Factors Associated with Self-Esteem in Persons with Morbid Obesity and in Persons with Chronic Obstructive Pulmonary Disease: A Cross-Sectional Study

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Abstract

Living with chronic illnesses can be stressful and may negatively impact persons' self-esteem. Personal factors, like self-efficacy and illness perceptions, and also factors related to the environment, activity, and participation may be associated with self-esteem in chronic illness populations. This cross-sectional comparative study explored sociodemographic variables, work, physical activity, illness perceptions, and general self-efficacy in relation to self-esteem in persons with morbid obesity and in persons with chronic obstructive pulmonary disease (COPD). The study had a cross-sectional design. A total of 223 eligible participants were recruited from patient education courses, and data was collected at baseline. Self-esteem was measured with The Rosenberg Self-Esteem Scale; the General Self-Efficacy Scale was used to measure self-efficacy, and Brief Illness Perception Questionnaire was also used. This is an instrument assessing cognitions about the illness and emotional responses towards it. Multivariate linear regression was used in the statistical analyses. In obese participants (n = 134), higher self-esteem was associated with lower emotional response, a shorter timeline, and higher general self-efficacy. In COPD participants (n = 89), higher self-esteem was associated with higher general self-efficacy. The independent variables accounted for 42.9 % (morbid obesity) and 49.4 % (COPD) of the self-esteem variance. In participants in both illness-groups, higher self-efficacy was associated with increased self-esteem. A shorter timeline and lower emotional response to illness was related to higher self-esteem only for the obese participants. The results indicate that believing in one's capacity to cope with everyday challenges is important for self-esteem in persons with morbid obesity and in persons with COPD, whereas illness perceptions related to the duration of illness and the coping with emotions also is important for self-esteem in persons with morbid obesity.

Key words: self-esteem, illness perception, self-efficacy, morbid obesity, chronic obstructive pulmonary disease

Introduction

Self-esteem refers to the positive and negative feelings and evaluations we have about ourselves, and represents our sense of self-worth (Rosenberg, 1979). Current conceptualizations of health include personal factors, like self-esteem, in the outline of health determinants. According to the International Classification of Functioning, Disability, and Health (ICF) model, functioning is created by the interaction of the person, the illness, and the environment (World Health Organization, 2001). High self-esteem can be a resource for coping with illness (Juth, Smyth, & Santuzzi, 2008), buffering against depression, stress and negative emotions (Bisschop, Kriegsman, Beekman, & Deeg, 2004; Simpson, Lekwuwa, & Crawford, 2013). Conversely, illness may impact negatively on self-esteem (Pinquart, 2012). Self-esteem may be threatened by experiencing illness-related consequences, or by decreased coping with everyday life challenges (Bandura, 1997; Hogg & Vaughan, 2011). In turn, low self-esteem may lead to unhealthy behaviors in an attempt to self-regulate negative emotions (Canetti, Berry, & Elizur, 2009).

Lower self-esteem has been found in obesity samples compared to non-clinical populations. Compared to normal-weight persons, self-esteem appear to be lower in obese children and adults (Abiles et al., 2010; Griffiths, Parsons, & Hill, 2010; Nowicka et al., 2009). In addition, low self-esteem has been associated with poor weight reduction in obese persons after treatment (Canetti et al., 2009; Teixeira et al., 2002), an association that may be mediated by more frequent emotional eating among persons with low self-esteem (Canetti et al., 2009). Evidence is similarly available to assume low self-esteem in persons with chronic obstructive pulmonary disease (COPD) (Ninot, Moullec, Desplan, Prefaut, & Varray, 2007). One study found lower self-esteem in COPD patients compared to asthma patients , suggesting that self-esteem may decrease with increasing severity of illness (Hesselink et al., 2004).

A common feature for the groups in this study is that unhealthy lifestyle behaviors are dominant forces in causing them. The person realizing that his or her lifestyle is a major cause of illness may feel shame or guilt. Morbidly obese persons often feel guilty about overeating (Abiles et al., 2010), and smokers with COPD typically blame themselves (Plaufcan, Wambolt, & Holm, 2012). Persons in both groups may anticipate stigmatization (Earnshaw, Quinn, & Park, 2011), all of which increases the risk of low self-esteem.

