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Measuring young people's attitudes to breastfeeding using the Theory of Planned Behaviour

Melanie Giles[1], Samantha Connor[1], Carol McClenahan[1], John Mallett[1], Barbara Stewart-Knox[2], Marion Wright[3]

[1]Psychology Research Institute, School of Psychology, University of Ulster, Cromore Road, Coleraine County, Londonderry BT52 1SA, UK
[2]Biomedical Sciences Research Institute and Northern Ireland Centre for Food & Health, University of Ulster, Cromore Road, Coleraine County, Londonderry BT52 1SA, UK
[3]Institute of Nursing Research and School of Nursing, University of Ulster, Cromore Road, Coleraine County, Londonderry BT52 1SA, UK
Address correspondence to Samantha Connor, E-mail: sl.connor@ulster.ac.uk

ABSTRACT

Background The focus of this study was to design and pilot a questionnaire to measure young people's attitudes to breastfeeding using the Theory of Planned Behaviour (TPB). This is intended for subsequent use in a large-scale attitude survey, which in turn will inform the design of a breastfeeding intervention programme with adolescents.

Methods The first three phases of a research programme employing the theory are described: belief elicitation, questionnaire development and a pilot study. Firstly, an elicitation study to identify the modal salient beliefs underlying young peoples' motivations to breastfeed, using six semi-structured focus groups with 48 young people, was performed. Secondly, the measurement instrument was constructed, incorporating all the key theoretical constructs and both direct and belief-based measures. The questionnaire was then piloted on a sample of 121 female and male schoolchildren to identify and assess the relative importance of the determinants of breastfeeding intention.

Results The questionnaire proved to be reliable, and preliminary analysis provided strong support for the predictive power of the TPB.

Conclusions Some key issues involved in the operationalization of the theory are highlighted, which may be of interest to researchers involved in the design of TPB questionnaires for use in other intervention programmes.

Keywords attitudes, breastfeeding, schoolchildren, theory of planned behaviour

Introduction

Breastfeeding is promoted internationally as the preferred method of infant feeding because it is associated with health benefits to both mother and child.[1,2] However, the prevalence of women breastfeeding in the United Kingdom generally falls short of national goals and recommended targets. Although recent efforts to promote breastfeeding have resulted in much progress in many areas, evidence is now accumulating to suggest that breastfeeding promotion should be aimed at the entire population and should be undertaken in schools.[3] Several researchers have acknowledged that the school system can play an important role in health promotion and should expose all pupils (both male and female) to the art of breastfeeding through its health classes.[4–8] Recently, these sentiments have been echoed in several policy documents.[9,10] Although some education programmes have been developed,[11] current attempts to provide breastfeeding education in schools tend to be rather fragmented and lack a co-ordinated and theoretical focus.[5] Research suggests that intervention strategies based on empirically validated theories are potentially more effective in changing health behaviours,[12] because theory can provide an explanation of how the intervention works.

Theoretical framework

One such theory that has the potential to shape interventions is the Theory of Planned Behaviour (TPB, see Fig. 1).[13] The theory works on the premise that the best way to target behaviour is to measure behavioural intention, which in

Melanie Giles, Senior Lecturer
Samantha Connor, Research Associate
Carol McClenahan, Lecturer
John Mallett, Lecturer
Barbara Stewart-Knox, Senior Research Fellow
Marion Wright, Lecturer

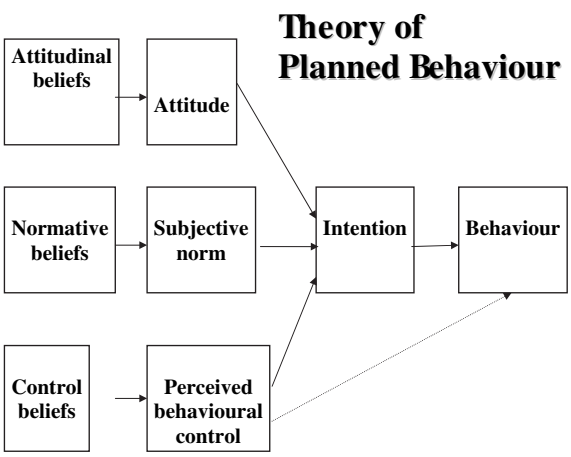

Fig. 1 The Theory of Planned Behaviour.

