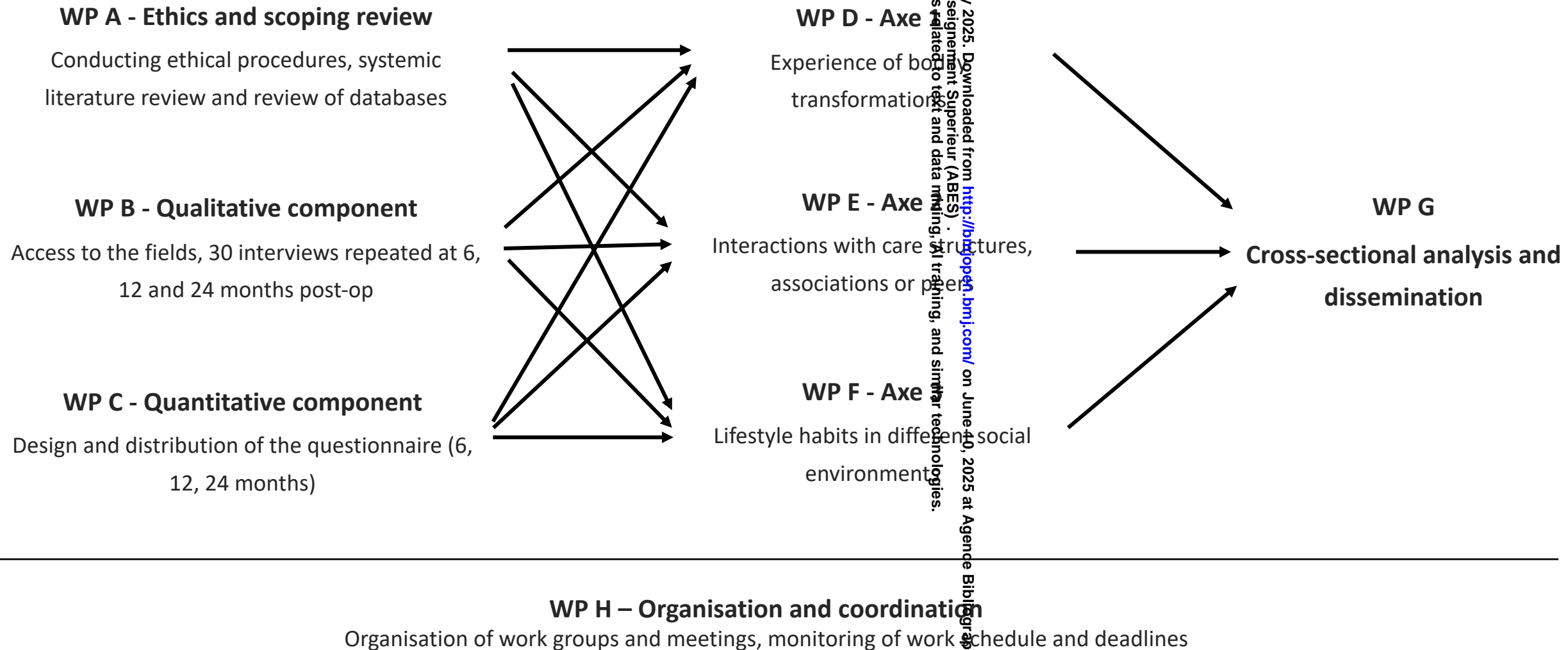
61. Yue, T. P., Mohd Yusof, B.-N., Nor Hanipah, Z. B., & Gee, T. (2022). Food tolerance, nutritional status and health-related quality of life of patients with morbid obesity after bariatric surgery. *Clinical Nutrition ESPEN*, 48, 321-328. <https://doi.org/10.1016/j.clnesp.2022.01.026>



**Figure 1** Theoretical frame of the ChiBarAPS study, France. Study of the evolution of interactions between three dimensions of the social experience of obesity, articulated through the sociological concept of career, in the 24 months following bariatric surgery



**Figure 2** Flowchart of the ChiBarAPS study, France. Sociological study of post-bariatric surgery biographical uncertainties (6-24 months) through the prism of changes in bodily practices.



**Figure 3** Study framework on work-packages, ChiBarAPS Study, France. Study of the evolution of interactions between three dimensions of the social experience of obesity, articulated through the sociological concept of career, in the 24 months following bariatric surgery.



# BMJ Open

## Investigating biographical post-bariatric surgery uncertainties in the light of changes in bodily practices: a mixed-method, multicentric and longitudinal research protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2025-101199.R1
Article Type:	Protocol
Date Submitted by the Author:	23-Apr-2025
Complete List of Authors:	Ferez, Sylvain; Montpellier University, Santesih (UM211) Bouchet-Mayer, Cyriac; Montpellier University, Santesih (UM211) Charissou-Pujol, Lise; University of Toulouse, CRESCO Terral, Philippe; University of Toulouse, CRESCO Couvry, Camille; Max Weber Centre Issanchou, Damien; Université Claude Bernard Lyon 1, Laboratoire L-VIS (STAPS) Julien, Marie-Pierre; University of Lorraine, TETRAS Perrin, Claire; Université Claude Bernard Lyon 1, Laboratoire L-VIS (STAPS) Oppert, Jean-Michel; Sorbonne University, Department of Nutrition, Pitie-Salpêtrière hospital (AP-HP) Ritz, Patrick; CHU Toulouse, CERPOP Disse, Emmanuel; University Claude Bernard Lyon 1, Hospices Civils de Lyon Study group, Members; Université de Montpellier
<b>Primary Subject Heading</b>:	Sociology
Secondary Subject Heading:	Sociology, Research methods, Surgery
Keywords:	Bariatric Surgery, Obesity, Physical Fitness, Quality of Life, Life Change Events

SCHOLARONE™  
Manuscripts

Investigating biographical post-bariatric surgery uncertainties in the light of changes in bodily practices: a mixed-method, multicentric and longitudinal research protocol

ABSTRACT

**Introduction:** The effects of bariatric surgery have largely been studied from a medical viewpoint, seeking to measure changes in anthropometric, physiological or quality-of-life factors after the operation. Few studies, however, have focused on the dynamics of lifestyle changes. Yet we know that changing lifestyle habits – which are often part of the established social configurations at the origin of morbid obesity – is essential for a sustainable recovery from obesity. We also know that the major bodily transformations that occur in the six to twelve months following surgery produce a high degree of biographical uncertainty and affect social interactions. From a sociological perspective, the authors propose to study the processes of disruption and re-establishment of lifestyle habits in the first 24 months following bariatric surgery.

**Methods and analysis:** The ChiBarAPS study relies on a mixed method longitudinal survey, comprising three components: qualitative, quantitative, literature and data review. It aims to document three main dimensions, which must be articulated to understand the dynamics of change: (1) the work undertaken by patients on themselves in order to identify and measure the evolutionary effects of surgery, as well as to adapt to them ; (2) the experience of using pre- and post-surgery information and support systems, and evaluating their effects on the agency of the people who have undergone surgery ; (3) the evolution of social participation and lifestyle habits. The qualitative component concerns a cohort of 30 patients, interviewed in depth (2 hours) on these three dimensions 6 months, 12 months and 24 months after the operation. The quantitative part uses questionnaires applied to a second group of 200 patients, following the same timeline.

**Ethics and dissemination:** This study complies with reference methodology MR004 of the French National Data Protection Authority and was registered by the Data Protection Officer of the University of Montpellier on the activity registry of the institution (24 April 2024). Ethics approval has been obtained from the University of Montpellier ethics research board (n°UM2024-037). Informed consent from all participants will be obtained before data collection. The project has received funding from the French National Research Agency (n°ANR-23-CE41-0020-01) from February 2024 to the end of January 2028. The first results of the research will be disseminated from 2026 onwards to researchers, health professionals and patient support organizations. The results of the study will then be published in peer-reviewed scientific journals, both national and international.

