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Original Articles

Social Networks and Social Support in Weight Loss

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Abstract

In the research on weight control, there is currently a move away from use of artificial support groups to use of more naturally occurring support systems such as families and friends. While clients who are attempting to control their weight are often encouraged to seek support from families, friends, and co-workers, there is little information available which describes what kinds of support have been found to be most helpful and who are the best providers of this support. The purpose of this pilot project was to examine and describe the influence of different types of support and sources of support on weight control using a social networks analysis approach. Results of this pilot study suggest that social support is important in weight control with appraisal support, both general and specific to weight control, being most strongly correlated with weight loss. The precise influence of spouses and families needs further clarification. Results of this pilot project showed that over 40% of the sample identified family members as both the most and least helpful in attempts to control weight.

Keywords: Social networks; Social support; Weight control.

Introduction

Data from the national Health and Nutrition Examination Survey II revealed that approximately 34 million American adults were overweight and of these, 10—12 million individuals were judged to be severely overweight [1]. Aside from the social pressures to be thin, a number of studies have demonstrated an association between obesity and diabetes, hypertension, and coronary heart disease [2—4].

Recent reviews of the literature on behavior modification programs for obesity conclude that most programs produce consistent short-term weight losses of approximately 1—2 pounds per week with average losses for a 12 week program of about 10—12 pounds [5]. In addition, weight loss is greater in programs of longer duration [5]. While progressive weight loss appears to be adequate during enrollment in behavior modification programs, continued weight loss upon comple-

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tion of the program is rare [6]. In a review of over 200 articles, Foreyt et al. [6] concluded that it is unlikely that behavioral techniques themselves are responsible for the short-term success of programs and that it is more likely due to contact with a therapist or social pressure from others in the program.

The logical extension of this finding has been the use of more naturally occurring support systems such as families, friends, and coworkers. In a recent study, Zimmerman and Connor [7] examined the influence of significant others on health behavior change and reported that significant others, and family members in particular, were important in making behavior changes such as increasing exercise and reducing consumption of fat. In this study, the authors used a concept that was broader than social support and social networks, and referred to "both relationships and ties as well as to the institutional and cultural milieu in which individuals find themselves"(p. 59).

Currently, the results of studies in which spouses have been involved are inconsistent [8—10]. Brownell et al. [8], using a total of 19 couples, examined the effectiveness of a weight reduction program which included a spouse training component. They found that subjects in the training group lost significantly more weight and were better able to maintain the loss than those in the nontraining groups. Later, Brownell and Stunkard [10], used the same program and reported no significant results.

Weight loss programs at the worksite [11] have resulted in losses similar to other programs but have reported much greater attrition rates. Brownell [5] suggests that this may be due to lack of fees, greater complexity in the social characteristic of the worksite, and less committed participants than those found in clinical programs. Findings from all of the above suggest a need to further examine the precise types and sources of social support that may be important in weight loss and maintenance of those losses.

While many of the reviews have suggested use of social support to improve weight loss, none could be located which clearly defined "support". Furthermore, none of the studies applied a social networks analysis approach to the examination of social support in weight loss.

Currently there is still debate with regard to a consensual definition of social support. Definitions range from broad statements such as "the resources provided by others" [12] to the definition by House [13] which includes four categories of support: emotional concern or affective support, instrumental aid, information, and appraisal support. Social networks are defined as a "set of personal contacts through which the individual maintains his social identity and receives emotional support, material aid, services, information, and new social contacts" [12]. Israel and Rounds [14] suggest that social networks is a broader concept that includes social support as defined by House's typology [13]. In this context, social support is included as a functional characteristic of one's social network. Therefore, social networks refer to the presence and nature of social ties among people, and social support refers to some of the functions that may or may not be provided by these ties. This study is an attempt to integrate these two concepts in the manner suggested by Israel and Rounds [14].

While House's definition of social support includes informational support, this type of support was not included in this pilot study. In addition to the four categories of support defined by House, negative aspects of relationships is believed to be a potentially important aspect of close relationships which may influence weight control. A measure of negative aspects of relationships was therefore included in this pilot study.

The purpose of this pilot project was to examine the relationship between social support and weight loss using a social networks analysis approach. The identification of the specific type(s) and source(s) of support may

be important in the development of improved weight loss programs.

Methods

Twenty-six subjects who had completed a behavior-modification based weight loss program agreed to participate in a pilot project that was designed to prevent relapse following weight loss. (Table I presents the demographic information for this sample). This relapse prevention program was based on the work of Marlatt and Gordon [15]. A brief overview of the relapse prevention program is provided in Table II. Each session of the 6-week program lasted approximately 90 min. One session of the program dealt with developing diet partnerships and included topics such as ways to decide if a partnership would be helpful and how to identify a "good" partner.

