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# Are Self-Management Interventions Suitable for All? Comparing Obese Versus Nonobese Type 2 Diabetes Patients

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## Abstract

*Objective*. The aim of the current study was to compare obese and nonobese type 2 diabetes patients at baseline and after participating in an existing self-management intervention (i.e., *Beyond Good Intentions*) on cognitive, self-care, and behavioral measures to examine whether both groups are equally prepared and able to adopt self-management approaches. *Methods*. A total of 94 type 2 diabetes patients were included, of whom 64 (59% male) completed the study. The final sample consisted of 27 obese (33% male) and 37 nonobese (78% male) patients. The intervention comprised one individual and four group sessions and aimed to improve self-management behavior by enhancing proactive coping skills (i.e., setting concrete goals, identifying barriers, coping with difficult situations, action planning, and progress evaluation). Cognitive (i.e., proactive coping, self-control, self-efficacy), self-care (i.e., adherence to lifestyle recommendations), and behavioral (i.e., diet, exercise) measures were assessed at baseline and after completing the intervention. *Results*. At baseline, obese patients reported to possess lower cognitive skills and lower adherence to lifestyle recommendations compared with nonobese patients. The intervention was effective in improving cognitive skills, self-care activities, as well as dietary and exercise behaviors. Improvements were equal for obese and nonobese patients. However, obese patients were more likely to drop out. *Conclusions*. Although obese type 2 diabetes patients were found to possess limited skills at baseline compared with nonobese patients, the self-management course proved to be equally effective for both groups.



## Keywords

obesity, self-management, type 2 diabetes


Type 2 diabetes is a serious condition that affects increasing numbers of people, especially in Western societies. The rapid increase in prevalence over the past few decades is directly related to the rise of obesity levels, which is known to be a major risk factor (e.g., Mokdad et al., 2001). Approximately 60% to 90% of type 2 diabetes is said to be attributable to excess weight (Anderson, Kendall, & Jenkins, 2003). Besides increasing the chance of developing type 2 diabetes, obesity also complicates the management of the disease as it is related to increased insulin resistance and blood glucose levels (Klein et al., 2004). In addition, obesity is associated with severe diabetes-related comorbidities such as cardiovascular disease (Sullivan, Morrato, Ghushchyan, Wyatt, & Hill, 2005).

Accordingly, lifestyle guidelines and interventions aimed at type 2 diabetes patients often focus on weight management behaviors such as healthy eating and increasing exercise to prevent deterioration of the disease. Such lifestyle changes are especially important for obese, compared with nonobese, patients, as they have the most benefit to gain in this regard. Indeed, improving diet and exercise behaviors has been shown to yield beneficial effects for type 2 diabetes patients, for example, by delaying or reducing the need to take medication (Anderson et al., 2003).

A number of successful lifestyle interventions aimed at type 2 diabetes patients have been reported. In particular, research has shown that patients benefit substantially from self-management programs targeting skills and motivation (Chodosh et al., 2005; Norris, Engelgau, & Venkat Narayan, 2001). A guiding principle for a Task Force that was convened by the American Association of Diabetes Educators and the American Diabetes Association was that "Diabetes [self-management] education is effective for improving clinical outcomes and quality of life" (Funnell et al., 2009, p. S87). Moreover, interventions targeting the improvement of

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self-management skills are now considered "an essential part of diabetes management" (Jarvis, Skinner, Carey, & Davies, 2010).

However, the effectiveness of self-management interventions for obese type 2 diabetes patients in particular is unclear. In fact, on a more general level it has been stated that trying to improve self-management skills in obese people is not feasible in the long term (Lowe, 2003) or "inadequate" (Nestle & Jacobson, 2000). Indeed, the literature provides some suggestions that self-management training would not be sufficient for this particular group. For example, in accordance with obesity treatment guidelines, research suggests that obese patients benefit most from pharmacotherapy and/or intensive dietary guidance rather than less intensive behavioral lifestyle counseling (Tsai & Wadden, 2009; Yanovski, 2005). Also, it was found that obesity is related to low self-control or impulsiveness (e.g., Davis, Patte, Curtis, & Reid, 2010; Nederkoorn, Smulders, Havermans, Roefs, & Jansen, 2006), which in turn is suggested to limit the success of self-regulation interventions for these people (Crescioni et al., 2011). However, empirical evidence for the limited responsiveness of obese type 2 diabetes patients to self-management interventions has not been reported so far. In fact, it may also be argued that obese patients have more room for improvement and would benefit more, rather than less, from self-management interventions.

