

Review

The theoretical strategy for overweight and obesity intervention programs in adult population

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The theoretical strategy for overweight and obesity, which consist of many factors, is reviewed. As the main theoretical strategy, many intervention programs are known as theory framework; examples of theory framework selection, theory framework with overweigh and obesity intervention programs, theory framework to practice example, theory with client, theory with practitioners, theory with disciplines, fit the theory for behavior change, selection theory framework, theory with barriers, theory framework with hypotheses, theory with barriers and theory framework with hypotheses. Theory of framework can apply overweight and obesity intervention across health domains to explore whether efficacy can apply the associated types of interventions with the target populations.

Key words: Theory framework, diseases, obesity, diabetes.

INTRODUCTION

An integrative research review indicates that there are several effective theoretically based strategies for overweight and obesity interventions in adult population. According to the Centers for Disease Control and Prevention, article published in the journal *Population Health Metrics* predicts an obesity trend. Also, the number of adults in the United State with diabetes will escalate from the current rate of one in ten to as many as one in three adults in the years of 2050; a largely aging population, an increase in high-risk minority and people with diabetes living longer will be all causes, which contribute to the projected increase. What are the specific theoretically based psychological and physiological strategies for development of overweight and obesity prevention programs? The purpose of this review is to articulate the theory framework and to explore its implications.

RISK FACTORS FOR OVERWEIGHT AND OBESITY IN INTERVENTION PROGRAM TREATMENT

There are examples of risk factors in type 2 diabetes that include obesity, sedentary lifestyle, unhealthy eating habits, family history, genetics, increased age, high blood pressure and high cholesterol and history of gestational diabetes. But, some can be turned around to prevent type 2 diabetic and chronic diseases. For decreasing risks factors, several treatments or prevention measurements for obesity and overweight have been developed and studied. These are the use of the intervention programs of dietary and physical behavioral modification.

Intervention program

In an intervention program there is relative effectiveness of the intervention factor as predictors of efficacy of intervention. Several intervention factors include; age of the population, risk status of the population, intervention setting, delivery mode of the intervention, intervention

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intensity, theoretical basis of intervention, quality score of the studied, and the intervention included in non-nutrition components. Also, other factors are known; specific intervention components that consist of family component, social supports, and interactive education involving food, goal setting, cultural specificity and individual tailoring. Relative effectiveness factor in intervention program is that the program is fitted to the theory framework. Theory frameworks consist of effective strategies and the implication of the strategies.

THEORY FRAMEWORK

Theory framework is a study guide, which has the ability to influence present knowledge, to address a particular problem, and to identify an appropriate solution. The solution defines specific possibilities for experimental questions to formulate hypotheses. Specifically, a theory selection framework is a class of frameworks concerned with easily making decisions, applying in the development or acquisition of behavior intervention program. They can guide the early stages of idea, methodology, developing, and implementing for health intervention program and research agendas (Connell et al., 1995). Thus, theory frameworks can reduce trial error and waste of resources with poorly conceived research and implementation (Leeuw, 2003).

EXAMPLES OF THEORY FRAMEWORK SELECTION

There are examples of theory selection frameworks including the health belief model (Rosenstock, 1966; Becker, 1974), self-determination theory (Ryan and Deci, 1980), social cognitive theory (Bandura, 1977), theory of reasoned action/planned behavior (Ajzen and Fishbein, 1980) and the transtheoretical model (Prochaska, 1992). Indeed, these theories formed the familiar dialectic of the theoretical perspective that has dominated the field of research in health behavior.

THEORY FRAMEWORK WITH OVERWEIGHT AND OBESITY INTERVENTION PROGRAM

The intervention theory frameworks adjust our interventions with various populations in developing a health intervention program. Intervention experience allows us to overcome challenges and barriers, which are related to matches among health interventions program and target populations. Knowledge is required to guide such an initiative. A theory-motivated framework can yield insight into the appropriate confirmation of dependent factors to maximize benefits and to overcome barriers, which are given with specific intervention settings and conditions. We endeavor to identify additional challenges, barriers, and applying solutions with a focus on the intersection of

informatics, human factors, public health, communication and socio-cultural factors.