**Keywords:** Bariatric surgery; obesity; lifestyle habits; sociology; longitudinal survey; mixed methods.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The research uses a multicenter, longitudinal, mixed-method approach capable of capturing the biographical uncertainties that mark the two-year period following sleeve-type bariatric surgery.
- ⇒ The longitudinal approach makes it possible to capture social processes in the making, but involves repeating interviews and questionnaires with the same panels at 6, 12 and 24 months after surgery, meaning that we must be careful to limit the number of people lost to follow-up.

- ⇒ The sociological approach, which is attentive to the social processes that follow and are consubstantial with weight loss – but more for its own sake than for assessing the effects of certain social variables on the success or otherwise of the operation, or of the operation on certain social components – will provide a demedicalized understanding of the experience of overcoming obesity through bariatric surgery.
- ⇒ The fact that the samples were recruited mainly through public hospital partners may lead to an under-representation of the specific experiences of people operated on in private clinics, and the fact that recruitment was on a voluntary basis may lead to an over-representation of certain experiences which we will have to try to identify.

## 1- INTRODUCTION

The health benefits of bariatric surgery have been extensively studied. Although maintaining these benefits requires a lasting change in those lifestyle habits considered to be at the origin of morbid obesity, few studies have questioned the conditions for such a change.

### 1- Health and quality of life impacts

Medical literature positively assesses the benefit/risk ratio of bariatric surgery by comparing metabolic improvements due to weight loss and the risks of death or side effects related to the surgery<sup>1</sup>. Complications and dietary constraints (in particular to limit gastroesophageal reflux and avoid nutritional deficiencies) following the surgery are well documented<sup>2,3</sup>. However, Correy's sociological approach<sup>4</sup> points to the effort of redefining the physiological symptoms experienced by patients after surgery. Indeed, the latter perceive these symptoms rather as a tool for strengthening self-control, or as signs of weight loss synonymous with health gain, than from the perspective of illness or disability.

Surgery is also a source of stress and anxiety, before and after the operation. Measured using psychometric scales, these emotional difficulties expose patients to addictive behaviours and eating disorders<sup>5-7</sup>. They can also lead to depressive symptoms related to the feeling of not being able to follow medical recommendations<sup>8-10</sup>. Post-surgery quality of life is studied using specific scales, as Bariatric Quality of Life-BQL<sup>11</sup> or Bariatric Analysis Reporting Outcome System-BAROS<sup>12</sup>. These scales consider the impact of the operation in terms of: 1) reduction or disappearance of adverse effects or medical treatments; 2) reduction of functional limitations and increase of physical activity<sup>13,14</sup>; 3) reduction of emotional difficulties. By influencing these aspects, bariatric surgery can also impact family, friendship and sexual relationship dynamics<sup>15-17</sup>.

However, social dimensions are not integrated into quality of life measurement tools, but are designed as distinct variables impacted by quality of life<sup>18-20</sup> or impacting it themselves<sup>21-23</sup>. Social variables are therefore not completely absent from studies on the health impact of bariatric surgery (or on the predictors of its success on an anthropometric level in terms of weight loss or lowering of BMI). Nevertheless, sociological approaches to the latter remain rare. They aim to shed light on the processes involved in the maintenance or evolution of lifestyle habits following surgery, rather than measuring the positive or negative effects of the operation on health within the broader spectrum of quality of life. These sociological processes are very different from psychological predictors. They involve taking into account the influence of living environments and social interactions on individual experiences.

### 2- Living environment, social participation and stigmatization

Studies on the impact of social representations of obesity and the use of surgery show that it is a means of escaping discrimination in educational environments<sup>24,25</sup>, work<sup>26,27</sup> and sex life<sup>28</sup>. However, the use of bariatric surgery runs the risk of confirming the weakness of character often considered to be at the root of obesity<sup>29,30</sup> and contributes to stigmatization on the part of health professionals themselves<sup>31,32</sup>. Verhaak *et al.* (2022)<sup>33</sup> show that, when weight-related biases are internalized, they affect the clinical attrition of patients engaged in a medicalized path to weight loss. A recent literature review on the stigma of bariatric surgery<sup>34</sup> points out the methodological shortcomings of existing studies, all of which were carried out in the general population or with health professionals. The authors regret the failure to take into account the patient's point of view when studying the effects of surgery and the exploration of the socio-cultural foundations of its stigmatization. To compensate for this lack of data, they propose a comparative survey (the results of which are not yet available) between the Netherlands, France and the United Kingdom, questioning people who have undergone surgery, as well as health professionals and the general public<sup>35</sup>.

**3- Supporting the evolution of lifestyle habits in the face of uncertainty**

The effects of prejudice and stigmatization of bariatric surgery are investigated in the few sociological<sup>36,30,4,37</sup> or psychology studies<sup>38</sup> examining the social experience of post-surgery body modifications. This experience is marked by a disruption in lifestyle habits, in terms of food intake and hydration, but also in the practice of physical activity<sup>14</sup>. After a few weeks or months, the gradual experimentation of increased mobility abilities sometimes produces the feeling of being “un-disabled”<sup>39</sup>. The rapid weight loss is then often referred to as a “rebirth”<sup>40,41</sup>. In some cases, identity reconfigurations associated with body changes are described as being more traumatic. Working on oneself is then necessary in order to find a medical<sup>4</sup>, aesthetic<sup>37</sup> or moral<sup>30</sup> meaning to the changes experienced. This work of appropriating one's “new” body is done under the public eye, by being confronted with the fears to which social interactions expose. All these elements are not included in quantitative studies that seek to assess the impact of surgery on social interactions, based on the comparison of questionnaires administered before and after the operation<sup>42</sup>. These descriptive approaches struggle to grasp the processes behind the changes measured, or how they can affect lifestyle habits. However, while bariatric surgery affects social participation and any attempt to adopt new lifestyle habits<sup>43-45</sup>, its long-term effectiveness depends on lasting changes to these habits<sup>22</sup>.

**4- Social dynamics of lifestyle change and medium-term impact**

Social processes follow temporal dynamics. A few months after surgery, when their weight stabilizes, the patients who have undergone surgery often find that the amount lost is insufficient<sup>40,41</sup>. Over time, regaining weight can also occur<sup>46</sup>. In addition to the threat to their attained silhouette<sup>47-49</sup>, there is also the risk of losing the social relationships established as a result of weight loss – particularly in relationships of seduction<sup>50</sup>. In this situation, social pressure is strong, as is the fear of returning to a “fat” body, a stigma associated with a lack of self-control<sup>30</sup>. Bariatric surgery produces multiple and variable effects on the body such as it is perceived over the weeks and months following the operation, and involves managing these effects within the social environments (family, medical, professional) frequented. The rare sociological studies that have studied the articulation of these elements used qualitative data from the retrospective narratives of a small number of patients recruited in a single hospital<sup>4,23,39</sup>, or repeated interviews within a timeframe not exceeding 12 months after the operation<sup>36,30</sup>.

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Enseignement Supérieur (ABES).

Longitudinal approaches that include more patients and which repeat measurements over time focus on the impact of bariatric surgery on mental health or quality of life in the medium term<sup>51</sup>, psychological predictors (mental health, eating disorders) of the success of the surgery<sup>52</sup>, or the effects of feelings of self-efficacy and health competence on changes in post-surgery quality of life<sup>53,54</sup>. When, exceptionally, a study focuses on the evolution of behaviours, medical and psychological variables remain decisive. The examination of physical activity (as it promotes weight loss, health and quality of life) leads to the observation that none of the psychological determinants measured (pleasure, self-efficacy, social support) explain the level of physical practice<sup>55</sup>.

