Trajectories of Self-Efficacy in Persons with Chronic Illness: An Explorative Longitudinal Study

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Abstract

Background: Self-efficacy is important for changing health behavior in persons with chronic illness. Longer-term trajectories have not been previously explored.

Objective: This study's objective was to explore the trajectories of self-efficacy in two different groups with chronic illnesses attending a patient education course.

Design: The study design was a longitudinal, comparative cohort study with five time points during a one year follow-up, using repeated measures analysis of variance.

Setting and participants: Persons with morbid obesity (n = 55) and persons with chronic obstructive pulmonary disease (COPD; n = 56) were recruited at the start of patient education courses in Norway and followed-up four times the following year.

Main outcome measure: The General Self-Efficacy Scale (GSE) was the main outcome.

Results: Obese persons showed a linear pattern of increasing self-efficacy during the follow-up period, whereas persons with COPD had an initial increase followed by a decrease in self-efficacy. Having paid work was associated with a more positive self-efficacy trajectory.

Conclusion: The results provide support for the currently employed patient education course for morbidly obese persons. In contrast, persons with COPD may need more extensive and/or more frequent support in order to increase and maintain self-efficacy across time.

Keywords: self-efficacy, illness perceptions, morbid obesity, chronic obstructive pulmonary disease, longitudinal study.

Self-efficacy refers to a person's belief in his or her capacity to perform the behaviors necessary to produce a desired outcome (Bandura, 1997). Such beliefs have been empirically associated with a range of actual behaviors and positive outcomes in various populations, including groups with chronic illness (Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001; Marks, Allegrante, & Lorig, 2005). Recent research has demonstrated that self-efficacy, in conjunction with illness perceptions, is a factor that mediates the association between disease severity and health satisfaction (Steca et al., 2013). Adjusting to chronic illness often requires negotiating life roles and activities, managing the emotional consequences of illness, and changing health-related behaviors (Lorig & Holman, 2003). For the groups investigated in this study, behavior change related to eating, smoking, and physical activity are considered particularly important.

Self-efficacy is reported to be associated with increased adherence to a recommended diet in persons with Type I diabetes (Nouwen, Law, Hussain, McGovern, & Napier, 2009). However, studies have suggested that self-efficacy may not translate into healthy eating if the intentions to improve diet remain unchanged (Guillaumie, Godin, Manderscheid, Spitz, & Muller , 2013), but also that an intentional change towards healthy eating can be predicted by increased self-efficacy (Scholz, Nagy, Göhner, Luszczynska, & Kliegel, 2009). Higher self-efficacy has also been associated with behaviors such as reduced smoking (Scholz et al., 2009) as well as improved adherence to medication, improved stress management, and use of relaxation techniques (Clark & Dodge, 1999).

Physical activity has been shown to be influenced by self-efficacy in COPD patients (Hartman, ten Hacken, Boezen, & de Greef, 2013). Self-efficacy is also found to moderate the planning-behavior relationship in persons with diabetes (Luszczynska, Schwarzer, Lippke, & Mazurkiewicz, 2011). In this study, persons with higher self-efficacy who attended a group aimed at planning physical activity increased their physical activity levels more than persons

with lower self-efficacy attending the same group. The review of the literature provides evidence for the role of self-efficacy in adopting and maintaining positive health behaviors among persons with chronic illness, and also in reducing behaviors that can cause or exacerbate illness.

Bandura's self-efficacy model has been used as the theoretical framework for a range of intervention studies related to chronic illness, many of which have demonstrated self-efficacy to increase by means of self-management programs (Marks et al., 2005). Increased self-efficacy following short-term interventions has been shown in groups with different chronic illnesses, including obesity (Park & An, 2006) and COPD (Kara & Asti, 2004). Long-term improvements following self-management interventions, such as the Chronic Disease Self-Management Program (CDSMP), have similarly been shown in previous research (Lorig et al., 2001). The CDSMP, with 17 hours of education during a seven-week period, focuses on skills mastery, reinterpretation of symptoms, modeling, and social persuasion among adults with chronic illness. A large sample of adults with various chronic illnesses showed improved health status in almost all domains, improved health behaviors, and higher self-efficacy at the one-year follow-up assessment (Lorig et al., 2001). Most longitudinal research on self-efficacy, however, has been limited to assessing differences between two time points: before and after intervention. We found only one study using repeated measures methodology to assess trajectories of self-efficacy across time. This study of a home-based CDSMP intervention with a mixed chronic illness sample found self-efficacy to increase linearly across time (Jerant, Moore, Lorig, & Franks, 2008). However, the follow-up period was limited to six months.