On the other hand, the illnesses are markedly different in terms of prospects. Persons with morbid obesity may achieve weight reduction and improved health as result of changes in diet and activity. Persons with COPD, contrastingly, must reconcile with a chronic and progressive disease. Differences between the illnesses may result in different factors being associated with self-esteem in the two groups. The model explored in this study is illustrated in Figure 1.

[FIGURE 1 ABOUT HERE]

Summarizing, persons with chronic illness appear to have lower self-esteem than healthy persons. However, previous studies have used self-esteem largely as a predictor variable for quality of life and not as an outcome variable. Moreover, comparisons between different illness conditions have been rare (Bisschop et al., 2004). Persons with morbid obesity and COPD share a risk of low self-esteem. However, they are markedly dissimilar with regard to the progression of illness, and due to such differences these two groups were chosen for the study. We have not found any studies exploring factors associated with self-esteem in a comparative perspective.

Purpose

The present study explores factors associated with self-esteem in persons with morbid obesity and in persons with COPD.

Research questions

1. What are the levels of self-esteem in persons with morbid obesity compared to persons with COPD?

2. How are personal factors, environmental factors and activity associated with self-esteem in the two groups?

Methods

Study design

In this cross-sectional design study, data related to self-esteem, physical activity, illness perceptions, self-efficacy and socio-demographic factors were collected by questionnaires at baseline.

Sample and data collection

Persons with morbid obesity or COPD were recruited during 2009-2010 at the first day of a disease-specific patient education course. All course attendants were given verbal and written information about the study and invited to participate. Out of a total number of 312 course attendants, 242 (78 %) gave their consent to participate. Those who consented completed the questionnaires in a secluded room on-site and returned it in a sealed envelope.

Persons with missing responses on the self-esteem scale, on categorical variables or on single-item scales were excluded from the sample. Missing data up to two items (20 %) of the self-efficacy scale was considered acceptable, and missing item scores were replaced with the mean value of the person's valid scores. Following this procedure, 19 persons were excluded, leaving a total sample of 223 participants for this study.

In the sample, 134 participants (60.1 %) were diagnosed with morbid obesity, defined as having a body mass index (BMI) ≥ 40, or as BMI ≥ 35 combined with obesity-related somatic illness (World Health Organization, 2010). Eighty-nine participants (39.9 %) were diagnosed with COPD, representing GOLD stages 2 and 3 with varied levels of functioning (Global Initiative for Chronic Obstructive Lung Disease, 2011). No sex differences were

found between participants and non-participants in this study ($p = 0.48$), but participants ($M = 51$ years, $SD = 15$ years) had a non-significant tendency to be younger than non-participants ($M = 57$ years, $SD = 14$ years; $p = 0.09$).

Measures

All the relevant measures had been translated into Norwegian and validated before being used in this study.

Background

Data for age, sex, and formal education level was dichotomized with two categories; 12 years (secondary) education or less *versus* more than 12 years (university/college) education.

Personal factors

The *Rosenberg Self-Esteem Scale* (RSES) (Rosenberg, 1965) was used to assess participants' global self-esteem. The original RSES consists of ten statements with responses ranked from 1 'strongly agree' to 4 'strongly disagree'. Our study used a Norwegian abbreviated 4-item version (RSES-4), selected by linear regression analysis and showing high correlation ($r = 0.95$) with the full 10-item version (Ystgaard, 1993). The sum score on the RSES-4 ranges from 4 to 16, with higher score representing higher self-esteem. Cronbach's α was 0.79 for this study, similar to that of another Norwegian study (Tambs, 2004).