## II- STUDY AIMS AND HYPOTHESIS

This article details the protocol of the ChiBarAPS study, which examines the evolution of physical and dietary practices in relation to the overall body experience, within the social environments frequented by the individual, over a period of 24 months after surgery. This protocol aims to shed light on the social factors that weigh on the reorganization of lifestyle habits following the disruption caused by surgery. ChiBarAPS has three main objectives:

### OBJECTIVE 1

The first objective is to document the work undertaken by patients on themselves in order to identify and measure the evolutionary effects of surgery (bodily transformations, pain, discomfort, fatigue, etc.), as well as to adapt to them (transformation of lifestyle, dietary, and intake habits, etc.).

### OBJECTIVE 2

The second objective is to provide information on the experience of the use of pre- and post-surgery information and support systems (medical devices and non-medical, associative or community networks), and to evaluate their effects on the agency of the people who have undergone surgery.

### OBJECTIVE 3

The third objective concerns the study of the evolution of the forms of social participation and lifestyle habits based on the Human Development Model – Disability Creation Process (HDM-DCP)<sup>56</sup> in order to identify processes for reducing situations of disability (e.g. by improving physical capacities) or, on the contrary, social participation (due to pain, discomfort, stigma, etc.).

The research is based on two hypotheses:

#### Hypothesis 1

The period of 6 to 24 months following surgery is a pivotal period, marked by a high degree of biographical uncertainty, during which the success or otherwise of escaping obesity in the longer term is at stake, depending on the ability of individuals to engage in work on themselves and to change their lifestyle in the long term.

#### Hypothesis 2

"Escaping" from obesity is not solely the symbolic passage below a certain weight threshold, but implies a transformation of oneself under the gaze of others, in particular to escape the stigma of obesity; a stigma that the use of surgery can reinforce despite weight loss.

## III- METHOD



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## 1- Theoretical approach

This research focuses on the transformations of the body, lifestyles and social practices (physical activities, diet, sexuality, body care, clothing, etc.) following surgery. Post-surgery obesity is understood as a "combined in action"<sup>57</sup> everyday work, that takes place in different environments (health, sports, professional, family, etc.). The sociological concept of *career*<sup>58,59</sup> makes it possible to articulate, based on attention to the different forms of work that the individual deploys, the three objectives mentioned above. It is thus the dynamics of the interactions between the three dimensions associated with these objectives (self-perception, experience of information and support systems, social participation) that should make it possible to model the evolution of careers related to obesity (Figure 1). By focusing on the relationships that individuals establish with their social environments, the concept of *career* aims here to shed light on the social conditions of the transformations identified or "the social space of the transformation of the self"<sup>60</sup>.

## 2- Study population

The participants in this study have undergone a sleeve procedure, are in employment or of working age (excluding students and retirees), and do not have an illness involving too heavy a treatment likely to have a strong impact on their post-surgery life experience (e.g. cancer, multiple sclerosis, Parkinson's disease). Participants were recruited from within the active lists of the study's partner hospital departments with the aim of achieving the greatest possible diversity in terms of gender, social origin, pre- and post-operative weight trajectory, etc. Attention was paid to the recruitment of men, who are not well represented in studies on bariatric surgery. In the event that these sampling diversity objectives were not achieved, recruitment could occasionally take place through patient associations or social networks.

## 3- Design of the study

ChiBarAPS is a multicentre longitudinal study conducted by sociologist researchers from Montpellier, Toulouse, Lyon 1, Lorraine, Paris Sorbonne and Saint-Etienne universities, comprising three components: qualitative, quantitative, literature and data review.

The qualitative component of the study aims to carry out semi-structured interviews of the life story and practice type, repeated at 6, 12 and 24 months after surgery with 30 patients. The relationship of trust established by the sociologist and post-doctoral fellow, over the course of these meetings should make it possible to document several dimensions presented to participants at the beginning of the first interview. Namely, these are the bodily experience (obj. 1), the interactions with the actors of the specialized services (obj. 2), as well as lifestyle habits (obj. 3) during this pivotal period of the first two years post-surgery. Recruitment is carried out in partnership with the bariatric surgery departments of the public hospitals of Montpellier, Toulouse and Lyon. It began in May 2024 and will end in March 2026.

The quantitative component, using questionnaires, targets a minimum of 200 patients, recruited 6 months after surgery and recontacted at 12, then 24 months. This part of the study involves the same partners as for the qualitative study, with the addition of clinics from the same cities, as well as public and private partners from other French cities such as Pau, Bayonne, Dax, Nancy, Rennes, Reims and Paris (which vary in size, territorial location and proximity to the rural world). The minimal number of participants does not correspond to a calculation of representativeness. It is the result of discussions with partner services to estimate the minimum number of participants who can be expected to take part three times, based on their active files,

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.  
Enseignement Supérieur (ABES)

which represents around 25% of the latter over the recruitment period. Initiated 12 months after the start of the qualitative component, it will run from May 2025 to March 2027.

In parallel, a review of the literature and existing databases was undertaken during the first year of the project. The systematic review of the literature on bariatric surgery and the theoretical currents and notions used (see dedicated section above) led to the design of the interview guide and a first version of the questionnaire. The latter will need to be complemented by the analysis of the 6-month interviews, a review of existing quantitative databases on obesity (in order to include a certain number of items for comparative purposes) and a test phase. Figure 2 shows how the different components of the study interact.

#### 4- Data collection

Systematic reviews of literature and available data are a crucial step in refining our data collection tools. An equation was applied to various bibliographic search engines such as Isidore, Cairn, Psycinfo, Cochrane, Open Edition, Érudit - (Obesit\* OR Fat bod\* OR Overweight OR Fat) AND (Bariatric\* OR Gastrectom\* OR Bypass\*). Then, it has been adjusted for Jstor and PubMed to rule out the many results that were not related to bariatric surgery - Jstor : (Obesit\* OR Overweight OR Fat) AND (Bariatric\* OR Gastrectom\* OR Bypass\*) ; Pubmed : (post OR after) AND (Bariatric\* OR Gastrectom\* OR Bypass\*) AND (soci\* NOT card\*). It identified 8.3k articles. A sorting by title and abstracts then led to the elimination of articles unrelated to the social dimensions of bariatric surgery, reducing the number of references under consideration to 288. This systematic review of the literature, which is mainly composed of works from the medical field, was finally supplemented by publications developing the sociological theoretical frameworks associated with the research suggested by the sociologists involved in the project.

A second review of existing databases is currently in progress, encompassing national portals (such as the French Open Data Portal and DataIned) and international portals (such as Jstor and PubMed), in addition to medical databases (SNDS) and academic databases (CENHTOR), including the Quêtelet-Progedo-Diffusion network specializing in social sciences. To conduct this research, we performed a lexicometric analysis using text processing software and a vocabulary distribution analysis<sup>61</sup> based on the literature review. This process revealed a total of 22 keywords of interest for our study. After testing these keywords on data platforms, we selected five (BMI, Obesity, Health, Disability, Lifestyle Habits) that allowed us to target relevant studies for our research. These five keywords were applied across all existing data platforms to achieve a comprehensive review. Filtering measures were employed to avoid biases related to excessively outdated data or deviations from the relevant disciplinary field. The objective was to target variables corresponding to our primary research domains, namely obesity, disability, health, dietary consumption, bodily transformations, lifestyle habits, and social participation. For each of the selected studies, we additionally recorded the emerging socio-demographic data. We then downloaded datasets and variables pertinent to our study objectives, which informed the construction of our questionnaire and served to archive questions that will be utilized for comparative purposes with our results. This exhaustive review has three objectives: (1) to identify completed or ongoing quantitative studies on the subject, (2) to collect existing databases in anticipation of weighting issues and sample comparisons during analysis phases, and (3) to draw inspiration from the formulations and structures of questions and responses from repeatedly administered questionnaires to document changes in lifestyle habits. The design of the interview guide and questionnaire was partly inspired by the ongoing systematic review of the literature and partly by the theoretical approach used under the supervision of four researchers from the team. The questionnaire was also refined based on data from the initial interviews and the database review. The literature review, the database

review, and the initial results from the interviews served as sources of inspiration during the questionnaire design phase, but their integration was not part of a formalized protocol. The focus here is more on showing that the reviews were conducted primarily to support the development of the methodological tools for data collection rather than for their analytical potential.