Recent studies have shown that factors associated with self-efficacy may differ between clinical groups. For example, higher physical activity and lower emotional response to illness was associated with self-efficacy in persons with morbid obesity, whereas more

social support, less consequences from illness, and more understanding of the illness were associated factors in persons with COPD (Bonsaksen, Lerdal, & Fagermoen, 2012). Age and sex, on the other hand, were unrelated to self-efficacy in both samples. Factors associated with self-efficacy may also vary over time. In a sample of adults with heart disease, self-efficacy at baseline was predicted by perceived illness consequences and outcome expectations concerning diet and exercise, whereas these relationships had vanished nine months later (Lau-Walker, 2006).

Improved health behavior, for which self-efficacy is an important motivating force, is one central aim for persons with morbid obesity and persons with COPD alike. However, given the differences between persons with COPD and persons with morbid obesity in terms of illness experiences and other life events, we expect the two groups to have different courses of self-efficacy over time. Obese persons may hope for weight reduction and improved health as a result of changes in their diet and activity, taking medication or having surgery. Persons with COPD, on the other hand, have to adapt to a lifetime course of illness and their hope may be limited to achieving a more effective way of managing their illness. The different expectations in the two illness groups concerning the future course of illness may therefore affect the course of self-efficacy.

In summary, evidence suggests that self-efficacy is modifiable, and that self-management interventions can lead to positive changes in self-efficacy. The present study has a one year perspective, allowing us to assess whether changes in self-efficacy are maintained over time. It uses data from five time points, allowing us to assess whether changes are linear or follow a fluctuating course. The study has two diagnostically-defined samples, which make the results comparable with results from previous research. Taken together, these qualities make this study unique in its contribution to the field.

Purpose

This study is part of a larger prospective longitudinal cohort study designed to evaluate 12 instruments assessing perception of illness and coping strategies with regard to their ability to detect change over time and to explore changes in health-related quality of life among persons participating in patient education courses in Norway (Lerdal et al, 2011). The purpose of the present study was to explore the one year trajectories of self-efficacy in persons with morbid obesity and in persons with COPD.

Hypothesis

1) The trajectories of self-efficacy are more favorable among persons with morbid obesity compared to the trajectories among persons with COPD.

Method

Study design

In this study, data related to self-efficacy, sociodemographic variables, physical activity, and illness perceptions, were included in a longitudinal exploration of the trajectories of self-efficacy in a convenience sample of persons with morbid obesity and persons with COPD.

Sample and data collection

In Norway, morbid obesity and COPD are two chronic illness groups for which patient education courses are frequently provided. A pragmatic approach to recruitment thus indicated that these illness groups would be preferable to include, given the aim of recruiting a sufficient number of participants within the given time frame. During 2009-2010 participants were recruited among morbidly obese and COPD patients about to begin a patient education course. All patients were referred to the course by a physician. There were no exclusion criteria, and all course participants were invited to participate in the study. The inclusion of morbidly obese participants required the person to have a body mass index of 40 kg/m^2 or greater (World Health Organization, 2010), as this was the target group for the

patient education course. The inclusion of participants with COPD required the person to be classified with moderate to severe limitation of airflow, representing GOLD stages 2 and 3, respectively (Global Initiative for Chronic Obstructive Lung Disease, 2011). After receiving verbal and written information about the study, course attendants were invited to participate. Data were collected at five time points: before the course started, two weeks after the course, and at three, six, and 12 months follow-up.

Patient education courses

The patient education courses for both the obesity patients and the COPD patients were designed to help the participants achieve a healthier lifestyle, and thereby improve their health-related quality of life (Lerdal et al., 2011). The approach was grounded in cognitive behavior theory and the same principles as in the CDSMP. The courses emphasized the participants' work in uncovering hidden resources, strengthening self-concept and social skills, and raising consciousness of lifestyle choices. They covered major subjects that included available treatments and their intended and unintended consequences, necessary lifestyle changes, and subsequent changes in mind and body. The course participants were encouraged to participate in subsequent self-help groups. The course for the obesity patients lasted nine weeks and consisted of 40 hours of education, including small group discussion, and work with individualized action plans. The COPD courses were shorter with durations of three to five weeks, and the number of educational sessions varied between 20 and 48 hours.

