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Morbid obesity and physical activity: From frustration to satisfaction of basic psychological needs

Tesis doctoral

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Que el trabajo de investigación titulado: "**Morbid obesity and physical activity: From frustration to satisfaction of basic psychological needs**" realizado por D. Ángel Megías Boró bajo la dirección de Dr. D. David González-Cutre Coll y Dr. D. Vicente Javier Beltrán Carrillo sea depositado en el departamento y posteriormente defendido como Tesis Doctoral en esta Universidad ante el tribunal correspondiente.

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Morbid obesity and psysical activity: From frustration to satisfaction of basic psychological needs.

Presentada por:

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Andaluces de Jaén,
aceituneros altivos,
decidme en el alma: ¿quién,
quién levantó los olivos?

No los levantó la nada,
ni el dinero, ni el señor,
sino la tierra callada,
el trabajo y el sudor.

...

(Miguel Hernández, 1937)

Parece que fue ayer, pero ya han pasado cuatro años y medio desde que comencé a trabajar en mi tesis doctoral. Cuatro años y medio, tres elecciones nacionales, dos finales de "Champions" perdidas, un sí quiero (bueno dos), y dos maravillosas criaturas de 2 y 5 años. Sin embargo, todo comenzó mucho tiempo atrás. Tenía 23 añitos y la cabeza hecha un lío intentando decidirme entre preparar oposiciones para Secundaria o aceptar la oferta de mi profesor el Doctor Don Marcos Mainar Mariño para empezar el Tercer Ciclo en Mánchester. Es evidente que me decidí por la primera opción, lo cual me ha permitido disfrutar de mi vocación durante todos estos años. De cualquier forma, mi recuerdo y mi agradecimiento a

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El mundo es eso…

Un montón de gente, un mar de fueguitos.

Cada persona brilla con luz propia entre todas las demás.

No hay dos fuegos iguales.

Hay fuegos grandes y fuegos chicos y fuegos de todos los colores.

Hay gente de fuego sereno, que ni se entera del viento, y gente de fuego loco, que llena el aire de chispas.

Algunos fuegos, fuegos bobos, no alumbran ni queman; pero otros arden la vida con tantas ganas, que no se puede mirarlos sin parpadear, y quien se acerca se enciende.

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Índice

1. Abstract

The aims of this PhD work are three, as the number of the studies contained in it: 1- analyzing the different factors associated with the development of morbid obesity situations, 2- gaining an understanding of the personal experiences of individuals dealing with morbid obesity based on self-determination theory (SDT), and 3- providing an in-depth description and analysis of the perceived physical and, mainly, psychosocial benefits of participation in a six-month exercise program grounded on SDT, of post-bariatric surgery patients.

These studies were conducted with 10 patients (nine women and a man) aged between 31 and 59 years (M = 45.90, SD = 8.78) who suffered morbid obesity and received bariatric surgery for weight loss. One month after bariatric surgery, patients joined the six-months physical activity (PA) program, and qualitative data was collected through observations and interviews. The field notes and interviews were transcribed and analyzed with the support of the software NVivo, which was used to organize and classify data efficiently.

The content analysis of this qualitative information showed that there were multiple factors which conditioned the participants' sedentary lifestyle and bad eating habits, and led them to morbid obesity. In this sense, some elements that contributed to their sedentary lifestyles were embarrassment of showing their body in public, pain and poor physical condition, and their bad experiences in non-inclusive PA contexts. Other factors such as bad family food education, loss of a loved person, family problems, arguments or

disputes, and past traumatic events like childhood sexual abuse influenced their development and maintenance of unhealthy eating behaviors. Moreover, findings illustrate the continuous struggle that participants lived with obesity along their lives, with failed attempts of losing weight by multiple diets and PA, and the corresponding sense of failure.

Likewise, participants suffered from health and mobility troubles in their daily life and experienced stigmatization and discrimination in most areas of their social functioning. Participants described how these experiences resulted in the thwarting of their basic psychological needs for autonomy, competence, and relatedness. In turn, psychological need frustration contributed to negative consequences such as body image concerns, low self-esteem, anxiety, and depression; controlled regulation of their eating behavior; rigid behaviors like avoiding social situations; and self-defeating behaviors like giving up diet and PA regimens and binge eating. These findings highlight how living with morbid obesity can impair optimal functioning and well-being via experiences of psychological need frustration.

On regard the PA program participants followed after the bariatric surgery, they reported many circumstances which facilitated their basic psychological needs such as the instructors' caring about their opinion, perceived social support and affection, fitness improvement, pain reduction, and acquisition of knowledge for being autonomous exercisers. These circumstances promoted autonomous motivation towards PA participation, enjoyment and

intention to be physically active, and improved their happiness, self-confidence, and attitude for a better social life.

The results suggest the need of rethinking strategies for prevention and treatment of morbid obesity, taking into account the specific profile and traits of these patients. Moreover, these studies highlight the convenience of incorporating psychological aspects based on SDT in dieting or PA programs, a part from developing coping strategies and social interventions to diminish the stigmatizing effects of the social obesity discourse.

2. Resumen

Los objetivos de esta tesis doctoral son tres, igual que el número de estudios contenidos en la misma: 1- analizar los diferentes factores asociados con el desarrollo de situaciones de obesidad mórbida, 2- ayudar a comprender las experiencias que vivencian individuos con obesidad mórbida desde el punto de vista de la teoría de la autodeterminación (TAD), y 3- aportar una descripción y un análisis en profundidad sobre los beneficios fisiológicos y, principalmente, psicosociales percibidos por pacientes intervenidos de cirugía bariátrica en un programa de actividad física (AF) de seis meses de duración basado en la TAD.

En estos estudios participaron 10 pacientes (nueve mujeres y un hombre) con edades comprendidas entre los 31 y los 59 años (*M* = 45.90, *DT* = 8.78) que padecían obesidad mórbida y que recibieron cirugía bariátrica para la reducción de su peso. Un mes después de la intervención, los pacientes se incorporaron a un programa de AF de seis meses de duración, y se recogió información cualitativa a través de observaciones y entrevistas. Las notas de campo y las entrevistas fueron transcritas y analizadas con el apoyo del programa NVivo, que fue utilizado para organizar y clasificar la información eficientemente.

El análisis de contenido de esta información cualitativa mostró que había múltiples factores que condicionaron el estilo de vida sedentario y los malos hábitos alimenticios de los participantes, lo que les llevó a la obesidad mórbida. En este sentido, algunos de los elementos que contribuyeron a su estilo de vida sedentario fueron la vergüenza de mostrar su cuerpo en público, el dolor y la

mala condición física, y sus malas experiencias en contextos de AF no inclusivos. Otros factores como una mala educación alimentaria familiar, la pérdida de una persona querida, problemas familiares, discusiones o disputas, y acontecimientos traumáticos del pasado como abusos sexuales en la niñez, influyeron en el desarrollo y mantenimiento de conductas alimentarias insalubres. Además, los resultados ilustran el continuo sufrimiento de los participantes por perder peso, con intentos fallidos a través de múltiples dietas y actividad física, y la consecuente sensación de fracaso.

Por otra parte, los participantes sufrían problemas de salud y de movilidad en su vida diaria, y experimentaban extigmatización y discriminación en la mayor parte de áreas de desarrollo social. Los participates describieron cómo estas experiencias favorecían la frustración de las necesidades psicológicas básicas de autonomía, competencia y relación. La frustración de las necesidades psicológicas provocó consecuencias negativas como la preocupación por la imagen corporal, baja autoestima, ansiedad, y depresion; regulacion controlada de su comportamiento alimentario; comportamientos rígidos como la evitación de situaciones sociales; y comportamientos contraproducentes como el abandono de dietas y programas de AF, y los atracones. Estos resultados subrayan el hecho de que vivir con obesidad mórbica puede impedir el funcionamiento óptimo y el bienestar a través de experiencias de frustración de las necesidades psicológicas.

En referencia al programa de AF que siguieron después de la cirugía bariátrica, los participantes explicaron muchas

circunstancias que facilitaron la satisfacción de sus necesidades psicológicas básicas como la preocupación del monitor por su opinión, la percepción de cariño y apoyo social, las mejoras en su condición física, la reducción del dolor, y la adquisición de conocimientos para poder practicar actividad física de forma autónoma. Estas circunstancias favorecieron la motivación autónoma hacia la práctica de AF, el disfrute y la intención de ser físicamente activos, y mejoraron su felicidad, autoconfianza, y su actitud hacia una vida social mejor.

Los resultados sugieren la necesidad de reconsiderar las estrategias de prevención y tratamiento de la obesidad mórbida, tomando en consideración el perfil y las caracteríscias específicas de estos pacientes. Además, estos estudios subrayan la conveniencia de incorporar aspectos psicológicos basados en la TAD en las dietas y los programas de AF, a la par que desarrollar estrategias de afrontamiento e intervenciones sociales para reducir los efectos estigmatizadores del discurso social sobre la obesidad.

3. General introduction

Morbid obesity is an extreme situation of obesity, defined as having a Body Mass Index (BMI) ≥40 kg/m2, and it is the fastest growing obesity subgroup in many places, including Spain (Basterra-Gortari et al., 2011; Katzmarzyk & Mason, 2006; Sturm, 2007). Morbid obesity has a very negative impact on the physical, psychological and social health of individuals who suffer it. When non-invasive methods like diet or PA fail, bariatric surgery has been shown to be an effective treatment for long-weight lost and health improvements. Nevertheless, to maintain the positive effects of bariatric surgery in the long term, it is of vital importance a change in the patients' lifestyle, including an appropriate healthy diet and regular PA. However, there are no standardized strategies to organize, not only effective PA programs for post-bariatric surgery patients, but also successful promoting exercise adherence.

That was the starting point of a research project titled "Physical and psychological effects of an exercise program on bariatric surgery patients", financed by the "School of Universitary Studies Real Madrid – Universidad Europea de Madrid" and "Fundación MAPFRE", through a call to develop sport research projects, whose Director was Dr. David González-Cutre Coll and counted on Dr. Vicente Javier Beltrán Carrillo's collaboration who was inside the research group. The present PhD document, which follows a qualitative methodology, is bound to this research project which employed a mixed method design to analyze the physical, psychological and social effects of a PA program, based on SDT (Deci & Ryan, 1980, 1985, 1991; Ryan & Deci, 2017), on post-bariatric patients who suffered previously morbid obesity.

Chronologically, the first study of this doctoral thesis aimed to understand how this PA program facilitated participants' basic psychological need satisfaction, exercise autonomous motivation and different outcomes at all levels in post-bariatric patients from a qualitative approach to complement and increase the quantitative findings of the research project. Therefore, this study might be helpful for PA and health professionals to devise strategies for the design of future PA programs which facilitate basic psychological needs satisfaction, exercise adherence, and well-being in post-bariatric patients. With this purpose, qualitative data was gathered through handwritten observations in research diaries and recorded individual semi-structured interviews. However, when participant's comments and answers were analyzed, it came up a lot of rich information relative to their subjective retrospect experiences as morbid obese individuals during a wide part of their life, leading to the two other studies included in this PhD document: The first one aimed to gain an in-depth understanding of the factors influencing the formation of morbid obesity; the second one aimed to understand the meaning of living with morbid obesity, from the point of view of SDT; of course, both of them from the retrospect and subjective perception of post-bariatric patients. Therefore, we finally developed 3 studies with the following logical organization:

- Etiology of morbid obesity.
- Living with morbid obesity.
- Effects of a PA program on bariatric patients (chronologically the first one, and introduced above).

Regarding the first study, it exists a lot of literature analyzing obesity formation (Hill, Wyatt, & Peters, 2012; World Health Organization, 2011), but there are few studies regarding morbid obesity formation and fewer using a qualitative methodology. This study contributes to gain an in-depth understanding about the causal attribution beliefs and subjective perception post-bariatric patients do retrospectively, after receiving weight loss surgery, about the etiology and pathways of their extreme obesity formation, bringing a broader perspective on this issue. First, it highlights the big influence of psychological and socio-cultural factors on the medical aspects for the formation of morbid obesity. Second, this subjective perspective of the individuals suffering morbid obesity might help to understand why some current strategies or trends are not working successfully, and find more effective and efficient strategies for morbid obesity prevention. And third, this study shows that current strategies might be underestimating the relevant influence of immediate context and specific psychological profiles of people suffering morbid obesity.

Regarding the second study, there is also a lot of literature analyzing the meaning of living with obesity and the social stigma which affects obese individuals in many contexts. However, there are few studies with morbid obese individuals and using a qualitative approach. It is, therefore, important for research to focus on the experiences of individuals classified as morbidly obese with the objective to improve their quality of life and well-being. Likewise, although previous studies have shown the negative psychosocial consequences of living with obesity, research is scarce

about the motivational processes that guide maladaptative behaviors and development of different harmful outcomes that affect the general life satisfaction in this population. In this sense, some authors (e.g., Biddle, Mutrie, Gorely, & Blamey, 2012) suggest the need to use theoretical frameworks to analyze behaviors in health contexts with the objective to delineate the mechanisms and relationships among the different variables involved in these motivational processes, and develop intervention strategies. The primary and innovative purpose of this study is to understand, from the perspective of SDT, how morbid obesity, and the wider social environment experienced by individuals living with morbid obesity, affects this population and has negative repercussions for social and psychological functioning and health. This qualitative approach represents an innovation, since the most of research from SDT has been based on quantitative methods (e.g, see the meta-analysis of Ng et al., 2012). When quantitative data come from closed quantitative questions based on the variables stipulated by SDT, there is not much room to the advance of theory. Nonetheless, a qualitative approach to SDT offers a more flexible frame for new ideas to emerge and for the improvement of theory and its practical contributions. Moreover, qualitative methods offer better possibilities to analyze in depth, from a relativist ontology and an interpretative epistemology, the experiences lived by individuals, the subjective impact of these experiences, the social processes and contexts, and why people think, feel and behave in a certain way (Sparkes & Smith, 2014). An increased understanding of these issues is important so that we can devise strategies, at both

individual and societal levels, to avoid the thwarting of basic psychological needs satisfaction and the negative consequences in morbidly obese people.

This PhD document, which uses a qualitative methodology, contributes to capture and to analyze a wide and deep range of perceptions and thoughts inaccessible from quantitative approaches, and it helps us to understand the etiology of morbid obesity formation, the meaning of living with morbid obesity and the effects of a PA program on post-bariatric patients; all of this inside the natural environment and paying the proper attention to the meanings, experiences and points of view of the participants.

4. Theoretical framework

4.1. Obesity: Prevalence, definition and etiology

Obesity, as a global phenomenon, emerged in western industrialized societies in the 1960s and increased in the 1980s (Prentice & Jebb, 2004). Worldwide obesity has more than doubled since 1980 (World Health Organization, 2011). Prevalence of obesity in Europe reaches between 4% and 28.3% in males, and between 6.2 and 36.5% in females, depending on the geographic area (Berghöfer et al., 2008). The highest incidence rates in Europe are observed in Spain, together with Italy, 28.3% in males and 30% in females (González et al., 2000). Obesity is a chronic and multi-factorial disease characterized by an accumulation of excess body fat, and defined as a body mass index (BMI) greater than or equal to 30 kg/m2. Morbid obesity is the most extreme type of obesity, defined as a BMI greater than or equal to 40 kg/m2 (World Health Organization, 2011), and associated with a greater risk of health conditions. Current data suggests that the number of individuals in the heaviest body mass index (>40 kg/m2 and >50 kg/m2) constitutes the fastest growing obesity subgroup in the United States (Sturm, 2007), in Canada (Katzmarzyk & Mason, 2006) and in Spain (Basterra-Gortari et al., 2011).

Regarding the etiology of obesity, the leading factors are complex and manifold, and usually lay in a combination of behavioral, environmental, sociocultural and psychological factors, and genetic or biological attributes. Since a long-term energy imbalance between calories consumed and calories expended is the

fundamental cause of obesity (Hill, Wyatt, & Peters, 2012; World Health Organization, 2011), the research community has frequently supported an obesity discourse which associates the responsibility for obesity with the individual behavior (Cliff & Wrig, 2010; Gard, 2011; Gard & Wright, 2001; Puhl & Heuer, 2010). This discourse focuses on inactivity and food consumption as the root causes of increased rates of obesity, blaming and stigmatizing individuals for their own obesity in order to press them for behavior change (Gard & Wright, 2001), and fostering psychological distress and emotional imbalances as a consequence (Davin & Taylor, 2009; Raggi, Sirtori, Brunani, Liuizzi, & Leonardi, 2009; Stunkard & Wadden, 1992). But these two behavioral challenges (inactivity and food consumption) may, in part, be symptoms of other environmental, cultural and psychosocial challenges. In fact, the fundamental causes of the obesity epidemic are societal, resulting from an environment that promotes sedentary lifestyles and the consumption of high-fat, energy-dense diets (Basu, McKee, Galea, & Stuckler, 2013; De Vogli, Kouvonenb, & Gimenoc, 2014; Swinburn, Sacks, & Ravussin, 2009; World Health Organization, 2000).

Generally, research on obesity has been made from the medical approach and under a quantitative perspective. However, if we want to get a deeper understanding about obesity, and morbid obesity in particular, we should include the subjective perception of those who suffer or suffered this situation. In this sense, qualitative methodology gains importance as it is able to capture a deeper and wider range of thoughts and perceptions of those affected by a

morbid obese situation than only using a quantitative perspective (Green & Thorogood, 2004). In fact, some qualitative studies about obesity etiology have been already developed to explore the obese individuals' subjective perception about the genealogy and course of their obesity (Braun, Schell, Siegfried, Müller, & Ried, 2014; Brogan & Hevey, 2009; Ogden & Flanagan, 2008).

Apparently, qualitative research shows there is not any genealogical starting point or initial life event for morbid obesity. Individuals experience obesity as something that has always been present (Braun et al., 2014) and describe personal stories of complex struggles of short-term weight loss and longer-term weight gain, usually characterized by a sense of failure (Greener, Douglas, & Teiklingen, 2010). Obesity is experienced as a long-term process that, nevertheless, includes some situations in which individuals are more exposed to larger weight gains (Braun et al., 2014).

In this regard, some studies have shown that food is often used as a coping mechanism by those with weight problems, particularly when they are sad, anxious, stressed, lonely, and frustrated (Bocchieri, Meana, & Fisher, 2002; Brogan & Hevey, 2009; Collins & Bentz, 2009; Puhl & Heuer, 2010). There are psychosocial variables that not only have influence on obesity development but they can also follow ongoing struggles to control weight. For example, the influence of depression on obesity has been thoroughly shown (Needham, Epel, Adler, & Kiefe., 2010), and bidirectional associations between depression and obesity have been found (Luppino et al., 2010). Moreover, some psychological

problems specific to obesity have been described, like binge eating disorder (Spitzer et al., 1991; Kolotkin, Revis, Kirkley, & Janick, 1987) and night eating syndrome (Stunkard, Grace, & Wolff, 1955; O'Reardon, Peshek, & Allison, 2005), being both highly associated with morbid obesity.

Sedentary lifestyles also contribute to obesity and morbid obesity. Qualitative research shows that morbid obese individuals report barriers to PA, both non-obesity and obesity related (Zabatiero et al., 2016). In general, the non-obesity related barriers to PA are similar between morbid obese and non-obese individuals in general population (Caperchione et al., 2012; Shuval et al., 2013). The key barriers are lack of motivation, self-described 'laziness' and lack of time (Napolitano, Papandonatos, & Borradaile, 2011; Zabatiero et al., 2016), next to other barriers like work and family commitments, limited financial resources and the weather (Caperchione et al., 2012). Regarding obesity related barriers, literature shows bodily pain, physical strain and self-presentational issues regarding showing their body in public, as the most prevalent barriers to PA (Boscatto, Duarte, & Gomes, 2011; Zabatiero et al., 2016). These last barriers are more frequently reported by those with higher weights, having a detrimental PA effect (Leone & Ward, 2013; Napolitano et al., 2011). In general, the current findings suggest that morbid obese population describe their PA experiences as repeated unsuccessful attempts to lose weight (Zabatiero et al., 2016).

4.2. Physical and psychosocial consequences of morbid obesity

Being obese constitutes a chronic stressful condition which can have a negative impact on health, social behaviors and outcomes, and this issue is much more prevalent for those people suffering from morbid obesity (Lewis et al., 2011). Research conducted to date has focused heavily on the physical and physiological problems associated with obesity (Jinks, Jordan, & Croft, 2006; Ling, Brotherton, & Smith, 2009; Piper & Grunstein, 2010) which may result in reduced capacities for activities of daily living (Ling et al., 2009; Mello et al., 2010; Raggi et al., 2009; Sirtori et al., 2012). Obesity has been associated with a greater risk of health conditions such as type II diabetes, hypertension, cardiovascular problems and some cancers, reducing life expectancy (Haslam & James, 2005). Likewise, carrying excess body weight is a material stressor that puts considerable strain on affected people. Obesity has been associated with respiratory problems (Piper & Grunstein, 2010), chronic pain (McCarthy, Bigal, Katz, Derby, & Lipton, 2009), arthritis (Haslam & James, 2005), and morbid obesity is also associated with instability during movement, making walking a challenging activity (Ling et al., 2009). In this line, the highest levels of obesity were related to increased odds of activities of daily living impairment like getting in and out of bed, dressing, kneeling, lifting and carrying weight, or walking, and, at the same time, diabetes, congestive heart failure,

myocardial infarction and stroke are significantly associated with this impairment (Alley & Chang, 2007).

In addition, societal values related to body weight often result in psychosocial consequences for the obese people (Davin & Taylor, 2009; Puhl & Heuer, 2010). Currently, there is an obesity discourse, frequently supported by the research community, which promotes a society's stereotype of obesity as a disability resulting from the individual's laziness and lack of self-control or willpower (Cliff & Wright, 2010; Gard, 2011; Puhl & Heuer, 2010). This individualist discourse places the responsibility for health firmly with the individual (Gard & Wright, 2001) and justifies weight stigmatization as an instrument to motivate individuals to adopt healthier behaviors. Such attitudes towards obese people can have serious negative psychological consequences for this population (Lather & Stunkardt, 2003; Puhl & Heuer, 2010). For example, studies have documented the stigmatization of obese people in most areas of social functioning, resulting in problems like interpersonal strain and social alienation (Carr & Friedman, 2006), educational, professional, and occupational difficulties (Puhl & Brownell, 2001; Stunkard & Wadden, 1992), perceived prejudices in medical and health related settings (Puhl & Brownell, 2001), or the humiliation that arises from the failure to fit into theater or airplane seats (Stunkard & Wadden, 1992). Moreover, experiencing social stigmatization and unsuccessful efforts to reduce weight may increase the likelihood of psychological distress and emotional imbalances, impairing subjective well-being (Davin & Taylor, 2009; Raggi et al., 2009).