Qualitative interviews, lasting approximately 2 hours, are conducted with patients who have consented to participate in a study introduced by members of the partner services during a post-surgical medical consultation. The recruitment ends as soon as 10 people have been accepted to participate per partner centre. They take place in a location of the patient's choice, in order to minimize the constraints on discourse production, and are fully recorded. Participants are contacted by telephone at 12 and 24 months after surgery for the second and third interviews. The questionnaires, each approximately 30 minutes in length, are administered to a new sample of 200 individuals, one year after the initial interviews, over a 6-month period for each assessment phase (+6, +12, and +24 months). The inclusion criteria for participants are consistent with those used in the qualitative study. The sample size was determined based on (1) the representativeness proportion relative to the total number of surgeries conducted over six months in France, and (2) the practical feasibility of recruiting participants through our partner hospital and clinical services. One week prior to their 6-month post-operative follow-up appointment, patients receive a detailed email invitation, including an informed consent form, to participate in the online questionnaire. If patients have not participated prior to their appointment, assistance is offered, including an in-person meeting or phone support, to facilitate their participation and bridge the digital divide. Following the initial questionnaire at 6 months, participants are invited via email to complete follow-up questionnaires at 12 and 24 months. Non-respondents are contacted to assess their need for support or to document the reasons for their potential withdrawal from the study.

5- Analysis

This research project is structured in several work packages, four operational and four analytical ones (see Figure 3). Among the operational packages, one is devoted to the organisation of meetings and working groups, another to ethical and regulatory approaches as well as to the literature review (see dedicated section). The other two focus, respectively, on the constitution of qualitative and quantitative data corpuses (including database analysis).

The scientific references and the results of the qualitative and quantitative components are then analysed in three working groups, one for each objective of the project, namely: (1) experience of bodily transformations, (2) interactions with care structures, associations or peers, (3) lifestyle habits. These are thematic entries aimed at exploring all types of data (literature, transcribed interviews, cleaned databases) to shed light on a specific research axis. Finally, a fourth work package is responsible for carrying out a cross-sectional analysis of the three axes and disseminating the results. It aims to link and ensure coherence between the interpretations and analyses carried out for the different axes.

Once fully transcribed, the interview data is analysed according to the principles of Grounded Theory<sup>62</sup>, in an inductive manner. Individual summary sheets are produced. They will make it possible to readjust the interview grids between the different meetings (6, 12, 24 months) and to carry out case-by-case analyses. At the same time, a transversal thematic analysis grid will record all the verbatims by axis and thematic sub-axes. A first grid will be established, based on the analysis of one case, then completed and reorganized within the framework of collective exchanges between the ten researchers involved in the other cases. Once this grid has been stabilized, the entire corpus of interviews will be coded by the post-doctoral fellow under supervision of at least one of the ten researchers using the Maxqda software made available by

Enseignement Supérieur (ABES) .  
Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

the Humanum Digital Research Infrastructure (a support platform for human and social sciences supported by the French Ministry of Higher Education and Research). The quantitative data will be analysed using the copyright-free statistical software R. This analysis will be carried out per axis within the working groups, then pooled and discussed during wider meetings twice a year.

Each year, during the 48 months of the project, two workshop days will unite all the researchers involved in the study to discuss the data, its analysis and the challenges of presenting and disseminating the results. These workshops will also include external researchers working on related subjects, but also non-academic partners who are experts in the issues addressed (health professionals, representatives of associations, and patients).

## 6- Patient and public involvement

Patients are involved on several levels. First, in the context of the interviews, by asking for their opinion on the items to be included in the questionnaire for the quantitative part of the study. In addition, interested patients are also invited to participate in the two days organized each year, with their travel expenses covered. Finally, they are asked to participate in the design and dissemination of research results for future patients and their families.

## IV- ETHICS AND DISSEMINATION

### 1- Ethical approvals and consent collection

The protocol of this study was deemed to comply with MR004 by the data protection officer of the University of Montpellier, and approved by the ethics committee of the same university (n°UM2024-037). The research is funded for a period of 4 years by the French National Research Agency (n°ANR-23-CE41-0020-01).

Data protection information is presented to the participants, as well as their rights in terms of access, rectification, erasure or limitation of the information collected, or its portability, in accordance with the Data Protection Act and the European regulations for data protection. An information leaflet is provided to each participant by their doctor during the contact phase. It is signed before the interview, or read and approved before the questionnaire. Each participant is also reminded of the non-compulsory nature of participation, the absence of transfer of personal data to doctors or impact on their follow-up, as well as the absence of remuneration for participation. Participation is however facilitated by the fact that the interviewer comes to them, thus limiting any inconvenience.

### 2- Data processing and analysis

Data management is governed by a data management plan validated by the University of Montpellier's referent on data protection issues. Specifically, this plan provides: 1) the transcription of data based on the Whisper software made available by Humanum-Progedo, 2) the pseudonymization and anonymization of the data, 3) its storage on the Sharedocs server made available by Humanum (digital research infrastructure under the supervision of the French Ministry of Higher Education and Research), to which only researchers involved in data analysis have access, through individual accounts. The questionnaire collects, by design, anonymised information.

### 3- Dissemination



The pseudonymized and anonymized data will be used in a certain number of oral communications at conferences and within articles in journals specializing in sociology or medical health. Material vectors for the dissemination of the study results will be produced for patients and care professionals, with the help of some of the latter in order to produce content that is both adapted and accessible to the target populations. Once the main analyses have been carried out, the quantitative database will be made available to the scientific community on the Quêtelet-Progedo-Diffusion platform, in accordance with the principles of open science. The project will lead to the production of an awareness guide on the issues of long-term follow-up and monitoring of people who have undergone surgery, which will be aimed primarily at patients and their families. This guide will present meaningful indicators to identify key moments in post-surgical development, and will propose resources or possible support systems to deal with the difficulties and obstacles encountered in social environments. A book will also be produced for health professionals. It will be possible to use this as support material for the training of individuals responsible for assisting the use of bariatric surgery. It will aim to disseminate the knowledge obtained concerning the processes that can hinder changes in lifestyle habits. This knowledge can be used to adjust existing post-operative information and support systems, or to consider new ones. Co-constructed with the study's associative and hospital partners, this book will be promoted and disseminated in conjunction with them.

V- DISCUSSION

The ChiBarAPS study analyses the transformations faced by people who have undergone bariatric surgery and their management during the two years following surgery. Funded by the French National Research Agency (n°ANR-23-CE41-0020-01), it has the particularity of adopting a sociological perspective and relying on a research protocol that is both multicentre, through mixed methods, and longitudinal. For the time being, the vast majority of studies on the effects of bariatric surgery – whether qualitative or quantitative – focus on patients in a hospital centre. Multi-centrism can shed light on variations related to post-operative support depending on the centre involved. However, it will be necessary to ensure that the study includes people who were operated on in centres with very different characteristics (e.g. public/private, integrated obesity centre/surgery department, large city/medium-sized city, etc.), as well as being attentive to the diversity of the interindividual characteristics of the people operated on (e.g. gender, level of education, social origin, rural/urban, etc.). The choice of a mixed research method should make it possible both to quantify and qualify the changes identified. Quantitative approaches dominate in bariatric surgery research. However, they sometimes struggle to go beyond a descriptive reading to identify the sequence of events and processes underlying the transformations observed. Qualitative methods can, in this instance, help to identify processes that are difficult to objectify. The back and forth between the two parts of the study should help to overcome the limitations of the two approaches taken separately. Concerning the interview approach, 30 people constitutes a large cohort regarding other similar studies and the capacity of the recruited person to carry out this work. Particular attention should be paid to building and maintaining relationships of trust so as not to lose individuals over the course of the interviews. Another challenge will be related to the ability to adjust the interview grids from one meeting to the next, in order to renew the questions in a way that is adapted to each individual. This leads us to the third specificity of the study, its longitudinal dimension. No qualitative study on bariatric surgery has so far offered repeated interviews over such a long period, up to 24 months after the operation, in a longitudinal (and not retrospective) perspective. Longitudinal follow-up of cohorts using quantitative approaches, on the other hand, is common.