Measures

Data were collected with questionnaires that had been translated into Norwegian and validated prior to use in this study. Sociodemographic information was collected at baseline only. The questionnaire about illness perceptions was placed last in the sequence of questionnaires employed in the study so that illness perception would not influence responses to other questionnaires.

Self-efficacy

The *General Self-Efficacy Scale* (GSE) (Schwarzer & Jerusalem, 1995) measures optimistic self-belief in coping with the challenges and demands of life. It consists of 10 statements that respondents rate on a scale from 1 (completely disagree) to 4 (completely agree). Two sample items are: item 1) "I can always manage to solve difficult problems if I try hard enough" and item 2) "If someone opposes me, I can find the means and ways to get what I want". The score is calculated by summing each individual's scores for the items. Missing up to two items (20% of the scale) was considered acceptable, and missing item scores were replaced with the mean value of the person's valid scores. In total, substituting missing item scores occurred three times across the five assessments. The GSE score range is 10-40, with 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). Factor analysis of the GSE has consistently produced a one-factor solution. Item-total correlations have been found to range between 0.25 and 0.63, with factor loadings ranging between 0.32 and 0.74, and internal consistency (Cronbach's α) = 0.82 (Leganger, Kraft, & Roysamb, 2000). Internal consistency of the GSE scale in the present sample was $\alpha = 0.92$, which is considered excellent (Fayers & Machin, 2007).

We measured generalized instead of specific self-efficacy in this study because persons with morbid obesity and persons with COPD have to manage different types of tasks and behaviors. Persons in both groups face new challenges when it comes to adopting a more health-promoting lifestyle, but the content of the most central self-efficacy beliefs will most likely differ for the two groups.

Sociodemographic background

Data for age (years), sex, and employment status (paid work *vs.* not paid work) were collected. Participants' formal level of education was dichotomized as 12 years (secondary) education or less *versus* more than 12 years (university/college) education.

Health-related behavior

The level of physical activity was measured by the participants' 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' aggregated level of physical activity was then scored by the published definition (Thorsen et al., 2005). Scores ranged between 0, indicating no physical activity, and 3, indicating a high level of physical activity.

Environmental characteristics

Social support was measured with participants' response to one question: "I think I have enough support from people with whom I have a close relationship." Response categories were on a five point Likert type scale, ranging from "totally agree" (1) to "totally disagree" (5). The scores were reversed for analysis, so that higher scores indicated more support.

Illness perception

The *Brief Illness Perception Questionnaire* (BIPQ) (Broadbent, Petrie, Main, & Weinman, 2006) assesses cognitive and emotional representations of illness in eight one-item domains. The items are assigned a score between 0 and 10, where a higher score indicates more of the measured construct. Three sample questions are: 1) How much does your illness

affect your life? (*consequences*), 7) How well do you feel you understand your illness? (*understanding*), and 8) How much does your illness affect you emotionally? (*emotional response*). The instrument has been shown to possess good psychometric properties, in terms of test-retest reliability and concurrent, predictive, and discriminant validity (Broadbent et al., 2006), and this brief form well represents the dimensions contained in a revised version of the original instrument (Moss-Morris et al., 2002). A prior study showed that the illness perception domains regarding consequences, understanding, and emotional response had clinically significant associations with self-efficacy at baseline (Bonsaksen et al., 2012). Therefore, these three domains were included in this study in order to illustrate group differences concerning illness perceptions at baseline.

Statistical analyses

Data were analyzed using SPSS for Windows version 19 (SPSS Inc., 2010). Differences between groups were assessed by Chi-square (χ^2) test for categorical variables or by *t*-test for continuous variables. One-way and two-way repeated measures analyses of variance (ANOVA) were used to assess the course of self-efficacy in the whole sample, with diagnostic group included as a between-subjects factor. In cases of statistically significant interactions with diagnostic group, the analyses were repeated for the morbid obesity and COPD subsamples separately. Possible confounding variables were identified from the analysis of group differences regarding sociodemographic variables. In the two-way ANOVA, thus, we explored the trajectories controlling for age, sex, and work status among the participants.

