



Self-Efficacy & Locus of Control as Predictors of the Efficacy of a Lifestyle Modification Program for Patients with Pre-Diabetes



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Background

Lifestyle interventions reduce diabetes risk in pre-diabetes people. Programs such as the Diabetes Prevention Program (DPP)¹ involve intensive teaching, coaching, and counseling to help individuals exercise, lose weight, and monitor their own behavior. However, these programs are expensive, require regular contact between professionals and clients, and overall are not practical in the contexts of normal dietetic and medical practice.

One question we addressed was whether we could use DPP materials in a classroom setting to teach people at risk for Type II diabetes to modify their lifestyles and to lose weight. Accordingly, the fourth and fifth authors (VG and DK) adapted DPP instructional materials for use in a series of 16 group teaching sessions whose aims were to teach about (1) healthy food choices; (2) monitoring of eating; (3) the importance of exercise to health; and (4) developing and maintaining exercise plans.

A second question we addressed was whether the success of instructional approaches to lifestyle change may hinge on personality variables known to influence people's capacity to manage their own behavior. Two such variables are *internal locus of control* and *self-efficacy*.^{2, 3, 4} Internal locus of control is the degree to which people believe they control outcomes in their lives, and self-efficacy is the extent to which people believe they are able to achieve what they want to achieve. Nominally similar, these are two operationally and conceptually distinct variables that have been found important to understanding healthy behavior.

Hypotheses

We examined three hypotheses:

- ❖ A classroom approach to lifestyle change and management using DPP materials will help pre-diabetes patients lose weight.
- ❖ Individuals who enjoy strong senses of internal health locus of control will lose more weight in the training program than those who have weaker senses of internal control.
- ❖ Individuals who enjoy strong senses of health self-efficacy will lose more weight in the training program than those who have weaker senses of health self-efficacy.

Method

Participants: Clients of a medical clinic in a medium-sized midwestern city (N = 65, 12 men and 53 women) identified as at risk for Type II diabetes.

Materials: Training materials were packets obtained from the Diabetes Prevention Project website, and included forms to record participants' weights at the beginning of each training session. Self-efficacy and health locus of control measures were adapted from those in use at Stanford University⁵ and Vanderbilt University⁶, respectively.

Design: 2 x 2 x 2 mixed within and between; participants' weights at sessions 1 and 16 of training; low and health internal locus of control and health self efficacy determined by a median split of participants' scores on each measure

Procedure: The participants completed a 16 session health education course taught primarily by VG and DK. At Session 1 participants completed demographic forms and the personality measures; they also received all of the materials to be used for the course in three-ring binders. The instructors took participants' weights at the beginning of each session. Training consisted of direct instruction about nutrition, eating habits, exercise, and strategies for maintaining participant determined exercise programs, which aimed to achieve various types of 30-minute daily workouts. Other aspects of the training program included discussions of the material and role-playing by instructors and their assistants to illustrate how to improve and maintain eating habits and patterns of exercise.