Psychological vulnerabilities among the obese are consistently documented and include lower levels of self-acceptance (Carr & Friedman, 2005), body-image disturbances (Greenberg, Perna, Kaplan, & Sullivan, 2005; Raggi et al., 2009; van Hout, van Oudheusden, Krasuska, & van Heck, 2006), intimate relationship problems (Raggi et al., 2009), less interpersonal contact (Bocchieri et al., 2002; Raggi et al., 2009), and poorer social skills (Carr & Friedman, 2006). This leads to a sense of isolation which can be attributed to the failure of family and friends to understand the frustrations associated with a weight problem (Stunkard & Wadden, 1992). These psychological vulnerabilities may lead to psychological disorders like anxiety (Kalarchian et al., 2007; Osei-Assibey, Kyrou, Kumar, Saravanan, & Matyka, 2010), difficulties in handling stress (Raggi et al., 2009), binge eating disorders (Collins & Bentz, 2009; Grucza, Przybeck, & Cloninger, 2007; Osei-Assibey et al., 2010), low self-esteem (Osei-Assibey et al., 2010; van Hout, van Oudheusden et al., 2006), and depression (Collins & Bentz, 2009; Ma & Xiao, 2010; Osei-Assibey et al., 2010).

4.3. Self-determination theory, basic psychological needs frustration and well-being

SDT is an organismic-dialectical theory of human motivation that has been widely applied to health contexts (Ng et al., 2012), including interventions with obese people, in order, for example, to understand the mechanisms underlying positive behavior change (Teixeira et al., 2015). Analyzing the morbid obesity experience

from the perspective of SDT could, therefore, benefit the design of motivational interventions aimed at improving the quality of life of this population. Specifically, SDT has been used to explain the process of living well (eudaimonic living), establishing the factors that promote versus thwart positive motivation and well-being in development in general, and in specific contexts (Ryan, Huta, & Deci, 2008). As such, the theory is uniquely situated in order to inform our understanding of the experiences of individuals living with morbid obesity.

SDT is based on the premise that individuals are active in their pursuit to satisfy three basic and universal psychological needs for autonomy, competence, and relatedness. Autonomy refers to the need to be the origin of our actions, to have control over and endorse our own behavior and to make our own decisions, without pressure from other people. Competence describes the need to feel effective in ongoing interactions with the social environment. Finally, relatedness refers to the need to feel connected to people, to establish good relationships, and to feel that people respect and value you. In SDT, these needs specify innate psychological nutriments that are essential for motivation, ongoing psychological growth, integrity, and well-being (Deci & Ryan, 2000). Social contexts and individual differences that support satisfaction of the basic psychological needs facilitate natural growth processes, eudaimonic lifestyles focused on what is intrinsically worthwhile, life satisfaction, positive affect, self-acceptance, a sense of meaning, vitality, and health outcomes (Ryan et al., 2008). However, when there is deprivation of basic psychological needs satisfaction, SDT

predicts significant psychological costs and accommodations (Deci & Ryan, 2000).

Recent conceptualization about psychological growth from the perspective of SDT has begun to distiguish between the constructs of need dissatisfaction (i.e., a lack of need satisfaction) and need frustration (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Chen et al., 2015; Vansteenkiste & Ryan, 2013). From this point of view, need disatisfaction does not adequately tap the intensity of need frustration. Need frustration is experienced when basic psychological needs are thwarted within social contexts (Bartholomew et al., 2011). For example, morbidly obese people may perceive themselves to be less competent at completing life activities (i.e., need dissatisfaction) and thus have less vitality and positive affect. However, they can also be actively rejected by other people (i.e., need frustration), in which case they may suffer from more maladaptive functioning and symptoms of anxiety or depression. The difference between these concepts lies in that need dissatisfaction is not related as robustly to malfunctioning as need frustration.

The SDT model on need satisfaction and need frustration (Vansteenkiste & Ryan, 2013) establishes that need thwarting contexts develop people's experiences of need frustration that will be related to controlled motivation or amotivation, ill-being and compensatory behaviors such as loss of self-control, rigid behavior patterns, and oppositional defiance (resistance to engage in the socially requested activity). Controlled motivation includes

introjected regulation, in which behaviors are adopted to avoid feelings of guilt; and external regulation, in which individuals engage in activities to obtain incentives and rewards or avoid punishments and reprimands. It is likely that morbidly obese individuals who experience basic psychological needs frustration in their lives will become amotivated or only engage in behaviors because they feel pressure from themselves or significant others. This general tendency to focus on indicators of ineffectance, to not behave intentionally, and to be amotivated in life, is referred to as an impersonal causality orientation, implying a negative relation to general well-being (Deci & Ryan, 2000).

4.4. Bariatric surgery and physical activity. Motivation for physical activity adherence and well-being improvement

As we have described in the previous sections, morbid obesity constitutes a chronic stressful condition, with a lot of associated comorbidities, which handicap individuals in their daily life greatly. When non-invasive methods, like diet or PA, fail, bariatric surgery has been shown as an effective treatment to weight loss and comorbidities improvements (Jacobi, Ciangura, Covet, & Oppert, 2011; Kruseman, Leimgruber, Zumbach, & Golay, 2010; Moya et al., 2014), associated to psychological positive outcomes (Järvholm et al., 2011; Sarwer et al., 2008) and better psychosocial functioning (Jiménez-Loaisa, Beltrán-Carrillo, González-Cutre, & Cervelló, 2015; van Hout, Boekestein, Fortuin, Pelle, & Van Heck, 2006). In fact, the number of bariatric surgeries performed has been rapidly

increasing since the mid-1990s (Nguyen et al., 2005; Smoot, Xu, Hilsenrat, Kuppersmith, & Singh, 2006), mainly in women (Boscatto et al., 2011).

After bariatric surgery, it is paramount to avoid sedentary lifestyle (Mazure Lehnhoff et al., 2007). In this line, exercise recommendations are common after bariatric surgery as a great number of studies show positive associations between PA and postoperative weight loss (Bond et al., 2008; Egberts, Brown, Brennan, & O'Brien, 2012; Livhits et al., 2010; Miller, Hale, & Dunla, 2015; Moya et al., 2014), and between PA and overall mental health-related quality of life (Bond et al., 2008; Forbush, Nof, Echternach, & Hill, 2011) and better psychosocial outcomes (Jiménez-Loaisa et al., 2015; Rosenberg, Henderson, White, Masheb, & Grilo, 2011).

However, there are no standardized guidelines for the most appropriate exercise regime (Livhits et al., 2010; Moya et al., 2014) or evidence-based psychosocial guidelines to help these patients make a long-lasting behavioral change concerning PA (Peacock & Zizzi, 2011). Besides, motivating this population to participate in PA can be especially difficult, much more for some patients with comorbidities such as osteoarthritis and asthma (Elkins et al., 2005; Livhits et al., 2010), being lack of motivation one of the most perceived barriers to practice PA (Zabatiero et al., 2016). For this reason, research highlights the importance of motivating patients to participate in PA and improving their quality of life after surgery (Boscatto et al., 2011; van Hout, Boekestein et al., 2006), much

more in the long term when the effect of bariatric surgery itself stops being effective (Moya et al., 2014) and high rates of weight regain have been found (Magro et al., 2008). In this sense, SDT has demonstrated efficacy in explaining the motivational processes underlying exercise and PA behavior (e.g., Ng et al., 2012; Teixeira, Carraça, Markland, Silva, & Ryan, 2012; Teixeira, Silva, Mata, Palmeira, & Markland, 2012; Wilson, Mack, & Grattan, 2008).

From a SDT perspective, basic psychological needs represent the energy underlying people's behavior. That is, people will be motivated to engage in certain activities (e.g., healthy behaviors) to the extent that their needs are satisfied (Teixeira, Silva et al., 2012; Vallerand, 2007). In this regard, if the bariatric patients satisfy their basic psychological needs while participating in PA, they are going to develop more autonomous forms of motivation. Concretely, they would enjoy the activity (intrinsic motivation), they would integrate it in their lifestyle (integrated regulation), and they would realize that PA is important because of its associated benefits (identified regulation). On the contrary, if basic psychological needs are thwarted, the patients would acquire more controlled forms of motivation (introjected and external regulations) or amotivation. Introjected regulation reflects a participation in PA with a sense of internal obligation, avoiding feelings of guilty, while external regulation refers to a participation based on obtaining external incentives or avoiding punishments, such as the recrimination of others for not being involved in healthy behaviors. Amotivation represents a lack of motivation and interest in the activity.

5. Objectives

Once expounded the theoretical framework, it is important to emphasize the objectives we tried to reach with this PhD dissertation:

- On one hand, we wanted to find out (1) the different causes that promote morbid obesity formation, and (2) the meaning of living with morbid obesity from the point of view of SDT. Both objectives from the retrospective and subjective point of view of ex-morbid patients who recently received bariatric surgery.
- On the other hand, we wanted to find out (3) the physiological and, mainly, psychosocial effects of a PA program grounded on SDT from the subjective perspective of bariatric patients.

6. Study 1: The etiology of morbid obesity from a qualitative perspective

6.1. Method

6.1.1. Participants

The participants in this qualitative study were 10 post-bariatric surgery patients (nine women and one man) aged between 31 and 59 years (*M* = 45.90, *SD* = 8.78). Seven patients were married, two were single and one was divorced. Four participants had a low-income socio-economic status, five participants had a middle-income, and one participant had a high-income (see Table 1 for more details). All participants had suffered from morbid obesity and, as a consequence, had received surgery in a public Spanish hospital. The inclusion criteria for bariatric surgery included having a BMI of greater than 40 kg/m2, or greater than 35 Kg/m2 with associated comorbidity. Concretely, in the present study, the mean score of weight was 107.09 Kg pre-operation and 96.58 Kg one month after surgery. Taking into account that the mean score of height was 1.596 m, BMI was 42.04 Kg/m2 pre-operation and 37.91 Kg/m2 one month after surgery. To receive surgery, patients also had to be between 18 and 60 years old; having followed endocrinology and nutritional monitoring; accomplishing the therapeutic instructions properly; experienced previous failed obesity treatments with diets and medicines; and have no medical, psychological or social contraindication for surgery. These criteria try to improve the surgery success rate regarding weight loss and the capacity to maintain healthy behaviors over time. Participants were recruited by their clinical psychologist one month after

bariatric surgery (between November 2011 and February 2012) and enrolled onto a 6-month PA program.

Table 1

Characteristics of Participants

Gender	Pseudonym	Age	Occupation	Relationship status	Children
Female	Telma	31	Cobbler	Single	0
	Alice	31	Hairdresser	Married	0
	Ronda	44	-	Married	1
	Pam	45	Cobbler	Married	2
	Emily	49	-	Married	2
	Susan	50	Cleaner	Married	2
	Lucy	53	Cobbler	Divorced	2
	Lezly	54	Psychiatrist	Single	0
	Sofie	59	-	Married	5
Male	Andrew	43	Taxi driver	Married	0

6.1.2. Research design and ethical considerations

This qualitative study was part of a wider research project which utilized a quasi-experimental and mix-method design to analyze the physical, psychological, and social effects of a PA program on patients with morbid obesity who had undergone bariatric surgery a month before the beginning of the program. This project included quantitative and qualitative methodologies and

both an experimental and a control group. No qualitative data of the control group were collected, since this qualitative study was developed with the patients who took part in the PA program (experimental group). The project was approved by an ethical research board and its location has been omitted for confidential reasons to protect the participants' anonymity. Participants were informed about the procedure and provided written consent. The participants' anonymity was protected through the use of pseudonyms. This was particularly important as the study was focused on personal and potentially sensitive issues and contained evaluations of other people.

6.1.3. Data collection

Two in-depth semi-structure interviews with each participant were conducted and recorded to collect qualitative information. The first batch of interviews (i.e., ten interviews) (Appendix 1) was conducted 7 months after the surgical intervention (right after finishing the PA program). This interview included closed questions, related to key SDT-based concepts, about the effects of the PA program and the experience of living with morbid obesity, and open-ended questions related to the experience of living with obesity. Nevertheless, when participants responded to these questions they frequently made reference to their process of weight gain and their morbid obesity formation. The second batch of interviews (Appendix 2) took place one year later, after a process of transcription, data analysis and identification of knowledge gaps related to the study (see Data analysis). Both interviews lasted

between 40 and 60 minutes, were conducted in a quiet room of the research center and in each case by the same researcher for consistency. One participant did not take part in the second interview without reporting any reason. In addition to the written consent obtained at the start of the study, participants also provided verbal consent at the start of each interview.

6.1.4. Data analysis

The semi-structured interviews were transcribed with a word processor and analyzed with the support of the software NVivo, which was used to organize and classify data efficiently (Bazeley & Jackson, 2013). This qualitative data was analyzed following a "content analysis" (Hsieh & Shannon, 2005), which was carried out in two different phases. Concretely, in the first phase, all transcriptions of the first interviews were read several times to become familiar with the data and get a sense of the whole. Then, the exact words from the text that captured key thoughts or concepts related to the aim of the study were coded. These codes were sorted into a system of interrelated categories and subcategories which gave sense to the data in accordance with the aim of the study. This first analysis was useful to identify knowledge gaps and new questions which were used in the second batch of interviews.

In the second phase of data analysis, the information coming from the second interviews was also read and coded. These new codes were used to complete, refine and readjust the previous system of interrelated categories and subcategories. The final

categorical system (Table 2) was coherent for the researchers and sustained the findings presented in the results section.

6.1.5. Trustworthiness

Following Shenton (2004), several strategies were accomplished during the fieldwork to enhance the trustworthiness and rigor of this study. First, triangulation was achieved including a considerable number of participants with different profiles. This was useful to verify that individual viewpoints and experiences were in line with the rest of the participants. Second, several strategies were considered so that participants would feel free to give frank opinions. In this regard, participants were informed they could withdraw from the study at any moment and could choose not to respond to a question if they did not feel comfortable. Researchers also showed a learning, instead of a judging, attitude during data collection (making questions with respect, never judging participants' opinions or behaviors, and showing kind and empathic gazes and gestures).

The process of data analysis was supervised by the director of the research project and a specialist in qualitative research (the supervisors of this PhD dissertation). The main researcher presented the data analysis using diagrams, responded to questions, and outlined the codes included in the different categories. This way, all three researchers were involved in resolving any discrepancies in coding or in the identification of emergent categories. These debriefing sessions, and the involvement of several researchers during the process of data analysis, reduced the influence of

individual bias and enhanced the trustworthiness of this study (Shenton, 2004).

6.2. Findings and discussion

Participants declared that the etiology of their morbid obesity was multifactorial and transcended a simple equation between expended and consumed calories. We can see their perceptions through the categories we have identified in the interviewees' discourse. These categories and subcategories are shown in Table 2 and are developed and illustrated by quotations from the participants below.

Table 2

Structure of Categories and Subcategories related to Participants' Perceptions about how they Reached a Morbid Obese Situation

Categories	Subcategories
Sedentary lifestyle	Lack of time
	Economic barriers
	Low motivation
	Other leisure preferences
	Pain and poor physical condition
	Embarrassment of showing their body in public
	Non-inclusive PA facilities for obese people
Bad eating habits	Unhealthy diet and excessive eating
	Bad family food education
	Lack of time to prepare healthy food
	Compulsive snacking and cravings
	Emotional and comfort eating
	Family problems
	Loss of a loved person
	Arguments or disputes
	Past traumatic event / Childhood sexual abuse
	Low self-esteem, anxiety and depression
A lifetime struggling with diets and failed attempts of losing weight	Feeling guilty after turning to food to cope with distress
	Giving up diet and exercise
	Rebound effects, regaining weight

Sedentary Lifestyle

A general sedentary life was one of the most commented factors which participants believed that contributed to their weight gain till reaching obese and morbid obese situations. With regard to their daily life, some participants commented that they barely did any physical efforts, and hardly did any exercise along their life story before surgery:

> I have always been sedentary… I took the car to go anywhere, and I parked the car as near as possible to the place I went, walking the least as possible… Nothing about climbing stairs. I have always gotten touchy when I have to climb stairs… (Lezly; woman, 54 years old, second interview).

> I did nothing. Moreover, I have to be seated all day at work; after being sit down I went to the sofa… From the sofa to work and back to the sofa. The four things you do at home and that's all. No physical activity, not even walking. My mom lives very close and I drove the car… (Pam; woman, 45 years old, second interview).

Lack of time is one of the most commented reasons participants claimed for their lack of exercise. Either because of taking care of their children, their studies or their jobs, participants hardly found enough time to do exercise:

> When I started to be obese with 20 years, I started to do exercise, right? … I gave up exercise because of the classes…

> I was studying medicine, and I didn't have enough time, so I was letting exercise aside... (Lezly; woman, 54 years old, second interview).

A part from lack of time, a participant, Lucy, reported lack of money as another reason for not exercising:

> … I like the gym, but if I do not work I have no money, and if I work, when could I come? (Lucy; woman, 53 years old, first interview).

Moreover, participants showed through their comments they had very low levels of interest or motivation towards PA and gave preference to any other behavior before exercise:

> On weekends, when I didn't work, I went for a walk in the beach or I went cycling… It was alright at the beginning, but I lost interest very soon… I don't know why. I started to give up and to get lazy. One day because there was a football match on TV, other day because we had a date with anyone, and other day because there was a TV serie. I gave preference to anything before the thing I should do (Andrew; man, 43 years old, second interview).

On the other hand, a vicious circle between sedentary lifestyle and obesity occurred, as weight gain was associated to inactivity (and viceversa), through a progressive deterioration of the physical condition. A participant, Lezly, explained clearly this process through the following quotation:

> … there is a vicious circle between obesity and the lack of exercise. One thing leads to the other. With excessive weight… your legs hurt, you don't have energy to walk or do exercise because you get exhausted and you don't feel good. And the lack of exercise promotes weight gain, as you burn less calories than you eat (Lezly; woman, 54 years old, second interview).

Finally, participants recognized they were very embarrassed and concerned about their body shape when having to do PA in public (*Andrew: … I felt embarrassed in a spinning class of a normal gym; Ronda: … I wasn't able to put on a swimming suit. It was very tough for me; Sofie: … I felt embarrassed regarding going to the pool because I was so fat).* Moreover, if they finally got involved in PA programs, they felt bias and marginalization in gyms because they perceived these facilities as non-inclusive places and saw themselves far away from the sort of people who attended these facilities. Likewise, they felt that staff and instructors did not look after them nor their specific needs. Therefore, they finally quit attending, as the following quotation clearly depicts:

> …if you go to any gym they pay you no attention… there you have a muscly guy, like the rest of guys attending these places, and he tells you, "ten minutes on the treadmill", and he goes away. They give you a notebook… I didn't know how it worked and they explained four exercises to me and got rid of me. So, then, you quit attending (Lezly; woman, 54 years old, first interview).

The influence of a sedentary lifestyle on obesity development is widely reported in the literature (Brogan & Hevey, 2009; Swinburn et al., 2009). Likewise, obese people perceive more passive behavior and less PA as proximal causes of obesity (Brogan & Hevey, 2009). Regarding the explanations of our participants for their inactivity, qualitative literature is in correspondence with them, as lack of time, low financial resources, lack of motivation and laziness have been found to be the most commented barriers to PA not only by obese population but also by general population (Napolitano et al., 2011; Zabatiero et al., 2016). Concerning obese population, literature shows bodily pain, physical strain and self-presentational issues as the most prevalent barriers to PA (Boscatto et al., 2011; Wilcox et al., 2006; Zabatiero et al., 2016). That was the case of many of our participants whose weight and worsening physical condition did not allow them to exercise or made them avoid public exposure situations due to their body complex and embarrassment. This last barrier is related to the current social obesity discourse which promotes a society's stereotype of obesity as a disability resulting from the individual's laziness and lack of self-control or willpower (Cliff & Wrig, 2010; Gard, 2011; Puhl & Heuer, 2010). This individualist discourse places the responsibility for health firmly with the individual (Gard & Wriht, 2001), promotes a negative stereotype of obese people (Cliff & Wrig, 2010; Gard, 2011; Greenberg, Eastin, Hofschire, Lachlan, & Brownell 2003; Himes & Thomson, 2007; Puhl & Heuer, 2010), and justifies stigmatization, discrimination and negative attitudes

toward the obese population in a lot of social contexts (Puhl & Heuer, 2010), including exercise contexts.

Bad Eating Habits

Unhealthy diet and excessive eating. Participants recognized through their comments that they had followed an unhealthy diet along their lives. They used to consume high fat and sugar products and ate big amounts of food without any control:

> … I ate very bad. My mom would do an omelet and I could eat the whole omelet. I loved fried food, I never had enough. I could eat a whole baguette diping in the fried oil (Pam; woman, 45 years old, second interview).

> … I ate what I shouldn't and I had no control. I ate what I felt. I finished having my breakfast and I said, I am ready for a stew. And I ate it with its meat ball, beans, meat… And after that if I felt like eating a pie, I ate a piece of pie (Lucy; woman, 53 years old, second interview).

Increased energy intake appears to be more than sufficient to explain weight gain (Swinburn et al., 2009), much more with the rise of obesogenic processed food in developed industrialized societies (Basu et al., 2013; Swinburn et al., 2009; World Health Organization, 2000). High consumption of particular food types such as french fries, sweets, meat, cheese, butter, high-fat snacks, fried foods and desserts has been associated negatively to weight maintenance (Elfhag & Rössner, 2005).