The aim of this article is twofold: First, we investigate whether obese and nonobese type 2 diabetes patients at baseline differ on relevant cognitive and behavioral factors regarding diabetes self-management. Specifically, the cognitive factors examined include proactive coping skills, self-control, and self-efficacy. On a behavioral level, self-care, dieting, and exercise behavior are included. In this way, we explored whether the "starting points" for obese patients may be worse compared with that of nonobese patients. The second aim, then, is to investigate whether obese and nonobese patients are equally responsive to an existing self-management intervention (i.e., *Beyond Good Intentions*; Thoolen, De Ridder, Bensing, Gorter, & Rutten, 2008). This theory-based intervention aims to improve proactive coping skills (i.e., goal setting, dealing with obstacles, evaluating progress) and targets several self-care domains, including eating and exercise behavior. Prior studies have proven it effective for diabetes patients (Thoolen et al., 2007; Thoolen, De Ridder, Bensing, Gorter, & Rutten, 2009), yielding significant improvements of proactive coping skills, which in turn lead to improved self-care behavior and medical outcomes. The current study will thus serve to replicate and extend previous findings by systematically comparing obese with nonobese patients to see whether similar beneficial effects can be obtained for the former, supposedly "difficult" group of patients.

## Method

### Participants

Type 2 diabetes patients were contacted through general practitioners and were eligible to participate if they received a certified type 2 diabetes diagnosis in the past 5 years and possessed sufficient mastery of the Dutch language. Exclusion criteria were serious physical or psychiatric comorbidities or being involved in another diabetes self-management program. Ninety-four patients agreed to participate and completed baseline questionnaires. Of these, 48 patients had a body mass index (BMI) of 30 or higher and were classified as obese. The remaining 46 participants had BMIs lower than 30 and were classified as nonobese. During the intervention, 30 patients dropped out, leaving 64 patients (27 obese, 37 nonobese) who returned their questionnaires after the intervention. Participants' mean age was 60.3 years ($SD$ = 7.7), ranging from 46 to 74 years. The mean BMI for obese patients was 35.5 kg/m$^2$ ($SD$ = 5.3; range = 30.1-54.3), and for nonobese patients it was 26.9 kg/m$^2$ ($SD$ = 1.9; range = 22.3-29.8). Among nonobese patients, only 3 (5.7% of the participants who completed the intervention) had a BMI lower than 25 (i.e., a normal weight). Fifty patients (23 obese, 27 nonobese) used diabetes medication. On average, commitment to change was high ($M$ = 5.5, $SD$ = 0.9, on a 7-point scale), and no difference in commitment was found between obese and nonobese patients ($F < 1$). Further demographics and medical characteristics are shown in Table 1.

### Procedure

The *Beyond Good Intentions* program (Thoolen et al., 2008) consists of one individual and four group sessions, delivered over a period of 8 weeks (i.e., the individual session in Week 0 and group sessions in Weeks 2, 4, 6, and 8) in three cohorts starting in 2009 and 2010. Groups were led by instructed trainers and consisted of six to eight individual patients. The core of the intervention comprises a proactive five-step plan that involves setting small, concrete goals (Step 1); recognizing conditions for and barriers to goal achievement (Step 2); coming up with problem-solving strategies in challenging situations (Step 3); formulating specific action plans (Step 4); and defining ways to evaluate progress (Step 5; see Thoolen et al., 2008, for a detailed description). The group sessions focused on "staying fit," "healthy eating," and "medication and self-care." Assessments of psychological and behavioral measures were taken at baseline before the individual session (T1) and after the last group session (T2). BMI, Hba1c, and blood glucose levels were assessed at baseline by registered nurses. The study was approved by the Medical Ethics Committee of the Utrecht University Medical Center and registered in the Dutch Trial Register (#NTR2765). All participants signed informed consent forms before the start of the intervention.