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Enseignement Supérieur (ABES).



However, the approaches deployed are often very descriptive and aim, through a before/after comparison, to measure the impact of surgery on quality of life (in the more or less long term) or to identify psychological predictors of the surgery's success. Oriented by their evaluative purposes, these medical or medico-psychological studies struggle to penetrate the understanding of the social processes underlying the statistical links identified.

The last particularity of the study is linked to its theoretical anchoring, which leads it to go beyond the usual questions concerning the surgery technique and its anthropometric, physiological and psychological effects, to introduce hypotheses stemming from the fields of sociology of the body, health and disability. The approach adopted here places the individual at the centre of the analysis, without seeking to make the postoperative experience a means of evaluating his or her success or failure. Beyond measurable or perceived changes (weight, side effects, etc.), it will be a question of looking at the social interactions of individuals within the care structures as well as in their daily environments, paying close attention to the effects of these interactions on lifestyle habits and social participation. These interactions will thus be apprehended both in terms of bodily transformations (objectified by measurement indicators used in other studies, but also considered as they are subjectively felt by the patient) and the support of the care team that can contribute to giving them meaning.

We believe that these different components of the protocol, and the unprecedented results it will bring by shedding light on the situations experienced by individuals, will be equally of interest to sociologists and to the hospital doctors, associations and expert patients who are partners in the project.

### Contributors

As the guarantor of the study, SF designed the research protocol. SF and CBM wrote this paper. LCP and PT participated in reviewing the text. All the authors reviewed and contributed to the final version of the manuscript.

### Funding

The study was supported by the French National Research Agency (ANR-23-CE41-0020-01).

### Competing interest

SF, PT, CC, DI, M-PJ, CP, EP, and YM declared being involved in the presented research, and as such, their research unit received part of the funding granted by the National Research Agency (ANR). LCP and CBM declared being salaried respectively by the Universities of Toulouse and Montpellier, through the ChiBarAPS funding obtained from the ANR. PR and ED declared being heads of hospital departments partnering in the project, which received funding to support the recruitment of study participants. J-MO, declared as head of the Integrative Center of Obesity at the Pitié-Salpêtrière Hospital in Paris, is the coordinator of another ANR-funded research program running from 2024 to 2027. He is also a member of the interface committee on osteoarticular diseases and sits on the board of the research group on sport and physical activity at the French National Center for Scientific Research (CNRS).

### Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

### Patient consent for publication

Not applicable

Study group

M. Baron, Y. Beldame, A. Coquereau, D. Delaunay, U. Duranteau, L. Favre, L. Fituque, F. Garcia, R. Gontier, S. Granier, M. Hournau, A. Marcellini, M. Matichescu, Y. Morales, D. Nocca, L. Paccaud, É. Perera, M. Perez, S. Petracovschi, T. Rougnant, A. Savart, M. Silvestri, A. Sterkers, M.A. Thébault, K. Verkooijen

REFERENCES

1. Saux, P., Bauvin, P., Raverdy, V., *et al.* Development and validation of an interpretable machine learning-based calculator for predicting 5-year weight trajectories after bariatric surgery: A multinational retrospective cohort SOPHIA study. *The Lancet Digital Health*, 2023;5(10):e692-e702. doi: [10.1016/S2589-7500\(23\)00135-8](https://doi.org/10.1016/S2589-7500(23)00135-8)

2. Lent, M. R., Campbell, L. K., Kelly, M. C., *et al.* The feasibility of a behavioral group intervention after weight-loss surgery: A randomized pilot trial. *PloS One*, 2019;14(10):e0223885. doi: [10.1371/journal.pone.0223885](https://doi.org/10.1371/journal.pone.0223885)

3. Yue, T. P., Mohd Yusof, B.-N., Nor Hanipah, Z. B., *et al.* Food tolerance, nutritional status and health-related quality of life of patients with morbid obesity after bariatric surgery. *Clinical Nutrition ESPEN*, 2022;48:321-328. doi: [10.1016/j.clnesp.2022.01.026](https://doi.org/10.1016/j.clnesp.2022.01.026)

4. Corey, S. Sick but Healthy: Bariatric Patients and the Social Construction of Illness and Disability. *Sociology of Health & Illness*. 2020;42(4):907-924. doi: [10.1111/1467-9566.13074](https://doi.org/10.1111/1467-9566.13074)

5. Beck, N. N., Mehlsen, M., Støving, R. K. Psychological characteristics and associations with weight outcomes two years after gastric bypass surgery: Postoperative eating disorder symptoms are associated with weight loss outcomes. *Eating Behaviors*. 2012;13(4):394-397. doi: [10.1016/j.eatbeh.2012.06.001](https://doi.org/10.1016/j.eatbeh.2012.06.001)

6. de Man Lapidoth, J., Ghaderi, A., Norring, C. Binge eating in surgical weight-loss treatments: Long-term associations with weight loss, health-related quality of life (HRQL), and psychopathology. *Eating and Weight Disorders: EWD*. 2011;16(4):e263-269. doi: [10.1007/BF03327470](https://doi.org/10.1007/BF03327470)

7. de Zwaan, M., Hilbert, A., Swan-Kremeier, L., *et al.* Comprehensive interview assessment of eating behavior 18-35 months after gastric bypass surgery for morbid obesity. *Surgery for Obesity and Related Diseases: Official Journal of the American Society for Bariatric Surgery*, 2010;6(1):79-85. doi: [10.1016/j.soard.2009.08.011](https://doi.org/10.1016/j.soard.2009.08.011)

8. Strain, G. W., Kolotkin, R. L., Dakin, G. F., *et al.* The effects of weight loss after bariatric surgery on health-related quality of life and depression. *Nutrition & Diabetes*, 2014;4(9):e132. doi: [10.1038/nutd.2014.29](https://doi.org/10.1038/nutd.2014.29)

9. White, M. A., Kalarchian, M. A., Levine, M. D., *et al.* Prognostic Significance of Depressive Symptoms on Weight Loss and Psychosocial Outcomes Following Gastric Bypass Surgery: A Prospective 24-Month Follow-Up Study. *Obesity Surgery*, 2015;25(10):1909-1916. doi: [10.1007/s11695-015-1631-9](https://doi.org/10.1007/s11695-015-1631-9)

10. Woods, R. The evolution of depressive symptoms following bariatric surgery for purposes of substantial weight loss [Thesis]. Montreal: Concordia University; 2022. <https://spectrum.library.concordia.ca/id/eprint/991943/>

11. Weiner, S., Sauerland, S., Fein, *et al.* The Bariatric Quality of Life index: A measure of well-being in obesity surgery patients. *Obesity Surgery*, 2005;15(4):538-545. doi: [10.1381/0960892053723439](https://doi.org/10.1381/0960892053723439)

12. Nicareta, J. R., de Freitas, A. C. T., Nicareta, S. M., *et al.* Baros method critical analysis (bariatric analysis and reporting system). *Arquivos Brasileiros de Cirurgia Digestiva: ABCD = Brazilian Archives of Digestive Surgery*, 2015;28suppl.1:73-78. doi: [10.1590/S0102-6720201500S100020](https://doi.org/10.1590/S0102-6720201500S100020)

13. Miras, A. D., Kamocka, A., Patel, D., *et al.* Obesity surgery makes patients healthier and more functional: Real world results from the United Kingdom National Bariatric Surgery Registry. *Surgery for Obesity and Related Diseases*, 2018;14(7):1033-1040. doi: [10.1016/j.soard.2018.02.012](https://doi.org/10.1016/j.soard.2018.02.012)