Many participants blamed their families for the bad eating education they got during their childhood, as they followed hiper-caloric and fatty diets (*Alice: ... the diet at home was always base on pork fatty meat and potatoes; Telma: ... fried food... I got used to that because at home we ate fried food every night*). A participant even relates how her family associated health with overweight, under a "healthy-chubby" concept:

> My mother didn't take care if the food promoted weight gaining or not. "If you like it, you eat it and that's all". She cooked every food we liked. My mother associated being chubby with being healthy. We are five sisters and all of us are chubby (Pam; woman, 45 years old, second interview).

In this sense, Braun et al. (2014) found in a qualitative study that obesity was generally framed as a problem primarily located within the family and not in the wider environment. Moreover, the lack of time for preparing the food appropriately and eating calmly is another factor participants reported as a reason for consuming junk food or high-calorie snacks:

> … when you work, you don't cook the same; you just grab a crisps bag, a donut… you stave off the hunger with this stuff… (Emily; woman, 49 years old, second interview).

Regarding this issue, prevalence of fast-food consumption has been strongly associated with obesity (Anderson, Rafferty, Lyon-Callo, Fussman, & Imes, 2011; Basu et al., 2013; De Vogli et al., 2014).

Compulsive snacking and cravings. Many participants described they had no control about snacking on a lot of hiper-caloric junk food along the day. This difficulty to manage cravings have been shown to be counter-productive to weight maintenance (Elfhag & Rössner, 2005) and associated to obesity (Nuru & Mamang, 2015). Food was always kept on participants' mind and deeply associated to their daily routines:

> I was working and I was eating crisps, with the 2-litres-coke ready, some peanuts… all the day eating (Pam; woman, 45 years old, first interview).

> … I was watching TV and thinking, "what can I eat? ... I would stand up and eat a banana, after that I would prepare a glass of milk with biscuits… (Telma; woman, 31 years old, second interview).

> …during the afternoons it was extreme. Going to the kitchen, opening the fridge or the cupboard, getting something… to the sofa. When I finished it, after half an hour, I had to go to the kitchen to grab another thing. I ate it, and in half an hour, again! I had to go to the kitchen to grab another thing (Emily; woman, 49 years old, first interview).

We could say participants had a psychological addiction to food, as food was totally associated to their daily routines, and it was a constant thought in their minds, even describing night eating episodes in some cases. This impulse for the immediate satisfaction of drives has been described for some types of psychogenic obesity

similar to drug addiction (Elfhag & Rössner, 2005). In fact, addictive personality has been found to act distally on over-eating and, therefore, on obesity (Brogan & Hevey, 2009).

Emotional and comfort eating. Participants recognized using food to calm anxiety caused by any problem they had. This experience, is in total agreement with the literature, as a common characteristic in people struggling with weight is that they tend to eat in response to stressful or negative life events, using eating to regulate mood and negative emotions (Bocchieri et al., 2002; Brogan & Hevey, 2009; Collins & Bentz, 2009; Elfhag & Rössner, 2005; Puhl & Heuer, 2010). This behavior explains the existence of moments and situations in which morbidly obese individuals are more exposed to larger weight gains (Braun et al., 2014). So, in significant and critical situations with high levels of distress associated, participants turned to food to cope with these situations, what is conceptualized as "comfort eating" by Brogan and Hevey (2009), and gets participants in a perpetual cycle of mood disturbance, overeating, and weight gain. We can find a big number of quotations which reflected this "problem–distress–eating" sequence:

> I was very nervous… Because of family problems… My son was a drug addict, and I started eating. I got more and more overweight… (Sofie; woman, 59 years old, second interview).

> … my father passed away. I started eating and crying, and I put a lot of weight… Any time I've had a problem, I've

always turned to eat (Pam; woman, 45 years old, second interview).

… I've had a problem or argued with someone and… eating… I felt comfortable and it was as if the problem disappeared (Telma; woman, 31 years old, second interview).

Lastly, one participant (Emily) related how a traumatic experience of sexual abuse in her childhood was the trigger point of her obesity problem. The participant describes that, after getting married, she rekindled this traumatic past event of her childhood, causing her a lot of anxiety which tried to cope eating compulsively:

… I had a trouble [sexual abuse during her childhood]… so much anxiety… you cope that anxiety a part from crying… you cope it by eating, and having your mind busy eating when you aren't crying… (Emily; woman, 49 years old, second interview).

I started gaining weight when I got married. I got married when I was 21, and from this point I put on almost 20 kilograms. I weighed 50 kg when I got married and then I got to 70 (Emily; woman, 49 years old, second interview).

In this sense, literature has found that traumatic events act distally on over-eating and comfort eating (Brogan & Hevey, 2009). Relatively few studies have examined the relationship between childhood sexual abuse and adult obesity (Gustafson & Sarwer,

2004; Stevelos & White, 2000). However, these studies have identified poor self-esteem, poor body image, impulsive behavior and depression as effects of child abuse, and these effects are common predictors of binge eating or compulsive eating. These eating behaviors are useful to manage the depression related to child sexual abuse, and may play an adaptive and "de-sexualizing" function to protect against further abuse.

Synthesizing, we can appreciate through participants' comments that their problematic eating behaviors were frequently related to their daily troubles or relevant negative events in their lives, which caused them low self-esteem, anxiety or depression:

> ...when I've felt down, I've always reacted eating… (Pam; woman, 45 years old, second interview).

> … my obesity problem was because of anxiety and depression… I think it was because of the depression I got (Lucy; woman, 53 years old, second interview).

Literature has repeatedly shown that there is an overlap between obesity and mood disorders like depression (Elfhag & Rössner, 2005; Needham et al., 2010; Luppino et al., 2010; Stunkard, Faith, & Allison, 2003). Depression increases the risk of developing obesity (Luppino et al., 2010), much more in case of disadvantaged groups, including women, because they tend to have access to fewer stress-buffering resources (Paluska & Schwenk, 2000; Sutin & Zonderman, 2012). In addition, depression is

associated with reduced PA, which may lead to weight gain as well (Paluska & Schwenk, 2000).

A Lifetime Struggling with Diets and Failed Attempts of Losing Weight

Participants described how diets to lose or to maintain weight had been a part of their life story. They remembered struggling to follow diets, needing high doses of sacrifice and self-control to cope with hunger and to avoid those hiper-caloric products they loved and used to eat. Dieting was an important source of stress and anxiety for many participants, who lived under rigid self-control during their whole life in order to control their weight. This stress got to the highest level when they did not perceive weight lost, turning to food to cope with distress, and giving up exercise in case they were doing it:

> It is tiring. A sheet with instructions for lunch, snack, breakfast and dinner. And the next week the same. When I went for the monthly visit the doctor asked me, "what happen that you lost only five hundred grams?" I followed all the instructions written on the paper, but… you realize you are doing a big sacrifice and you don't lose weight… you get more anxiety and more nerves, and you turn to the same… to eat because of the nerves you get (Emily; woman, 49 years old, second interview).

> … one day I said… I'm going to follow a diet… and… I signed up in a gym. It was like resetting, carrying on with

> everything. I started and when I realized I got bogged down again, I quit the diet and I gave up the gym, and I regained the weight and even the double. After two months… I got under diet again. All the same… I have been living like that my whole life (Telma; woman, 31 years old, second interview).

> I have been on a diet for half a life. You get tired at the end… "what is this?"… you always eat the same and… there is a moment… "fuck, I feel like going to a terrace and having an ice-cream", "why can't I go to a terrace and have an ice-cream?" But always controlling the food issue (Alice; woman, 31 years old, first interview).

Previous studies have found that individuals experience their battle with obesity as something that always has been present (Braun et al., 2014). Likewise, struggling to lose weight by dieting has been reported to be accompanied by starvation syndrome consisting of depression, anxiety, weakness and preoccupation with food (Stunkard & Rush, 1974), and lead to some behavioral manifestations such as disinhibition, binge eating and cravings (Elfhag & Rössner, 2005; Wooley & Garner, 1991). For most people with weight problems, dieting is not effective, and it fosters a tough lifelong battle of short-term weight loss and long-term weight gain (Elfhag & Rössner, 2005; Greener et al., 2010; Wooley & Garner, 1991).

This life in continuous struggle, trying to control weight and failing, had important consequences on participants. For instance,

participants struggled inside a vicious circle of "distress-eating-distress", and felt guilty after turning to food to cope with distress:

> The worst thing for me has been anxiety. I lost control… My escape was food… a piece of cheese, some salami, now a cookie, chocolate… Eating, eating… After that, sometimes, I felt anger… but as I had already eaten… (Lucy; woman, 53 years old, second interview).

This finding is in line with other studies, which show how the majority of the obese people struggle in vain to lose weight and blame themselves for relapses, experiencing failure, overall discouragement and impaired self-confidence (Elfhag & Rössner, 2005; Greener et al., 2010; Wooley & Garner, 1991). Some participants even reacted to this distress acting negligently against their health by binge eating/snacking, or giving up exercise:

> They would tell me to walk, I would lay down on the couch. "Don't eat that", and I would eat it. I rose up against them. I don't know what happened… My head wouldn't react… Instead of taking care of myself, I wanted to destroy myself. As I'm telling you, they'd tell me not to do something, and I'd do the contrary. "Follow a diet", and I'd go snacking (Lucy; woman, 53 years old, second interview).

According to Baumeister (1997), adults engage in a variety of self-defeating behaviors as a result of breakdowns of self-regulations. Participants dieting by high doses of self-control, when failing dieting, react eating large quantities of food without control

(binge eating) and believing they are unable to control their weight (Collins & Bentz, 2009; Elfhag & Rössner, 2005). This situation results in an abandonment of weight maintenance behaviors (Cooper & Fairburn, 2001; Pfeil, Pulford, Mahon, Ferguson, & Lewis, 2013; Zabatiero et al., 2016).

Finally, as one participant (Telma) described above, dieting and PA withdrawals caused them rebound effects, not only regaining the lost kilograms, but putting on more. This continuum cycle of starts and withdrawals promoted their weight rise along their life:

> I've followed five thousand diets, but it happens that… I followed a diet three months, I lost ten kilograms and when I quit it I gained fifteen. It's like a slope I've been always climbing (Andrew; man, 43 years old, second interview).

The current findings suggest that the management of obesity is complex, not only with frequent weight regain following conservative treatment options, such as increased PA and calorie-restrictive diets (Zabatiero et al., 2016), but with long-term weight gain (Braun et al., 2014; Pfeil et al., 2013; Greener et al., 2010).

7. Study 2: The impact of living with morbid obesity on experiences of psychological need frustration

7.1. Method

7.1.1. Participants, research design and ethical considerations

The participants of this study were the same participants of Study 1 as both form part of the same wider project. Therefore, the research design and the ethical considerations to guarantee consent and anonymity are the same than in Study 1.

7.1.2. Data collection

The fieldwork was conducted by three members of the research group. Two different techniques were used to gather qualitative information. First, the director of the research project and the instructor of the PA program took chronologically field notes about observed conversations and informal interviews related to participants' experiences associated with living with obesity and the effects of the PA program in their health and wellbeing. This information was recorded in their research diaries, just in the moment it emerged, and avoiding opinions and judgements, for a later data analysis after the field work. Specifically, the instructor collected qualitative information before, during, and after the 90-minute sessions which comprised the 6-month PA program. The director of the research project also collected qualitative information from the participants when they visited the research center for pre and post health-related fitness testing and during the sessions he observed over the 6-month PA program (approx. 20 sessions).

Second, at the end of the PA program, a third researcher conducted and recorded an in-depth semi-structured interview (interview 1 – Appendix 1) with each participant (i.e., ten interviews) in a quiet room of the research center. These interviews included closed questions, related to key SDT-based concepts, about the effects of the PA program and the experience of living with morbid obesity. When participants responded to questions related to the effects of the program, they frequently made reference to their previous situation of living with morbid obesity before surgery, comparing it with their situation in the moment of the interview. Moreover, open-ended questions related to the experience of living with obesity were included in the interviews (see Table 3). The interviews lasted between 40 and 60 minutes and were conducted by the same researcher for consistency. In addition to the written consent obtained at the start of the study, participants also provided verbal consent at the start of each interview.

Table 3

Examples of Closed (concerning SDT) and Open Questions in the Interview

Closed questions

- Have you felt any improvement in your health or physical fitness with the physical activity program? Do you feel more competent to get on your daily life than before? (Competence)
- Did obesity suppose for you a limitation in daily life tasks? Can you now do more daily life tasks by yourself? (Competence / Autonomy)
- Did you feel limitations in your social life before surgery? Do you feel more valued than before? (Relatedness)
- Do you think society, doctors, politicians… do as much as possible to help obese people? (Relatedness)

Open questions

- What has obesity meant in your life? At the labor, social, emotional, sexual level…
- How was living with morbid obesity?
- Do you remember any negative experience related to being obese?
- What would you advise to other people in your situation?

7.1.3. Data analysis

The field notes were transcribed by the observers and the semi-structured interviews were transcribed by the main researcher (the person who led the process of data analysis). The total transcription consisted of 195 pages. The data were analyzed, as in Study 1, with the support of the software NVivo, which was used to

organize and classify the data efficiently (Bazeley & Jackson, 2013).

This particular analysis used combined strategies of both "conventional" (inductive) and "directed" (deductive) content analysis (Hsieh & Shannon, 2005). The analysis had a deductive component because SDT was useful to give sense to the data during the process of analysis and influenced, in a general way, the thoughts and terms used in the processes of coding and categorizing. However, the processes of coding and categorizing were inductive. Concretely, the analysis followed these steps. First, all the transcriptions were read to become familiar with the data and get a sense of the whole. Second, the text fragments that captured key thoughts or concepts related to the aim of the study were inductively coded. Then, the codes were classified, into a system of interrelated categories and subcategories, which emerged inductively when codes were compared to identify similarities, differences and relationships. Having ended the categorization process, a process of categorical refinement was conducted to readjust previously identified categories, subcategories, and their contents. The final categorical system (Table 4) was coherent for the researchers and sustained the findings presented in the next section.

Table 4

Structure of Categories and Subcategories Arising from Qualitative Content Analysis

Categories	Subcategories
Personal factors and basic psychological needs thwarting	Reduced mobility and health problems Struggle to control weight
Social factors and basic psychological needs thwarting	Social tendency to blame obese individual A society focused on body shape Experiences of rejection and stigmatization - Jokes and taunts - Professional and occupational difficulties - Struggle to find clothes - Non-valued physical activity exercisers - Perceived prejudices from medical and health professionals - Physical barriers and obstacles in public accommodations and transports
Amotivation	
Consequences	Cognitive-affective level Behavioral level

7.1.4. Trustworthiness

Following Shenton (2004), the same strategies than in Study 1were accomplished to enhance the trustworthiness and rigor of this study. However, some others strategies were used regarding the field work during the 6-months PA program and the research diaries as another instrument to gather qualitative information. First, a long stay in the field let the observers study participants in depth and provided them with enough time and opportunity to tackle emerging gaps and topics related to the research along the 6-month PA program. Second, triangulation was established with the use of different techniques of data collection, and checking that data coming from observations and interviews were coherent. In addition, the fact that the three researchers involved in the fieldwork frequently interacted with the participants, and maintained a friendly relationship with each of them, enabled participants to speak openly.

7.2. Findings and discussion

The comments and interview responses provided by participants reflected how their past morbid obesity situation thwarted their basic psychological needs satisfaction, not only because of the social context but also because of personal factors related to their morbid obesity state. We can see this experience of basic psychological needs thwarting and its consequences through four major categories and seven subcategories which were identified from the interviewees' data (Table 4).

Personal Factors and Basic Psychological Needs Thwarting

Reduced mobility and health problems. According to the participants, morbid obesity reduced their motor abilities to a large extent, becoming a very restricting factor for their quality of life. This impact of obesity on health related quality of life has been reported in some previous studies (Mello et al., 2010; Sirtori et al., 2012; Wiczinski, Döring, John, & von Lengerke, 2009). Participants described this condition through the following quotations:

> I don't feel so limited as I felt before [the surgery]… Just tying your laces… I had to juggle… (Andrew; man, 43 years old)

> … I have felt a psychological improvement regarding I feel more agile to do things I wasn't able to do, … things I didn't do before… for example, going up a ladder to put some boxes in order, because I wasn't able to, because I was afraid to mess the ladder up because of the weight… [She laughs] Do you know what I mean?… I had no agility or strength (Lezly; woman, 54 years old).

Feelings of competence were actively thwarted by participants' reduced motor abilities. As participants realized they were not able to carry out the normal activities involved in daily living, and they reported feelings of inadequacy and incompetence. This situation is according to the definition of competence need

frustration since participants had feelings of failure and doubts about their efficacy (Chen et al., 2015).

Moreover, the reduced mobility made individuals dependent on others to do some basic duties which they were not able to do on their own:

> Lucy (Woman, 53 years old): I wasn't able to do anything before… I had to call my sister so that she could put on my socks or cut my toe-nails. I had to ask her for help when I cleaned the windows because right after starting to clean I said "phew…I am so tired! (Instructor's research diary).

Similarly, Bocchieri et al. (2002) noted that several of the morbidly obese patients in their study recognized the fact that they were dependent on their partners. Physical limitations associated with morbid obesity thwarted the need for autonomy since participants needed other people to help them with daily life activities. The absence of psychological freedom and the impossibility of doing different actions on their own would reflect an autonomy need frustration (Deci & Ryan, 2000).

Motor impairment was even more evident for the participants in social contexts in which they compared themselves with others that can do these tasks with ease. In line with previous research (Bocchieri et al., 2002; Stunkard & Wadden, 1992), participants in the present study did not feel able to perform basic activities and were not able to get involved in some social activities, as other friends and colleagues did:

> … when we travel to congresses, I remember, as a negative thing, people always going for a walk, while I felt very frustrated because I was not able to do it. It is obvious, you have to walk in a new city and I was always limited. I mean, I've waste the chance of knowing some places… I remember one time in Chicago that it was a hassle, all the people walking and walking, and it was very hot [She remembers the moment expressing tiredness with her voice tone]. (Lezly; woman, 54 years old).

These experiences besides thwarting the need for competence and autonomy also thwarted relatedness satisfaction because it made their relationships dependence-based and meant that they could not engage in a lot of social activities (Bocchieri et al., 2002; Stunkard & Wadden, 1992). As a consequence, some of the participants perceived themselves to have less opportunity to feel a sense of connectedness arising from being part of a social group (Deci & Ryan, 2000).

Participants also reported a lot of health problems associated with being morbidly obese. They described the way in which the medicines they were forced to take regularly, and the medical equipment they needed in order to manage physiological conditions, hindered their physical and social functioning. Some participants explained how they experienced extreme knee pain, sometimes requiring surgery. Others described different troubles such as high blood pressure, diabetes, and respiratory difficulties, having to take a lot of pills, inject insulin or even use a breathing machine to sleep:

> Lucy (Woman, 53 years old): Now, my well-being and comfort have improved. Before, I was always taking pills and sleeping with the breathing machine… (Director's research diary).
>
> Ronda (Woman, 44 years old): …when I went to have a beer… Do you know how annoying it was asking people to wait for you whilst you inject insulin? (Instructor's research diary).

These findings are in line with previous studies reporting that obese individuals are more likely to suffer arthritis, diabetes, congestive heart failure, myocardial infarction, stroke (Alley & Chang, 2007), knee pain (Jinks et al., 2006), chronic pain (McCarthy et al., 2009), and respiratory problems (Piper & Grunstein, 2010). In this case, competence was thwarted by participants' health troubles and chronic pain since they didn't feel effective and capable in their daily routine, and autonomy was thwarted because of their dependence on medicines or devices to live their lives normally.

Struggle to control weight. Some of the participants stressed that people do not always become morbidly obese because of bad eating habits. They related individual circumstances as factors influencing their situation:

> Sometimes, society does not know how a person can become like that. Because it could be due to thyroid problems. It could be due to antidepressant pills. It could be due to genetics. It

> could be due to a lot of things. And classifying that fat man or that fat woman… perhaps there is a hidden problem which nobody sees (Alice; woman, 31 years old).

Participants suggested that they were unable to lose weight, struggled to maintain any weight loss, or kept putting on weight, resulting in the perceived thwarting of their needs for autonomy and competence. This is in line with previous research which outlines associated feelings of discouragement, hopelessness, and a lack of confidence for future weight loss attempts (Bocchieri et al., 2002; Collins & Bentz, 2009; Davin & Taylor, 2009; Stunkard & Wadden, 1992).

Although Bartholomew et al. (2011) emphasize the need thwarting behavior of significant others in their environment, the present data suggests that experiences of need frustration are not only influenced by social factors, but can also be induced by personal factors. In the case of illness or disability (e.g., morbid obesity), the personal limitations (both physical and psychological) associated with the condition not only lead to low perceived autonomy, competence, and relatedness (i.e., need dissatisfaction) but also actively obstruct basic psychological needs satisfaction and result in intense feelings of need frustration (Bartholomew et al., 2011; Vansteenkiste & Ryan, 2013).

Social Factors and Basic Psychological Needs Thwarting

As we have just seen, morbid obesity itself involves factors that thwart participants' basic psychological needs. However,

participants also described the ways in which the social context impacted on their basic psychological needs satisfaction. Sometimes explicitly and sometimes in more subtle ways, morbidly obese individuals receive continuous controlling, over-challenging, and rejecting messages from the social context.

Social tendency to blame obese individual. The blaming obesity discourse, mentioned in the theoretical framework, promotes a societal stereotype of obesity as a visible sign of neglect, lack of self-control, and irresponsibility (Cliff & Wright, 2010; Crandall & Schiffhauer, 1998; Gard, 2011; Gard & Wright, 2001; Puhl & Heuer, 2010). In this regard, participants suggested that there was generally a lack of understanding in society regarding the causes of morbid obesity. They felt society blamed them and made them responsible of their own obesity:

> Sometimes, I think there should be more information in general about morbid obesity, because there are people who are not informed enough. I don't know… when people see a fat guy in the street they normally say: "what a fat guy, he must eat a lot!" This person has enough dealing with obesity. What else do you want? (Alice; woman, 31 years old).