### Measures

*Personal Characteristics.* At baseline, demographics (i.e., age, sex, education, employment) and disease characteristics (i.e., time since diagnosis, BMI, Hba1c, blood glucose) were

**Table 1.** Demographic and Medical Characteristics.

| Scale | Nonobese (*N* = 37) | Obese (*N* = 27) | *p* Value |
|---|---|---|---|
| Age (years), mean (*SD*) | 61.3 (7.2) | 59.0 (8.2) | .248 |
| BMI | 26.9 (1.9) | 35.5 (5.3) | <.001 |
| Gender | | | |
| % Male | 78 | 33 | .001 |
| % Female | 22 | 67 | |
| Education level,[a] mean (*SD*) | 3.4 (1.4) | 3.0 (1.3) | .180 |
| Employed % | 39 | 27 | .420 |
| Hba1c, mean (*SD*) | 6.6 (.7) | 6.9 (.9) | .121 |
| Blood glucose, mean (*SD*) | 8.0 (2.0) | 8.3 (1.1) | .440 |
| Time since diagnosis (years), mean (*SD*) | 5.1 (9.0) | 4.1 (3.8) | .567 |

*Note.* BMI = body mass index.
a. Education level was measured on a 5-point scale (1 = *lowest*, 5 = *highest*).

assessed. Furthermore, commitment to change was assessed with four items (e.g., "How committed are you to change your self-management behavior?" Cronbach's α = .71) that were answered on a scale from 1 (*not at all*) to 7 (*very much*).

## Psychological Measures

*Proactive coping*. Proactive coping skills were assessed using the Utrecht Proactive Coping Competences Questionnaire (Bode, Thoolen, & De Ridder, 2008). The scale consists of 21 items (e.g., "I am capable of recognizing my own shortcomings"; Cronbach's α = .94) that were answered on a scale from 1 (*not at all*) to 4 (*very capable*).

*Self-control*. Self-control was assessed using the Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004). The scale included 13 items (e.g., "I do certain things that are bad for me, if they are fun" [reverse coded]) that could be answered on a scale from 1 (*not at all*) to 5 (*very much*) (Cronbach's α = .62).

*Self-efficacy*. To assess self-efficacy, an adapted version of a questionnaire developed by Lorig et al. (1996) was used (cf. Thoolen et al., 2009). The 12-item scale assesses self-efficacy in performing a range of specific self-care behaviors (Cronbach's α = .86). Each item was phrased as "How confident are you that you can [e.g., adhere to your doctor's dietary advice]" and was answered on a scale from 1 (*not at all*) to 7 (*totally*).

## Self-Care Measures

*Diabetes self-care*. General self-care behavior was assessed using the revised summary of the Diabetes Self-Care Activities measure (Toobert, Hampson, & Glasgow, 2000). The 10-item questionnaire assesses diet, exercise, blood-glucose testing, and foot care (Cronbach's α = .69). Participants were asked to indicate for each domain "Over the last 7 days, how often did you . . . " resulting in a mean score of 0 to 7. Besides the general scale, subscales for diet (Cronbach's α = .59) and exercise (Cronbach's α = .81) were computed.

*Medication adherence*. The Medication Adherence Report Scale (Horne & Weinman, 1999) assessed the degree to which patients do not take their medication as prescribed (i.e., changing doses, stopping, or forgetting to take medication). The five-item scale is scored from 1 (*always true*) to 5 (*never true*), such that higher scores indicate better adherence (Cronbach's α = .75).

*Lifestyle adherence*. An adaptation of the Medication Adherence Report Scale (Theunissen, de Ridder, Bensing, & Rutten, 2003) was included to assess adherence to lifestyle recommendations (e.g., "I forget to adhere to the lifestyle guidelines provided by my general practitioner"). The scale consists of five items with scores ranging from 1 (*always true*) to 5 (*never true*), such that higher scores indicate better adherence (Cronbach's α = .94).

## Behavior Measures

*Physical activity*. Physical activity was assessed using the Physical Activity Scale for the Elderly (Schuit, Schouten, Westerterp, & Saris, 1997), which incorporated not only exercise but also occupational, leisure, and household activities. The 15-item scale yields a composite score between 0 and 800 reflecting total energy expenditure.

*Dietary habits*. Diet was measured using the Kristal Food Habits Questionnaire (Kristal, Shattuck, & Henry, 1990), which consists of 20 items assessing how often patients use specific activities to reduce fat intake (e.g., "How often do you use fat-free dairy products"; Cronbach's α = .67). Items were answered on a scale from 1 (*never*) to 4 (*always*), including a "not applicable" option, with higher scores reflecting lower fat intake.

## Data Analysis

Data analysis included three parts: First, dropout analyses were conducted to test whether dropouts and completers of the intervention differed on specific characteristics. Chi-square analyses were conducted to test whether dropouts and completers differed on being obese, sex, or employment. In addition, separate analyses of variance (ANOVAs) were conducted to test for differences between dropouts and completers on disease characteristics (i.e., time since diagnosis, Hba1c, blood glucose), age, educational level, commitment to change, and cognitive and self-care measures assessed at T1. Variables on which a difference between dropouts and completers was found were entered in a binary logistic regression analysis to determine the odds ratios. The remaining analyses only included patients who completed the intervention program.