14. Oppert, J.-M., Bellicha, A., Ciangura, C. Physical activity in management of persons with obesity. *European Journal of Internal Medicine*, 2021;93(1):8-12. doi: [10.1016/j.ejim.2021.04.028](https://doi.org/10.1016/j.ejim.2021.04.028)

15. Arolfo, S., Scozzari, G., Di Benedetto, G., *et al.* Surgically induced weight loss effects on sexual quality of life of obese men: A prospective evaluation. *Surgical Endoscopy*. 2020;34(12):5558-5565. doi: [10.1007/s00464-019-07356-y](https://doi.org/10.1007/s00464-019-07356-y)

16. Conason, A., McClure Brenchley, K. J., Pratt, A., *et al.* Sexual life after weight loss surgery. *Surgery for Obesity and Related Diseases: Official Journal of the American Society for Bariatric Surgery*. 2017;13(5):855-861. doi: [10.1016/j.soard.2017.01.014](https://doi.org/10.1016/j.soard.2017.01.014)

17. Treacy, P.-J., Mazoyer, C., Falagario, U., *et al.* Sexual Activity After Bariatric Surgery: A Prospective Monocentric Study Using the PISQ-IR Questionnaire. *The Journal of Sexual Medicine*, 2019;16(12):1930-1937. doi: [10.1016/j.jsxm.2019.09.004](https://doi.org/10.1016/j.jsxm.2019.09.004)
18. Kantarovich, K., Wnuk, S., Cassin, S., *et al.* Employment Outcomes 2 Years After Bariatric Surgery: Relationship to Quality of Life and Psychosocial Predictors. *Obesity Surgery*, 2019;29(9):2854-2861. doi: [10.1007/s11695-019-03905-5](https://doi.org/10.1007/s11695-019-03905-5)
19. Mancini, A., Borel, A.-L., Coumes, S., *et al.* Bariatric surgery improves the employment rate in people with obesity: 2-year analysis. *Surgery for Obesity and Related Diseases*, 2018;14(11):1700-1704. doi: [10.1016/j.soard.2018.04.001](https://doi.org/10.1016/j.soard.2018.04.001)
20. Sockalingam, S., Wnuk, S., Kantarovich, K., *et al.* Employment outcomes one year after bariatric surgery: The role of patient and psychosocial factors. *Obesity Surgery*, 2015;25(3):514-522. doi: [10.1007/s11695-014-1443-3](https://doi.org/10.1007/s11695-014-1443-3)
21. Griauszde, D. H., Ibrahim, A. M., Fisher, N., *et al.* Understanding the psychosocial impact of weight loss following bariatric surgery: A qualitative study. *BMC Obesity*, 2018;5:38. doi: [10.1186/s40608-018-0215-3](https://doi.org/10.1186/s40608-018-0215-3)
22. Lin, H.-C., Tsao, L.-I. Living with my small stomach: The experiences of post-bariatric surgery patients within 1 year after discharge. *Journal of Clinical Nursing*, 2018;27(23-24):4279-4289. doi: [10.1111/jocn.14616](https://doi.org/10.1111/jocn.14616)
23. Natvik, E., Gjengedal, E., Råheim, M. Totally changed, yet still the same: Patients' lived experiences 5 years beyond bariatric surgery. *Qualitative Health Research*, 2013;23(9):1202-1214. doi: [10.1177/1049732313501888](https://doi.org/10.1177/1049732313501888)
24. Crosnoe, R., Muller, C. Body mass index, academic achievement, and school context: Examining the educational experiences of adolescents at risk of obesity. *Journal of Health and Social Behavior*. 2004;45(4):393-407. doi: [10.1177/002214650404500403](https://doi.org/10.1177/002214650404500403)
25. Karnehed, N., Rasmussen, F., Hemmingsson, T., *et al.* Obesity and attained education: Cohort study of more than 700,000 Swedish men. *Obesity*, 2006;14(8):1421-1428. doi: [10.1038/oby.2006.161](https://doi.org/10.1038/oby.2006.161)
26. Brunello, G., d'Hombres, B. Does body weight affect wages?: Evidence from Europe. *Economics & Human Biology*. 2007;5(1):1-19. doi: [10.1016/j.ehb.2006.11.002](https://doi.org/10.1016/j.ehb.2006.11.002)
27. Cawley, J. The impact of obesity on wages. *Journal of Human Resources*. 2004; 39(2): 451-474. doi: [10.2307/3559022](https://doi.org/10.2307/3559022)
28. Bajos, N., Wellings, K., Laborde, C., *et al.* Sexuality and obesity, a gender perspective: Results from French national random probability survey of sexual behaviours. *BMJ*. 2010;340:c2573. doi: [10.1136/bmj.c2573](https://doi.org/10.1136/bmj.c2573)
29. Hansen, B., Dye, M. H. Damned if You Do, Damned if You Don't: The Stigma of Weight Loss Surgery. *Deviant Behavior*, 2018;39(2):137-147. doi: [10.1080/01639625.2016.1263081](https://doi.org/10.1080/01639625.2016.1263081)
30. Beldame, Y., Ferez, S., Marcellini, A., *et al.* La chirurgie de l'obésité: Continuité du stigmate ou déstigmatisation durable?. *Déviance et sociétés*. 2024;48(2):211-242. doi: [10.3917/ds.482.0211](https://doi.org/10.3917/ds.482.0211)
31. O'Reilly, C. Nineteen: Mitigating Weight Stigma Through Health Professional Education. *Counterpoints*, 2016;467(1):189-197. <http://www.jstor.org/stable/45157143>
32. López-Lara, K. M., Cruz Millán, A. C., Barrera-Hernandez, L. F., *et al.* Mitigating Weight Stigma: A Randomized Controlled Trial Addressing Obesity Prejudice through Education among Healthcare Undergraduates. *Obesities*, 2024;4(2):73-84. doi: [10.3390/obesities4020008](https://doi.org/10.3390/obesities4020008)
33. Verhaak, A. M. S., Ferrand, J., Puhl, R. M., *et al.* Experienced Weight Stigma, Internalized Weight Bias, and Clinical Attrition in a Medical Weight Loss Patient Sample. *International Journal of Obesity* (2005), 2022; 46(6), 1241-1243. doi: [10.1038/s41366-022-01087-2](https://doi.org/10.1038/s41366-022-01087-2)
34. Garcia, F. K., Mulder B. C., Hazebroek E. J. *et al.* Bariatric Surgery Stigma from the Perspective of Patients: A Scoping Review. *Journal of Advanced Nursing*. 2023;80(6):2252-2272. doi: [10.1111/jan.15994](https://doi.org/10.1111/jan.15994)
35. Garcia, F. K., Verkooijen K. T., Veen E. J., *et al.* Stigma Toward Bariatric Surgery in the Netherlands, France, and the United Kingdom: Protocol for a Cross-Cultural Mixed Methods Study. *JMIR Research Protocols*, 2022;11(4):e36753. doi: [10.2196/36753](https://doi.org/10.2196/36753)
36. Beldame, Y., Ferez, S., Perera, E., *et al.* Opération du poids et poids de l'opération. *Sciences sociales et santé*. 2021;39(3):41-67. doi: [10.1684/ss.2021.0205](https://doi.org/10.1684/ss.2021.0205)
37. Park, J. The meanings of physical appearance in patients seeking bariatric surgery. *Health Sociology Review*, 2015;24(3):242-255. doi: [10.1080/14461242.2015.1051080](https://doi.org/10.1080/14461242.2015.1051080)
38. Grimaldi, D., Van Etten, D. Psychosocial adjustments following weight loss surgery. *Journal of Psychosocial Nursing and Mental Health Services*, 2010;48(3):24-29. doi: [10.3928/02793695-20100202-04](https://doi.org/10.3928/02793695-20100202-04)
39. Troisoef, A. "Je me sens déshandicapée": Approche anthropologique de la chirurgie de l'obésité et des situations de sortie de handicap. *Alter*, 2020;14(1):13-26. doi: [10.1016/j.alter.2019.07.001](https://doi.org/10.1016/j.alter.2019.07.001)