Effect sizes (*ES*) were provided as Cohen's *d* and partial η^2. Cohen's $d > 0.40$ was considered a moderate effect size and clinically significant (Cohen, 1992). Similarly, partial $\eta^2 = 0.01$ was considered a small effect size, whereas partial $\eta^2 > 0.06$ and > 0.14 were considered moderate and large effect sizes, respectively (Cohen, 1992). Adjustments for

multiple comparisons were made using the Bonferroni correction. The level of significance was set at $p < 0.05$ and all tests were two-tailed.

Ethics

The Norwegian Research Ethics Committee and the Ombudsman of Oslo University Hospital approved of the study (REK S-08662c 2008/17575). Informed written consent was received from all participants.

Results

Sample characteristics and self-efficacy

Of the 312 course attendants, 242 (78 %) gave their consent to participate in the study and completed the baseline assessment. Of these, 131 were excluded from the longitudinal analysis because of missing data on one or more of the five assessments. The remaining 111 participants (45.9 %) were included in the analysis; 55 (49.5 %) were diagnosed with morbid obesity, and 56 (50.5 %) were diagnosed with COPD. In the final sample, a larger proportion of the COPD course participants were included (56.0 %) compared to the proportion of course participants in the obesity group (38.7 %; $p = 0.008$). No sex differences were found between included and excluded participants ($p = 0.37$), although those who were included ($M = 55.7$ years, $SD = 14.2$ years) were older than those who were excluded ($M = 48.1$ years, $SD = 14.4$ years, $p < 0.001$). Self-efficacy levels at baseline did not differ between included ($M = 27.1$, $SD = 6.3$) and excluded participants ($M = 26.0$, $SD = 6.5$, $p = 0.17$).

The characteristics of the two sample subsets are described in Table 1. The groups with obesity and COPD participants showed statistically significant differences on several of the sociodemographic variables at baseline. The participants in the COPD group were older, had a higher proportion of men, and were less often in paid employment. In addition, when compared to participants in the obesity group, COPD participants reported fewer consequences from illness, less understanding of the illness ($p =0.048$), and less emotional

response to illness. Levels of self-efficacy, however, did not differ between the groups, nor did levels of physical activity or social support.

[INSERT TABLE 1 ABOUT HERE]

Trajectories of self-efficacy

In the analysis of the total sample, a significant interaction between time and diagnosis was found (Wilks' lambda = 0.89, F [4, 106] = 3.40, p = 0.01, partial η^2 = 0.11), implying different courses of self-efficacy in the subsamples. For the obesity subsample, the change in self-efficacy across time was significant and had a large effect size (Wilks' lambda = 0.67, F [4, 51] = 6.34, $p < 0.001$, partial η^2 = 0.33). There were significant results for a linear pattern of increasing self-efficacy (F [1] = 22.11, $p < 0.001$, partial η^2 = 0.29) as well as a cubic pattern (F [1] = 5.22, p = 0.03, partial η^2 = 0.09). For the COPD subsample, the main effect for time was borderline statistically significant (Wilks' lambda = 0.84, F [4, 52] = 2.49, p = 0.06, partial η^2 = 0.16). The effect size justified a closer inspection of the data, and a quadratic low-high-low change pattern was found for this group (F [1] = 5.03, p = 0.03, partial η^2 = 0.08).

Covariates associated with self-efficacy trajectories

Age and sex were unrelated to self-efficacy trajectories (data not shown). There was a significant interaction between time and work status (Wilks' lambda = 0.89, F [4, 103] = 3.36, $p < 0.05$, partial η^2 = 0.12), indicating different self-efficacy trajectories for participants in paid work compared to participants not in paid work. However, controlling for age, sex, and work status, the different trajectories between the two illness groups remained statistically significant (Wilks' lambda = 0.90, F [4, 103] = 2.92, $p < 0.05$, partial η^2 = 0.10). In spite of the groups' different trajectories, none of the groups showed significant change patterns in the subsequent illness-specific analyses when age, sex, and work status were used as covariates

(data not shown). Figure 1 shows the self-efficacy trajectories in the two illness groups when controlling for age, sex, and work status.

[INSERT FIGURE 1 ABOUT HERE]

Self-efficacy increased with a fluctuating pattern for those who were in paid work, when controlling for age, sex, and illness group (n=48; F [1] = 4.72, $p < 0.05$, partial η^2 = 0.10). Controlling for the same variables, the participants who were not in paid work (n = 63) showed no statistically significant trajectory (data not shown). Figure 2 shows the trajectories for participants in paid work versus participants not in paid work, controlling for age, sex, and illness group.