Table I. Demographic information.

	N		Percent
Sex			
Male	2		8
Female	24		92
Marital status			
Married	14		54
Divorced	9		35
Widowed	1		4
Never Married	2		7
Employment			
Employed	21		81
Unemployed	5		19
	Range	Mean	S.D.
Weight (lbs)			
Initial	118—264	180.24	41.08
Final	115—264	182.57	40.33
	N		Percent
Change			
Lost	18		69
No change	1		4
Gained	7		27
	Range	Mean	S.D.
Age (years)	24—61	44.8	9.89

Table II. Overview of the relapse prevention program.

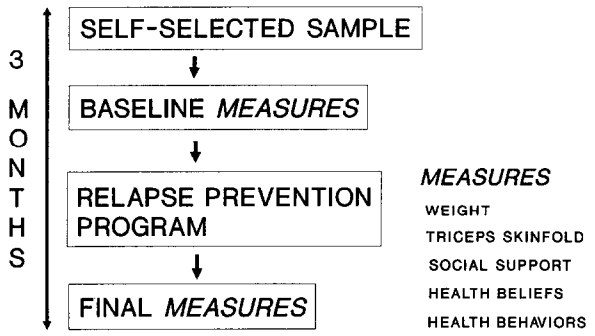
Week	Major activities
1	Measures were taken and contingency contracting was discussed and initiated
2	Introduction and overview of the Relapse Prevention program; class generation of a decision matrix; self-monitoring assignment was explained
3	Definition and discussion of high risk situations (HRS); situational competency tests administered and discussed
4	Class generation of techniques to cope with HRSs; coping response checklist given as an assignment
5	Discussion of social support, ways to select a "good partner", and helping others help you; partnership quiz given
6	Discussion of techniques/steps for coping with relapse crises; reminder cards provided; other techniques such as buddy system, reviewing commitments, etc. discussed

Subjects returned one and three months later for repeat of objective measurements and completion of questionnaires.

Prior to the onset of the program, subjects completed self-administered questionnaires on diet history, health beliefs, health behaviors, and social support. In addition, objective measures of height, weight, and triceps skin fold were taken. These objective measures were repeated at the conclusion of the program and again at the 3-month follow-up. In addition, subjects completed the social support questionnaire for the second time at the 3-month follow-up (see Fig. 1 for a diagram of the study).

This paper describes the findings related to social support and weight loss. The effectiveness of the relapse prevention program will not be presented. Measures of social support at baseline were correlated with weight change from baseline to the 3-month follow-up in a very preliminary attempt to examine the relationship of social support and weight loss emphasizing close network relationships.

Fig. 1. Study design.



As noted above, subjects completed a self-administered questionnaire on social support which contained 45 items, and used a social networks analysis approach. The first part of the questionnaire asked respondents to identify up to five people (over age 18) who were very close to them, so close that they could not imagine life without them. For each of the important others identified, subjects were asked to rate the amount of affective, appraisal, and instrumental support that was provided by these others. (Informational support was not included in this data set). Table III includes examples of items used to measure general appraisal, affective, and instrumental support. In addition, a measure of the negative aspects of each of these relationships was obtained.

The second part of the questionnaire asked respondents to identify up to five people who were important in their efforts to lose or maintain their weight. In this part of the questionnaire, respondents rated each of the important others on affective support related

Table III. Examples of items used to create general measures of support.

Type of support	Item	Responses
Appraisal	How often do each of these people compliment you when you do something well?	1 = never 2 = rarely 3 = sometimes 4 = often 5 = almost always
Positive affective	To what extent do each of these people reassure you when things aren't going your way?	1 = never 2 = rarely 3 = sometimes 4 = often 5 = almost always
Instrumental	To what extent would each of these people help you with tasks you needed to do such as grocery shopping, child care, or providing you with transportation?	1 = never 2 = rarely 3 = sometimes 4 = often 5 = almost always
Negative aspects of relationships	How often does each of these people hassle you or make too many demands on you?	1 = never 2 = rarely 3 = sometimes 4 = often 5 = almost always

Table IV. Examples of items used to create measures of support specific to weight control.

Type of support	Item	Responses
Positive affective	How much can you rely on each of these people to encourage or comfort you when you encounter difficulties in your weight loss or maintenance program?	1 = not at all 2 = a little 3 = somewhat 4 = very much
Appraisal	How often does each of these people praise you for following your diet?	1 = never 2 = rarely 3 = sometimes 4 = often 5 = almost always
Instrumental	How often do each of these people do some physical activity with you (jog, walk, etc.)?	1 = never 2 = rarely 3 = sometimes 4 = often 5 = almost always
Interference	To what extent does each of these people encourage you to have snacks, dessert, etc.?	1 = not at all 2 = a little 3 = somewhat 4 = very much

to weight control, appraisal support related to weight control, and instrumental support related to weight control. For this section as well, subjects rated each of the important others with regard to interference in weight control. (See Table IV for examples of items used to measure each of the types of support specific to weight control).