40. Throsby, K. Happy re-birthday: Weight loss surgery and the new me. *Body & Society*, 2008;14(1):117-133. doi: [10.1177/1357034X07087534](https://doi.org/10.1177/1357034X07087534)

41. Throsby, K. Obesity surgery and the management of excess: exploring the body multiple. *Sociology of Health & Illness*, 2012;34(1):1-15. doi: [10.1111/j.1467-9566.2011.01358.x](https://doi.org/10.1111/j.1467-9566.2011.01358.x)

42. Pfabigan, D. M., Hertel, J. K., Svanevik, M., et al. Single-Centre, Non-Randomised Clinical Trial at a Tertiary Care Centre to Investigate 1-Year Changes in Social Experiences and Biomarkers of Well-Being after Bariatric Surgery in Individuals with Severe Obesity: Protocol for the Bariatric Surgery and Social Experiences (BaSES) Study. *BMJ Open*, 2023;13(8):e071332. doi: [10.1136/bmjopen-2022-071332](https://doi.org/10.1136/bmjopen-2022-071332)

43. Ivezaj, V., Grilo, C. M. The complexity of body image following bariatric surgery: A systematic review of the literature. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 2018;19(8):1116-1140. doi: [10.1111/obr.12685](https://doi.org/10.1111/obr.12685)

44. Marek, R. J., Martin-Fernandez, K., Ben-Porath, Y. S., et al. Psychosocial Functioning of Bariatric Surgery Patients 6-Years Postoperative. *Obesity Surgery*, 2021;31(2):712-724. doi: [10.1007/s11695-020-05025-x](https://doi.org/10.1007/s11695-020-05025-x)

45. Mirijello, A., D'Angelo, C., Iaconelli, A. et al. Social phobia and quality of life in morbidly obese patients before and after bariatric surgery. *Journal of Affective Disorders*, 2015;179:95-100. doi: [10.1016/j.jad.2015.03.030](https://doi.org/10.1016/j.jad.2015.03.030)

46. Rudolph, A., Hilbert, A. Post-operative behavioural management in bariatric surgery: A systematic review and meta-analysis of randomized controlled trials. *Obesity Reviews*, 2013;14(4):292-302. doi: [10.1111/obr.12013](https://doi.org/10.1111/obr.12013)

47. Aguilera, M. Post-surgery support and the long-term success of bariatric surgery. *Practice Nursing*. 2014;25(9):455-459. doi: [10.12968/pnur.2014.25.9.455](https://doi.org/10.12968/pnur.2014.25.9.455)

48. Jensen, J. F., Petersen, M. H., Larsen, T. B., et al. (2014). Young adult women's experiences of body image after bariatric surgery: A descriptive phenomenological study. *Journal of Advanced Nursing*, 2014;70(5):1138-1149. doi: [10.1111/jan.12275](https://doi.org/10.1111/jan.12275)

49. Sarwer, D. B., Wadden, T. A., Moore, R. H. et al. Changes in quality of life and body image after gastric bypass surgery. *Surgery for Obesity and Related Diseases*, 2010;6(6):608-614. doi: [10.1016/j.soard.2010.07.015](https://doi.org/10.1016/j.soard.2010.07.015)

50. Assimakopoulos, K., Karaivazoglou, K., Panayiotopoulos, S., et al. Bariatric surgery is associated with reduced depressive symptoms and better sexual function in obese female patients: A one-year follow-up study. *Obesity Surgery*. 2011;21(3):362-366. doi: [10.1007/s11695-010-0303-z](https://doi.org/10.1007/s11695-010-0303-z)

51. Devlin, M. J., King, W. C., Kalarchian, M. A., et al. Eating Pathology and Associations with Long-Term Changes in Weight and Quality of Life in the Longitudinal Assessment of Bariatric Surgery Study. *The International Journal of Eating Disorders*. 2018;51(12):1322-1330. doi: [10.1002/eat.22979](https://doi.org/10.1002/eat.22979)

52. Marchitelli, S., Ricci, E., Mazza, C., et al. Obesity and Psychological Factors Associated with Weight Loss after Bariatric Surgery: A Longitudinal Study. *Nutrients*, 2022;14(13):2690. doi: [10.3390/nu14132690](https://doi.org/10.3390/nu14132690)

53. Jaensson, M., Dahlberg, K., Nilsson, U., et al. The Impact of Self-Efficacy and Health Literacy on Outcome after Bariatric Surgery in Sweden: A Protocol for a Prospective, Longitudinal Mixed-Methods Study. *BMJ Open*, 2019;9(5):e027272. doi: [10.1136/bmjopen-2018-027272](https://doi.org/10.1136/bmjopen-2018-027272)

54. de Meireles, A. J., Carlin, A. M., Bonham, A. J., et al. A Longitudinal Analysis of Variation in Psychological Well-Being and Body Image in Patients Before and After Bariatric Surgery. *Annals of Surgery*. 2020;271(5):885-890. doi: [10.1097/SLA.0000000000003146](https://doi.org/10.1097/SLA.0000000000003146)

55. Imhagen, A., Karlsson, J., Ohlsson-Nevo, E., et al. Levels of Physical Activity, Enjoyment, Self-Efficacy for Exercise, and Social Support Before and After Metabolic and Bariatric Surgery: A Longitudinal Prospective Observational Study. *Obesity Surgery*, 2023;33(12):3899-3906. doi: [10.1007/s11695-023-06887-7](https://doi.org/10.1007/s11695-023-06887-7)

56. Alflen, V. E. V., Pereira, G. S., Condé, M. D. S., et al. Content analysis of the Measure of the Quality of the Environment by linkage with the International Classification of Functioning, Disability and Health. *Physiotherapy Research International*. 2024;29(2):e2089. doi: [10.1002/pri.2089](https://doi.org/10.1002/pri.2089)

57. Corbin, J. *Trajectory as an analytic tool*. San Francisco: University of California Press, 1991.

58. Becker, H. *Outsiders. Etudes de sociologie de la déviance*. Paris: Métailié, 1985.

59. Darmon, M. La notion de carrière: un instrument interactionniste d'objectivation. *Politix*. 2008;82(2):149-167. doi: [10.3917/pox.082.0149](https://doi.org/10.3917/pox.082.0149)

60. Darmon, M. *Devenir anorexique: une approche sociologique*. Paris: La découverte, 2014.

61. Labbé, C., Labbé, D. *La répartition du vocabulaire*. Grenoble : Laboratoire d'informatique de Grenoble, 2017.

62. Glaser, B., Strauss, A. *The discovery of grounded theory. Strategies for Qualitative Research*. Chicago: Aldine, 1967.

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Enregistrement Supérieur (ABES).



