



Predicting healthy eating intention and adherence to dietary recommendations during pregnancy in Australia using the Theory of Planned Behaviour



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ABSTRACT

This study aims to aid in the development of more effective healthy eating intervention strategies for pregnant women by understanding the relationship between healthy eating intention and actual eating behaviour. Specifically, the study explored whether Theory of Planned Behaviour (TPB) constructs [attitude, subjective-norm, perceived-behavioural-control (PBC)] and additional psychosocial variables (perceived stress, health value and self-identity as a healthy eater) are useful in explaining variance in women's 1) intentions to consume a healthy diet during pregnancy and 2) food consumption behaviour (e.g. adherence to food group recommendations) during pregnancy. A cross-sectional sample of 455 Australian pregnant women completed a TPB questionnaire as part of a larger comprehensive web-based nutrition questionnaire. Women's perceived stress, health value and self-identity as a healthy eater were also measured. Dietary intake was assessed using six-items based on the 2013 Australian Dietary Guidelines. Hierarchical multiple linear regression models were estimated (significance level <0.05), which explained 70% of the variance in healthy eating intention scores and 12% of the variance in adherence to food group recommendations. TPB constructs explained 66% of the total variance in healthy eating intention. Significant predictors of stronger healthy eating intention were greater PBC and subjective norm, followed by positive attitude and stronger self-identity as a healthy eater. Conversely, TPB constructs collectively explained only 3.4% of total variance in adherence to food group recommendations. These findings reveal that the TPB framework explains considerable variance in healthy eating intention during pregnancy, but explains little variance in actual food consumption behaviour. Further research is required to understand this weak relationship between healthy eating intention and behaviour during pregnancy. Alternative behavioural frameworks, particularly those that account for the automatic nature of most dietary choices, should also be considered.

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1. Introduction

Dietary intake around the time of pregnancy has the potential to impact both maternal and fetal health outcomes (Osmond & Barker, 2000). In particular, the offspring's long-term chronic disease risk

can be adversely affected by poor maternal dietary quality in the early life stages, which encompass preconception, pregnancy and lactation (Osmond & Barker, 2000). Women are generally required to make dietary changes during pregnancy in order for them to meet their increased macro and micronutrient requirements. This includes increased energy requirements in the second and third trimester and increased folate, iodine and iron requirements throughout pregnancy. Although specific dietary recommendations for pregnancy exist, which aim to help women meet their increased nutrient requirements (National Health and Medical Research Council, 2013; U.S. Department of Agriculture & U.S. Department

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of Health and Human Services, 2010), these recommendations are not always adopted by women (Blumfield et al., 2011; Bodnar & Siega-Riz, 2002; Crozier et al., 2009; Morton et al., 2014).

Several previous studies have identified the diverse factors influencing women's dietary choices during pregnancy (Malek, Umberger, Zhou, & Makrides, 2015). Influencing factors include: perceptions regarding the benefits of and need for healthy eating during pregnancy; perceptions regarding risks associated with unhealthy eating; psychological factors (e.g. stress, anxiety, and depression); self-efficacy and control-beliefs; nutrition knowledge; financial constraints; the social environment (including family, friends and healthcare providers); and the food environment (Malek et al., 2015).

There is still limited evidence regarding the relative importance of the psychosocial variables influencing healthy eating or healthy eating intention during pregnancy (Whitaker, Wilcox, Liu, Blair, & Pate, 2016). Moreover, targeted approaches are required to address different behavioural factors, which may prohibit healthy eating (Rothman, Sheeran, & Wood, 2009). While it is useful to know the range of factors that influence dietary choices during pregnancy, the development of effective intervention strategies requires an understanding of which factors have a considerable impact on dietary behaviour during pregnancy, and how these factors are related.

This study aims to address these aforementioned knowledge gaps in an effort to enable development of more targeted and effective intervention strategies aimed at improving both nutritional intake and health outcomes of mothers and their unborn children. Specifically, we test the usefulness of the Theory of Planned Behaviour (TPB) framework to understand the role that social and psychological factors play in influencing healthy eating behaviour of women during pregnancy. No previous studies have used the TPB to explain dietary behaviour during pregnancy; yet, previous literature found the TPB to be a useful framework for predicting dietary behaviours in other contexts (McEachan, Conner, Taylor, & Lawton, 2011).