A society focused on body shape. In addition, individuals' perceptions of societal ideals for body weight/image are reinforced through popular media, which predominately transmits images of thin and low body weight individuals not representative of the general population (Greenberg et al., 2003) as well as negative

stereotypical messages regarding overweight individuals (Greenberg et al., 2003; Himes & Thomson, 2007). Participants recognized feeling psychological distress due to ideal-body stereotypes and did not feel socially accepted:

> What happened? Don't you have the right to live because you are fat? I don't understand it. Perhaps I am more competent than a person who is the perfect size [She speaks with annoyance]. But this society has a bad habit […] of valuing appearance. But people are more than a body. They have a heart and a mind… (Ronda; woman, 44 years old).

According to SDT, the social ideal of beauty can be understood as an extrinsic aspiration (or goal) which is more related to obtaining contingent approval or external signs of worth and thus it is less likely to yield direct need satisfaction and may even distract from it (Kasser & Ryan, 1993, 1996). People will accept and internalize a new behavioral regulation or guiding value to the extent that they feel support for relatedness, autonomy, and competence in the context of behaving. The problem is that the social context is structured, through the obesity discourse, in a way that is likely to turn the needs against each other. Specifically, competence and relatedness are incompatible or competing with autonomy because, in order to feel accepted and competent, morbidly obese individuals have to subjugate their autonomy to the social control, demands, and pressures present in the environment. This means that individuals lose their autonomy following the social obesity discourse in order to satisfy their basic psychological

needs for competence and relatedness. Whilst the satisfaction of relatedness and competence needs would facilitate internalization and can be sufficient to produce introjected values (or poorly integrated compartmentalized identification), supports for autonomy are also essential for a regulation to become more integral to one's self (Deci & Ryan, 2000). Moreover, competence and relatedness are also frustrated by a society influenced by the obesity discourse, as we can see in the following sections. In sum, society uses the obesity discourse as a controlling form of socialization regarding weight-control and, at the same time, endorses the unattainable goal of beauty which leads to feelings of alienation and anomie among morbidly obese individuals.

Experiences of rejection and stigmatization.

***Jokes and taunts*.** The participants discussed being the target of taunts and insults during their lives because of their morbid obesity. This situation has been reflected in the literature (Carr & Friedman, 2005; Lather & Stunkardt, 2003; Puhl & Heuer, 2010). The continuous jokes and lack of respect made participants feel incompetent, stigmatized, and rejected, and resulted in desperate situations like them not wanting to leave their home and suicidal thoughts:

> I was always the chubby one in the group or among the friends or the people I went out with. People on the street get to be very cruel too… I remember a time, when I was very young, that I did not want to live, I didn't want to leave my

> house. Because people are very cruel. "Where is this fat woman going?", "take care baby, don't break the floor", "you could break the chair". Things like that… (Ronda; woman, 44 years old).

Professional and occupational difficulties. The individuals in this study described being marginalized when they looked for a job due to not having an appearance close to the social stereotype:

> … I was looking for a job and I went to a gift shop … "Ok, you would do this job well but… you are chubby…" And I said, "look, I am fat, but you are stupid, and my problem has a solution, but yours does not" [She remembers the situation with outrage and annoyance] And I turned around and went home… That has always hurt me a lot. This is unfair not only for me, but for the rest of the people who are like me (Ronda; woman, 44 years old).

Previous studies have reported how individuals make negative inferences about obese people in the workplace, believing that such people are lazy, lack self-discipline, and are less competent (Puhl & Brownell, 2001). Discriminatory behaviors and inequity in wages, promotions, and employee evaluations are also common (Carr & Friedman, 2005; Crandall & Schiffhauer, 1998; Puhl & Brownell, 2001).

Struggle to find clothes. One of the most recurrent themes that the participants commented on was that it was practically impossible for them to find clothes for their size in clothing stores

or commercial centers where most people go shopping, specifically in clothing stores of leading brands. They finally had to buy "ugly" or "old people" clothes. Their body shape, together with these kinds of clothes, produced a real stigma, a visible feature promoting others' rejection. Moreover, participants felt a lack of respect and faced awkward situations when they looked for clothes. For example, sales clerks made reference to their obesity as the main reason for not having clothes which were suitable for them:

> Some time ago I went to a clothing store… there was a beautiful dress in the shop window and I asked her, "that dress, do you have it in a size for me?" She looks at me and says, "oh, do you want to wear that dress as fat as you are?... And I say, "and could your fucking mother wear it?" And she says, "ok, don't be offensive". "You have offended me before". What is this? Talking to me like that. Just tell me you have no sizes (Pam; woman, 45 years old).

This finding is in line with previous studies which have reported that sales clerks at stores are worryingly influenced by weight bias (Puhl & Brownell, 2006).

Non-valued physical activity exercisers. Participants felt bias and marginalization in gyms too, because they perceived these facilities as non-inclusive places that frustrated their needs for competence and relatedness. They saw themselves as being far removed from the sort of people who attended these facilities and

they felt that staff and instructors did not look after them or cater for their specific needs. As a result they stop attending:

> …if you go to any gym they pay you no attention… there you have a muscly guy, like the rest of guys attending these places, and he tells you, "ten minutes on the treadmill", and he goes away. They give you a notebook… I didn't know how it worked and they explained four exercises to me and got rid of me. So, then, you quit attending [She explains it with outrage] (Lezly; woman, 54 years old).

Perceived prejudices from medical and health professionals. Prejudices and negative attitudes of medical professionals toward obese individuals have been reported in previous studies (Puhl & Brownell, 2001, 2006), particularly with respect to very obese people (≥35 kg/m2) (Carr & Friedman, 2005; Crandall & Schiffhauer, 1998). Participants complained because obesity was always present in the doctors' diagnosis of their health problems without investigating other possible causes. They felt stigmatized because they perceived that doctors did not get involved enough and just recommended dieting and participating in PA without further explanations. Anderson and Wadden (2004) found that obese and bariatric patients believed that doctors did not understand their problems and did not discuss weight control with them. This circumstance is depicted in the following quotations:

> The only thing they tell you is "get on a diet". I think that is not the solution either. They should get involved a little bit

more and there should be more information in order to not classify people (Alice; woman, 31 years old).

Pam (Woman, 45 years old): …The doctor just tells you to do more exercise and that's all (Director's research diary).

Physical barriers and obstacles in public accommodations and transports. One of the most common types of stigma for obese individuals was encountering physical barriers and obstacles in daily life (Phul & Brownell, 2006) that made them to feel ineffective in the interaction with the environment. Obese individuals can experience problems in theaters, restaurants, airplanes, buses and trains because of inadequate seat size and features such as the seatbelts (Phul & Brownell, 2006; Stunkard & Wadden, 1992). Participants perceived an unfriendly environment as we can see through the following quotation:

For example, in the past when I traveled by plane I was not able to fasten the belt, or if you travel by train you do not have enough room to open the lunch table because of your belly… And then, for example, when I drove I reached the wheel with my body… (Lezly; woman, 54 years old).

As has been described in the previous sections, participants with morbid obesity suffered stigmatization, discrimination, and negative attitudes in different social contexts. The jokes and taunts that they frequently suffered, and the contempt of employers, shop assistants, fitness instructors, and health professionals thwarted their need for relatedness, giving rise to feelings of frustration, relational

exclusion and loneliness (Chen et al., 2015). The underestimation by diverse social agents, together with the difficulty they had finding a job, buying nice clothes, or finding public facilities adapted to their size thwarted their need for competence, giving rise to the believe that they were not capable and worthwhile people. The difficulties and barriers they had to face in order to find a job, to buy the clothes they liked, or to travel also thwarted their need for autonomy. In this sense, previous studies have reported similar findings and have pointed out that social contexts influenced by the current obesity discourse promote an evaluating-controlling context that presses obese people to adopt healthier behaviors (Puhl & Heuer, 2010) and, therefore, forestalls rather than facilitates their need for autonomy (Deci & Ryan, 2000).

Amotivation

Studies with morbid obese patients conducted before they underwent bariatric surgery have shown patient's passive dependency and self-denigration, resignation, chronic sense of helplessness, hopelessness, and failure (Stunkard & Wadden, 1992). This psychological state of amotivation towards life in general (i.e., an impersonal causality orientation) was depicted by some participants. They described feeling carried along by the events without caring about what happened to them:

> There was a moment I was very downcast and I didn't care about living or dying (Ronda; woman, 44 years old).

> … I was very messy before … I saw myself so bad that I didn't care about the way I had to live (Telma; woman, 31 years old).

The absence of environmental conditions that allow satisfaction of basic psychological needs, in participants' immediate contextual situations and in their global developmental histories, is thus a key predictor of becoming controlled or amotivated, which has significant negative consequences for their vitality, integrity, and health (Deci & Ryan, 2000). This process is perfectly depicted in Vallerand's (1997) hierarchical model which states that motivation exists at three levels of generality (global, contextual, and situational). The different experiences that thwart the satisfaction of participants' basic psychological needs, because of the morbid obesity condition itself and because of stigmatization at the situational and contextual level are, over time, likely to have a recursive bottom-up effect on the participants' causal orientations at the global level (Postulate 4: Vallerand, 1997). This may cause them to develop a high level of amotivation or an impersonal causality orientation, both of which have been associated with a number of maladaptive consequences such as self-derogation and feelings of helplessness (Deci & Ryan, 2000; Ryan, Deci, & Grolnick, 1995).

Consequences

Need thwarting and subsequent maladaptive motivation and impersonal causality orientations can have serious negative cognitive, affective, and behavioral consequences.

Cognitive-affective level. Several studies have shown higher levels of impaired body image (Raggi et al., 2009), body dissatisfaction and negative body image in severely obese individuals compared to the general population (van Hout, van Oudheusden et al., 2006). Likewise, body image disparagement is a common problem of severely obese people (Stunkard & Wadden, 1992), which consists on the belief that one's body is grotesque and loathsome and that others view it with hostility and contempt. We can appreciate through the participants' comments this negative perception of their body, and this belief which made them feel shame and embarrassment showing their body even to their loved person:

> I have never seen myself as pretty, I have always been a little bit ugly… I didn't like myself, either dressed or naked… When I was with my husband, I even felt anger when he stared at me, because I didn't feel pretty (Ronda; woman, 44 years old).

Moreover, it is broadly assumed in the literature that obesity has a negative impact on self-esteem (Osei-Assibey et al., 2010; van Hout, van Oudheusden et al., 2006) and self-acceptance (Carr & Friedman, 2005), causing negative emotions (Stunkard & Wadden,

1992). Some of our participants also admitted suffering from extremely low self-esteem and very negative thoughts and feelings, as we can see in the following quotation:

> I was embittered… of seeing myself…and when I went to buy clothes. I was always exhausted, complaining… (Lucy; woman, 53 years old).

Participants also admitted having suffered anxiety and depression. Previous studies have emphasized the association between obesity and depression (Atlantis & Baker, 2008; Luppino et al., 2010), which becomes more prevalent in morbidly obese individuals (Collins & Bentz, 2009; Ma & Xiao, 2010; Osei-Assibey et al., 2010). There is also some evidence that depression could increase the odds for developing obesity (Luppino et al., 2010). As we can appreciate in the following quotation, participants felt hopeless and became pessimistic towards life:

> Lucy (Woman, 53 years old): "I got depression, anxiety… I stuffed myself…the world has ended for me… (Director's research diary).

Behavioral level. Participants described how they would avoid social situations (inventing excuses or showing a lack of interest) in order to prevent exposure to social contacts that they perceived to be potentially rejecting. Several studies have shown avoidant behaviors to be a common response to stigmatization and negative social evaluation in morbidly obese individuals (Carr & Friedman, 2006; Fontaine, Faith, Allison, & Cheskin, 1998;

Kalarchian et al., 2007; Puhl & Brownell, 2001). This behavior is depicted in the following quotation:

> …I was very isolated. My friends called me to go for a coffee and I didn't go. "Let's go for a walk"…and I had always an excuse. "My baby is sick, and so on" or my child said me "Mummy, let's go there"…and I said "No, I don't feel like doing it" (Ronda; woman, 44 years old).

Another behavior that participants discussed was the tendency to avoid talking about the problem and facing it. They recognized that speaking about their obesity problem was uncomfortable and tiring, so they tried to escape from conversations related to obesity.

According to SDT, these avoidant behaviors can be characterized as rigid behavior patterns that are adaptive to the extent that they protect individuals from the inner hurt resulting from the thwarted needs but may, over time, lead to further thwarting of need satisfaction (Deci & Ryan, 2000).

Another defensive adaptation promoted by the thwarting of psychological needs is the development of controlled regulatory styles. For example, an individual's eating behavior may become regulated via introjected motivation against the backdrop of having been controlled by the contingent regard and evaluations of significant others (Strauss & Ryan, 1987). Participants used "body control" as a substitute satisfaction to reduce deficits in perceived competence and autonomy, but rather than staying on the natural track toward healthy development, they became controlled:

> I have been on a diet for half my life. You get tired at the end… "what is this?"… you always eat the same and… there is a moment… "fuck, I feel like going out and having an ice-cream", "why can't I go out and have an ice-cream?" But I am always controlling the food issue (Alice; woman, 31 years old).

In this vein, research has shown that patients adhere less to medical regimens when their motivation is controlled (external or introjected) rather than autonomous (Williams, Grow, Freedman, Ryan, & Deci, 1996). Participants recognized suffering multiple failed dieting attempts, which it is in accordance with previous studies (Bocchieri et al., 2002; Collins & Bentz, 2009; Saunders, Johnson, & Teschner, 1998):

> A paper… breakfast, lunch and dinner, the same, the same… next week the same… You realize you are making a big sacrifice and you don't lose weight… so you get anxiety, nerves on edge and you go back to the same… to eat because of the nerves you have (Emily; woman, 49 years old).

According to Baumeister (1997), adults engage in a variety of self-defeating behaviors as a result of breakdowns in self-regulation, and, in terms of SDT, a breakdown in self-regulation is similar to controlled motivation and amotivation (Deci & Ryan, 2000). So participants who follow introjected regulations in their dieting behavior react with binge eating behavior (health care negligence) or learned helplessness (amotivation) when they fail

dieting. Specifically, research has shown that food is often used as a coping mechanism by those with weight problems, particularly when they are sad, anxious, stressed, lonely, and frustrated (Bocchieri et al., 2002; Collins & Bentz, 2009; Phul & Heuer, 2010):

> I had a problem… so much anxiety… you cope with that anxiety, apart from crying… you cope with it by eating, and having your mind busy eating when you aren't crying… All the anxiety you have because of your problem (Emily; woman, 49 years old).

Such behavior may result in temporary attenuation of their distressed mood, but the weight gain and the resulting guilt may reactivate the cycle and lead to further basic psychological needs frustration. Research depicts a perpetual cycle of mood disturbance, overeating, and weight gain (Collins & Bentz, 2009). The link between need frustration and binge eating found in the present study is particularly important given the recent inclusion of binge eating disorder in the fifth edition of the diagnostic and statistical manual of mental disorders (DSM-5, American Psychiatric Association, 2013). Perhaps now that it is formally recognized as a disorder, social stigma will be reduced? Likewise, it appears that experiencing weight stigma not only facilitates unhealthy eating behaviors like binge eating but also promotes a refusal to diet and increases the likelihood of physical inactivity (Phul & Heuer, 2010) and exercise avoidance (Vartanian & Shaprow, 2008):

> My problem because of obesity: anxiety and depression. I was chubby, but I went from 80-81 kilograms to 125… They told me "walk", and I lay on the sofa; "don't eat that", and I ate double… I refused to follow orders… (Sofie; woman, 59 years old).

From the point of view of SDT, this defiance and health care negligence could be considered to be a form of coping behavior that makes the problem worse and leads to the continued thwarting of basic psychological needs satisfaction (Deci & Ryan, 2000). In sum, the results of this study were in line with the postulates of the SDT model on need satisfaction and need frustration (Vansteenkiste & Ryan, 2013). The experiences of need frustration in morbidly obesity people were associated to extrinsic goals, controlled regulations and amotivation, ill-being (e.g., body image concerns, low self-esteem, anxiety, and depression), and compensatory behaviors such as releasing self-control (e.g., binge eating), rigid behavioral patterns (e.g., avoid social situations), and oppositional defiance (e.g., resistance to engage in health behaviors like diet and PA).

8. Study 3: Effects of a physical activity program on post-bariatric patients: A qualitative study from a self-determination theory perspective

8.1. Method

8.1.1. Participants, research design and ethical considerations

The participants of this study were the same participants of Studies 1 and 2, as the three of them form part of the same wider project. Therefore, the research design and the ethical considerations to guarantee participants' consent and anonymity are the same than in both previous studies. As it is indicated in both previous studies, one month after the bariatric surgery intervention, the participants were recruited (between November 2011 and February 2012) by their clinical psychologist and were enrolled onto a 6-month PA program.

8.1.2. The physical activity program

The 6-months PA program took place in a public fitness center starting on November 2011. The program consisted of two sessions per week during the first two months (months 1-2), three sessions per week during the following two months (months 3-4), and four sessions per week during the final two months (months 5-6), each lasting one hour and 30 minutes. The program combined two different sorts of sessions; 1) Sessions with machines for the development of cardiorespiratory endurance and muscular strength; 2) Sessions not only designed as a complement for the improvement of physical fitness, but also to introduce novelty, avoid routine, and enhance the psychosocial benefits of the PA program, including the following contents one day per week: games, directed activities

(aerobic, aerobox, spinning, etc.), dance, aquatic training in the pool and the beach, body expression, quotidian materials circuit (e.g., full bottles to work the strength), core-training, and trekking.

The instructors were sport science professionals, who were trained on strategies based on SDT, focused on the satisfaction of needs for competence, autonomy and relatedness during the sessions (e.g., to favor autonomy giving options to choose different activities, to favor competence providing positive feedback and information to the patients about their progress, to favor relatedness proposing group physical tasks in which patients had to interact and collaborate). These strategies are thoroughly presented in the findings and discussion section from the perspective of the participants.

8.1.3. Data collection

Qualitative data for this study were collected during and immediately after this PA program. The procedure and techniques used to gather the qualitative information were exactly the same used in Study 2: The research diary with chronologically organized field notes, and the same semi-structured interviews with each participant at the end of the PA program.

8.1.4. Data analysis

The field notes and semi-structured interviews were transcribed and analyzed with the support of the software NVivo, which was used to organize and classify data efficiently (Bazeley &

Jackson, 2013). This particular analysis used combined strategies of both "directed" (deductive) and "conventional" (inductive) content analysis (Hsieh & Shannon, 2005). First, having read the transcriptions, a map of interrelated categories and subcategories was created in accordance with SDT. The exact words from the text that captured key thoughts or concepts related to the following pre-established categories were all classified: PA program characteristics that may satisfy the needs for autonomy, competence, and relatedness; exercise autonomous motivation (i.e., intrinsic, integrated and identified regulations); and affective, cognitive, and behavioral consequences. Second, this categorized information was analyzed inductively to identify concrete subcategories emerging from the main categories. Third, having ended the categorization process, a process of categorical refinement was conducted to readjust previously identified categories, subcategories, and their contents. In this process some categories were restructured: cognitive, affective and behavioral consequences were fused in only one category. Moreover, not only contextual (in PA), but global (in life) consequences were included in the "consequences" category. These adjustments to the classification facilitated the interpretation of the data. The final categorical system (Table 5) was coherent for the researchers and sustained the findings presented in this Study.

8.1.5. Trustworthiness

The strategies followed to enhance trustworthiness and rigor of this study, were also the same implemented in Studies 1 and 2.

8.2. Findings and discussion

The comments and interview responses provided by participants reflected how the PA program positively affected basic psychological needs satisfaction, developed autonomous motivation towards PA, and had positive influence not only on the contextual level, promoting the experience of fun, higher intention to become physically active and higher levels of PA, but also on the global level, favoring more autonomous causal orientations and positive consequences as body image improvement, higher levels of happiness, self-esteem, extroversion, socialization, and wellbeing.

Table 5

Structure of Categories and Subcategories relative to the Effects of a Physical Activity Program, grounded on Self-Determination Theory, on Post-Bariatric Surgery Patients

Categories	Subcategories
Physical activity program characteristics and basic psychological needs satisfaction	Caring about their opinion and preferences.
	Instructors with a democratic and positive disposition.
	Acquiring knowledge for being autonomous exercisers.
	Improvements in physical fitness and perceived competence
	Pain reduction.
	Perceived social support and affection.
	Feeling understood by people in the same situation.
	Trust to talk about intimate thoughts or experiences.
Exercise autonomous motivation	
Consequences	Experience of fun.
	Physical activity involvement and intention to become physically active.
	Body image improvements.
	Improvements in perceived happiness and self-confidence.
	Attitude improvement for a better social life.

Physical Activity Program Characteristics and Basic Psychological Needs Satisfaction

Caring about their opinion and preferences. Participants felt that people in charge of the PA program favored a positive feeling of autonomy, because they were allowed to take some decisions regarding the sort of exercises, the machines, the music and even the attendance schedule:

> … you have worried about the opinion of all of us. You have always offered options to choose… If we wanted to do this or that… or if we preferred any sort of music… You have always provided the chance to choose to all of us (Alice; woman, 31 years old).

Instructors with a democratic and positive disposition. According to the participants' comments, instructors showed at any moment a suggesting, more than an imposing, disposition. They also assisted participants with a positive mood during the sessions, prevailing positive feedback what enhances autonomous motivation (Hancox, Ntoumanis, Thogersen-Ntoumani, & Quested, 2015), as we can appreciate through the following quotation:

> I think that instructors should be like the ones we have here, because if you are getting pressured at the end you get tired and bored, because you say: "fuck, do I have to stand this guy?" In general [in the PA program], everybody tells you: "you can do it this way or this other way", but they don't impose or oblige you. It is harder to carry out imposed things

than if you get an explanation of the goals with a good mood (Alice; woman, 31 years old).

Both circumstances described above not only favored better relationships, but promoted the feeling of choice and volition, thanks to the instructor's autonomy-support behavior, providing greater autonomy perception during the sessions which can result in more positive outcomes (Deci & Ryan, 2000; Silva et al., 2011; Silva, Markland et al., 2010; Silva, Vieira et al., 2010; Teixeira, Carraça et al., 2012) as facilitation of exercise autonomous motivation (Edmunds, Ntoumanis, & Duda, 2007; Silva, Vieira et al., 2010; Teixeira, Carraça et al., 2012).