The *General Self-Efficacy Scale* (GSE) (Schwarzer & Jerusalem, 1995) measures optimistic self-beliefs related to coping with challenges and demands in life. It consists of 10 items that are rated on a scale from 1 'not at all true' to 4 'exactly true'. The sum score is calculated for each individual. Score range is 10-40, higher scores indicating higher self-efficacy. High correlations with self-appraisal, self-acceptance, and optimism indicate theoretical accuracy of the self-efficacy concept (Posadzki, Stockl, Musonda, & Tsouroufli, 2010), and factor analysis of the GSE has consistently produced a one-factor solution

(Leganger, Kraft, & Roysamb, 2000). Internal consistency of the GSE scale in the present sample was α = 0.92, which is considered excellent (Fayers & Machin, 2007).

The *Brief Illness Perception Questionnaire* (BIPQ) assesses cognitive and emotional representations of illness in eight one-item domains (Broadbent, Petrie, Main, & Weinman, 2006). The eight domains represent different dimensions of a person's illness perception; including consequences, timeline, personal control, treatment control, identity, concern, understanding, and emotional response. The items are assigned a score between 0 and 10, representing the lowest and highest levels of the item content. For example, the item 'emotional response' is measured by the participants' score on the question: "How much does the illness affect you emotionally?" The instrument possesses good psychometric properties, in terms of test-retest reliability and concurrent, predictive, and discriminant validity (Broadbent et al., 2006).

Environmental factors

Relationship status was measured with one categorical variable: Living in a paired relationship (1) *versus* not living in a paired relationship (0). Social support was measured with participants' response to one question: "I think I have enough support from persons with whom I have a close relationship." Response categories were on a five point Likert type scale, higher scores indicating more support.

Activity and participation

Employment status (working = 0 / not working = 1) was registered. Physical activity was measured by responses to the following question, taken from the Norwegian "*HUNT-2*" survey (Holmen et al., 2003): "How much physical activity do you have in leisure time? Travel to work is regarded as leisure. State approximately how many hours per week you are physically active. Choose a number of hours that may apply to a typical week last year". Responses were given for two intensity-based categories of physical activity; low-level (not

sweaty/breathless) and high-level activity (sweaty/breathless). The participants' level of physical activity was scored by the published definition (Thorsen et al., 2005), scores ranging between 0 (no physical activity) and 4 (high level of physical activity).

Statistical analyses

Differences between groups were assessed by χ^2-test for categorical variables or by t-test for continuous variables. Pearson's coefficient r was used for bivariate correlation analysis. To obtain the most parsimonious predictive model, variables with an $r \geq 0.20$ bivariate relationship to self-esteem were first included in a backward stepwise regression analysis. The variables that in the stepwise regression were found to significantly predict self-esteem were included in a subsequent hierarchical linear regression analysis, investigating predictors of self-esteem specific to each illness group. In addition, the hierarchical regression analysis for both illness groups controlled for the potential impact of age and sex, given the group differences on these variables. The models also assessed the amount of variance in self-esteem accounted for by each block in the model, structured according to the ICF model (World Health Organization, 2001). As 'personal factors' were cognitions related partly to illness, and partly to mastery, these factors were assessed in separate blocks. For the obesity group, independent variables were entered in this order: 1) age and sex; 2) timeline and emotional response; 3) general self-efficacy. For the COPD group, independent variables were entered in this order: 1) age and sex; 2) relationship status; 3) emotional response; and 4) general self-efficacy.

Effect sizes (*ES*) were calculated as Cohen's *d*, and *ES* > 0.40 was considered medium effect size and clinically significant (Cohen, 1992). The level of significance was set at $p < 0.05$ and all tests were two-tailed. Data were analyzed using IBM SPSS Statistics for Windows, Version 19.0 (SPSS Inc., 2010).

Ethics

The Norwegian Research Ethics Committee (REK S-08662c 2008/17575) and the

Ombudsman of Oslo University Hospital approved of the study. Informed written consent

was received from all participants.