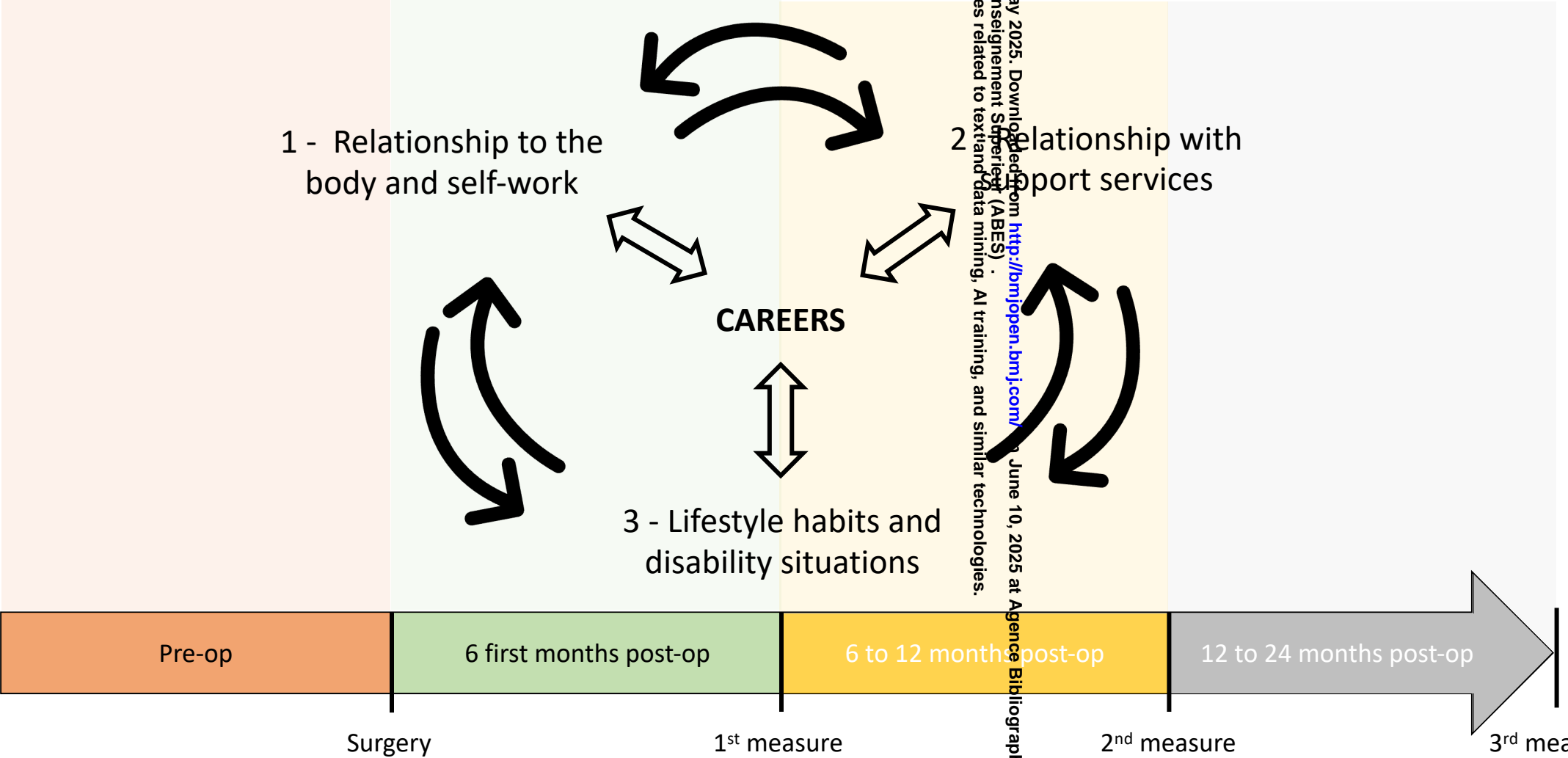
Figure legends:

Figure 1: Theoretical frame of the ChiBarAPS study, France. Study of the evolution of interactions between three dimensions of the social experience of obesity, articulated through the sociological concept of career, in the 24 months following bariatric surgery

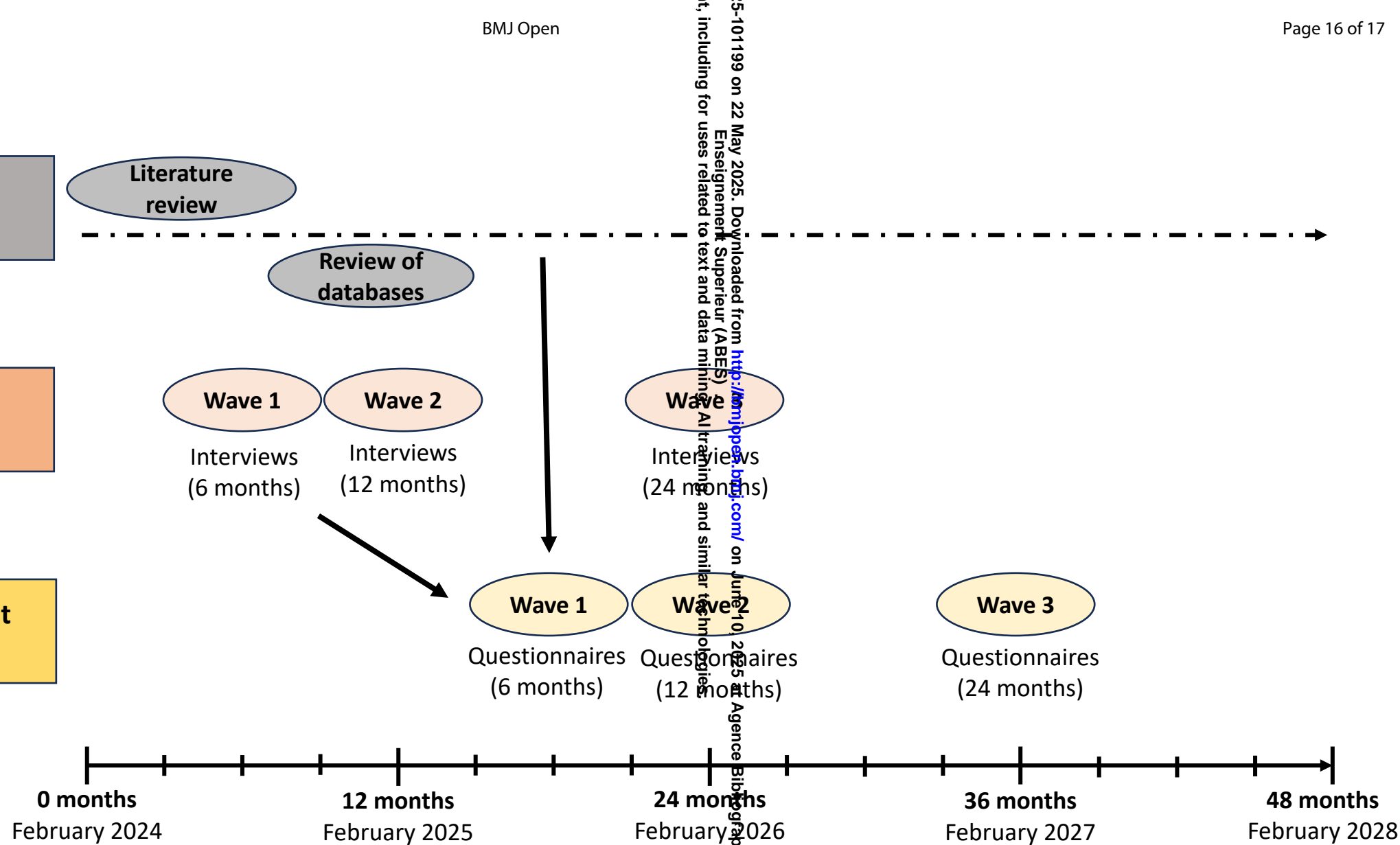
Figure 2 : Flowchart of the ChiBarAPS study, France. Sociological study of post-bariatric surgery biographical uncertainties (6-24 months) through the prism of changes in bodily practices.

Figure 3 : Study framework on work-packages, ChiBarAPS Study, France. Study of the evolution of interactions between three dimensions of the social experience of obesity, articulated through the sociological concept of career, in the 24 months following bariatric surgery.





1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41



5-101199 on 22 May 2025. Downloaded from <http://bmjopen.bmj.com/> on June 10, 2025 at Agence Bibliographique de l'Enseignement Supérieur (ABES).  
it, including for uses related to text and data mining, AI training, and similar technologies.

DATA GATHERING

DATA ANALYSIS