The second part of the analyses involved testing baseline differences on cognitive, self-care, and behavioral variables between obese and nonobese patients. Conceptually related variables were entered in a multivariate analysis of variance (MANOVA; i.e., self-care, diet self-care subscale, exercise self-care subscale, and lifestyle adherence), whereas the remaining variables were tested separately in ANOVAs. As sex was unequally distributed between groups (i.e., obese patients were more likely to be female, see Table 1), correlations were computed between sex and all dependent variables at T1. Only for dietary habits a significant correlation with sex was found ($r = .26$, $p = .04$). Hence, sex was included as a covariate only in the analyses of baseline difference between obese and nonobese patients on dietary habits.

Last, the effectiveness of the intervention on all variables was analyzed using repeated measures ANOVA including being obese as a between-subjects factor, and Time (T1 to T2) as a within-subjects factor. Correlations between sex and T2 variables revealed no significant associations, so sex was not included as a covariate in any of the analyses. Effect sizes are reported as partial $\eta^2$ (.01 = small, .06 = moderate, and .14 = large).

## Results

### *Dropout Analysis*

During the course of the intervention, 30 patients dropped out and did not return their questionnaires at T2. Compared with completers, dropouts were more likely to be obese, $\chi 2(1) = 6.32$, $p = .02$, and had higher proactive coping skills at T1, $F(1, 91) = 7.11$, $p = .009$, but did not differ on any other baseline variables. A binary logistic regression analysis including these two variables as predictors and dropout as the dependent variable resulted in a model that was significantly better than an intercept-only model, $\chi^2(2) = 15.00$, $p = .001$. The model revealed that obese type 2 diabetes patients (21 out of 48) were significantly more likely to drop out compared with nonobese patients (9 out of 46), $\text{Exp}(B) = 3.81$, $p = .007$. Also, patients who reported higher proactive coping skills at baseline were more likely to drop out, $\text{Exp}(B) = 3.77$, $p = .009$.

### *Baseline Difference Obese Versus Nonobese Patients*

*Cognition*. A significant effect of being obese was found on proactive coping skills, $F(1, 61) = 9.17$, $p = .004$, $\eta_p^2 = .13$, and on self-control, $F(1, 62) = 4.65$, $p = .035$, $\eta_p^2 = .07$, obese type 2 diabetes patients scored lower on these variables than nonobese patients. The difference between obese and nonobese patients on self-efficacy did not reach significance ($p = .10$). Means and standard deviations of all baseline differences are shown in Table 2.

*Self-care*. A significant overall difference between obese and nonobese patients was found on self-care measures (i.e., self-care, diet subscale, exercise subscale, lifestyle adherence), $F(4, 58) = 2.77$, $p = .036$, $\eta_p^2 = .16$. Univariate effects showed that obese, compared with nonobese patients, scored lower on all measures. In other words, obese patients reported to do worse in terms of adhering to self-care guidelines.

*Medication*. No difference between obese and nonobese patients was found on adherence to the medical regimen, $F < 1$.

*Behavior*. Finally, obese and nonobese patients did not differ on self-reported dietary habits ($F < 1$) and physical activity ($p = .18$). Sex was a significant covariate in the analysis for dietary habits, $F(1, 58) = 4.07$, $p = .05$.

### *Intervention Effectiveness for Obese and Nonobese Patients*

Results on the effectiveness of the intervention for obese and nonobese patients are shown in Table 3. The intervention was found to be effective with participants scoring higher on all cognitive, self-care, and behavior variables after the intervention compared with baseline, except on self-efficacy for which the effect of Time was not significant ($p = .084$). Also, medication adherence did not change over time ($F < 1$). Importantly, no difference in improvement over time was found between obese and nonobese patients, as indicated by the lack of significant Time * Obesity interaction effects despite having sufficient power (i.e., a power of more than .80) to detect a moderate effect.[1]

Hence, the effectiveness of the intervention was equal for obese and nonobese patients. If anything, trends would suggest that obese patients improved even more compared with nonobese patients. This is also reflected in participants' scores on self-care measures at T2 (i.e., after the intervention). Whereas obese and nonobese patients at baseline scored significantly different on self-control, proactive coping, and self-care measures, simple comparisons showed that differences between groups at Time 2 were only significant on self-efficacy ($p = .034$), self-control ($p = .002$), and the diet self-care subscale ($p = .009$), but not on any other measure.