For both sections of the questionnaire, sources of support included: spouses, family members, friends, neighbors, co-workers, and a category labeled "others". There were additional open-ended questions included in the questionnaire that asked respondents to identify what, if any, effect children under age 18 had on their weight control efforts, as well as who are the most and least helpful in their efforts to control their weight.

Measures of each of the three types of general support and a general measure of negative aspects of relationships as well as three types of support specific to weight control and a measure of interference in weight control were created by averaging responses to items in the appropriate category. (See Tables III and IV for examples of items used to create measures of each of the eight types of support). In addition, a total support score was calculated for each respondent. Items for each of the categories of support were combined on face validity in conjunction with the opinion of three judges. Due to the small number of subjects in this pilot, reliability coefficients were not calculated. The questionnaire was derived from the work of House [16], Caplan et al. [17], and Forster et al. [18]. A paper describing the psychometric properties of this instrument is in preparation [19]. Descriptive and correlational analyses were performed and are reported below.

Table V. Rank order of sources of general support.

Type of support	Rank order of source	*N*	Mean score
General support			
Positive affective	1. Neighbors	1	4.00
	2. Others	3	3.89
	3. Friends	11	3.70
	4. Spouse	14	3.59
	5. Family	23	3.28
	6. Co-workers	3	2.89
General appraisal	1. Neighbors	1	5.00
	2. Friends	11	4.12
	3. Others	3	4.00
	4. Spouse	14	3.93
	5. Family	23	3.85
	6. Co-workers	3	3.33
General instrumental	1. Spouse	14	3.89
	2. Family	23	3.20
	3. Neighbors	1	3.00
	4. Friends	11	3.00
	5. Others	3	2.67
	6. Co-workers	3	2.44
Negative aspects of relationships	1. Others	3	3.00
	2. Spouse	14	2.96
	3. Family	23	2.41
	4. Friends	11	2.28
	5. Co-workers	3	2.17
	6. Neighbor	1	2.00
Weight specific support			
Positive affective	1. Neighbor	1	4.00
	2. Spouse	14	3.26
	3. Friends	13	3.22
	4. Family	23	3.11
	5. Co-workers	8	3.06
	6. Others	4	2.78
Appraisal	1. Neighbor	1	3.33
	2. Friends	11	3.19
	3. Spouse	14	3.06
	4. Others	3	2.94
	5. Family	23	2.66
	6. Co-workers	3	2.44
Instrumental	1. Co-workers	8	3.00
	2. Friends	13	2.99
	3. Spouse	14	2.77
	4. Neighbor	1	2.66
	5. Family	23	2.14
	6. Others	4	1.63
Interference in weight control	1. Others	4	2.54
	2. Neighbors	1	2.00
	3. Family	23	2.00
	4. Friends	13	1.98
	5. Spouse	14	1.85
	6. Co-workers	8	1.27

Results

Sources of support

The six sources of support were rank ordered for each of the six types of support (three general measures of support and three measures of support specific to weight control), a measure of negative aspects of relationships and a measure of interference in weight control defined in this pilot project (see Table V). Neighbors and friends were the top two sources of general appraisal support and appraisal support related to weight control. Neighbors and others were the top two sources of general affective support and neighbors and spouses were the top two sources of affective support related to weight control. Spouses and family members were identified as the top two sources of instrumental support, with co-workers and friends taking the top two places in the rank ordering of instrumental support related to weight control. With regard to negative aspects of relationships, others and spouses ranked first and second for this measure. Others ranked number one for sources of interference in weight control with neighbors and family members tying for second place.

Table VI. Correlations between weight lost and types of support (N = 18).

Type of support	Correlation	Significance
General support		
Positive affective	0.10	0.68
Appraisal	0.47	0.05
Instrumental	0.24	0.33
Negative aspects of relationships	0.06	0.80
Support specific to weight control		
Positive affective	0.34	0.16
Appraisal	0.42	0.08
Instrumental	−0.03	0.92
Interference	−0.33	0.18
Total support score	0.44	0.07

Type(s) of support

Eighteen of the twenty-six subjects lost weight (mean weight loss was 6.4 pounds), 7 gained weight (mean weight gain was 10.8 pounds), and one remained the same. (It is important to note that the range in amount of weight gained for these seven subjects was from 1.5 pounds to 15 pounds. The mean weight gain for these seven subjects was heavily weighted by the unusually large gain of 15 pounds by one subject). For the subjects who lost weight, correlations between weight lost, each of the six types of support, the measure of negative aspects of the relationship and interference in weight control were computed and are displayed in Table VI. With regard to general measures of support, all were positively correlated with weight loss. Appraisal support was most strongly correlated to weight loss at +0.465 and reached significance at the $P = 0.05$. In addition, the total support score was positively correlated with weight loss at +0.440 and approached significance at $P = 0.07$.

