

ICLEP-2015-2 Ching-Fang Lee

## **Constructing an Exercise Counseling Model for Pregnant Women Using the Theory of Planned Behavior**

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### **ABSTRACT**

The American College of Obstetrics and Gynecology guidelines for exercise during pregnancy state that pregnant women without medical or obstetric complications may continue to exercise. However, past studies have indicated that pregnant women tend to decrease the frequency and intensity of their exercise routines. Moreover, few studies have explored the exercise counseling on pregnant women. The objective of this study was to construct an individual exercise counseling model for pregnant women. It was determined that the counseling model constructed would be reviewed and evaluated by a committee of 10 experts using the Delphi method. A three-round Delphi evaluative study by multi-disciplinary health care experts was undertaken. Consensus was reached on the following pregnancy exercise counseling model: (i) assessment of exercise beliefs, health status, pre-pregnancy exercise habits, intention status, GWG (gestational weight gain) and pre-pregnancy BMI, prenatal history, PARmed-X for pregnancy, demographic data, environment; (ii) definition of the target problems; (iii) planning: setting the goals, content, and strategies; (iv) implementation and monitoring: keeping good relationships, reinforcing continuing-to-exercise behavior; (v) evaluation: degree of achievement of goals, performance of exercise routines, and progression through stages of intention. Consensus has been reached on a definition of, and a set of principles governing, exercise counseling for pregnant women. The counseling model also provides guidelines for the health and sports staff to follow in promoting women's exercise during pregnancy. This will make more clear the process of implementation of any such programs, and likely areas for future research on promoting exercise for pregnant women.

*Keywords:* exercise counseling, pregnant women, theory of planned behavior, Delphi method

### **Introduction**

Exercise is good for the mother and fetus. If pregnant women had enough information about this topic, they would be better able to achieve the goal of exercising during pregnancy. Regular exercise throughout one's pregnancy is not a risk to maternal and fetal well-being, and it helps to control excessive weight gain [1], to prevent and help manage gestational diabetes [2], to decrease the risk of hypertension disorder during pregnancy [3], and to increase the well-being of pregnant women. Unfortunately, studies have also found that many women reduce their exercise level after becoming pregnant [4,5]. The American College of Obstetrics and Gynecology's 2002 guidelines for exercise during pregnancy state that pregnant women without medical or obstetric complications should continue

to exercise, as this will benefit them. Currently, there are no data confirming that exercise during pregnancy either harms or benefits the fetus [2, 6].

A popular theoretical model from social psychology, known as the theory of planned behavior [7,8], has been increasingly used to help health care workers and others understand exercise behavior. Behavioral beliefs are defined via the positive or negative outcome evaluations of specific behaviors, but also in terms of their direct influence on the subject's attitudes. Subjective norms concern the degree to which a person's significant others agree or disagree with his/her specific behaviors, while control beliefs are the subject's perception of the relative ease or difficulty of performing a particular behavior. Subjective norms, one's attitude, and one's perceived behavior control all directly influence his/her behavioral intention [9] (figure 1).

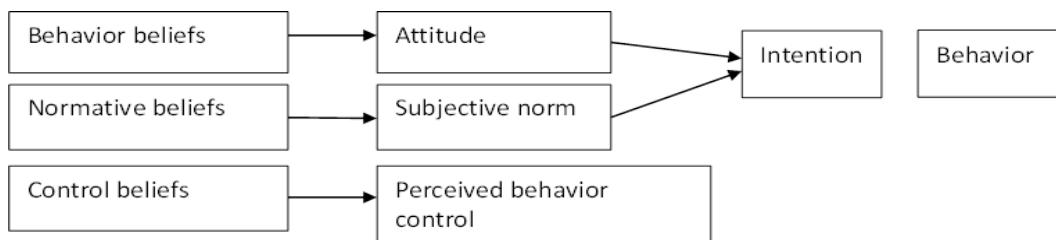


Figure 1. Theory of Planned Behavior

## Objective

This study used the theory of planned behavior and expert consensus (three rounds of a Delphi survey) to construct an exercise counseling model for pregnant women, and to develop strategies to guide counseling practice and future research.

## Methods

### Delphi Process

In the absence of a strong evidence base and clear guidance for the clinical practice of counseling, a consensus development technique may provide a sound basis and format for the counseling of pregnant women with regard to the need for regular exercise [10]. The Delphi technique is a recognized consensus method used to determine the extent of agreement on an issue [11]. It is an iterative process which supports the development of expert consensus on a particular topic, and is characterized by anonymity, multiple iterations of a similar survey tool, feedback between rounds, and the statistical assessment of consensus scoring [10-13].