Acquiring knowledge for being autonomous exercisers. Participants stated that they have learnt how *"to use the machines", "to do physical exercise", "stretching", "to control their walking rhythm and heart-rate", and why are the exercises for and which muscles are working"*… The acquisition of this knowledge, along the time, let the participants to perceive themselves as able enough to carry out the programmed sessions without supervision, as we can see through the following quotation:

> I know what I have to do in each machine, how to do it … I first do the cardio ones, around six minutes in order to warm up, and then I do the ones to work out the strength. If one day I work out arms, the following I work out legs… (Telma; woman, 31 years old).

Participants also declared that they have learnt to do different types of PA, getting a wider range of possibilities to keep an active lifestyle out of the program, as we can appreciate in the following quotation:

> You have taught us every kind of physical activity… I have been able to decide what I want to do because you have taught me … On August it is very hot, so I am doing exercise in the water, because I have tried it and I know what it is. You have even taught us how to do exercise by ourselves without going to the gym. I mean, you have shown us several possibilities (Pam; woman, 45 years old).

As we can appreciate, both circumstances above promote autonomy through the feelings of choice about what types of activity they engaged in out of the program, as well as competence through the perception that they can effectively perform the chosen activities. In this sense, literature (Teixeira, Silva et al., 2012; Silva, Markland et al., 2010) suggest that when individuals following healthy behavioral goals feel not just competent but also autonomous, their efforts are more likely to result in long-lasting behavior changes.

Improvements in physical fitness and perceived competence. Participants came from a morbid obesity situation characterized for a great physical worsening. Moreover, some participants suffered a great weakening after surgery. Nevertheless,

participants reported many physical improvements with their participation in the PA program:

> Lucy (woman, 53 years old): … since I started the program nothing is the same, I feel better, more strength, more agility (Director's research diary).

Participants pointed out that these improvements raised their capacity to perform and to overcome duties and activities easier, in and out of the program, as the following quotations depict:

> … before, ten minutes running on the treadmill and I went messed up. But now, ten minutes on the treadmill is nothing (Andrew; man, 43 years old).

> … I stand the work better… The same things I did before, now I do them easier. That encourages you, it encourages you a lot (Ronda; woman, 44 years old).

These improvements in their physical fitness can satisfy straightly their need for competence, as participants' progress perception can constitute a powerful positive feedback that signify effectance. A participant literally comments: *"You have shown me I am able"* (Lucy; woman, 53 years old; director's research diary). The improvements in physical fitness may also promote internalization of the value of the PA outcomes (health, optimal functioning, and quality of life) fostering identification and exercise participation (Teixeira, Carraça et al., 2012).

Pain reduction. Moreover, most of the participants declared that the PA program reduced their chronic pain in arms, legs and, mainly, knees. A participant even pointed out that he quit consuming medicines: *"Now I don´t take any pill and I endure physically* (Andrew; man, 43 years old; director's research diary). These health improvements also had a positive influence on their perception of competence:

> When I started to do this exercise with the legs, my knees hurt a lot and I complained a lot. I didn't finish it. But now I finish and my knee doesn't hurt so much (Emily; woman, 49 years old).

Regarding both effects of the PA program we just explained above, they could have a positive influence on the adherence to exercise not only through the mediator effect of competence on autonomous motivation, but through the softness of bodily pain and physical limitations as obesity barriers related to PA (Zabatiero et al., 2016).

Perceived social support and affection. All the participants highlighted the good relationships they had maintained in the PA program and the continuous support and affection that they received from the group:

> … during this process in which I have kept losing weight, I have had very much support from my program-mates… And the thing I needed the most… affection. I have received lots of affection (Emily; woman, 49 years old).

Moreover, participants pointed out that their relationship with the instructors had been very good, as instructors always showed a very kind attitude and they were always disposed to listen and help. This instructors' behavior fostered more than a professional relationship with the patients, and the perception that the instructors worried about them:

> … when you are living through this phase… it is very important being treated like a person, not just like a number. We are persons over all, and you have truly shown me a lot of affection and… I have felt very well with you. Very well (Ronda; woman, 44 years old).

Feeling understood by people in the same situation. Depending on participants' comments, the program was an opportunity not only to participate in PA, but to do it with people in the same situation. A participant (Ronda; woman, 44 years old) refers to the group as *"the surgery-group club"*, and other (Lezly; woman, 54 years old) points out that *"being with people with the same problem is rewarding… we have the same goal"*. Participants found in the program the chance to share with more freedom and confidence their feelings and experiences regarding the same problems, as we can see through the following quotation:

> Lucy (woman, 53 years old): "It's a group of people with the same situation, we talk about the same problems: food, if we have vomited… Even Andrew asked us the other day if we were having problems to pee" (Director's research diary).

Trust to talk about intimate thoughts or experiences. Participants trusted in the social group of the PA program, feeling secure to speak about themselves. As we have seen above, even the only male participant (Andrew) feels confident to speak with the other women about the urinate issue. Such was the confidence they reached that they revealed intimate experiences and thoughts which they had not been able to speak about before (a patient even explained how she was a victim of sexual abuse during her childhood), experiencing a great catharsis:

> "I have told things which I had inside. I have come out of my shell about things I had never told. I have started up and I have gotten rid of things I had inside and they hurt me…" (Emily; woman, 49 years old).

As it can be seen through the last three subcategories, need for relatedness was clearly satisfied in the PA context where participants shared the same situation and goals, forged authentic friendships and felt appreciated, understood and confident to talk sincerely, being these last three feelings facilitators of need for relatedness (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). In this sense, literature has showed that fitness and health professionals who behave with involvement and caring toward exercisers, promote optimal functioning, exercise autonomous motivation, and feelings of acceptance and integration within a group (Hancox et al., 2015), being social support a key ingredient for PA adherence and weight maintenance (Grave, Calugi, Centis, El Ghoch, & Marchesini, 2011).

Exercise Autonomous Motivation

The PA program contributed to satisfy participant's basic psychological needs, as it has been described in the previous sections. Therefore, taking into account SDT, the perceptions of competence, autonomy and relatedness would mediate the effect of social factors on motivation and promote the increase of participant's autonomous motivation toward PA (Edmunds et al., 2007; Teixeira, Carraça et al., 2012; Silva et al., 2011; Silva, Vieira et al., 2010). In some cases, this change was remarkable:

> … now I do things willingly. Now it isn't hard to come to exercise. Before I had to exercise or move compulsorily. What I'm doing now was inconceivable before, and now I have fun, I enjoy it (Andrew; man, 43 years old).

This quotation reflects a behavior change from external or introjected regulations (compulsory behavior) to intrinsic motivation (enjoyment) during the PA program. But social contexts that promote basic psychological needs satisfaction, not only foster intrinsically motivated behavior, but also the internalization of extrinsic motivation (Deci & Ryan, 2000; Silva et al., 2011; Silva, Vieira et al., 2010). In this line, most of participants showed an identified regulation because they reported doing PA because it was good for their health (*I had to have done more exercise before, because there are some benefits: elasticity, stamina… I come here to take care of myself, because it is beneficial for me* – Alice; woman, 31 years old). They identified themselves with the

behavior's value which is associated with higher adherence and performance (Deci & Ryan, 2000; Teixeira, Carraça et al., 2012). Moreover, it is noteworthy the comment of a participant who literally affirmed to be *"integrally motivated"* (Lezly; woman, 54 years old; director's research diary), so it seems she had integrated PA with other aspects of herself. This situation enhances fully internalized motivation, predicting greater PA persistence over time (Silva et al., 2011; Teixeira, Carraça et al., 2012).

Consequences

According to participant's comments, the satisfaction of their basic psychological needs and exercise autonomous motivation in the PA program gave also rise to other positive consequences, both in the contextual (in PA) and the global level (general life).

Experience of fun. All the participants recognized experiencing great doses of fun and enjoyment during the PA program:

> … we have lots of fun, there are many jokes, partying… I don't know… I enjoy it a lot (Alice; woman, 31 years old).

> I like to come to do the games. Oh yes, Wednesday! I was wishing the Wednesday to come here to do the games. Swimming or doing anything on Wednesday… I like it, now I am enjoying… I enjoy it (Emily; woman, 49 years old) [It seems noteworthy to point out that the games and novel

physical activities were developed on Wednesday to escape from normal routines].

Different studies (e.g., Moreno, López de San Román, Martínez Galindo, Alonso, & González-Cutre, 2008; Vlachopoulos & Karageorghis, 2005) have found that satisfaction of basic psychological needs and intrinsic motivation are positively related to enjoyment in PA programs.

Physical activity involvement and intention to become physically active. Most of the participants stated that the program favored the incorporation of PA into their lifestyle. For instance, a participant defined herself as a *"bike-addicted"*, and another participant declared *"when I don't go for a walk, I miss something"*. Moreover, all the participants reported that they wanted to keep doing any kind of PA after the program, either organized activities or on their own:

> Emily (woman, 49 years old): "When I finish the program I am going to keep walking, playing with the Wii console, and I would like to go cycling…" (Director's research diary).

> … I am thinking about to come here [to the gym] in September. I am considering I would like to continue (Lucy; woman, 53 years old).

In this line, literature has consistently found that need-supportive contexts lead to autonomous forms of exercise motivation and promotes adherence and PA participation in

populations with weight problems (Hancox et al., 2015; Silva, Markland et al., 2010; Silva, Vieira et al., 2010; Teixeira, Carraça et al., 2012). Moreover other studies (Edmunds et al., 2007; Markland & Ingledew, 2007; Silva et al., 2011; Teixeira, Carraça et al., 2012; Wilson, Sabiston, Mack, & Blanchard, 2012) support that doing weight loss PA programs for autonomous goals like enjoyment or health, fosters long-lasting behavior change.

Body image improvements. Some participants confessed that, as a consequence of surgery and losing so much weight in little time, they started to have *"flaccidity"*, *"softness"* and *"folds of sagging skin"* in different parts of their bodies. This situation caused them concern and complex, and made them think about getting surgery to remove their skin folds, what is in congruence with the literature (Bocchieri et al., 2002; Jiménez-Loaisa et al., 2015; Sarwer et al., 2008; van Hout, Boekestein et al., 2006). However, they also emphasized that the PA program, apart from *"accelerating more the weight loss"* (Lezly; woman, 54 years old), as other studies support (Egberts et al. , 2012; Livhits et al., 2010; Moya et al., 2014), also helped them to regain muscle tone, look more defined and reduce the "skin folds":

> Lezly (woman, 54 years old): I notice muscle regaining, reduction of flaccid skin… I don't notice skins in the face or abdomen, and I'm not getting surgery to remove them because I've perceived improvements with the exercise (Director's research diary).

So, a part from the manifested concerns about the skin-folds, body image improvement might be promoted not only because of the weight loss derived from surgery (Jiménez-Loaisa et al., 2015), but also because of our PA program grounded in SDT, in line with other studies which found significant relationships between appearance-related body image or physical self-worth and the more autonomous forms of exercise motivation among women with overweight and obesity (Pearson & Hall, 2013; Thøgersen-Ntoumani, & Ntoumanis, 2006).

Improvements in perceived happiness and self-confidence. Participants also believed that their participation in the PA program improved their mood and made them feel happier:

> Pam (woman, 45 years old): "In my house they have noticed… I'm glad, I'm happy and my husband tells me: when you come back from the gym you are radiant" (Director's research diary).

Likewise, participants also reported that they feel better about themselves, and more self-confidence. This allowed them to deal with more safety with everyday life situations, where previously showed some reluctance, as the following quotations show:

> ... I could not wear a swimsuit, it cost me horrors. And now I wear a swimsuit every day, what can I say. The truth is that it gives me more confidence. We see that we are not alone in the world, there are more people who support us and that gives us more courage (Ronda; woman, 44 years old).

In this line, literature has found that needs satisfaction and exercise autonomous motivation (particularly intrinsic regulation) is linked to positive affect (Edmunds et al., 2007; Teixeira, Carraça et al., 2012) and enhanced self-esteem (Vieira et al., 2011).

As we can see through the last two subcategories, basic psychological needs satisfaction in the PA program (contextual level) could likely have a positive bottom-up effect in the participants' daily life (global level) (Vallerand, 2007), promoting these positive consequences and others like vitality, psychological health, life satisfaction and well-being (Deci & Ryan, 2000; Edmunds et al. , 2007; Martín-Albo, Núñez, Domínguez, León, & Tomás, 2012; Reis et al., 2000; Teixeira, Carraça et al., 2012), as some quotations reflect:

> I feel much better. I didn't remember I could live in this fantastic way (Pam; woman, 45 years old).

> In my whole life I hadn't felt as well as now (Andrew; man, 43 years old).

In this line, several studies (see Jiménez-Loaisa et al., 2015 for a review) showed that postoperative increases in PA following bariatric surgery were associated not only with greater weight loss, but with greater improvements in general health, vitality and mental health.

Attitude improvement for a better social life. Regarding the possible improvements in participants' well-being described above,

literature indicates that emotional well-being is reliably related to several personality traits, including self-esteem, perceived personal control, optimism and extraversion (Myers & Diener, 1995). In this sense, participants indicated that there also was a change in their focus about personal relationships from avoiding to enjoying and even looking for them, as we can see by the following quotations:

> ... I feel more secure. I feel more sociable. I like to be more with people (Lucy; woman, 53 years old).

> … I was like a little isolated. My friends would call me for a coffee and I wouldn't go … I always had an excuse. And now they call me to meet and before hanging up the phone I'm on the street (Ronda; woman, 44 years old).

So, this improvement in extraversion could be another success of the program, as it is mediated by intrinsic and extrinsic behavioral regulations (e.g., fun and looking fit respectively), and it is positively related to exercise participation (Lewis & Sutton, 2011), and associated to subjective well-being (Li, Lan, & Ju, 2015).

9. General conclusions and recommendations

Once presented the three studies included in the present PhD document, it is time to analyze the most relevant contributions and conclusions we have reached.

Study 1

Thanks to participants' retrospect subjective perception we have identified multiple factors which conditioned their sedentary lifestyle and bad eating habits, and led them to morbid obesity. It has also described the continuous struggle that participants lived with obesity along their lives, with failed attempts of losing weight by multiple diets and PA, and the corresponding sense of failure.

With regard to sedentary lifestyle, participants perceived many barriers to PA:

- Some of them were not specifically related to obesity, as lack of time, low financial resources and lack of motivation. Against lack of time, a labor schedule more compatible with personal life and leisure would be desirable to favor active lifestyles. The promotion of PA at work could also be interesting in this regard, offering active recesses along the labor schedule and areas for exercise in the company facilities. The economic barriers could be reduced promoting health education programs for obese patients, including contents favoring that they are able to do healthy exercise on their own without the need of buying expensive equipment. Another measure could be the offer, by the public health system, of low-cost PA programs supervised

by a doctor and directed by sport sciences professionals. In this regard, previous studies indicate that the investment in the promotion of PA can reduce the economic cost of the health systems (Kruk, 2014). These health-education and PA programs should include motivational training so that obese patients are motivated to be active in the long term. The professionals in charge of these programs should also be trained in the special needs and characteristics of obese population.

- Other barriers to PA were associated with obesity, as pain and poor physical condition, embarrassment of showing their body in public, and the existence of non-inclusive PA facilities for obese people. Obese patients should know that doing exercise is crucial for breaking the vicious circle of "bad physical condition-inactivity-worse physical condition". This argument should be included in the messages spread in the interventions for the promotion of PA, although the target population should know that they need to be counseled by qualified professionals to do individualized, correct and healthy exercise. Moreover, interventions for the promotion of PA should be focused on the promotion of health, wellbeing and healthy behaviors, avoiding an excessive weight-management approach (Jiménez-Loaisa et al., 2015). This could be helpful to reduce patients' concerns about their body shape, reinforce their self-esteem, and reduce their embarrassment of doing exercise in front of others. In this sense, it is also necessary

to guarantee inclusive PA contexts in which participants can feel respected by the people in charge of the activities and other exercisers. PA facilities should also possess specific designs and physical structures to prevent patients' privacy if they have any body-complex and do not want to be observed by others (Jiménez-Loaisa et al., 2015). For instance, the availability of individual showers or swimming pools closed to external observers would be desirable.

Regarding their bad eating habits, participants recognized to have followed an unhealthy diet during many years of their lives, and to have eaten excessively and compulsively. However, like in the case of sedentary lifestyle, the interesting contribution of this study resides in shedding light on the hidden factors that influence these eating behaviors:

- Family food education has been identified as an important factor influencing the bad eating behaviors of the participants in this study. Strategies for the prevention of obesity should pay especially attention to this issue. Health centers should promote health education courses among families with especial lack of knowledge regarding healthy diet. School can also play a very important role in the prevention of obesity and unhealthy diet since childhood. Another factor was the lack of time to prepare healthy food. A readjustment of labor schedules to make them more compatible with family life could palliate this problem. In

addition, food industry should continue investing in a more extensive availability of fast healthy food.

- The findings of this study also bring to light the diverse kind of problems and negative life events which can be under the unhealthy eating behaviors of people with morbid obesity (family problems, loss of a loved person, arguments or disputes, childhood sexual abuse). Early psychological intervention to treat the psychological problems (low self-esteem, anxiety, and depression) which can lead to emotional and comfort eating should be part of the strategies for obesity prevention.
- Another factor influencing the PA and eating behaviors of the participants was their lifetime struggling with diets and failed attempts of losing weight. This failed long process of control and restriction contributed to their distress and deliberate abandonment of weight maintenance behaviors. In this sense, people with morbid obesity should understand that specific changes in diet and PA patters for concrete periods of time have no sense. A real change of lifestyle is what is needed for the treatment and prevention of obesity. These changes in diet and PA could be more successful if they were more focused on improving health and wellbeing, and less focused on losing weight. Likewise, this lifestyle changes could be more successful if they come together. The participation in PA can help obese patients reduce their weight with less restrictions in the energy intake (Moya et al., 2014), and can be useful to reduce emotional problems

and improve mental health (King et al., 2013). The support of health professionals, couples, family, friends, and other patients with morbid obesity can be of vital importance to achieve these lifestyle changes and reduce the risk of giving up exercise or turning to comfort eating. In this regard, it would be interesting that doctors are educated in health behavior change techniques to motivate patients during obesity treatment, instead of promoting failure feelings as some patients stated.

- The participants in this study recognized that they were physically inactive and kept unhealthy eating behaviors during many years of their lives, arriving to a situation of morbid obesity. However, although the individual responsibility concerning the etiology of morbid obesity is evident, this study describes the diverse educational, psychological and social factors, as well as the traumatic life events, which can influence the emergence and maintenance of these behaviors. This information may be helpful to understand the etiology of morbid obesity and to design prevention/treatment strategies from a more holistic, sensitive and respectful perspective. This comprehensive view is necessary in a society which tends to consider people with morbid obesity as lazy, irresponsible and guilty of their health problems (Gard, 2011).

Study 2

This study aimed to explore the experiences of individuals living with morbid obesity from a SDT perspective. It makes an important contribution to our understanding of the personal and social factors that thwart basic psychological needs satisfaction in this population as well as the negative cognitive, affective, and behavioral consequences which result from experiences of need frustration and impact on daily living. We can provide the following conclusions:

- It is important to take personal factors into account in order to obtain a more comprehensive understanding of need frustration. Our findings illustrate how suffering from morbid obesity can lead to experiences of need frustration, not only because of the stigmatizing and controlling social context (Bartholomew et al., 2011; Vansteenkiste & Ryan, 2013), but also because of personal limitations associated with their morbid obesity state. These data could help to better interpret the obese people life in order to develop social and motivational strategies to improve their quality of life.
- The current findings should be used to foster eudaimonic lifestyles through the development of strategies aimed at improving the quality of life of individuals living with morbid obesity. For example, obese people will be more likely to adhere to diets or PA programs when health care professionals and significant others adopt psychological

strategies and behaviors which promote need satisfaction and more autonomous behaviors. Health care professionals should treat morbidly obese individuals with closeness and understanding and help them develop realistic short and long term goals. They should also focus on the importance of health as the primary motivator for behavior change (rather than messages which emphasize achieving an ideal weight) as these are more likely to promote more autonomous (e.g., identified) regulations for weight loss and PA. In this sense, motivational interviewing has been suggested as an effective strategy to change dietary habits and reduce BMI (Saffari, Pakpour, Mohammadi-Zeidi, Samadi, & Chen, 2014). In fact, motivational interviewing has already been applied from a SDT perspective (Teixeira, Silva et al., 2012). When individuals fully endorse weight loss goals and, therefore, feel autonomous as well as competent, their efforts are more likely to result in long term behavior change (Teixeira, Carraca et al., 2012). Thus it is vital that we understand and attend to both personal and situational factors which thwart basic psychological needs satisfaction and undermine the internalization of health-related behaviors which are important for weight control.

- Individuals suffering from morbid obesity should be supported in developing adaptive coping strategies to help them deal with the need thwarting personal limitations and social stigmatization associated with the condition (i.e., so that they do not internalize negative weight-related

stereotypes). For example, using positive self-talk (to facilitate feelings of competence) and seeking social support (to promote feelings of acceptance and relatedness) have been found to relate to healthier psychological adjustment (Puhl & Brownell, 2006). In this sense, self-help groups could be an important instrument for people suffering from morbid obesity as they would allow individuals to share common concerns and problems and receive support from others. Teaching acceptance and mindfulness may be related to basic psychological needs fulfillment (Chang, Huang, & Lin, 2015), diminish the likelihood of psychological distress and facilitate weight loss outcomes and, therefore, improve quality of life (Lillis, Hayes, Bunting, & Masuda, 2009). In addition, a recent meta-analysis of mindfulness-based interventions for overweight and obese people showed an improvement in psychological health, eating attitudes, depression and anxiety (Rogers, Ferrari, Mosely, Lang, & Brennan, 2017). Although weight loss is important for physiological and psychological health, Robison and Carrier (2004) advocate a movement called "Health at Every Size" which campaigns against dieting in favor of body weight acceptance. This movement aims to support people to adopt practices that will improve their health and develop their resilience and coping ability against the trauma of living in a weight centered society (O'Hara & Taylor, 2014).