THEORY FRAMEWORK TO PRACTICE

There is a shortage of theory frameworks that consider behavior intervention factors in overweight and obesity research. This creates a problem in selecting more appropriate theory models. A theory framework is for developing intervention program; however, some of framework addresses theory in general and it is not adapted for health behavior intervention program (Sallis and Owen, 1999). A model of theory selection for developing intervention program presents the considerations of implementing health behavior intervention (Trochim, 1989). The program of health behavior change is vast, and it is based on a number of behavioral theorems as well as a more dynamic use of theories for developing intervention programs. However, there is not a specific framework that guides the decision-making process for health theory to applying study of overweight and obesity intervention (Biddle and Nigg, 2000).

PRACTICE EXAMPLE

Here, the study shows how a theory is applied for practice. The study and intervention characteristics with the outcome of the dietary and physical behavior are shown in Tables 1 and 2, respectively. Descriptive information about the studies is presented. In Table 1, targeted population is healthy adult participants (primary prevention), while participants with a variety of chronic conditions are included. These studies were applied to the theoretical model(s) that underpinned the intervention. The most common were social-cognitive theory and the transtheoretical model. Motivational interviewing and the health belief model were also used with many studies using more than one theory to inform intervention. All studies designed were randomized controlled trials. 85% used validated with dietary behavior measurement instruments. 32% of data, which were collected by staffs, were blinded to participants' study condition. In Table 2, this study is a theoretical basis for the intervention which is most based on SCT, TTM, the precaution adoption process, or a combination of theories. Study completion rates were generally high and ranged from 45 to 95%. All but one study evaluated the intervention with a study design that included at least one comparison group. Eight studies measured dietary behavior outcomes, which were usually assessed through the validated self-report food-frequency questionnaires or dietary recalls. Five studies measured anthropometric or physiologic outcomes (including body mass index, serum cholesterol and HbA1c). Although the integration of health intervention theory with practice has been applied throughout intervention process, the collected outcome data allowed for evaluations

Table 1. A review of healthy interventions for physical activity and dietary behavior change.

Author	Sample characteristic	Theoretical framework	Control condition	Result
Delichatsios (2001)	n = 298, Ret = 83%, Mean age = 45.9.	SCT FB, GS, RF.	Received TLC focused on PA change.	Increased dietary fiber grams/day and fruit servings/day decreased % of energy intake from saturated fat in intervention compared to controls.
Glasgow (2000, 2002)	n = 320, Ret = 89% >40 years of age, Mean age = 60.	SCT/self-management, MI GS, RF, PR, PS, FB, TL, barriers, empowerment principles.	None.	All groups had improvements in fat, weight, lipids at 3 and 6 months. At 12 months, significant decrease for fat, HbA1c, lipids for all groups.
McKay (2002)	n = 160, Ret = 84%, Ages 40 – 70, Mean age = 59.3.	Self-management EDU, skills training, SS, FB, GS, barriers.	None.	Decreases in fat intake and poor diet practices for all groups.
Oenema (2005)	n = 616, Ret = 79%, Mean age = 42.	Precaution adoption process model FB, increase awareness, GS, ML.	No information control.	Lower intake of vegetables for controls than intervention (p<0.10). No intake differences for fruit and fat.
Stevens (2002, 2003)	n = 616, Ret = 85%, Ages 40 – 70, Mean age = 53.5.	TTM, SCT, MI FB, GS, TL, barriers, SE.	Control group focused on breast cancer screening.	At 12 months, Percent of calories from fat decreased more in intervention group. FV increased significantly more in intervention group. Saturated, monounsaturated, and polyunsaturated fat decreased significantly for intervention group.
Verheijden (2004)	n = 146, Ret = 89.0%, Mean age = 63.	TTM TL Self-assessment SS.	Usual care.	No differences in stage of change, social support, anthropometry, blood pressure, cholesterol levels.

Summary of dietary behavior intervention studies. Behaviors: FFQ, food frequency questionnaire; FV, fruit and vegetables; FJV, fruit, juice, and vegetables. Theoretical models: CBT, cognitive behavioral therapy; MI, motivational interviewing; SCT, social cognitive theory; SEM, social ecologic model; TRA, theory of reasoned action; TTM, transtheoretical model. Behavior change strategies: CE, changing the environment; DB, decisional balance (benefits and barriers); EDU, education and/or knowledge; FB, feedback; GS, goal setting; ML, modeling; PC, pros and cons; PR, prompts/cues; PS, problem solving; SE, self-efficacy; SH, shaping; SM, self-monitoring; SS, social support; RF, reinforcement, rewards; TL, tailoring; TS, tip sheets. BMI, body mass index; IPAQ, International Physical Activity Questionnaire; PA, physical activity; PAR-Q, Physical Activity Readiness Questionnaire; Ret, retention.

for evaluations of both practice and theory.