## Discussion

Our findings yield two important conclusions. First, regarding baseline differences between obese and nonobese type 2 diabetes patients, the current data showed that obese type 2 diabetes patients, compared with nonobese patients, report to possess lower proactive coping skills and self-control and do worse in terms of adhering to self-care guidelines. These

**Table 2.** Baseline Differences Between Obese and Nonobese Diabetes Type 2 Patients.

| Scale | Nonobese ($N$ = 37) | Obese ($N$ = 27) | $p$ Values for Difference | Effect Size ($\eta_p^2$) |
|---|---|---|---|---|
| Cognition | | | | |
| Proactive coping (UPCC) | 2.9 (0.4) | 2.6 (0.6) | .004 | .13 |
| Self-efficacy | 5.7 (0.8) | 5.3 (0.9) | .104 | — |
| Self-control | 3.5 (0.5) | 3.2 (0.4) | .035 | .07 |
| Self-care | | | | |
| Self-care | 3.8 (0.9) | 3.2 (1.1) | .021 | .08 |
| Self-care diet | 5.2 (1.0) | 4.6 (1.3) | .047 | .06 |
| Self-care exercise | 4.3 (1.9) | 3.1 (2.3) | .027 | .08 |
| Lifestyle adherence | 4.0 (0.7) | 3.5 (1.1) | .018 | .09 |
| Medication | | | | |
| Medication adherence | 4.7 (0.3) | 4.7 (0.4) | .653 | — |
| Behavior | | | | |
| Dietary habits | 2.5 (0.3) | 2.5 (0.4) | .708 | — |
| Physical activity | 135 (60) | 111 (76) | .182 | — |

*Note.* UPCC = Utrecht Proactive Coping Competences Questionnaire.

**Table 3.** Effectiveness of the Proactive Coping Intervention for Obese and Nonobese Type 2 Diabetes Patients.

| | Nonobese ($N$ = 37) | | Obese ($N$ = 27) | | Overall | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Scale | T1 | T2 | T1 | T2 | T1 | T2 | Time | Effect Size[a] ($\eta_p^2$) | Time * Obese Interaction |
| Cognition | | | | | | | | | |
| Proactive coping | 3.0 | 3.0 | 2.5 | 2.8 | 2.8 | 2.9 | $F(1, 60) = 5.86, p = .019$ | .09 | $F(1, 60) = 2.30, p = .135$ |
| Self-efficacy | 5.7 | 5.9 | 5.3 | 5.4 | 5.5 | 5.7 | $F(1, 61) = 3.09, p = .084$ | .05 | $F < 1$ |
| Self-control | 3.5 | 3.7 | 3.3 | 3.3 | 3.4 | 3.5 | $F(1, 61) = 6.69, p = .012$ | .10 | $F(1, 61) = 1.53, p = .221$ |
| Self-care | | | | | | | | | |
| General self-care | 3.8 | 4.2 | 3.2 | 3.8 | 3.5 | 4.0 | $F(1, 62) = 24.70, p = .000$ | .29 | $F < 1$ |
| DSCA–diet | 5.2 | 5.6 | 4.6 | 4.9 | 4.9 | 5.3 | $F(1, 61) = 6.60, p = .013$ | .10 | $F < 1$ |
| DSCA–exercise | 4.3 | 4.9 | 3.1 | 4.3 | 3.8 | 4.7 | $F(1, 62) = 11.89, p = .001$ | .16 | $F(1, 62) = 1.29, p = .262$ |
| Lifestyle adherence | 4.0 | 4.1 | 3.5 | 3.9 | 3.8 | 4.0 | $F(1, 61) = 7.72, p = .007$ | .11 | $F(1, 61) = 1.98, p = .164$ |
| Medication | | | | | | | | | |
| Medication adherence | 4.8 | 4.8 | 4.7 | 4.8 | 4.7 | 4.8 | $F < 1$ | — | $F < 1$ |
| Behavior | | | | | | | | | |
| Dietary habits | 2.5 | 2.7 | 2.6 | 2.7 | 2.5 | 2.7 | $F(1, 50) = 27.49, p = .000$ | .36 | $F(1, 50) = 2.59, p = .114$ |
| Physical activity | 135 | 154 | 111 | 162 | 125 | 157 | $F(1, 59) = 18.21, p = .000$ | .24 | $F(1, 59) = 3.54, p = .065$ |

*Note.* DSCA = Diabetes Self-Care Activities measure.
a. Effect sizes are reported for Time effects only, as no interaction effects reached significance.

findings are in line with previous research showing that obesity is related to impulsiveness and low self-control (e.g., Davis et al., 2010; Nederkoorn et al., 2006). Although it appears that obese patients may be in a disadvantaged position in terms of possessing the relevant skills to successfully manage their disease, these findings were only reflected in self-care activities but not in dietary and exercise behaviors.