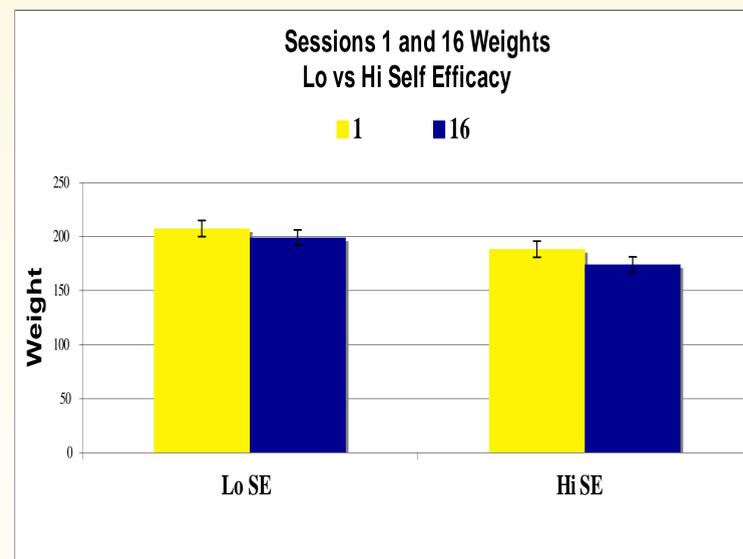
Results

The median of the internal locus of control measure was 27 (S.D. = 3.92) on a scale that could range from 6 to 36. The median of the self-efficacy measure was 45 (S.D. = 5.85) on a scale that could range from 9 to 54. Reliability estimates for the measures were .61 and .88, respectively.

There was a small though significant correlation between the personality measures ($r = .25, p < .05$), but crossing the median splits of participants according to their scores on the measures of locus of control and self-efficacy produced four cells having sample sizes of 20, 12, 15, and 18 which were independent ($\chi^2 = 1.89, n.s.$).

A 2 (time of measurement) x 2 (Level of self-efficacy) x 2 (level of internal locus of control) ANOVA demonstrated significant effects of time of measurement, level of self-efficacy, and the interaction of these two variables.

- ❖ Average weight (in pounds) at Session 16 (M = 185.96, S.E. = 5.14) was less than average weight at Session 1 (M = 197.37, S.E. = 5.11) ($P < .0001; \eta^2 = .59$).
- ❖ High self-efficacy participants weighed less overall (M = 181.27, S.E. = 7.04) than low self-efficacy subjects (M = 203.48, S.E. = 7.35) ($p < .04; \eta^2 = .07$).
- ❖ As indicated in the following figure, high self-efficacy participants lost more weight between Session 1 and Session 16 than did low self-efficacy participants ($p < .03; \eta^2 = .09$).



Acknowledgement

The Office of Research and Sponsored Programs at UWEC provided funds to cover student assistant stipends and poster printing costs for this project. Marshfield Clinic provided a grant to cover costs of printing and packaging DPP materials, salaries, and related costs of the training program.

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Discussion

Overall, our implementation of the Diabetes Prevention Project's curriculum for lifestyle was associated with a clear reduction of participants' weights. On average individuals lost 11.41 pounds, or six percent of their average beginning weight. This compares very favorably with the findings of the original study¹, which found a five-percent reduction in weight. The five-percent reduction in that study was associated with a 58-percent reduction in risk for Type II diabetes.

Originally we expected that weight loss would interact markedly with the personality variables, possibly to the extent that only people high in internal health locus of control and health self-efficacy would lose a statistically significant amount of weight. However, only self-efficacy interacted with weight loss, such that high self-efficacy participants lost more weight. Interestingly these people also began the course at lower average weight, hinting that they may already have been more successful at managing their lifestyle vis-à-vis their risk for Type II diabetes.

There are two methodological constraints on our findings. First, the reliability of the locus of control measure was rather low, which suggests that that attribute may not have been accurately assessed. Second, participants' average levels of internal locus of control and self-efficacy were fairly high at the beginning of the study. Thus we did not really sample the full range of these personality traits in terms of their possible association with the success of the course. Had we been able to sample the full range we might have found effects associated with both traits rather than just one. And if the logic of our expectations is correct, the overall apparent effectiveness of the program may have been due to the already high levels of internal locus of control and self-efficacy displayed by participants.

Finally, we must note that our data do not tell us how either the program itself or the personality variables contributed to weight loss. We were not able to collect data consistently for all participants on measures of food intake, self monitoring, and exercise.

Conclusions

Our results suggest that dietitians and physicians may be able to help patients at risk for Type II diabetes in a straightforward way by teaching groups of patients about appropriate lifestyle management strategies. We also suggest that personality factors may play a role in the success of teach approaches, although the extent of their influence must be determined by future research. The specific behavioral mechanisms of teaching must also be investigated in future studies.

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