### Framework of the Delphi Process

The counseling model will be reviewed and evaluated by a committee of 10 experts using the Delphi method. A three-round Delphi study using multi-disciplinary health care experts was undertaken. The counseling model was based on the Laitakari and Asikainen[14] individual physical activity counseling model, with its six-step counseling process: assessment, defining the target, planning, implementation, evaluation and reformulation.

The Delphi technique was utilized to collect the three-round questionnaires, responses and comments. Experts were given 2 weeks to complete each round, and reminder e-mails were sent one and two weeks after this deadline. If the experts had not completed the round at this point they were excluded from further rounds.

In the first round, experts were asked to write comments about the exercise counseling model for pregnant women in the form of open questions. Results of

round 1 were analyzed and categorized via content analysis. We presented a summary of round 1 in round 2, and discussed additional factors suggested by participants. In round 3, participants were asked to rank in order of importance the features which they had agreed were essential to an exercise counseling model for pregnant women. In rounds 1 and 2, statements were rated using a 5-point Likert scale of agreement and free text responses. The Likert scale ranged from 5 (fully agree) to 1 (totally disagree) for each category.

### Data Collection and Analysis

Data were collected from March to May of 2014. The response rate was 100% for each round. We used the SPSS 21.0 software package (SPSS Inc., Chicago, IL, USA) to analyze the data.

The aim was to reach consensus regarding which exercise counseling principles were most important and most consistent, and this was judged by a panel of experts in sequential rounds. Importance was measured in terms of mean (M) or majority (Mo), and consistency was measured in terms of quartile deviation (Q) or standard deviation (SD). Consensus was defined as having been reached if a mean (M) or majority (Mo)  $>3$  of experts agreed on the importance of an item, allowing for a quartile deviation of (Q)  $\leq 1$  or standard deviation of (SD)  $\leq 1$  on the consistency of an item [15-16].

After each round, the questions on which consensus was reached were removed from the questionnaire, and a reformulated version was presented in the following round. Stability was declared when the lack of consensus on specific items remained unchanged and an inability to reach consensus on specific items was noted. Free text responses were analyzed thematically. Between rounds a number of strategies (e.g., amended wording of statements, generation and removal of statements) were used to move towards consensus.

## Results

### Expert Sample and Response Rate

The 10 experts completed the 3 rounds of the Delphi process. The committee of experts for the Delphi survey consisted of 10 people, of whom 2 were obstetricians, 2 were experts in the theory of planned behavior and health education, 2 were experts in the field of pregnant women and health, 2 were nurses trained in midwifery, 1 was a sports psychologist, and 1 was a sports physiologist. The sample population ( $n=10$ ) participated for the duration of the study, resulting in a 100% participation rate.

### Summary of Rounds

Consensus was reached on 70 statements pertaining to 5 domains of exercise counseling for healthy pregnant women: assessment, defining the target problems, planning, implementation and monitoring, and evaluation.

In the first stage of the counseling process, counselors should find out about their subjects' gestational weight gain and pre-pregnancy BMI; prenatal history of GPA (Grava, Para and Abortion); PARmed-X for pregnancy; exercise habits during pre-pregnancy; beliefs regarding exercise behavior; normative and control beliefs; social-demographic data regarding age, occupation, educational level, family income, number of family members at home, number of children in daycare, and exercise intention stage; and environmental factors such as facilities, location, weather, and social environment.

In the second stage of the counseling process, the key issues should include: exercise habits, exercise intentions, exercise beliefs, environment. In the third stage, the key issues should include the setting of exercise goals (in terms of frequency, duration, intensity, and pattern) for each trimester, and the determination of strategies (in terms of when, where, which, with whom, and how, where the latter includes the question of using which available resources).

In the fourth stage of the counseling process, the issues of implementation and monitoring should be emphasized. Thus counselors will need to keep a good relationship with subjects (e.g. by providing prenatal health-related information, support, and encouragement); to reinforce subjects' desire to continue in their current exercise behavior (e.g. by monitoring them and keeping records of their progress; and to give the subjects positive reinforcement by reminding them of the benefits both they and their fetuses will derive from (the mother's) regular exercise.

The final stage of the counseling process is the evaluation stage. Now the key questions should be: Have the subjects reached their goals? Why or why not? To what degree did their planning help them to reach their goals? To what degree did their belief that they would succeed help them to reach their goals? And: If they did not reach their goals with regard to both planning, belief and actual performance, the counselor may want to re-start the exercise counseling process from the beginning. All the statements that reached consensus within the five domains are presented in Figure 2 and Table 1.