In the design of our study, we attempt to address some of the limitations of the TPB framework when considering complex human decisions and behaviour. We do so by incorporating additional psychosocial variables, which may account for variance not adequately measured by the TPB constructs. In essence, this study is a first-step in gaining a greater understanding of how some of the factors influencing dietary choices during pregnancy might be linked, and therefore, might be targeted in healthy eating interventions aimed at pregnant women and those planning pregnancy. The following section provides an overview of the TPB framework and the additional variables that we considered in this study.

1.1. Theoretical framework

The TPB is a well-established psychological framework used to quantitatively measure social and psychological factors influencing behaviour (Ajzen, 1991, 2002b; Fishbein & Ajzen, 2010). The framework organises different psychosocial constructs into a structure, which can be used to predict and understand the motivational influences on healthy and unhealthy behaviour (e.g. adopting healthier eating habits) in order to identify strategies for changing behaviour. According to the TPB, the most important determinants of a specific behaviour are an individual's intention to perform a behaviour (behavioural intention) and an individual's actual control over performing the behaviour (Ajzen, 1991, 2002b;

Fishbein & Ajzen, 2010). Three factors have been shown to determine an individual's behavioural intention: (1) attitude toward a behaviour (e.g. *Eating a healthy diet during pregnancy is beneficial for me*); (2) 'subjective norm' (e.g. *It is expected of me that I eat a healthy balanced diet during pregnancy*); and (3) 'perceived behavioural control' (PBC) (e.g. *I am confident that I could eat a healthy balanced diet during pregnancy if I wanted to*). In this context, 'subjective norm' refers to an individual's perceptions of the social pressure (e.g. from friends, family or health practitioners) to consume a healthy diet during pregnancy, as well as their perceptions of the behavioural norms of specific reference groups that they value (e.g. whether their friends consumed a healthy diet during their own pregnancies). PBC refers to an individual's beliefs about their ability to control and perform a specific behaviour, or in other words, their beliefs about the ease or difficulty of consuming a healthy diet during pregnancy.

Further, in an effort to explain variance in behaviour and intention not accounted for by TPB constructs, numerous studies have investigated the role of additional variables in the TPB framework (Conner & Armitage, 1998). A recent paper by Ajzen (2011) addressed this issue, confirming that the TPB can include additional variables provided that variables are: behaviour-specific and compatible with measures of behavioural intention; possible causal factors in determining behaviour and intention; conceptually independent of attitude, subjective norm and PBC; and applicable to a wide range of human behaviours. Finally, predictions of behaviour or intention should be consistently improved if the variable is to be incorporated into the theory (Ajzen, 2011). Considering the criteria discussed by Ajzen (2011), three additional variables were included alongside the TPB constructs in this study as potential predictors of healthy eating and healthy eating intention: perceived stress, health value and self-identity (as a healthy eater). Each of these variables has been found to influence dietary behaviour in previous studies (Conner, Kirk, Cade, & Barrett, 2001; Rise, Sheeran, & Hukkelberg, 2010; Louis, Chan, & Greenbaum, 2009).

Although previous studies have used the TPB to explain health-related behaviours in the context of pregnancy (Ben Natan, Golubev, & Shamrai, 2010; Downs & Hausenblas, 2003, 2007; Duncan, Forbes-Mckay, & Henderson, 2012; Hausenblas & Symons Downs, 2004; Park & Ureda, 1999; Whitford & Jones, 2011), there is only one known study which has used the TPB framework to examine intentions to follow nutrition recommendations during pregnancy (Whitaker et al., 2016). This recently published study tested the TPB's ability to explain variance in nutrition intentions in 189 pregnant women residing in the USA and Canada; and elicited salient behavioural, normative, and control beliefs for meeting dietary recommendations during pregnancy (Whitaker et al., 2016). Notably, no attempt was made in this study to link salient beliefs with intentions or to examine predictors of dietary intake. The present study addresses these knowledge gaps.

Thus, using the TPB as a framework, the present study aims to increase understanding of the factors influencing women's intention to consume a healthy diet during pregnancy and their actual adherence to food group recommendations. The primary objective of the study was to determine whether TPB variables and additional psychosocial variables (self-identity as a healthy eater, health value and perceived stress) explain significant variance in women's intentions to consume a healthy diet during pregnancy. Secondary objectives were to examine the associations between healthy eating intention and behavioural, normative and control beliefs; and to examine the TPB's ability to explain variance in women's adherence to the food group recommendations during pregnancy.

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