Results

Sample characteristics and self-esteem

The two sample subsets are described in Table 1. Self-esteem was higher among COPD

participants compared to obese participants, whereas self-efficacy was similar in the two

groups. Persons with COPD were older and experienced more social support; they perceived a

longer term prospect of illness (timeline), and they had less faith in treatment (treatment

control) than obese persons. The obesity group had a higher proportion of women, and obese

participants had more often paid work than COPD participants. Obese persons experienced

more consequences from illness; felt less personal control; were more concerned; and had

more illness-related emotional response.

[INSERT TABLE 1 ABOUT HERE]

Bivariate associations with self-esteem

The bivariate relationships between self-esteem and each of the other variables are

shown in Table 2. In the obesity group, higher self-esteem was associated with higher levels

of physical activity, higher self-efficacy, and lower scores on consequences; timeline;

identity; concern; and emotional response. In COPD participants, higher self-esteem was

associated with living in paired relationship, higher self-efficacy, higher understanding, and

lower scores on consequences; concern; and emotional response.

[TABLE 2 ABOUT HERE]

Multivariate associations with self-esteem

For both groups, we included age and sex in the initial step of the hierarchical

regression analysis. Following the stepwise regression analysis, timeline, emotional response,

and general self-efficacy were selected for the hierarchical regression analysis of factors associated with self-esteem in the obesity group. For the COPD group, relationship status, emotional response and general self-efficacy were selected.

The results from the hierarchical regression analyses are shown in Table 3. In the obesity subsample, a shorter timeline, lower emotional response, and higher self-efficacy were directly associated with higher self-esteem after controlling for all variables in the final model. The proportion of variance explained by the models is provided in Table 3. General self-efficacy accounted for the largest proportion of the self-esteem variance (24.3 %). In the COPD subsample, higher self-efficacy was the only variable with a direct association with higher self-esteem after controlling for all variables in the final model. General self-efficacy accounted for the largest proportion of the self-esteem variance (25.6 %).

[TABLE 3 ABOUT HERE]

Discussion

Research has shown that stigma is common in various groups with chronic illness (Earnshaw et al., 2011). However, morbid obesity may be particularly burdensome in today's culture (Puhl & Brownell, 2001), and more stigma and self-blame may potentially explain lower self-esteem among the morbidly obese participants compared to those with COPD. Previous research has also shown that girls and young women may have lower self-esteem compared to boys (Moksnes & Espnes, 2012; Pinquart, 2012). In this study, however, age and sex was not related to self-esteem in any of the two illness groups.

Factors associated with self-esteem

In both groups, higher self-esteem was strongly related to higher self-efficacy. Self-efficacy explained 24-26 % of the self-esteem variance in both groups, and should therefore be considered important for self-esteem in persons with these chronic illnesses.

Bandura suggested that experiencing success in performing activities is vital for the development of self-efficacy (Bandura, 1997). Higher self-efficacy being associated with higher self-esteem is consistent with previous research, suggesting that the promotion of success experiences is one important source for self-esteem (Pinquart, 2012). Thus, success experiences may contribute to both aspects of the person, the perceived ability to cope with challenging tasks (self-efficacy) and positive self-regard in general (self-esteem). Self-esteem has been found to be a resource for quality of life (Han, Lee, Lee, & Park, 2003), thus it appears clinically important to seek ways to strengthen self-esteem in persons with chronic illness. One route to improved self-esteem can be to strengthen self-efficacy.

For the participants with morbid obesity, higher self-esteem was associated with less negative emotional response to illness. A previous study found that illness-related emotional response was inversely related to self-efficacy in the obese participants (Bonsaksen, Lerdal, & Fagermoen, 2012). Given the positive association between self-efficacy and self-esteem found in this study, the association between higher self-esteem and less negative emotional response is not surprising. However, this study does not establish cause-and-effect relationships. Rather, it seems plausible to suggest reciprocal relationships between the personal factors. Experiencing the illness as less threatening may lead to stronger belief in one's own capacity for self-management, and in turn, higher self-esteem.