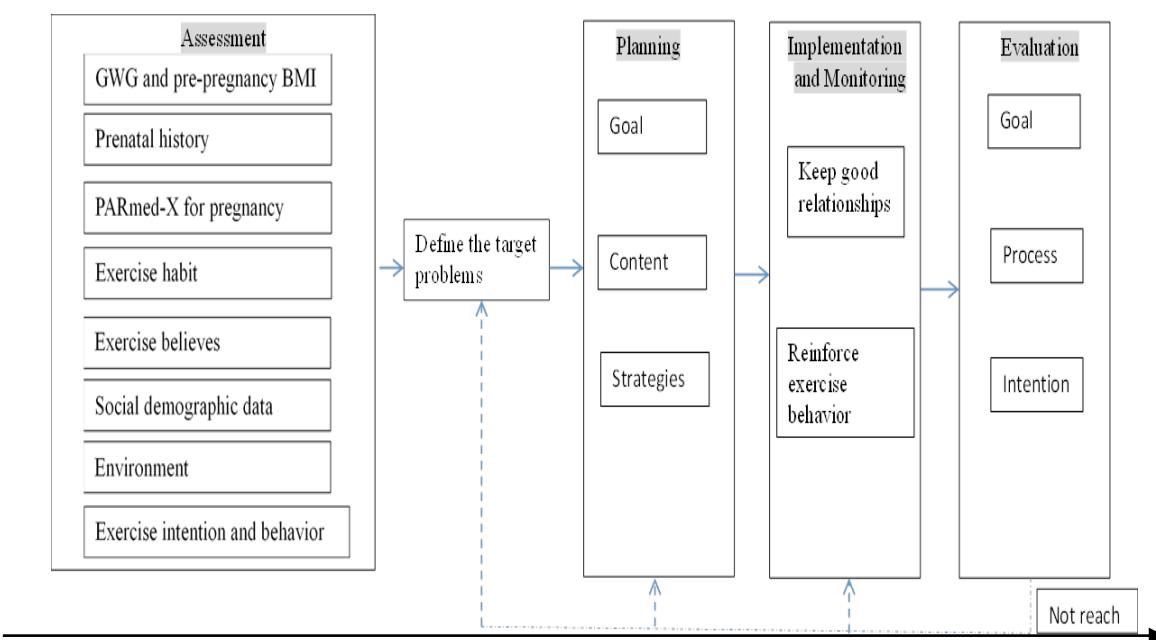


Figure 2. Exercise counseling model for healthy pregnant women

Table 1  
*Accept Statements*

	Statement		When was consensus reached
Counseling process items	Assessment		Round 2
	Definition of target problems		Round 2
	Planning		Round 2
	Implementation and monitoring		Round 2
	Evaluation		Round 2
Assessment items	Gestational weight gain and pre-pregnancy BMI		Round 3
	Prenatal history		Round 2
	PARmed -X for Pregnancy		Round 2
	Exercise habits	Pattern	Round 2
		Frequency	Round 2
		Intensity	Round 2
		Duration	Round 2
		How long	Round 3
	Exercise beliefs	Behavioral belief	Round 2
		Normative belief	Round 2
		Control belief	Round 2
	Exercise intention	No intention stage	Round 3
		Intention Stage	Round 3
		Preparation stage	Round 3
		Action stage	Round 3
		Maintenance stage	Round 3
	Demographic data	Education level	Round 2
		Age	Round 2
		Occupation	Round 2
		Family income	Round 2
		Number of family members at home	Round 3
	Environment	Children's daycare	Round 2
		Equipment and place	Round 2
		Weather	Round 2
		Social environment	Round 3
Defining the target problems	Exercise belief		Round 2
	Exercise intention		Round 2
	Exercise habit		Round 2
	Environment		Round 3
Planning of items	Set the exercise goals for each trimester	Pattern	Round 2
		Frequency	Round 2
		Intensity per time	Round 3
		Duration per time	Round 3
	Set the strategies in	When	Round 2

	Statement		When was consensus reached
	order to reach the goals for each trimester	Where Which With whom Useable Resource	Round 2 Round 2 Round 2 Round 3
Implementation and monitoring of items	Keep good relationships	Provide support and encouragement	Round 2
		Provide prenatal health-related information	Round 2
	Reinforce continuing exercise behavior	Self-monitoring or other form of record	Round 3
		Perception of exercise benefit for mother and fetus	Round 3
Evaluation of items	Reaching the goal		Round 2
	Performance of exercise process		Round 3
	Changing of exercise beliefs stage		Round 3

### Discussion

This study's aim was to utilize expert opinion in order to construct an exercise counseling model for healthy pregnant women, one that is based on the theory of planned behavior. Consensus was reached on seventy statements pertaining to the five domains of the exercise counseling process: assessment, defining the target problems, planning, implementation and monitoring, and evaluation.

We believe that our results will enable health workers who counsel pregnant women to more effectively encourage these women to exercise regularly, for the sake of both themselves and their fetuses. The exercise counseling model we have constructed should be very clear and easy to follow.

### Acknowledgment

This research project was funded by the Ministry of Science and Technology (Grant Number: MSC 102-2314-B-161-001).

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