Furthermore, regarding our second aim of testing the effectiveness of a self-management intervention, we concluded that obese and nonobese patients showed significant and equal improvement on cognitive, self-care, and behavioral measures. This is a relevant finding, as prior literature suggested that obese patients may not be sensitive to self-management interventions (Crescioni et al., 2011; Lowe, 2003; Nederkoorn et al., 2006; Nestle & Jacobson, 2000; Tsai & Wadden, 2009; Yanovski, 2005). The current article challenges this notion by showing that the intervention was effective for both obese and nonobese patients. Moreover, after completing the intervention obese patients did no longer differ from nonobese patients on proactive coping skills or self-care measures of lifestyle adherence and exercise, unlike baseline scores. Hence, our study indicates that there is no reason to be hesitant about including obese patients in self-management interventions.

We also concluded that, in addition to patients who reported higher proactive coping skills, obese type 2 diabetes patients were more likely to be dropouts of the intervention program compared with nonobese patients. Our data showed that this selective dropout was not because of, for instance, education levels, disease characteristics, commitment, or baseline self-management skills. Future research should devote specific attention to the reasons for obese type 2 diabetes patients' dropout, and more important, to ways to keep this group in interventions, as they may in fact be particularly likely to benefit.

## *Study Strengths and Limitations*

The current study was the first to systematically compare obese and nonobese type 2 diabetes patients on cognitive and behavioral measures both at baseline and with respect to the outcomes of a self-management intervention. Furthermore, our findings provided additional support for the growing enthusiasm for self-management interventions (Chodosh et al., 2005; Funnell et al., 2009; Jarvis et al., 2010; Norris et al., 2001) and shows that obese patients should also be encouraged to participate in programs focusing on the development of proactive coping skills. By taking into account both cognitive and self-reported behavioral outcomes, we were able to show that proactive coping skills were effectively improved and that participants reported better self-care and dietary and exercise behaviors after the intervention compared with baseline.

The intervention did not improve medication adherence, however. A plausible explanation could be that patients in our sample already scored quite high on this measure (with a mean score of 4.7 on a scale from 1 to 5), such that improvement was hardly possible. Similar findings were reported in a previous evaluation of the intervention (Thoolen et al., 2009).

The current study did not include a control condition, which may be a seeming limitation to the interpretation of the results. However, as the intervention had previously been found effective compared with a control group receiving a brochure on diabetes self-management (Thoolen et al., 2007; Thoolen et al., 2009), we deemed it unnecessary and even unethical to again assign half of our participants to a control condition. Patients in the control group of the previous study (Thoolen et al., 2009) showed no significant changes on any cognitive or behavioral measure, indicating that reported improvements in the current study are unlikely to be because of mere measurement effects. Furthermore, as far as identical measures were used, our obtained scores are very similar to the ones reported previously (Thoolen et al., 2009).

Finally, the current study is limited to cognitive and behavioral outcomes. Additional, preferably larger scale, studies are needed to see whether the induced changes on cognitive and behavioral levels can be sustained in the long run and translated into improved medical outcomes. In particular, it would be interesting to see whether proactive coping skills can help obese type 2 diabetes patients successfully lose weight, as reaching and/or maintaining a healthy body weight remains the most important recommendation for type 2 diabetes patients (Anderson et al., 2003).

In summary, our findings replicate and extend earlier reported effects of the *Beyond Good Intentions* program (Thoolen et al., 2008) by showing that the intervention has similar positive effects for obese and nonobese type 2 diabetes patients, although obese patients were more likely to drop out. Given that our results showed that obese patients at baseline tend to be in the disadvantaged position of possessing fewer relevant cognitive skills as well as reporting worse adherence to lifestyle recommendations, it is especially hopeful to see that this "difficult" group can reach significant improvements in terms of proactive coping skills and self-care behavior.

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## Note

1. Additional analyses entering standardized BMI values as a continuous predictor, rather than the dichotomous obese versus nonobese factor, also revealed no significant Time * BMI interactions (all *p*s > .08).

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