In the obese participants, higher self-esteem was also associated with a shorter perceived timeline. Generally, perceiving the illness as more severe has been considered a risk factor for disengagement with self-management (Disler, Gallagher, & Davidson, 2012). Illustratively, Scharloo and colleagues found negative beliefs concerning the progression of illness in COPD patients to be associated with lower functioning (Scharloo et al., 2007). Thus, it makes sense that obese persons' self-esteem was related to their views on how their illness would progress. However, the inverse association between a longer timeline and higher

health-related quality of life in the mental health domain was previously found within the

COPD subsample (Bonsaksen, Haukeland-Parker, Lerdal, & Fagermoen, 2014). For persons

with COPD, a longer timeline may reflect reconciliation with a chronic disease. For persons

with morbid obesity, however, a shorter timeline indicates a belief that the condition will

change. Further, belief in being in control of the change (i.e., self-efficacy) may result in

increased self-esteem.

Interestingly, previous research has argued that general self-efficacy, neuroticism

(degree of emotional stability or emotional adjustment), locus of control, and self-esteem all

may be indicators of a higher order construct (Judge, Erez, Bono, & Thoresen, 2002).

Although theoretically distinct from each other (Bandura, 1997), the strong empirical

associations found between self-esteem and general self-efficacy in both illness groups may

suggest some commonality between these constructs. Also, there may be a relationship

between emotional response to illness and negative emotional responsiveness in general

(Lawson, Bundy, & Harvey, 2007; Williams, O'Connor, Grubb, & O'Carroll, 2011). Although

a moderate association between emotional response and self-esteem was found for the obese

participants in our study, this does not support the general notion of these constructs being

indicators of a higher order construct due to a low number of participants.

Study limitations

In this study, the obesity group was substantially larger than the COPD group. This

reduced the number of independent variables to be included in the analyses. The relatively

small sample size may have caused Type II errors; that is, effects in the data may not have

been detected. Also, the large number of statistical tests performed may have caused Type I-

errors; that is, some of the statistically significant associations reported in this article may be a

result of chance. The cross-sectional study design did not allow causal relationships to be

inferred from the results. Associations reported in this study between self-esteem, self-

efficacy, and illness perceptions may be oppositely directed – self-esteem may also contribute to determine self-efficacy and illness perceptions. Models where the direction of influence goes both ways are equally viable. There is a potential sampling bias related to the study participants being at the start of a patient education program, indicating a motivation toward making changes. Hence, the sample may be different from the larger populations with morbid obesity and COPD.

Conclusion

This study showed that self-efficacy was strongly associated with self-esteem in persons with morbid obesity and in persons with COPD. From a clinical point of view, increasing self-esteem in chronically ill persons is an important aim, and efforts to increase self-efficacy appear to be one way of achieving it. In addition, supporting the perception of a shorter duration of illness and providing support and strategies for managing emotional response to illness may increase self-esteem in persons with morbid obesity. Health professionals who seek to improve self-efficacy and attend to these aspects of patients' illness perception may contribute to increase self-esteem in persons with these chronic illnesses.

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Conflict of interest

The authors report no conflicts of interest.

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Table 1

Characteristics of the morbid obesity and COPD subsamples

Characteristics	Obesity	COPD	ES	p
Background	(*n* = 134)	(*n* = 89)		
Mean age (*SD*)	42.4 (10.5)	64.3 (9.6)	-2.18	<0.001
Male sex (%)	41 (30.6)	48 (53.9)		<0.001
Education > 12 years (%)	45 (33.6)	25 (28.1)		0.39
Environmental factors				
Mean social support (*SD*) (1-5)	3.9 (1.0)	4.2 (0.9)	-0.32	0.04
Living in relationship (%)	89 (66.4)	52 (58.4)		0.23
Activity and participation factors				
Working (%)	75 (56.0)	24 (27.0)		<0.001
Mean physical activity (*SD*) (0-3)	1.3 (1.0)	1.2 (0.9)	0.11	0.85
Personal factors	*M (SD)*	*M (SD)*		
Consequences (0-10)	7.3 (2.2)	6.2 (2.5)	0.47	0.001
Timeline (0-10)	6.9 (2.5)	9.4 (1.2)	-1.27	<0.001
Personal control (0-10)	3.8 (2.5)	4.9 (2.3)	-0.46	0.002
Treatment control (0-10)	8.5 (2.1)	6.8 (2.4)	0.75	<0.001
Identity (0-10)	6.7 (2.3)	6.3 (2.0)	0.19	0.20
Concern (0-10)	7.5 (2.4)	6.0 (2.8)	0.57	<0.001
Understanding (0-10)	7.3 (2.4)	7.0 (2.4)	0.12	0.42
Emotional response (0-10)	6.9 (2.6)	5.1 (2.9)	0.65	<0.001
General self-efficacy (10-40)	26.5 (6.4)	27.3 (6.5)	-0.12	0.37
Self-esteem (4-16)	10.3 (2.7)	11.8 (2.2)	-0.61	<0.001