[INSERT FIGURE 2 ABOUT HERE]

Discussion

For obese participants, self-efficacy increased from pre-course to 12-months follow-up. For COPD participants, the changes in self-efficacy were less obvious, but a low-high-low change pattern was found. However, controlling for age, sex, and work status, the change patterns vanished for both groups; yet, a significant difference between the illness groups remained. Self-efficacy trajectories were more favorable for participants who were in paid work compared to non-working participants.

Trajectories of self-efficacy

Consistent with prior studies, we found that self-efficacy in persons with COPD and obesity increased from pre-course to post-course assessment (Kara & Asti, 2004; Park & An, 2006). As with other chronic illness groups (Lorig et al, 2001), the increase in self-efficacy among the obese participants lasted at least until the one-year follow-up. Adding to previous research, we found that self-efficacy developed differently for participants in the two illness groups. These different trajectories may be related to different characteristics of the groups. The age difference between the groups was large, with the COPD participants being on

average more than 20 years older than their obese counterparts (Table 1). However this explanation conflicts with previous empirical research, as cross-sectional studies generally have found no associations between age and self-efficacy (Bonsaksen et al., 2012; Leganger et al., 2000), or associations between these factors have been largely dependent on health status (Schieman & Campbell, 2001). In addition, repeating the analysis with age and sex as model covariates did not change the results. Therefore, the higher age and the larger proportion of males among the COPD participants do not adequately explain the difference in self-efficacy trajectories between the COPD and obese participants.

The additional analysis showed favorable trajectories among participants who were in paid work compared to those who were not. Earlier research on a sample from the general working population has similarly found higher self-efficacy levels among persons working compared to persons who were on long-term sick leave (Labriola et al., 2007). These researchers suggested that lower self-efficacy in the participants not working was a result of their sickness absence. Other studies have conceptualized the relationship in the opposite direction, with self-efficacy predicting work status. For example, a large cross-sectional study on chronic pain patients found a relationship between higher self-efficacy and being in work (Sardá, Nicolas, Asghari, & Pimenta, 2009). Conversely, low self-efficacy was associated with a higher risk of disability. A longitudinal study on cancer patients also found self-efficacy to play a positive role for subsequent self-perceived work ability, as well as for subsequent actual work status (Bains et al., 2012). Our results, however, build on the understanding of the association between self-efficacy and work set forth by Labriola and colleagues (2007). Being in work was associated with a favorable trajectory of self-efficacy during the following year. As the obese participants were more frequently in paid work compared to their COPD counterparts (Table 1), this may partially account for the different trajectories shown for the two illness groups.

Different expectations concerning illness progression are a second possible explanation for the different patterns of change in self-efficacy observed in the two groups. Obesity patients may experience their disease as temporary, i.e. they believe their health condition can change by changing their behavior and/or having surgical or medical treatment. Therefore, during the follow-up period obese participants may have practiced behaviors important to their health – like physical activity, a healthier diet, and exploring alternatives to eating when feeling 'down' – and started to experience the benefits from these changes. Mastery experience is theoretically described as the most influential source of self-efficacy (Bandura, 1997), and having such experiences during the follow-up period might explain the more positive self-efficacy trajectory in this group. Alternatively, different perceptions about how the illness was likely to progress may have affected the participants' motivation differently in the two groups. Longer lasting patient education courses for the obesity group, allowing for more integration of the course contents into the participants' everyday lives, may also have had an impact on the more positive self-efficacy trajectories in this group. In addition, 21 (39.6 %) of the obese participants reported that they had participated in self-help groups during the follow-up period. Their experiences from these groups may have had a similar positive impact on their self-efficacy trajectory during follow-up.

At baseline, the obese participants perceived their illness to be more severe than the COPD participants. The results showed significantly more perceived *consequences* from illness, as well as more *emotional response* to illness in the obese subsample compared to the COPD subsample. Nonetheless, these perceptions did not hinder a more positive trajectory among the obese participants. Similarly, a subsequent additional analysis, using baseline levels of *consequences* and *emotional response* as model covariates, found no association between these variables and self-efficacy development over time. It is possible that these specific illness perceptions at a given point in time are less important for subsequent self-

efficacy development than are actual life experiences arising from a range of situations such as working, performing positive health behaviors, or receiving social support.