- Finally, negative attitudes and behaviors towards obese individuals should be removed from society through

promoting legislation to prohibit weight-based discrimination. The current study showed that the controlling and pressuring messages present in social obesity discourse thwart psychological needs and lead to amotivation or controlled regulations/orientations which are associated with negative cognitive-affective (e.g., anxiety) and behavioral (e.g., giving up diet and PA regimens and binge eating) outcomes. This situation affects more women than men, not only because they have higher physiological levels of adiposity, but also because there is a stronger social emphasis on them in relation to their appearance (Garret, 2004). This hegemonic obesity discourse must be challenged and anti-stigma messages must be spread throughout society if we are to help obese individuals and prevent further increases in the prevalence of obesity. In this direction, MacLean et al. (2009) suggested a number of recommendations for public health obesity interventions including (1) an evaluation of the social impact of existing interventions on stigma, (2) providing stigma-reduction training for health care professionals, (3) screening public health communication messages for stigmatizing content, (4) seeking perspectives from obese people in efforts to identify solutions to stigmatizing programs, and (5) ensuring consistent implementation of non-stigmatizing messages.

Study 3

Regarding Study 3 which aimed analyzing the physical and, mainly, psychosocial benefits of participation in a six-month exercise program grounded on SDT of post-bariatric surgery patients, we can conclude that:

- As intrinsic motivation and well-internalized extrinsic motivations (integrated and identified) are the bases for autonomous behavior (Deci & Ryan, 2000; Teixeira, Carraça et al., 2012; Wilson et al. , 2008), it is desirable offering PA programs based on strategies which allow individuals to feel full sense of volition and choice, effectiveness, connectedness and coherence. In this sense, to foster autonomy, health care professionals should adopt some strategies like acting democratically and positively at any moment, a part from helping patients to feel participant through taking their opinions and suggestions into account. To promote competence, professionals should help participants to develop realistic short and long term goals, which allow them be aware of their progress and improvements. Moreover, professionals should also make exercise worthwhile per se, not only centering it on the person's preferences, but also not setting inflexible boundaries or contingencies for success or failure (Teixeira, Carraça et al., 2012). Knowledge acquisition about techniques, methods and types of PA should be an aim of any program, not only to reach autonomous exercisers, in

and out the program, but to let them fell competence about the acquisition of new skills. To promote relatedness, professionals should treat patients with closeness, understanding and affectivity, and promote warm, close and supporting relationships between the group participants.

- Including new activities and games during the PA programs could be another resource to promote intrinsic motivation. Novelty has been a cornerstone of the PA program of this study, and depending on participants comments, it had a very important impact on intrinsic motivation. This direct impact of novelty on autonomous motivation could merit special attention in future studies because it may be a basic psychological need (González-Cutre, Sicilia, Sierra, Ferriz, & Hagger, 2016). The inclusion of sessions to avoid routine with contents as spinning, dance, aquatic training, trekking, etc., was a very important strategy that influenced patients' motivation and could be related to exercise adherence.
- Professionals should also emphasize health (rather than weight or appearance) as the primary motivator in bariatric patients, as it promotes more autonomous regulations (e.g., identified) for PA participation (Ingledew, Markland, & Ferguson, 2009). Literature has shown that identified regulation predicts initial/short-term PA adoption more strongly (Teixeira, Carraça et al., 2012) and correlates more with frequent PA behavior (Wilson et al., 2012) than intrinsic motivation. However, participants' non-autonomous reasons (e.g., weight loss or attractiveness),

which promote controlled regulations (e.g., introjected and external) (Ingledew et al., 2009) should not be disregarded automatically, as literature shows they may be predominant in populations with obesity attempting to lose weight (Pearson & Hall, 2013) and may catalyze PA initiation (Hancox et al., 2015; Silva et al., 2011; Silva, Markland et al., 2010), mainly in women, before participants can begin to endorse the performance of PA towards more autonomous and enjoyable commitments (Pearson & Hall, 2013; Teixeira, Carraça et al., 2012) in a need-supportive context. In any case, health campaigns or PA programs should avoid excessive controlling messages and turn expressions like "should / must / ought to exercise against obesity" into expressions like "want to / enjoy exercise for health", presenting exercise as a positive experience rather than a simple attempt to change behavior (Silva, Markland et al., 2010).

- It would be very useful to introduce these supervised programs in earlier stages before bariatric surgery, as pre-bariatric patients who become aware of exercise benefits and become confident doing exercise are more likely to participate in PA after surgery (Wouters, Larsen, Zijlstra, Van Ramshorst, & Geenen, 2011). Likewise, these programs should be long enough to produce internalization of the exercise behavior on the long-term, as we have identified many PA withdrawals in our participants one year after the end of the program. Self-help groups of bariatric patients

could be an interesting tool to keep a safe environment in which getting support and understanding, and discussing challenges to stay in the healthy track, as social support may make the difference for PA participation (Grave et al., 2011; Peacok & Zizzi, 2011; Zabatiero et al., 2016) and for well-being after surgery (Ogle, Park, Damhorst, & Bradley, 2015).

- For these reasons, public investments in the development of PA programs, designed and supervised by professionals to encourage the adoption of PA as a healthy behavior, are fundamental not only for individuals undergoing bariatric surgery, but also for the general population.

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10. Conclusiones generales y recomendaciones

Una vez presentados los tres estudios incluídos en la presente tesis, es hora de analizar las contribuciones y conclusiones más relevantes a las que hemos llegado.

Estudio 1

Gracias a la percepción retrospectiva y subjetiva de los participantes, hemos identificado múltiples factores que condicionaron su estilo de vida sedentario y sus malos hábitos alimenticios, y que les llevaron a la obesidad mórbida. También se ha descrito el continuo sufrimiento de los participantes en su convivencia con la obesidad a lo largo de sus vidas, con intentos fallidos de perder peso a través de múltiples dietas y AF, y la consecuente sensación de fracaso.

En relación al estilo de vida sedentario, los participantes percibían muchas barreras que les impedían realizar AF:

- Algunas de ellas no estaban específicamente relacionadas con la obesidad, como la falta de tiempo, bajo nivel económico y falta de motivación. Para combatir la falta de tiempo, serían deseables horarios de trabajo más compatibles con la vida personal y de ocio. Promocionar la AF en el trabajo también sería interesante, ofreciendo descansos activos en el horario de trabajo y ofreciendo áreas para realizer AF en las intalaciones de las compañías. Las barreras económicas podrían reducirse a través de la oferta de programas de educación en salud para pacientes obesos, incluyendo contenidos que promuevan que puedan hacer

ejercicio saludable autónomamente sin la necesidad de comprar equipamientos caros. Otra medida podría ser la oferta, por el sistema público de sanidad, de programas de AF de bajo coste supervisados por doctores y dirijidos por profesionales de ciencias de la actividad física y del deporte. En este sentido, estudios anteriores indican que la inversión en la promoción de AF puede reducir el coste económico de los sistemas de salud (Kruk, 2014). Esta educación para la salud y estos programas de AF deberían de incluir un entrenamiento motivacional de modo que los pacientes estén motivados para ser activos a largo plazo. Los profesionales encargados de estos programas deberían ser también formados respecto a las necesidades y caracterisiticas especiales de la población con obesidad.

- Otras barreras para la práctica de AF estaban asociadas a la propia obesidad, como dolor, mala condición física, vergüenza a la hora de mostrar su cuerpo en público, e instalaciones para la práctica de AF no inclusivas para la población obesa. Los pacientes obesos deberían saber que realizar AF es crucial para romper el círculo vicioso de "mala condición física – inactividad – peor condición física". Este argumento debería ser incluído en los mensajes difundidos en las intervenciones para la promoción de la AF, aunque esta población debería saber que necesitan ser aconsejados por profesionales cualificados para realizar ejercicio de forma individualizada, correcta y saludable.

Además, las intervenciones para fomentar la práctica de AF deberían centrarse en la promoción de la salud, del bienestar y de comportamientos saludables, evitando focalizarse excesivamente en el control del peso (Jiménez-Loaisa et al., 2015). Esto podría ser útil para reducir la preocupación de los pacientes por la apariencia física, reforzar su autoestima, y reducir la sensación de vergüenza al realizar AF delante de otros. En este sentido, es también necesario garantizar contextos de AF inclusivos en los que los participantes se puedan sentir respetados por las personas encargadas de la actividad y por los otros participantes. Las instalaciones deportivas deberían respetar diseños específicos y contener estructuras físicas que favorezcan la privacidad de los pacientes en caso de que tengan algún complejo corporal y no quieran ser observados por otros deportistas (Jiménez-Loaisa et al., 2015). Por ejemplo, sería deseable la disponibilidad de duchas individuales o piscinas cerradas a observadores externos.

En lo referente a sus malos hábitos alimenticios, los participantes reconocieron haber seguido una dieta insalubre durante muchos años de su vida, y haber comido excesiva y compulsivamente. Sin embargo, como en el caso del estilo de vida sedentario, el interés de este estudio reside en tratar de comprender los factores que influyen en este tipo de comportamientos alimentarios:

- La educación alimentaria recibida desde la familia ha sido identificada como un imporante factor de influencia sobre la mala alimentación de los participantes en este estudio. Las estrategias para la prevención de la obesidad deberían prestar especial atención a este aspecto. Los centros de salud debería promover cursos sobre educación para la salud dirigidos a familias con especial carencia de conocimientos sobre alimentación saludable. La escuela puede jugar también un papel muy importante en la prevención de la obesidad y de dietas no saludables desde la niñez. Otro factor relatado fue la falta de tiempo para preparar comida saludable. Un reajuste de los horarios de trabajo para hacerlos más compatibles con la vida familiar podría paliar este problema. Además, la industria alimentaria debería de seguir investigando sobre la disponibilidad de más comida rápida saludable.
- Los resultados de este estudio también dan luz sobre los diversos tipos de problemas y acontecimientos vitales que pueden estar detrás de la mala alimentación de personas con obesidad mórbida (problemas familiares, pérdida de una persona amada, discusiones o disputas, abuso sexual en la niñez). Intervenciones psicológicas tempranas para tratar problemas psicológicos (baja autoestima, ansiedad, y depresión) que pueden llevar a comer emocionalmente o para afrontar el estrés, deberían ser parte de las estrategias para la prevención de la obesidad.

- Otro factor que influye sobre la AF y la alimentación de los participantes, fue su sufrimiento siguiendo dietas y los intentos fallidos por perder peso a lo largo de sus vidas. Este largo proceso fallido de control y restricción contribuyó a su estrés y al abandono deliberado de los comportamientos dirigidos al mantenimiento del peso. En este sentido, las personas con obesidad mórbida deberían comprender que cambios específicos en la dieta y en los hábitos de actividad física por periodos de tiempo puntuales no tienen sentido. Para la prevención y el tratamiento de la obesidad son necesarios cambios reales en el estilo de vida. Estos cambios en la dieta y en la AF podrían ser más exitosos si los sujetos estuvieran más centrados y orientados hacia la mejora de la salud y del bienestar, y menos hacia la pérdida de peso. Así mismo, estos cambios en el estilo de vida podrían tener más éxito si se produjesen de forma conjunta. La participación en AF puede ayudar a pacientes obesos a reducir su peso con menos restricciones en el consumo de calorías (Moya et al., 2014), y puede ser útil para reducir problemas emocionales y mejorar la salud mental (King et al., 2013). El apoyo de profesionales de la salud, parejas sentimentales, familia, amigos, y otros pacientes con obesidad mórbida puede ser de vital importancia para conseguir estos cambios en el estilo de vida y reducir el riesgo de abandono de la AF o de recurrir a la comida para mitigar el estrés. En este sentido, sería interesante que los doctores fueran formados en técnicas para la adopción de comportamientos saludables

para motivar a los pacientes durante el tratamiento de la obesidad, en lugar de promover sentimientos de fracaso como algunos pacientes explicaron.

- Los participantes en este estudio reconocieron que eran físicamente inactivos y que mantuvieron una alimentación no saludable durante muchos años de sus vidas, llegando a una situación de obesidad mórbida. Sin embargo, aunque la responsabilidad individual en los orígenes de la obesidad mórbida es evidente, este estudio describe diversos factores educacionales, psicológicos y sociales, así como sucesos vitales traumáticos, que pueden influir en la aparición y el mantenimiento de estos comportamientos. Esta información podría ser de ayuda para comprender el origen de la obesidad mórbida y diseñar estrategias para su prevención o tratamiento desde una perspectiva más holística, sensible y respetuosa. Esta visión comprensiva es necesaria en una sociedad que tiende a considerar a las personas con obesidad mórbida como vagos, irresponsables y culpables de sus problemas de salud (Gard, 2011).

Estudio 2

Este estudio pretendía explorar las experiencias de individuos que viven con obesidad mórbida desde la perspectiva de la TAD. Supone una importante contribución a nuestra comprensión de los factores personales y sociales que frustran la satisfacción de las necesidades psicológicas básicas en esta población, así como de las consecuencias negativas a nivel cognitivo, afectivo, y

comportamental resultantes de dicha frustración, y su impacto en la vida diaria. Podemos aportar las siguientes conclusiones:

- Es importante tener en consideración los factores personales para lograr un conocimiento más completo sobre la frustración de las necesidades psicológicas básicas. Nuestros resultados ilustran cómo sufrir obesidad mórbida puede provocar experiencias de frustración de estas necesidades, no sólo como consecuencia del contexto social estigmatizador y controlador (Bartholomew et al., 2011; Vansteenkiste y Ryan, 2013), sino también como consecuencia de las limitaciones personales asociadas con el estado de obesidad mórbida. Estos datos podrían ayudar a interpretar mejor la vida de las personas obesas, para desarrollar estrategias sociales y motivacionales que mejoren su calidad de vida.
- Los resultados recientes deberían ser utilizados para favorecer estilos de vida eudaimónicos a través del desarrollo de estrategias basadas en la mejora de la calidad de vida de los individuos que viven con obesidad mórbida. Por ejemplo, es más probable que las personas obesas se adhieran a dietas o programas de AF cuando los profesionales de la salud y sus otros significativos adoptan estrategias psicológicas y comportamientos que favorecen la satisfacción de las necesidades psicológicas básicas y comportamientos más autónomos. Los profesionales de la salud deberían tratar a las personas con obesidad mórbida con cercanía y comprensión, y ayudarles a fijarse objetivos

realistas a corto y medio plazo. Deberían también poner el foco en la importancia de la mejora de la salud como motivación principal para la modificación del comportamiento (más que en mensajes que enfaticen conseguir un peso ideal), pues así es más probable fomentar regulaciones más autónomas (e.g., identificada) para la pérdida de peso y la práctica de AF. En este sentido, la entrevista motivacional se ha sugerido como una estrategia eficaz para el cambio de hábitos alimenticios y para la reducción del índice de masa corporal (Saffari, Pakpour, Mohammadi-Zeidi, Samadi, y Chen, 2014). De hecho, la entrevista motivacional ha sido aplicada ya desde la perspectiva de la TAD (Teixeira, Silva et al., 2012). Cuando los individuos asumen completamente los objetivos de pérdida de peso y, por tanto, se sienten autónomos y competentes en su consecución, es más probable que sus esfuerzos conduzcan a un cambio comportamental de larga duración (Teixeira, Carraca et al., 2012). Por tanto, es vital que entendamos y nos ocupemos tanto de los factores personales como de los situacionales que frustran la satisfacción de las necesidades psicológicas básicas y socavan la internalización de comportamientos relacionados con la salud que son importantes para el control del peso.

- Los individuos que sufren obesidad mórbida deberían ser apoyados en el desarrollo de estrategias de adaptación y afrontamiento de las limitaciones personales y la estigmatización social asociadas a su condición y que

frustran las necesidades psicológicas básicas (e.g., para que no internalicen estereotipos negativos relativos al peso). Por ejemplo, usar un discurso positivo hacia uno mismo (para facilitar el sentimiento de competencia) y buscar apoyo social (para favorecer el sentimiento de aceptación y relación positiva) son comportamientos que han sido asociados a un ajuste psicológico más saludable (Puhl y Brownell, 2006). En este sentido, los grupos de auto-ayuda podrían ser un instrumento importante para las personas que sufren obesidad mórbida, ya que les permitiría compartir preocupaciones y problemas comunes, y recibir apoyo de otros. Aprender a aceptarse a uno mismo y a usar técnicas de mindfulness (atención plena, consciencia del momento presente) podría estar relacionado con la satisfacción de las necesidades psicológicas básicas (Chang, Huang, y Lin, 2015), disminuir la probabilidad de estrés psicológico y facilitar resultados en la pérdida de peso y, por tanto, mejorar la calidad de vida (Lillis, Hayes, Bunting, y Masuda, 2009). Además un meta-análisis reciente sobre intervenciones basadas en mindfulness con personas con sobrepeso y obesidad, mostró una mejora en la salud psicológica, en la actitud hacia la alimentación, y en los niveles de depresión y ansiedad (Rogers, Ferrari, Mosely, Lang, y Brennan, 2017). Aunque la pérdida de peso es importante para la salud fisiológica y psicológica, Robison y Carrier (2004) abogan por un movimiento llamado “Health at Every Size” (salud con cualquier talla) que se muestra a

favor de la aceptación del peso corporal, y en contra de las dietas. Este movimiento pretende apoyar a las personas para que adopten prácticas que mejoren su salud y desarrollen su resiliencia y su habilidad de afrontamiento ante el trauma de vivir en una sociedad centrada en el peso (O'Hara y Taylor, 2014).

- Finalmente, los comportamientos y actitudes negativas hacia las personas obesas deberían ser eliminados de la sociedad a través de la promoción de una legislación que prohiba la discriminación por razones de peso. Este estudio muestra cómo los mensajes de presión y control presentes en el discurso social relativo a la obesidad, frustran las necesidades psicológicas básicas y propician la desmotivación o regulaciones/orientaciones hacia el control que se asocian con consecuencias negativas a nivel cognitivo-afectivo (e.g., ansiedad) y comportamental (e.g., el abandono de dietas y programas de AF, o los atracones). Esta situación afecta más a las mujeres que a los hombes, no sólo porque tienen niveles más altos de adiposidad, sino porque existe un énfasis social más fuerte sobre ellas en relación a su apariencia (Garret, 2004). Si queremos ayudar a las personas con obesidad y evitar más incrementos en la prevalencia de la misma, debemos enfrentarnos a este discurso hegemónico relativo a la obesidad y difundir en la sociedad mensajes contra la estigmatización. En esta dirección, MacLean et al. (2009) sugirieron unas cuantas recomendaciones en el caso de intervenciones para el

fomento de la salud pública relativas a la obesidad: (1) una evaluación del impacto social de las intervenciones existentes en relación al estigma, (2) facilitar a los profesionales de la salud un entrenamiento en reducción del estigma, (3) examinar el contenido estigmatizador que pudiesen comunicar los mensajes referentes a la salud pública, (4) tener en cuenta la perspectiva de las personas obesas para identificar soluciones a programas que fomentan la estigmatización, y (5) asegurar la implementación consistente de mensajes que no estigmaticen.

Estudio 3

En relación al Estudio 3 que pretendía analizar los beneficios físicos y, principalmente, psicosociales de la participación en un programa de AF de seis meses de duración y basado en la TAD de pacientes intervenidos de cirugía bariátria, podemos concluir que:

- Como la motivación intrínseca y las motivaciones extrínsecas bien internalizadas (integrada e identificada) son básicas para el comportamiento autónomo (Deci y Ryan, 2000; Teixeira, Carraça et al., 2012; Wilson et al., 2008), es conveniente ofrecer programas de AF basados en estrategias que permitan a los individuos tener sensaciones de voluntad y elección, efectividad, conexión y coherencia. En este sentido, para fomentar la sensación de autonomía, los profesionales de la salud deberían adoptar algunas estrategias como actuar democrática y positivamente en todo

momento, además de ayudar a los participantes a que se sientan partícipes teniendo en cuenta sus opiniones y sugerencias. Para fomentar el sentimiento de competencia, los profesionales deberían ayudar a los participantes a fijarse objetivos realistas a corto y largo plazo, que les permitan darse cuenta de su progreso y mejora. Además, los profesionales deberían favorecer que la AF sea interesante en sí misma, no sólo orientándola hacia las preferencias del individuo, sino además no estableciendo límites o consecuencias inflexibles del éxito o del fracaso (Teixeira, Carraça et al., 2012). La adquisición de conocimientos sobre técnicas, métodos y tipos de AF debería ser una finalidad de cualquier programa, no solo para conseguir deportistas autónomos, dentro y fuera del programa, sino para que se sientan competentes en relación a la adquisición de nuevas habilidades. Para fomentar la sensación de relación positiva con los demás, los profesionales deberían tratar a los pacientes con cercanía, comprensión y cariño, y favorecer relaciones cálidas, cercanas y de apoyo entre los participantes del grupo.

- Otro recurso para favorecer la motivación intrínseca podría ser incluir actividades y juegos nuevos durante el programa de AF. La novedad ha sido una de las piedras angulares del programa de AF de este estudio, y según los comentarios de los participantes, tuvo un impacto muy importante sobre la motivación intrínseca. Este impacto directo de la novedad sobre la motivación autónoma podría merecer una atención

especial en futuros estudios, pues podría tratarse de una necesidad psicológica básica (González-Cutre, Sicilia, Sierra, Ferriz, y Hagger, 2016). La inclusión de sesiones para evitar la rutina mediante contenidos como el spinning, el baile, entrenamiento en el agua, senderismo, etc., fue una estrategia muy importante que influyó en la motivación de los participantes y podría estar relacionada con la adherencia al ejercicio.