The goal of theory is practice to target population for developing health interventions program, and this is to understanding the theory for clients' health in different population which is drawn on a range of research areas and disciplines, including public health practices, socio-medical science models, informatics methods, cognitive science, and user-centered design

principles. This is a complex research and there is need to consider development endeavor with many variables.

Theory with client

The two studies are used to construct a framework for practice by exploring the theory that

is related to ways of knowledge. This includes taking a new look at how intervention program is defined and the levels of development and practice. It also considers how the client thinks about what stage of knowledge he really is, and how it is acquired. Health interventions must have theory in an appropriate and effective manner. The theory must meet the client needs and communication methods of the health intervention.

Table 2. Study design, intervention characteristics, and outcomes for telephone-delivered dietary behavior intervention studies.

Author	Sample characteristic	Theoretical framework	Control condition	Result
Burke (2005)	Mean age = 55. 37% female. Recruited from medical and research clinics. Participation rate = 40%.	6 fortnightly calls over 12 weeks. Fat in diet. Delivered by a nurse. Self-efficacy theory.	Usual care: got physician F/U and/or lipid measurements every 3 – 6 months. F/U = 14 weeks. Attrition = 0%.	Significant effect at medium term for total fat. ES = 0.31. Significant effect at medium term for saturated fat. ES = 0.49. Significant effect at medium term for cholesterol, based on 3-day food record. ES = 0.39. Significant effect for LDL-C at medium term.
Pakiz (2005)	Mean age = 65. 30% female. Recruited via physician referral within 6 months of polyp resection. Participation rate = not reported.	Variable call schedule calls over 1 year: 3 – 10 daily calls during first month; weekly calls for 3 months; monthly calls for 8 months. Fat, fiber, F/V, calcium. Counselors SCT.	General dietary guidelines. Asked to monitor diet. F/U = 12 months. Attrition = 5%.	Significant long-term effect for vegetables, fruit, fiber, calcium, and fat ES at long term: Vegetables = 1.47, fruit = 0.26, fiber = 0.97, calcium = 1.03, fat = 0.56.
Woollard (2003)	Mean age = 60. 50% female. Recruited from seven general practices. Participation rate = about 36%.	12 monthly calls over 12 months. Practice nurses. Fat, fiber, sodium, alcohol. TTM, self-efficacy, MI.	Two comparison groups: 1) Monthly face-to-face sessions over 12 months. 2) Usual care + nontailored health promotion materials. F/U = 18 months Attrition = 33%.	No significant long-term effects on any outcome.
Pierce (2004)	Mean age = 52. Recruited from research clinics, community oncologists, tumor registries, and community outreach activities. Participation rate = 91%	Variable call schedule; 15 – 23 calls over 12 months. Fat, fiber, F/V. Dietary counselors. SCT.	Initial face-to-face assessment and review of baseline measures. Print materials (standard dietary guidelines). Bimonthly newsletters Invited to four cooking classes. F/U = 12 months. Attrition = not reported.	Significant effect at long term for F/V intake, fiber, and fat. ES at long term: fruit = 0.38, vegetables = 2.04, fiber = 1.09, fat = 0.9. Significant effect at long term for plasma carotenoid concentrations.
King (2002); USA, n = 100.	Underactive, postmenopausal female, older adults. Participation rate = 41%.	14 calls over 12 months (fortnightly to monthly) Fat, F/V. Health educator, SCT	14 calls over 12 months on physical activity. F/U = 12 months. Attrition = 15%.	Significant long-term effect for fat and saturated fat. ES for fat = 0.56. ES for saturated fat = 0.61.

BMI, body mass index; CHD, chronic heart disease; ES, effect size; F/U, follow-up; F/V, fruit and vegetables; g, grams; HBM, health belief model; HDL-C, high-density cholesterol; LDL-C, low-density cholesterol; MI, motivational interviewing; SCT, social-cognitive theory; TTM, transtheoretical model. Participation rate calculated as percentage participating of those reached and eligible. Attrition reported for longest follow-up. Short-term: <3 months; medium-term: 3 – 6 months; long-term: >6 months.

There are different ways in which various theories mediate different communication modalities; each theory offers diverse sets of constraints and costs.

For example, social cognitive theory and the role of social learning are useful when interventions program is developed for childhood overweight

(Cole et al., 2006). Intervention effectiveness can be optimized through careful consideration, which is fitted between the communication affordances

and constraints of various theory types.