Persons with COPD may realistically expect their disease to follow a downward course as their health is largely determined by the progressive disease. Therefore, COPD participants may generally experience a gradual deterioration from their illness, and efforts to manage symptoms and everyday life activities may not have been as effective as the person hoped for. The low-high-low change pattern, as initially demonstrated for this group, may reflect a self-efficacy increase due to the early instillation of hope and the learning of procedures for illness management. The later decrease may reflect the diminished sense of personal capability associated with persisting or exacerbating symptoms and functional limitations. However, controlling for age, sex, and work status, this change pattern was no longer significant, indicating that these variables impacted on the trajectories among the COPD participants.

Although lasting improvements in functional status and quality of life following pulmonary rehabilitation programs have been reported previously (Güell et al., 2000; Singh, Smith, Hyland, & Morgan, 1998; Troosters, Gosselink, & Decramer, 2007), a range of studies – even trials of purposefully designed maintenance programs after pulmonary rehabilitation – have reported opposing results of low outcome maintenance in COPD (Heppner, Morgan, Kaplan, & Ries, 2006; Ries, Kaplan, Myers, & Prewitt, 2003). A recent review suggested that rehabilitation programs for COPD may be too concerned with educating clients about the course and management of the illness, at the expense of helping the clients achieve and maintain changes in health behaviors like increased physical activity (Bourbeau, 2012). If this was the case with our subsample with COPD, it may be fair to associate their poorer self-efficacy trajectory to a similar lack of lasting improvements in health behavior in this group. Self-help groups may support participants to maintain health behavior change after

completing a patient education course. Unfortunately, we do not have information about participation in subsequent self-help groups among the COPD participants in the follow-up period, and thus, the potential impact of such participation cannot be assessed.

Study limitations

Although prior research has found specific efficacy beliefs to be good predictors of intentions and behavior (Ajzen, 1988; Conner & Norman, 1996; Hagler et al., 2007; Leganger et al., 2000), the present study measured the participants' general beliefs in their ability to cope with demands in life (Schwarzer & Jerusalem, 1995). Although the use of a general self-efficacy measure was more appropriate given the different subsamples being studied, comparisons with previous research using specific self-efficacy measures should be made with caution. Similarly, the social support measure used in this study was quite general, and the participants may have interpreted the concept in different ways. Social support experienced as emotional support, or alternatively, as instrumental health-specific support, may affect self-efficacy differently. The ambiguity of the concept measured is therefore a weakness. The association between having paid work and experiencing a positive self-efficacy trajectory may have been confounded by other variables (e.g., degree of disability) that we have been unable to control for. The lack of a control group, and the inability to establish cause-effect relationships, are other limitations of the study design.

The educational courses for the obesity and COPD groups were largely equal in theoretical orientation and number of sessions, although the duration of the obesity courses was longer than the COPD courses. The longer lasting courses for the obesity participants may have contributed to a more favorable trajectory of self-efficacy in this group. The lack of information about subsequent self-help group participation among the COPD participants limits our ability to assess the potential impact of participation in such groups. Also, as a majority of the initial sample was excluded from the analysis and the excluded participants

were significantly younger than the included participants, questions may be raised about how well the results generalize to the larger population of persons with obesity or COPD who attend patient education courses.

Clinical implications

Given that self-efficacy is important for adopting and maintaining health behavior, and for subsequent health status in persons with chronic illness, health professionals should continue in their efforts to increase patients' self-efficacy. Since the objective of this study was to compare self-efficacy trajectories in two different illness groups, we used a general measure of self-efficacy. However, self-efficacy should also be further explored within each of the illness groups, using specific self-efficacy measures in order to cover the illness-specific concerns and behavioral challenges they have. It is noteworthy that for the obese participants in this study the increase in self-efficacy continued for at least up to the one year follow-up. For COPD participants, the results suggest that this group may need continued assistance from health professionals in order to increase their self-efficacy. The COPD courses had a shorter duration, and extending the course for this group may be one option for improving longer-term outcomes. Alternatively, more frequent sessions in the follow-up period may also have positive effects. Generally, health professionals should be attentive to the role of work status for the development of self-efficacy over time – persons who are not in paid work may be at risk of a poorer trajectory.