- Los profesionales de la salud deberían también enfatizar la salud (más que el peso o la apariencia física) como el motivador principal en pacientes bariátricos, pues favorece regulaciones más autónomas (e.g., identificada) hacia la práctica de AF (Ingledew, Markland, y Ferguson, 2009). Algunos estudios han mostrado que la regulación identificada predice en mayor medida la práctica de AF a corto plazo (Teixeira, Carraça et al., 2012) y correlaciona más con la práctica de AF frecuente (Wilson et al., 2012) que la motivación intrínseca. Sin embargo, los objetivos no autónomos de los participantes (e.g., pérdida de peso o búsqueda del atractivo), que promueven regulaciones controladas (e.g., introyectada y externa) (Ingledew et al., 2009) no deberían ser descartados automáticamente, pues los estudios muestran que podrían ser predominantes en personas con obesidad que intentan perder peso (Pearson y Hall, 2013), y podrían catalizar el inicio de la práctica de AF (Hancox et al., 2015; Silva et al., 2011; Silva, Markland et al., 2010), principalmente en mujeres, antes de que los

participantes puedan dirigir la práctica de AF hacia compromisos más autónomos y de disfrute (Pearson & Hall, 2013; Teixeira, Carraça et al., 2012) en un contexto que facilite la satisfación de las necesidades psicológicas básicas. En cualquier caso, las campañas de salud o los programas de AF deberían evitar mensajes excesivamente controladores y transformar expresiones como "deberías / debes / tienes que hacer AF para combatir la obesidad" en expresiones como "elegir / disfrutar de la AF para estar más saludable", presentando el ejercicio físico como una experiencia positiva más que como un simple intento de cambiar el comportamiento (Silva, Markland et al., 2010).

- Sería muy útil introducir estos programas supervisados en etapas tempranas previas a la cirugía bariátrica, pues se ha demostrado que los sujetos pre-bariátricos que son conscientes de los beneficios de la AF y ganan confianza en su práctica, es más probable que realicen ejercicio después de la cirugía (Wouters, Larsen, Zijlstra, Van Ramshorst, y Geenen, 2011). Así mismo, estos programas deberían ser suficientemente duraderos como para favorecer la internalización de la práctica de AF a largo plazo, pues hemos identificado muchos abandonos del ejercicio en nuestros participantes un año después de la finalización del programa. Los grupos de autoayuda de pacientes bariátricos podrían ser un instrumento interesante para favorecer un contexto seguro en el que obtener apoyo y comprensión, y discutir sobre retos para permanecer en el camino saludable,

pues el apoyo social puede ser determinante para la práctica de AF (Grave et al., 2011; Peacok y Zizzi, 2011; Zabatiero et al., 2016) y para el bienestar después de la cirugía (Ogle, Park, Damhorst, y Bradley, 2015).

- Por estas razones, es fundamental la inversion pública para el desarrollo de programas de AF, diseñados y supervisados por profesionales, para favorecer la adopción de la AF como comportamiento saludable, no sólo para los individuos que reciben cirugía bariátrica, sino para la población en general.

11. Prospective research and limitations

At this point of the present PhD document we can present some prospective research or projects for the future which are derived from the 3 studies presented:

Study 1

- Future qualitative research on this topic could evaluate the process of implementation and final effects of interventions for the promotion of PA and healthy eating among people with morbid obesity. This research could be appropriate to identify the strong and weak points of different strategies, and to generate knowledge for the improvement of future interventions.

Study 2

- Previous SDT-based research has focused primarily on analyzing the effects of social-contextual factors on basic psychological needs satisfaction and has overlooked the importance of individual difference factors. It would be interesting to add personal factors in the SDT model on need satisfaction and need frustration, and that future SDT-based studies include personal variables in order to improve our knowledge about motivational processes. Likewise, it would be interesting develop similar studies with specific populations whose special personal characteristics could contribute to basic psychological needs frustration (e.g., people with disability).

- Future studies should be developed to give light about the influence of other social stereotypes or prejudices (gender, race, sexuality…) on basic psychological needs thwarting. For example, sexism could constitute another social discourse itself which promotes stereotypes and bias which could be thwarting women's basic psychological needs with negative consequences in multiple contexts.

Whilst Studies 1 and 2 provide important insight into the causes of morbid obesity formation, and into practical challenges and stigmatization/discrimination associated with living with morbid obesity, the findings are limited in that our participants discussed their past experiences (i.e., before they underwent bariatric surgery). This retrospective account could affect the accuracy of the information provided. However, participants were only one month post-surgery when they were recruited for the study and, therefore, they should not have had too much difficulty recalling their previous experiences of living with morbid obesity. On the other hand, the participants did choose to undergo bariatric surgery after having experienced previous failed obesity treatments and associated comorbidity. This may mean that our participants had developed particular relationships with their bodies and/or ways of living with the condition which differ from the experiences of people with morbid obesity who do not want to undergo bariatric surgery or even lose weight. Nevertheless, an in-depth understanding of this sub-sample, their perception about the causes of their morbid obesity formation and their experiences of psychological need frustration represents an interesting contribution

to the literature and will help to inform strategies which provide prevention or support for the increasing number of individuals who are living with the condition. Nonetheless, future studies could analyze possible differences in experiences of morbid obesity formation causes and need frustration between people with morbid obesity who want to undergo bariatric surgery and those who do not wish to receive the operation.

Study 3

- Despite of the analysis of novelty need satisfaction was not an objective of this study, the importance of variety, surprise and change regarding the "special" activities the patients carried out every Wednesday is a constant in their comments for the success of the program. For this reason, future studies could introduce novelty as another basic psychological need that influences internalization of new behaviors and behavior change. It would be interesting to develop quantitative studies which incorporate strategies like changing spaces, introducing new materials, modifying normal activities or introducing new ones (as we did in Study 3) to foster novelty and measure its influence on individual's motivation and on cognitive, affective and behavioral consequences. For example, the amount of PA is a behavioral consequence we could measure with accelerometers before, during and after implementing a PA program with strategies to promote novelty, and comparing

the results with a control group developing a normal PA program without these strategies.

An interesting limitation concerning the qualitative research approach in this study should also be recognized to take care of it in future similar studies. A longitudinal process of data analysis during the observations, in parallel to data collection, would have let observers to collect more detailed information related to the aims of this PhD dissertation and ensure data saturation.

12. References

Alley, D. E., & Chang V. W. (2007). The changing relationship of obesity and disability, 1988–2004. *American Medical Asociation, 298,* 2020-2027.

American Psychiatric Association. (2013*). Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: APA.

Anderson, B., Rafferty, A. P., Lyon-Callo, S., Fussman, C., & Imes, G. (2011). Fast-food consumption and obesity among Michigan adults. *Preventing Chronic Disease, 8(4),* A71.

Anderson, D. A., & Wadden, T. A. (2004) Bariatric surgery patients' views of their physicians' weight-related attitudes and practices. *Obesity Research, 12,* 1587-1595.

Atlantis, E., & Baker, M. (2008). Obesity effects on depression: systematic review of epidemiological studies. *International Journal of Obesity, 32,* 881-891.

Bartholomew, K. J., Ntoumanis, N., Ryan, R. M., & Thøgersen-Ntoumani, C (2011). Psychological need thwarting in the sport context: Assessing the darker side of athletic experience. *Journal of Sport and Exercise Psychology, 33,* 75-102.

Basterra-Gortari, F. J., Beunza, J. J., Bes–Rastrollo, M., Toledo, E., García–López, M. & Martínez–González, M. A. (2011).

Tendencia creciente de la prevalencia de obesidad mórbida en España: de 1,8 a 6,1 por mil en 14 años. [Increasing trend in the prevalence of morbid obesity in Spain: from 1.8 to 6.1 per thousand in 14 years]. *Revista Española de Cardiología, 64*, 424- 426.

Basu, S., McKee, M., Galea, G., & Stuckler, D. (2013). Relationship of soft drink consumption to global overweight, obesity and diabetes: A cross-national analysis of 75 countries. *American Journal of Public Health, 103*, 2071-2077.

Baumeister, R. F. (1997). Esteem threat, self-regulatory breakdown, and emotional distress as factors in self-defeating behavior. *Review of General Psychology, 1*, 145-174.

Bazeley, P., & Jackson, K. (2013). *Qualitative data analysis with NVivo*. Thousand Oaks: SAGE.

Berghöfer, A., Pischon, T., Reinhold, T., Apovian, C. M., Sharma, A. M., & Willich, S. N. (2008). Obesity prevalence from a European perspective: A systematic review. *BMC Public Health, 8,* 200.

Biddle, S. J. H., Mutrie, N., Gorely, T., & Blamey, A. (2012). Interventions for physical activity and sedentary behavior. In

G. L. Roberts & D. C. Treasure (Eds.), *Advances in motivation in sport and exercise* (3rd ed., pp. 357-386). Champaign, IL: Human Kinetics.

Bocchieri, L. E., Meana, M., & Fisher, B. L. (2002). Perceived psychosocial outcomes of gastric baipass surgery: A qualitative study. *Obesity Surgery, 12,* 781-788

Bond, D. S., Phelan, S., Wolfe, L. G., Evans, R. K., Meador, J. G., Kellum, J. M., … Wing, R. R. (2008). Becoming physically active after bariatric surgery is associated with improved weight loss and health-related quality of life. *Obesity, 17,* 78-83.

Boscatto, E. C., Duarte, M. F. S., & Gomes. M. A. (2011). Stages of behavior change and physical activity barriers in morbid obese subjects. *Brazilian Journal of Kinanthropometry and Human Performance, 13,* 329-334.

Brogan, A., & Hevey, D. (2009). The structure of the causal attribution belief network of patients with obesity. *British Journal of Health Psychology, 14,* 35-48.

Braun, M., Schell, J., Siegfried, W., Müller, M. J., & Ried, J. (2014). Re-entering obesity prevention: a qualitative-

empirical inquiry into the subjective aetiology of extreme obese adolescents. *BMC Public Health, 14*, 977.

Caperchione, C. M., Vandelanotte, C., Kolt, G. S, Duncan, M., Ellison, M., George, E., & Mummery, W. K. (2012). What a man wants: understanding the challenges and motivations to physical activity participation and healthy eating in middle-aged Australian men. *American Journal of Men's Health, 6*, 453–461.

Carr, D., & Friedman, M. A. (2005). Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. *Journal of Health and Social Behavior, 46,* 244-259.

Carr, D., & Friedman, M. A. (2006). Body weight and the quality of interpersonal relationships. *Social Psychology Quarterly, 69*, 127-149.

Chang, J. H., Huang, C. L., & Lin, Y. C. (2015). Mindfulness, basic psychological needs fulfillment, and well-being. *Journal of Happiness Studies, 16,* 1149-1162.

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L, Deci, E. L., Van der Kapp-Deeder, J., … Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need

strength across four cultures. *Motivation and Emotion, 39,* 216-236.

Cliff, K., & Wright, J. (2010). Confusing and contradictory: considering obesity discourse and eating disorders as they shape body pedagogies in HPE. *Sport, Education and Society, 15*, 221-233.

Collins, J. C., & Bentz, J. E. (2009). Behavioral and psychological factors in obesity. *The Journal of Lancaster General Hospital, 4*, 124-127.

Cooper, Z., & Fairburn, C.G. (2001). A new cognitive behavioural approach to the treatment of obesity. *Behaviour Research and Therapy, 39*, 499-511.

Crandall, C. S., & Schiffhauer, K. L. (1998). Anti-fat prejudice: Beliefs, values, and American culture. *Obesity Research, 6*, 458-460.

Davin, S. A., & Taylor, N. M. (2009). Comprehensive review of obesity and psychological considerations for treatment. *Psychology, Health & Medicine, 14,* 716-725.

De Vogli, R., Kouvonenb, A., & Gimenoc, D. (2014). The influence of market deregulation on fast food consumption

and body mass index: a cross-national time series analysis. *Bulletin of the World Health Organization, 92*, 99-107A

Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 13., pp. 39-80). New York: Academic Press.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska symposium on motivation: Vol. 38. Perspectives on motivation* (pp. 237-288). Lincoln, NE: University of Nebraska Press.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behaviour. *Psychological Inquiry, 11,* 227-268.

Edmunds, J., Ntoumanis, N., & Duda, J. (2007). Adherence and well-being in overweight and obese patients referred to an exercise on prescription scheme: A self-determination theory perspective. *Psychology of Sport and Exercise, 8,* 722-740.

Egberts, K., Brown, W. A., Brennan, L., & O'Brien, P. E. (2012). Does exercise improve weight loss after bariatric surgery? A systematic review. *Obesity Surgery, 22,* 335-341.

Elfhag, K., & S. Rossner (2005). Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. *Obesity Reviews, 6*, 67-85.

Elkins, G., Whitfield, P., Marcus, J., Symmonds, R., Rodríguez, J., & Cook, T. (2005). Noncompliance with behavioral recommendations following bariatric surgery. *Obesity Surgery*, *15*, 546-551.

Fontaine, K. R., Faith, M. S., Allison, D. B., & Cheskin, L. J. (1998). Body weight and health care among women in the general population. *Archives of Family Medicine, 7*, 381-384.

Forbush, S. W., Nof, L., Echternach, J., & Hill, H. (2011). Influence of activity on quality of life scores after RYGBP. *Obesity Surgery*, *21*, 1296-1304.

Gard, M. (2011). Truth, belief and the cultural politics of obesity scholarship and public health policy. *Critical Public Health, 21*, 37-48.

Gard, M. & Wright, J. (2001). Managing uncertainty: obesity discourses and physical education in a risk society. *Studies in Philosophy and Education, 20,* 535- 549.

Garret, R. (2004). Gendered bodies and physical identities. In J. Evans, B. Davies, & J. Wright (Eds.), *Body knowledge and control. Studies in the sociology of physical education and health* (pp. 140-156). London: Routledge.

González, C. A., Pera, G., Quirós, J. R., Lasheras, C., Tormo, M. J., Rodríguez, M., … Agudo, A. (2000). Types of fat intake and body mass index in a Mediterranean country. *Public Health Nutrition, 3,* 329-336.

González-Cutre, D., Sicilia, A., Sierra, A. C., Ferriz, R., & Hagger, M. S. (2016). Understanding the need for novelty from the perspective of self-determination theory. *Personality and Individual Differences, 102,* 159-169.

Grave, R. D., Calugi, S, Centis, E., El Ghoch, M. & Marchesini, G. (2011). Cognitive-behavioral strategies to increase the adherence to exercise in the management of obesity. *Jounal of Obesity, 2011,* 1-11.

Green, J., & Thorogood, N. (2004). *Qualitative methods for health research*. London: Sage.

Greenberg, B. S., Eastin, M., Hofschire, L., Lachlan, K., & Brownell, K. D. (2003). Portrayals of overweight and obese individuals on commercial television. *American Journal of Public Health, 93,* 1342-1348.

Greenberg, I., Perna, F., Kaplan, M., & Sullivan, M. A. (2005). Behavioral and psychological factors in the assessment of obesity surgery patients. *Obesity Research, 13,* 244-249.

Greener, J., Douglas, F., & Teiklingen, E. (2010). More of the same? Conflicting perspectives of obesity causation and intervention amongst overweight people, health professionals and policy makers. *Social Science & Medicine, 70,* 1042-1049.

Grucza, R. A., Przybeck, T. R., & Cloninger, C. R. (2007). Prevalence and correlates of binge eating disorder in a community sample. *Comprehensive Psychiatry, 48,* 124-131.

Gustafson, T. B., & Sarwer, D. B. (2004). Childhood sexual abuse and obesity. *Obesity Reviews, 5,* 129-135.

Hancox, J., Ntoumanis, N., Thogersen-Ntoumani, C., & Quested, E. (2015). Self-determination theory (SDT). In J. Middelkamp (Ed.), *Essentials of motivation & behaviour change* (pp. 68-85). Brussels: EuropeActive & BlackBoxPublishers.

Haslam, D. W., & James, W. P. (2005). Obesity. *Lancet, 366,* 1197-1209.

Hill, J. O., Wyatt, H. R., & Peters, J. C. (2012). Energy balance and obesity. *Circulation, 126,* 126-132.

Himes, S. M., & Thompson, J. K. (2007). Fat stigmatization in television shows and movies: a content analysis. *Obesity, 15,* 712-718.

Hsieh, H., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15,* 1277-1288.

Ingledew, D. K. Markland, D., & Ferguson, E. (2009). Three levels of exercise motivation. *Applied Psychology: Health and Well-being, 1,* 336-355.

Jacobi, D., Ciangura, C., Covet, C., & Oppert, J. M. (2011). Physical activity and weight loss following bariatric surgery. *Obesity, 12,* 366-377.

Järvholm, K., Olbers, T., Marcus, C., Mårild, S., Gronowitz, E., Friberg, P., Johnsson, P., & Flodmark, C. (2011). Short-term psychological outcomes in severely obese adolescents after bariatric surgery. *Obesity, 20,* 318-323.

Jiménez-Loaisa, A., Beltrán-Carrillo, V. J., González-Cutre, D., & Cervelló, E. (2015). Psychosocial effects of surgery and

physical activity in bariatric patients: A systematic review. *European Journal of Human Movement, 35,* 12-33.

Jinks, C., Jordan, K., & Croft, P. (2006). Disabling knee pain-another consequence of obesity: results from a prospective cohort study. *BMC Public Health, 6,* 258.

Kalarchian, M. A., Marcus, M. D., Levine, M. D., Courcoulas, A. P., Pilkonis, P. A., Ringham, R. M., … Rofey, D. L. (2007). Psychiatric disorders among bariatric surgery candidates: Relationship to obesity and functional health status. *American Journal of Psychiatry, 164,* 328-334.

Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology, 65,* 410-422.

Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Society for Personality and Social Psychology, 22,* 280-287.

Katzmarzyk, P. T., & Mason, C. (2006). Prevalence of class I, II and III obesity in Canada. *Canadian Medical Association Journal, 174,* 156-157.

King, W. C., Kalarchian, M. A., Steffen, K. J., Wolfe, B. M., Elder, K. A., & Mitchell, J. E. (2013). Associations between physical activity and mental health among bariatric surgical candidates. *Journal of Psychosomatic Research, 74*(2), 161-169.

Kolotkin, R. L., Revis, E. S., Kirkley, B. G., & Janick, L. (1987). Binge eating in obesity: associated MMPI characteristics. *Journal of Consulting and Clinical Psychology, 55,* 872-876.

Kruk, J. (2014). Health and economic costs of physical inactivity. *Asian Pacific Journal of Cancer Prevention, 15,* 7499-7503.

Kruseman, M., Leimgruber, A., Zumbach, F., & Golay, A. (2010). Dietary, weight, and psychological changes among patients with obesity, 8 years after gastric bypass. *Journal of the American Dietetic Association, 110,* 527-534.

Lather, J. D., & Stunkardt, A. J. (2003). Getting worse: the stigmatization of obese children. *Obesity Research, 11,* 452-456.

Leone, L. A., & Ward, D. S. (2013). A mixed methods comparison of perceived benefits and barriers to exercise between obese and nonobese women. *Journal of Physical Activity and Health, 10,* 461-469.

Lewis, M., & Sutton, A. (2011). Understanding exercise behavior: examining the interaction of exercise motivation and personality in predicting exercise frequency. *Journal of Sport Behavior, 34,* 82-97.

Lewis, S., Thomas, S. L., Blood, R. W., Castle, D. J., Hyde, J., & Komesaroff, P. A. (2011). How do obese individuals perceive and respond to the different types of obesity stigma that they encounter in their daily lives? A qualitative study. *Social Science & Medicine, 73,* 1349-1356.

Li, Y., Lan, J., & Ju, C. (2015). Self-esteem, gender and the relationship between extraversion and subjective well-being. *Social Behavior and Personality, 43,* 1243-1254.

Lillis, J., Hayes, S. C., Bunting, K., & Masuda, A. (2009). Teaching acceptance and mindfulness to improve the lives of the obese: a preliminary test of a theoretical model. *Annals of Behavioral Medicine, 37,* 58-69.

Ling, C. G., Brotherton, S. S., & Smith, S. O. (2009). Review of the literature regarding gait and class III obesity. *Journal of Exercise Physiology Online, 12(*5), 51-61.

Livhits, M., Mercado, C., Yermilov, I., Parikh, J. A., Dutson, E., Mehran, A., … Gibbons, M. M. (2010). Exercise following

bariatric surgery: systematic review. *Obesity Surgery, 20,* 657-665.

Luppino, F. S., de Wit, L. M., Bouvy, P. F., Stijnen, T., Cuijpers, P., Penninx, B. W. J. H., & Zitman, F. G. (2010). Overweight, obesity, and depression. A systematic review and meta-analysis of longitudinal studies. *Archives of General Psychiatry, 67,* 220-229.

Ma, J., & Xiao, L. (2010). Obesity and depression in US women: Results from the 2005-2006 national health and nutritional examination survey. *Obesity, 18,* 347-353.

MacLean, L., Edwards, N., Garrad, M., Sims-Jones N, Clinton, K., & Ashley, L. (2009). Obesity, stigma, and public health planning. *Health Promotion International, 24,* 88–93.

McCarthy, L. H., Bigal, M. E., Katz, M., Derby, C., & Lipton, R. B. (2009). Chronic pain and obesity in the elderly: Results from the Einstein aging study. *Journal of the American Geriatrics Society, 57,* 115-119.

Magro, D. O., Genoleze, B., Delfini, R., Pareja, B. C., Callejas, F., & Pareja, J., C. (2008). Long-term weight regain after gastric bypass: A 5-year prospective study. *Obesity Surgery, 18,* 648-651.

Markland, D., & Ingledew, D. K. (2007). Exercise participation motives: A self-determination theory perspective. In M. S. Hagger & L. D. Chatzisarantis (Eds.), *Intrinsic motivation and self-determination in exercise and sport* (pp. 23-34). Champaign, IL: Human Kinetics.

Martín-Albo, J., Núñez, J., Domínguez, E., León, J., & Tomás, J. M. (2012). Relationships between intrinsic motivation, physical self-concept and satisfaction with life: A longitudinal study. *Journal of Sport Sciences, 30,* 337-347.

Mays, N., & Pope, C. (1995). Rigour and qualitative research. *British Medical Journal, 311,* 109-112.

Mazure Lehnhoff, R. A., Salgado Mijail, G., Valencia, A., Villarreal, P., Cobo, B., Peran, S., & Culebras, J. (2007). Ejercicio físico y cirugía bariátrica [Physical activity and bariatric surgery]. *Nutrición Hospitalaria, 22,* 397-401.

Mello, D. B., Verdini, M. L. P., Dantas, E. H. M., Giani, T. S., Ferreira, M. A., Emygdio, R. F., & Hortale, V. A. (2010). Impact of obesity on quality of life in the elderly. *Medicina Sportiva, 14(2),* 63-66.