Note. Effect sizes (*ES*) are provided as Cohen's *d. P*-values indicate probability of differences between diagnostic groups by *t*-tests or χ^2-tests. Higher scores on the scales indicate higher levels for all variables.

Table 2

Bivariate relationships between self-esteem and the study variables in the subsamples with morbid obesity and COPD

Variables	Obesity (*n* = 134)		COPD (*n* = 89)	
	r	*p*	*r*	*p*
Age	-0.01	0.92	0.12	0.27
Sex	-0.06	0.49	-0.19	0.08
Education	0.05	0.60	0.21	0.05
Relationship status	-0.04	0.65	0.24	0.03
Work status	-0.17	0.05	0.16	0.13
Social support	0.13	0.13	0.16	0.13
Physical activity	0.22	0.01	0.11	0.32
Consequences	-0.36	<0.001	-0.27	0.01
Timeline	-0.29	0.001	0.17	0.11
Personal control	0.13	0.14	0.15	0.16
Treatment control	0.00	0.96	-0.13	0.22
Identity	-0.19	0.03	-0.05	0.65
Concern	-0.19	0.03	-0.41	<0.001
Understanding	0.06	0.50	0.26	0.01
Emotional response	-0.38	<0.001	-0.45	<0.001
General self-efficacy	0.60	<0.001	0.64	<0.001

Note. Table content is Pearson's correlation coefficients (*r*) and corresponding probability values (*p*). Coding: Male =1, female = 2; lower education = 1, higher education = 2; in paired relationship = 1, not in paired relationship = 0; working = 0, not working =1. Higher scores on illness perceptions, general self-efficacy, and self-esteem indicate higher levels.

Table 3

Hierarchical linear regression analyses with self-esteem as dependent variable for the

subsamples with morbid obesity and COPD

Independent variables	Obesity (*n*=134)		COPD (*n*=89)	
	Std. β	*p*	Std. β	*p*
1. Background				
Age	0.04	0.53	0.12	0.15
Sex	0.00	0.96	-0.07	0.42
Explained variance	**0.4 %**	**0.77**	**4.8 %**	**0.12**
2. Environment				
Relationship status	-	-	0.15	0.07
R² change	**-**	**-**	**3.7 %**	**0.07**
Explained variance	-	-	**8.5 %**	**0.05**
3. Illness perceptions				
Timeline	-0.16	0.02	-	-
Emotional response	-0.20	< 0.01	-0.15	0.09
R² change	**18.2 %**	**< 0.001**	**15.3 %**	**< 0.001**
Explained variance	**18.6 %**	**< 0.001**	**23.8 %**	**< 0.001**
4. Mastery cognitions				
General self-efficacy	0.52	< 0.001	0.57	< 0.001
R² change	**24.3 %**	**< 0.001**	**25.6 %**	**< 0.001**
Explained variance	**42.9 %**	**< 0.001**	**49.4 %**	**< 0.001**

Note. Standardized β = association with self-esteem having all other variables controlled for

in the final regression model. Coding: living in paired relationship = 1, not living in paired

relationship = 0. Higher scores on illness perceptions, general self-efficacy, and self-esteem

indicate higher levels.

Figure 1. Model of factors associated with self-esteem