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Table 1

Characteristics of the sample at baseline (N = 111)

	Obesity (n = 55)	COPD (n = 56)		Effect sizes
Sociodemographic variables	*M (SD)*	*M (SD)*	*p*	*d*
Mean age (*SD*)	44.9 (9.6)	66.3 (9.1)	<0.001	2.29
	n (%)	n (%)		
Male sex	14 (25.5)	33 (58.9)	<0.001	
Education ≥ 12 years	19 (34.5)	17 (30.4)	0.64	
In paid work	35 (63.6)	13 (23.2)	<0.001	
Health behavior	*M (SD)*	*M (SD)*		
Physical activity	1.2 (0.9)	1.3 (1.0)	0.50	-0.11
Social environment				
Social support	4.1 (0.9)	4.3 (0.7)	0.22	0.25
Illness perceptions				
Consequences	7.5 (1.9)	5.8 (2.3)	<0.001	0.81
Understanding	7.7 (2.2)	6.8 (2.3)	0.05	0.40
Emotional response	6.9 (2.4)	4.5 (2.7)	<0.001	0.94
Self-efficacy	26.6 (6.8)	27.7 (5.9)	0.35	-0.17

Note. Mean values (*M*), standard deviations (*SD*), and probability of differences (*p*) between the two subsamples as investigated with *t*-tests and χ^2-tests

Figure Captions

Figure 1. Self-efficacy trajectories (mean scores) for persons with morbid obesity (n = 55) and persons with CODP (n = 56), controlling for age, sex, and work status. Bars are lower and upper 95 % CI. Score range is 10-40.

Note. a) No significant change pattern for self-efficacy occurred for the participants with COPD; b) No significant change pattern for self-efficacy occurred for the participants with morbid obesity.

Figure 1

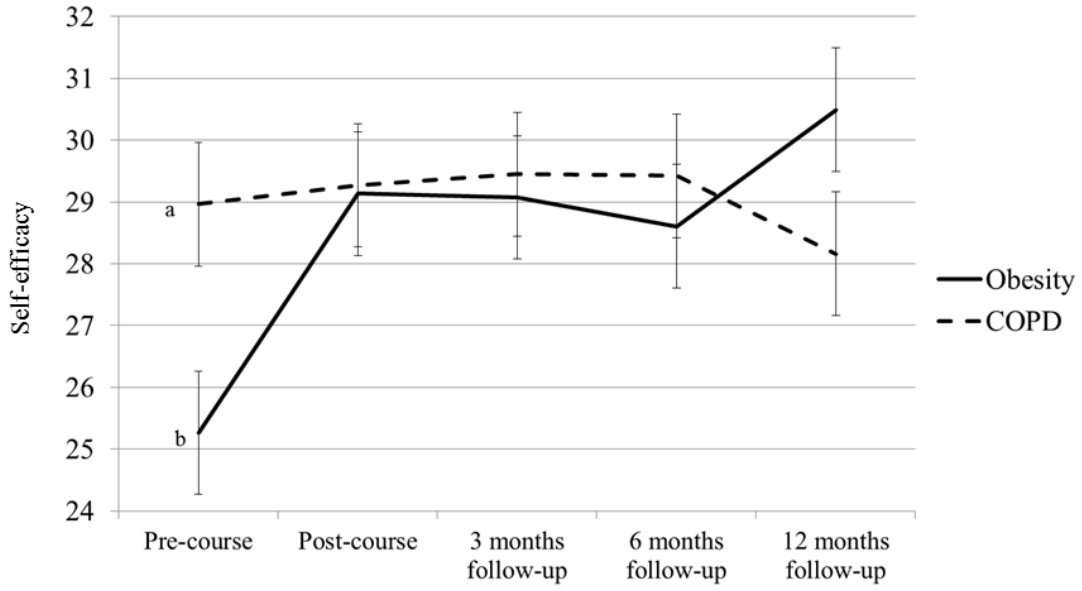

Figure 2. Self-efficacy trajectories (means scores) for persons in paid work (n = 48) and persons not in paid work (n = 63), controlling for age, sex, and illness group. Bars are lower and upper 95% CI. Score range is 10-40.

Note. a) Participants in paid work showed a fluctuating, yet increasing pattern of self-efficacy; b) Participants not in paid work showed no significant pattern of self-efficacy.

Figure 2