Miller, G. D., Hale, E., & Dunla, G. (2015). Current evidence for physical activity in the bariatric surgery patient for weight loss. *Jounal of Obesity and Weight Loss Therapy, 5*, 1-9.

Moreno, J. A., López de San Román, M., Martínez Galindo, C., Alonso, N. & González-Cutre, D. (2008). Peers' influence on exercise enjoyment: A self-determination theory approach. *Journal of Sports Science and Medicine, 7,* 23-31.

Moya, M., Hernández, A., Sarabia, J. M., Sánchez-Martos, M. A., Hernández-Davó, J. L., López-Grueso, R., … Fernández-Fernández, J. (2014). Bariatric surgery, weight loss and the role of physical activity: A systematic review. *European Journal of Human Movement, 32*, 145-160.

Myers, D. G., & Diener, E. (1995). Who is happy? *Psychological Science, 6*, 10-19.

Napolitano, M. A., Papandonatos, G. D., Borradaile, K. E., Whiteley, J. A., & Marcus, B. H.(2011). Effects of weight status and barriers on physical activity adoption among previously inactive women. *Obesity, 19*, 2183-2189.

Needham, B. L., Epel, E. S., Adler, N. E., & Kiefe, C. (2010). Trajectories of change in obesity and symptoms of

depression: the CARDIA study. *American Journal of Public Health, 100,* 1040-1046.

Ng, J. Y. Y., Ntoumanis, N., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Duda, J. L., & Williams, G. C. (2012). Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science, 7*, 325-340.

Nguyen, N. T., Root, J., Zainabadi, K., Sabio, A., Chalifoux, S., Stevens, C. M., … Wilson, S. E. (2005). Accelerated growth of bariatric surgery with the introduction of minimally invasive surgery. *Archives of Surgery 140*, 1198-1202.

Nuru, H., & Mamang, F. (2015). Association between snacking and obesity in children: a review. *International Journal of Community Medicine and Public Health, 2*, 196-200.

Ogden, J., & Flanagan, Z. (2008). Beliefs about the causes and solutions to obesity: a comparison of GPs and lay people. *Patient Education and Counseling, 71*, 72–78.

Ogle, J. P., Park, J., Damhorst, M. L., & Bradley, L. A. (2015). Social support for women who have undergone bariatric surgery. *Qualitative Health Research, 26,* 176-193.

O'Hara, L., & Taylor, J. (2014). Health at Every Size: a weight-neutral approach for empowerment, resilience and peace.

International Journal of Social Work and Human Services Practice, 2(6), 272-282.

O'Reardon, J. P., Peshek, A., & Allison, K..C. (2005). Night eating syndrome: diagnosis, epidemiology and management. *CNS Drugs*, *12*, 997-1008

Osei-Assibey, G., Kyrou, I., Kumar, S., Saravanan, P., & Matyka, K. A. (2010). Self-reported psychosocial health in obese patients before and after weight loss. *Journal of Obesity, 2010,* 1-6.

Paluska, S. A., & Schwenk, T. (2000). Physical activity and mental health: current concepts. *Sports Medicine, 29,* 167-180.

Peacock, C. P., & Zizzi, S. J. (2011). An assessment of patient behavioral requirements pre- and post-surgery at accredited weight loss surgical centers. *Obesity Surgery, 21,* 1950-1957.

Pearson, E. S., & Hall, C. R. (2013). Examining body image and its relationship to exercise motivation: an 18-week cardiovascular program for female initiates with overweight and obesity. *Baltic Journal of Health and Physical Activity, 5*, 121-131.

Pfeil, M., Pulford, A., Mahon, D., Ferguson, Y., & Lewis, M. P. N. (2013). The patient journey to gastric band surgery: a

qualitative exploration. *Bariatric Surgery Practice and Patient Care, 8,* 69-76.

Piper, A. J., & Grunstein, R. R. (2010). Big breathing: the complex interaction of obesity, hypoventilation, weight loss, and respiratory function. *Journal of Applied Physiology, 108,* 199-205.

Prentice, A., & Jebb, S. (2004). Energy intake/physical activity interactions in the homeostasis of body weight regulation. *Nutrition Reviews, 62,* S98-S104.

Puhl, R. M., & Brownell, K. D. (2001). Bias, discrimination and obesity. *Obesity Research, 9,* 788-805.

Puhl, R. M., & Brownell, K. D. (2006). Confronting and coping with weight stigma: an investigation of overweight and obese adults. *Obesity, 14,* 1802-1815.

Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: Important considerations for public health. *American Journal of Public Health, 100,* 1019-1028.

Raggi, A., Sirtori, A., Brunani, A., Liuizzi, A., & Leonardi, M. (2009). Use of the ICT to describe functioning and disability in obese patients. *Disability and Rehabilitation, 31*, S153-S158.

Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin, 26*, 419-435.

Robison, J., & Carrier, K. (2004). *The spirit and science of holistic health: More than broccoli, jogging, and bottled water...More than yoga, herbs and meditation*. Indiana: Authorhouse.

Rogers, J. M., Ferrari, M., Mosely, K., Lang, C. P., & Brennan, L. (2017). Mindfulness-based interventions for adults who are overweight or obese: a meta-analysis of physical and psychological health outcomes. *Obesity Reviews, 18,* 51-67.

Rosenberger, P. H., Henderson, K. E., White, M. A., Masheb, R. M., & Grilo, C. M. (2011). Physical activity in gastric bypass patients: associations with weight loss and psychosocial functioning at 12-month follow-up. *Obesity Surgery, 21*, 1564-1569.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York: Guilford Press.

Ryan, R. M., Deci, E. L., & Grolnick, W. S. (1995). Autonomy, relatedness, and the self: Their relation to development and

psychopathology. *Developmental Psychopathology, 1,* 618-655.

Ryan, R. M., Huta, V., & Deci, E. L. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies, 9,* 139-170.

Saffari, M., Pakpour, A. H., Mohammadi-Zeidi, I., Samadi, M., & Chen, H. (2014). Long-term effect of motivational interviewing on dietary intake and weight loss in Iranian obese/overweight women. *Health Promotion Perspectives, 4,* 206-213.

Saunders, R., Johnson, L., & Teschner, J. (1998). Prevalence of eating disorders among bariatric surgery patients. *Eating Disorders, 6,* 309-317.

Sarwer, D. B., Fabricatore, A. N., Jones-Corneille, L. R., Allison, K. C., Faulconbrige, L. N., & Wadden, T. A. (2008). Psychological issues following bariatric surgery. *Primary Psychiatry, 15,* 50-55.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information, 22,* 63-75.

Shuval, K., Hebert, E. T., Siddiqi, Z., Leonard, T., Lee, S. C., Tiro, J. A., … Skinner, C. S. (2013). Impediments and facilitators to physical activity and perceptions of sedentary behavior among urban community residents: the Fair Park Study. *Preventing Chronic Disease, 10*, 130-125.

Silva, M. N., Markland, D., Carraça, E. V., Vieira, P. N., Coutinho, S. R., Minderico, C. S., … Teixeira, P. J. (2011). Exercise autonomous motivation predicts 3-year weight loss in women. *Medicine and Science in Sports and Exercise, 43*, 728-737.

Silva, M. N., Markland, D. M., Vieira, P. N., Coutinho, S. R., Carraça, E. V., Palmeira, … Teixeira, P. J. (2010). Helping overweight women become more active: Need support and motivational regulations for different forms of physical activity. *Psychology of Sport and Exercise, 11*, 591-601.

Silva, M. N., Vieira, P. N., Coutinho, S. R., Minderico, C. S., Matos, M. G., Sardinha, L. B., & Teixeira, P. J. (2010). Using self-determination theory to promote physical activity and weight control: a randomized controlled trial in women. *Journal of Behavioral Medicine, 33*, 110-122.

Sirtori, A., Brunani, A., Villa, V., Berselli, M.E., Croci, M., Leonardi, M., & Raggi, A. (2012). Obesity is a marker of

reduction in QoL and disability. *The Scientific World Journal, 2012,* 1-6.

Smoot, T. M., Xu, P., Hilsenrat, P., Kuppersmith, N. C., & Singh, K. P. (2006). Gastric bypass surgery in de United States, 1998–2002. *American Journal of Public Health, 96,* 1187-1189.

Sparkes, A. C., & Smith, B. (2014). *Qualitative research methods in sport, exercise and health. From process to product*. London: Routledge.

Spitzer, R. L., Devlin, M., Walsh, B. T., Hasin, D., Wing, R., Marcus, M., … Nonas, C. (1992). Binge eating disorder: a multisite field trial of the diagnostic criteria. *International Journal of Eating Disorders, 11*, 191-203.

Stevelos, J. & White, C. (2000). Sexual abuse and obesity. What's the link? *Obesity Action Coalition*. Retrieved from http://www.obesityaction.org/wp-content/uploads/Sexual-Abuse-and-Obesity.pdf

Strauss, J, & Ryan, R.M. (1987). Autonomy disturbances in subtypes of anorexia nervosa. *Journal of Abnormal Psychology, 96,* 254-258.

Stunkard, A. J., Faith, M. S., & Allison, K. C. (2003). Depression and obesity. *Biological Psychiatry, 54,* 330-337.

Stunkard, A. J., Grace, W. J., & Wolff, H.G. (1955). The night-eating syndrome; a pattern of food intake among certain obese patients. *American Journal of Medicine, 19,* 78-86.

Stunkard, A. J., & Wadden, T. A. (1992). Psychological aspects of severe obesity. *American Journal of Clinical Nutrition, 55,* 524S-532S.

Stunkard, M. D., & Rush, J. (1974). Dieting and depression reexamined: a critical review of reports of untoward responses during weight reduction for obesity. *Annals of Internal Medicine, 81,* 526- 533.

Sturm R. (2007). Increases in morbid obesity in the USA: 2000–2005. *Public Health, 121,* 492-496.

Sutin, A., & Zonderman, A. (2012). Depressive symptoms are associated with weight gain among women. *Psychological Medicine, 42,* 2351-2360.

Swinburn, B. E., Sacks, G., & Ravussin, E. (2009). Increased food energy supply is more than sufficient to explain the US epidemic of obesity. *American Journal of Clinical Nutrition, 90,* 1453-1456.

Teixeira, P. J., Carraça, E. V., Markland, D., Silva, M. N., & Ryan, R. M. (2012). Exercise, physical activity, and self-determination theory: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 9,* 78.

Teixeira, P. J., Carraça, E. V., Marques, M. M., Rutter, H., Oppert, J-M., De Bourdeaudhuij, I., … Brug, J. (2015). Successful behaviour change in obesity interventions in adults: a systematic review of self-regulation mediators. *BMC Medicine, 13,* 84.

Teixeira, P. J., Silva, M. N., Mata, J., Palmeira, A. L., & Markland, D. (2012). Motivation, self-determination, and long-term weight control. *International Journal of Behavioral Nutrition and Physical Activity, 9,* 22.

Thøgersen-Ntoumani, C., & Ntoumanis, N. (2006). The role of self-determined motivation in the understanding of exercise-related behaviours, cognitions and physical self-evaluations. *Journal of Sports Sciences, 24,* 393-404.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 271-360). New York: Academic Press.

Vallerand, R. J. (2007). Intrinsic and extrinsic motivation in sport and physical activity. A review and a look at the future. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 59-83) New York: John Wiley.

van Hout, G. C., Boekestein, P., Fortuin, F. A., Pelle, A. J., & Van Heck, G. L. (2006). Psychosocial functioning following bariatric surgery. *Obesity Surgery, 16,* 787-794.

van Hout, G. C. M., Fortuin, F. A. M., Pelle, A. J. M., & van Heck, G. L. (2008). Psychosocial functioning, personality, and body image following vertical banded gastroplasty. *Obesity Surgery, 18,* 115-120.

van Hout, G. C. M., van Oudheusden, I., Krasuska, A. T., & van Heck G. L. (2006). Psychological profile of candidates for vertical banded gastroplasty. *Obesity Surgery, 16*, 67-74.

Vansteenkiste. M., & Ryan, R. M. (2013). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration, 23,* 263-280.

Vartanian, L. R., & Shaprow, .J. G. (2008). Effects of weight stigma on exercise motivation and behavior: a preliminary

investigation among college-aged females. *Journal of Health Psychology, 13,* 131-138.

Vieira, P. N., Mata, J., Silva, M. N., Coutinho, S. R., Santos, T. C., Minderico, C.S., ... Teixeira, P. J. (2011). Predictors of psychological well-being during behavioral obesity treatment in women. *Journal of Obesity, 2011,* 1-8.

Vlachopoulos, S. P., & Karageorghis, C. I. (2005). Interaction of external, introjected, and identified regulation with intrinsic motivation in exercise: relationships with exercise enjoyment. *Journal of Applied Biobehavioral Research, 10,* 113-132.

Wilcox, S., Der Ananian, C., Abbott, J., Vrazel, J., Ramsey, C., Sharpe, P. A., & Brady, T. (2006). Perceived exercise barriers, enablers, and benefits among exercising and nonexercising adults with arthritis: results from a qualitative study. *Arthritis & Rheumatism, 55,* 616-627.

Wiczinski, E., Döring, A., John, J., & von Lengerke, T. (2009). Obesity and health-related quality of life: Does social support moderate existing associations? *British Journal of Health Psychology, 14,* 717-734.

Wilson, P., Mack, D., & Grattan, K. (2008). Understanding motivation for exercise: A self-determination theory perspective. *Canadian Psychology, 49,* 250-256.

Wilson, P. M., Sabiston, C. M., Mack, D. E., & Blanchard, C. M. (2012). On the nature and function of scoring protocols used in exercise motivation research: an empirical study of the behavioral regulation in exercise questionnaire. *Psychology of Sport and Exercise, 13,* 614-622.

Williams, G. C., Grow, V. M., Freedman, Z., Ryan, R. M., & Deci, E. L. (1996). Motivational predictor of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology, 70,* 115-126.

Wooley, S. C., & Garner, D. M. (1991). Obesity treatment: the high cost of false hope. *Journal of American Dietetic Association, 91*, 1248-1251.

World Health Organization (2000). *Obesity: Preventing and managing the global epidemic, WHO technical report series no. 894*. Geneva: World Health Organization.

World Health Organization. (2011). Obesity and overweight (Fact sheet No. 311). Retrieved from

http://www.who.int/mediacentre/factsheets/fs311/en/print.html

Wouters, E. J., Larsen, J. K., Zijlstra, H., Van Ramshorst, B., & Geenen, R. (2011). Physical activity after surgery for severe obesity: the role of exercise cognitions. *Obesity Surgery*, *21*, 1894-1899.

Zabatiero, J., Hill, K., Gucciardi, D. F., Hamdorf, J. M., Taylor, S. F., Hagger, M. S., & Smith, A. (2016). Beliefs, barriers and facilitators to physical activity in bariatric surgery candidates. *Obesity Surgery*, *26*, 1097-1109.

13. Appendices

Appendix 1. First interview.

1. DATOS ENTREVISTADO/A

EDAD: ¿CASADO/A?: ¿HIJOS?:
TRABAJO**:**
ACTIVIDAD FÍSICA ANTES DE EMPEZAR CON EL PROGRAMA:
TIEMPO DESDE QUE LE OPERARON:
TIEMPO EN EL PROGRAMA:
DÍAS A LA SEMANA QUE ASISTE AL PROGRAMA:

2. EFECTOS DEL PROGRAMA: Influencia en su calidad de vida

2.1. Un día te llaman por teléfono y te ofrecen participar en un programa de actividad física para personas que habéis pasado por una cirugía bariátrica. ¿Qué es lo que te anima a participar?

2.2. Tras todos estos meses en el programa de actividad física, ¿has notado mejoras en tu condición física? ¿De qué tipo (al subir escaleras, vestirse, etc.)?

2.3. Y a nivel emocional (mental, psicológico), ¿Has notado algún cambio? (indagar como se sentía antes de realizar actividad física y ahora) (¿más autoconfianza, seguridad, competencia, autonomía?)

-¿Puedes hacer más cosas solo/a que antes? ¿Te sientes más capacitado/a para desenvolverte en el día a día?

-¿Te sientes más valorado/a?

-¿Te sientes capaz de realizar todas las tareas que te proponen los monitores en las sesiones? ¿Te sientes capaz de hacer dichas tareas cada vez mejor y sin necesidad de supervisión del monitor?

2.4. ¿Crees que realizar actividad física con este grupo ha hecho mejorar tus relaciones sociales? (diferenciar entre relación social dentro y fuera del grupo) ¿Te sientes mejor contigo mismo/a?

2.5. ¿Crees que este programa ha influido en tus hábitos diarios, mejor alimentación, más actividad física fuera del programa?

2.6. ¿Has observado cambios en tu cuerpo a lo largo de estos meses? ¿Cuáles? ¿Estás más contento/a con esos cambios? ¿Crees que esos cambios físicos puedan haber influido en tu vida social? ¿Y a nivel anímico (psicológico)? (Estética)

2.7. ¿Cuál es la experiencia más positiva que has vivido desde que estás en el programa? ¿Y la más negativa?

2.8. ¿Cómo te sientes normalmente al terminar las sesiones?

3. MEJORA DEL PROGRAMA

3.1. ¿Has asistido a todas las sesiones? ¿Con qué frecuencia? ¿Qué te ha empujado a asistir cada día?

Motivaciones:

- **Motivación intrínseca:** ¿Vienes porque te lo pasas bien?
- **Regulación integrada**: ¿Crees que el ejercicio forma parte de tu vida?
- **Regulación identificada:** ¿Crees que el ejercicio es importante? ¿Para qué? ¿Tú vienes al programa por eso?
- **Regulación introyectada y externa:** ¿A veces tienes la sensación de venir para no fallar a alguien (a ti mismo, a tu familia, a nosotros)?

3.2. En las ocasiones que has faltado, ¿Por qué motivos ha sido?

3.3. ¿El programa ha resultado como esperabas?

3.4. ¿Qué es lo que más te gusta del programa?

3.5. ¿Y lo que menos te gusta? ¿Y qué crees que se podría mejorar?

3.6. ¿Qué opinas de las sesiones especiales? (spinning, baile, expresión corporal, aeróbic, senderismo, piscina, etc.)

3.7. De todas las actividades que realizáis, ¿Cuál es la que más te gusta y la que crees que se adapta más a tus necesidades?

3.8. ¿Consideras que se te ha tenido en cuenta a la hora realizar las actividades? ¿Se han respetado tus preferencias y gustos? ¿Se preocupan por vuestra opinión?

3.9. ¿Cómo es la relación con los monitores?

3.10. ¿Cómo es la relación con tus compañeros/as?

3.11. ¿Consideras que durante el programa se te ha dado toda la información necesaria y has obtenido el conocimiento suficiente para mantener hábitos de salud fuera del programa (dieta y actividad física)?

3.12. ¿Crees que la variedad, la novedad, el cambio y no caer en la rutina es importante en tu vida? ¿Y en el programa de actividad física? ¿Se te ha proporcionado en estos meses? (otra posible necesidad psicológica: ¿novedad?)

4. EL DÍA A DÍA CON LA OBESIDAD

4.1. ¿Qué ha supuesto en tu vida la obesidad? A nivel laboral, social, sentimental, ¿sexual/en pareja?...

4.2. ¿Cómo convivías con la obesidad mórbida? ¿Cómo era tu día a día con la obesidad? (La misma pregunta expresada de dos formas para que la entiendan bien)

4.3. La situación de tener obesidad ¿te generaba algún problema en tu vida diaria a nivel físico, psicológico, social? (Ahondar bien en cada dimensión)

4.4. ¿Encontrabas alguna ventaja al hecho de tener obesidad?

4.5. ¿Qué experiencias negativas relacionadas con el hecho de ser obeso/a recuerdas haber vivido? ¿Y positivas?

4.6. ¿Cuándo decides cambiar la situación de obesidad mórbida? ¿Qué te lleva a querer cambiar? ¿Antes de la operación te habías propuesto cambiar en otras ocasiones? ¿De qué manera? ¿Qué te hace optar definitivamente por operarte?

4.7. ¿Qué significó la operación para ti? (pre, durante y post operación)

4.8. Crees que la sociedad, los médicos, políticos... ¿hacen todo lo posible para ayudar a las personas que como tú han sufrido o sufren de obesidad? ¿Crees que el programa de actividad física se debería ofertar a todos los pacientes?

4.9. ¿Qué es lo que más te molesta que te digan sobre la obesidad? ¿Por qué? ¿De qué modo te afecta?

4.10. Y si dependiera de ti, ¿Qué harías para ayudar a las personas que se encuentran en tu misma situación?

4.11. ¿Qué aconsejarías a otras personas que estén en tu misma situación?

4.12. En un futuro próximo ¿Tienes pensado continuar con alguna actividad física y algún cuidado de tu alimentación? ¿Cuál? ¿Cómo?

5. Para finalizar, ¿te gustaría añadir o comentarnos algo más? ¿Te gustaría hacer alguna reflexión?

Appendix 2. Second interview.

FACTORES QUE LLEVAN A LA OBESIDAD

- ¿Cuáles piensas que fueron las principales causas que te llevaron a una situación de obesidad mórbida?
- ¿Cuándo y por qué empezaste a subir de peso? ¿Cómo se fue dando este proceso de no tener a tener obesidad mórbida?
- ¿Crees que tus hábitos alimenticios te llevaron a la obesidad? ¿Por qué?
- ¿Crees que tus hábitos de actividad física te llevaron a la obesidad? ¿Por qué?
- ¿Crees que existen otras razones que te pueden haber llevado a hábitos inadecuados de dieta o ejercicio, y en consecuencia a la obesidad: aspectos físicos (lesión, enfermedad, etc.), aspectos psico-sociales (falta autoestima, depresión, experiencia negativa, trauma, problemas familiares o en el trabajo, etc.), contextuales (alimentos saludables más caros que los no saludables, ambiente cultural que te incita a dieta inadecuada, pocos espacios para hacer ejercicio, mucho calor en verano, etc.), etc.
- ¿Has seguido alguna dieta en alguna ocasión? ¿De qué tipo? ¿Funcionó? ¿Por qué?
- ¿Hiciste algún intento de practicar ejercicio en alguna ocasión? ¿Qué practicabas? ¿Durante cuánto tiempo practicaste? ¿Por qué lo dejaste?

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