THEORY WITH PRACTITIONERS

Developmental behavior intervention program is strong in part due to the range of disciplines represented by its practitioners. Developmental healthier comes from a multitude of backgrounds including psychology, client development, reading, and adult education to name a few. These multidisciplinary foundation may be applied an integrated approach to behavior intervention practice. This integration can further enhance by constructing an interdisciplinary theoretical framework. Such a framework theory would serve as a standard point of reference for training new practitioners and for facilitating decision making. Theory framework would also help to ensure that practices are not randomly implemented and, as a result, could increase communication and collaboration.

THEORY WITH DISCIPLINES

The intervention constructs a theoretical framework for the component of developmental behavior intervention program related to how program by making connections across disciplines. Theories from fields including psychology, linguistics, cognitive science, reading and adult intervention are organized into the following sets of concepts: the construct of intervention; different ways of knowing; the nature of constructivism; the active and strategic process of intervention; met cognition; and the cultural imperatives. Studies are utilized throughout the program to clarify connections between theoretical foundations and practicing process (Bickman, 1987).

FIT THEORY FOR BEHAVIOR INTERVENTION

Selection fidelity the theory to develop interventions program for overweight and obesity, has to do with changing behavior, intentions and knowledge of households, individuals, and organizations (grass roots, private and public sector). Crucial for understanding what can change behavior is information on behavioral and social mechanisms. An importation insight from theory based on evaluations is that theory interventions are often beloved to address and that trigger certain social and behavioral responses among people and organizations with case by case.

SELECTION THEORY FRAMEWORK

We propose a theory selection framework for selecting an appropriate theory to deliver and engage client with health interventions program and health field. Such a framework guides the decision-making process around

theory selection, and gives rise to a theory selection method. Theory framework considers high-level filters, and is potentially applicable to a range of theory's, domains, target populations, intervention and clinical settings. The conditions and setting in which the theory framework is used are powerful, but the theory framework criteria should be not change. It can help researchers and is acting with interest to changes on the goal, and it can also be used for reevaluating interventions at future goal as well. There are many factors involved in making us successful and in considering whether theory framework is a good fit. Different theories are appropriate in different settings for specific purposes. The theoretical selection framework integrates factors are concerned with making decision, selection criteria, and it puts together of component processes of theory selection. Chosen theory frameworks usually present different levels of filters or criteria that gradually constrain the selection space (McClintock, 1990; Rogers et al., 2000).

THEORY WITH BARRIERS

There is a growing interest in implementing health intervention program in publish health research. But its potential remains largely to untapped. The unique barriers and paucity of empirical evidence in these settings challenge the development and implementation of new health intervention program initiatives. The adaptation and development of theory frameworks and the specific models to the developed intervention program can begin to guide and expand research efforts in health field. We propose a framework for considering and selecting appropriate theory to deliver and support client's health interventions in the context of adult populations. The theory framework considers high-level factors of the decision-making process, including situational factors, theory fit with health interventions and target populations and empirical evidence. It differs from other theory selection frameworks theory in that it draws on the social and cognitive sciences in understanding theory bases, which are mediated through health behaviors. The theory framework is applicable to a range of theory, clinical domains and settings. How to choice the theory? Further testing is needed to assess its predictive validity and determine whether it can effectively guide the intervention by theory selection process.

THEORY FRAMEWORK WITH HYPOTHESES

A theory framework sound and grounded framework can serve to concept a problem and formulate potential approaches, to seed hypotheses for empirical exploration, to help anticipate and to adapt to dynamic factors. The theory framework can inform the decisions about which of these theories would be best further health promotion efforts amidst scarce resources. Theory

framework can be applied to health interventions in a range of health domain to explore how choices the theory can be used to support delivery of the associated types of interventions with the target populations. The framework can also contribute to the development of more precise models that address specific theory, setting or clinical domain considerations.

CONCLUSION

The program of health behavior change is vast and is based on a number of behavioral theorems as well as a more dynamic use theory for developing intervention programs. However, there is not a specific framework that guides the decision-making process for health theory to applying that investigates overweight and obesity intervention (Biddle and Nigg, 2000). The theory framework highlights research areas for further development, and it helps to inform potential research trajectories in the development of health intervention program with overweight and obesity. However, opportunities of theory framework for obesity and overweight interventions are not yet apparent. We will continue to articulate the theory framework and explore its implications, although the actual effectiveness of the theoretical basis of dietary intervention is not concluded in this review.

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