Regarding measures of support specific to weight control, positive affective or emotional support and appraisal support were again positively correlated with weight loss, and here again, appraisal support was most strongly related to weight loss at +0.418 ($P = 0.08$). For support specific to weight control, instrumental support and interference with weight control were both negatively related to weight loss, though not significantly so.

Other findings

Table VII presents a summary of responses to questions regarding the influence of one's children on weight control, as well as the responses to items which tapped the most and least helpful persons in efforts to maintain or lose weight. Fourteen of the 26 subjects in this pilot project reported having children under age 18. Of those reporting having children, 71% reported that children under 18 years old had a negative impact on their efforts to control their weight.

Table VII. Influences in weight control.

In what ways, if at all, does having children in your household influence your efforts to lose or maintain your weight (N = 14)

	Negative influence	No influence	Positive influence
N =	10	1	3
% =	71	7	21

What one person is MOST helpful to you in your efforts to lose or maintain your weight?

	Spouse	Family	Friend	Co-worker	Self
N =	7	12	4	2	1
% =	27	46	15	8	4

What one person is LEAST helpful to you in your efforts to lose or maintain your weight?

	Spouse	Family	Friend	Co-worker	No one	Self
N =	2	10	3	3	5	1
% =	8	42	12.5	12.5	21	4

When asked which one person is the most helpful in efforts to lose or maintain weight, 46% of the sample reported family, 27% said spouses, 15% said friends, 8% co-workers, and 4% said themselves. When asked who was the least helpful in efforts to control weight, 42% reported family members as least helpful and 8% reported spouses as least helpful.

Discussion

This prospective study was a first attempt to take an indepth look at the relationship between social support and weight loss using a social networks analysis approach. Despite the small sample size, results of this pilot suggest that social support is important in weight control. Of the three types of support examined (both general and specific to weight control), appraisal support was found to be most highly correlated with weight loss for subjects in this sample. The best sources of this support for the subjects in this pilot project were neighbors and friends. The influence of spouses and family members on efforts to control weight remains inconclusive and needs further clarification.

While it is recognized that the findings presented are preliminary in nature, Table VIII suggests the possible implications of these findings for health educators. Over 40% of the respondents identified family members as both the most and the least helpful person in their efforts to control their weight. This finding suggests a need for further research before use of spouses and families are suggested as support systems in weight loss programs. Specifically, we need to ascertain the conditions under which spouses and families are helpful or not helpful in efforts to control weight. Work by Baranowski et al. [20] and Brownell et al. [8] suggests that spouses and

Table VIII. Implications for practice.

1.	Clients need to identify those who would support and/or interfere in their efforts to control their weight
2.	Interventions are needed to help clients cope with those who sabbotage control efforts; techniques to enlist and offer reciprocal support could be included
3.	Interventions related to the influence of children are needed; special work with teens and controlling their influence on the environmental stimuli needs attention
4.	Encourage participation in new hobbies and community programs to broaden social contacts

families must be trained to give appropriate support to enhance behavior change in family members. In weight control programs, clients should be asked to identify those in their social network who they believe would help and/or interfere in their efforts to control their weight. In addition, subjects should be taught skills to resist the negative influences of those in their social network, and finally, where family members are interested in being supportive, they should be trained in ways to do this.

The finding that children were reported as a negative influence in weight control by 71% of the sample suggests the need to address the influence of children of clients in a weight loss program. Weight loss programs should stress the appropriateness of a healthy diet (with easy caloric modification) for the whole family as well as the importance of developing healthy dietary habits. Suggestions for low caloric snacks and behavioral suggestions to avoid snacking all together should be included.

For subjects in this pilot project, appraisal support was most highly correlated with weight loss and these subjects reported that this type of support was most often provided by friends and neighbors. This finding suggests that clients in weight control programs should be encouraged to socialize outside of the family. Encouraging participants to start new hobbies or take community classes will help to increase self-esteem, broaden social contacts, and increase the likelihood that they will receive appraisal support.

It is important to note that, at best, the results of this pilot project with regard to type and source of support are suggestive of trends. The small, self-selected sample limits the conclusions that can be made. External validity is limited as over 90% of the sample were women and most were married. However, it is important to note that this distribution of characteristics is very common in formal weight loss programs.

Research with a larger sample is needed to validate these findings and to further examine the relationship between social support and weight loss. Issues that need to be evaluated include the stability of the reported network, levels of support in a variety of settings, and their relationship to weight loss, social support, and relapse prevention.

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