turn is seen to be a function of four independent variables, notably attitudes, subjective norm (influence of significant others), perceived control and self-efficacy.[14,15]

To change behaviour using the theory, one would first conduct an elicitation study to identify the modal salient beliefs on which the independent variables are based. These would then be employed to construct a questionnaire, which in turn would be administered to a sample of people drawn from the target population to identify and assess the relative importance of the determinants of the target behaviour. The intervention would then be based on those components that were most strongly associated with the target behaviour, and the questionnaire would be used pre- and post-test to evaluate the effectiveness of the intervention.[16] Although much support has been obtained for the efficacy of the theory as a predictor of intentions and behaviour,[17] there are relatively few interventions based on the TPB within the health domain. As such, little guidance is currently available to help in the design of an intervention programme (but see 16, 18) and in the operational manipulation of the theoretical constructs. Moreover, the literature reveals a lack of research that utilizes such approaches in the field of infant feeding choice. Indeed, interventions to increase breastfeeding rates have usually been based on informal conceptualizations, designed without elicitation research, and directed primarily towards the provision of information to expectant mothers regarding the benefits of breastfeeding.

In the light of the above discussion, the aim of this study was to develop and pilot a TPB-based questionnaire for subsequent use in a breastfeeding intervention programme with adolescents aged 13–14 years. It is hoped that explaining the process will not only serve to highlight some of the main issues regarding young peoples' motivations to breastfeed and will help to inform the design of subsequent intervention studies but will also help to identify some of the issues involved in the operationalization of the TPB which may be of interest to researchers using the theory in other intervention programmes. Specifically, the aim was to first conduct an elicitation study to identify the modal salient beliefs underlying young peoples' motivations to breastfeed, using focus group methodology. Furthermore, it was the intention to employ these beliefs to construct a questionnaire to be piloted on a sample of people drawn from the target population to identify and assess the relative importance of the determinants of breastfeeding intention.

Phase 1: belief elicitation

Aim

The population (adolescents) and the behaviour of interest (intention to breastfeed) were first defined using the TACT principle (i.e. a description of the behaviour in terms of its target, action, context and time to ensure that each of the measures employed corresponds to the criterion of interest[18,19]). The objective of this phase of the research was then to elicit modal salient beliefs about breastfeeding from the target population, thereby enabling the development of questionnaire items based on these salient beliefs. Typically, elicitation studies conducted in the context of planned behaviour have involved the use of open-ended questions presented in one-to-one interviews, although the use of questionnaires and focus groups is advocated.[18] In the present context, given the limited exposure of most young people to breastfeeding[20] and the possibility that the age group of the participants might make them uncomfortable with face-to-face interviews, focus groups were deemed most appropriate for this phase of the research programme. A group dynamic can generate 'synergy, snowballing, stimulation and spontaneity',[21] thereby providing data that are rich and high in quality.[22] Indeed, 'the idea behind the focus group method is that group processes can help people to explore and clarify their views in ways that would be less accessible in a one-to-one interview' and can encourage contributions from people who are reluctant to be interviewed on their own or feel they have nothing to say (see 23, p. 299). As such, it was hoped that group interaction would trigger responses providing more detailed information than with other research methodologies.

Participants and procedure

Six semi-structured focus groups were conducted in two schools with 48 young people aged 13–14 years. In total, 22 of these participants were males and 26 were females. Within each school, three groups of between six and eight people were selected, one of which was exclusively male, one exclusively female and the other comprising both males and females. All socioeconomic backgrounds were represented in the sample.

Following the advice of Ajzen,[24] a series of nine questions were used to structure the focus group sessions. Thus, to elicit the beliefs underlying attitude, respondents were asked the following questions: 'If you were to have a baby at some time in the future...What do you see as the advantages?', 'What do you see as the disadvantages?' and 'Is there anything else you associate with your breastfeeding a baby?'. To elicit the beliefs underlying the normative component of the model, the following three questions were asked: 'Are there any groups or people who would approve of your breastfeeding a baby?', 'Are there any groups or people who would disapprove of your breastfeeding a baby?' and 'Are there any other groups or people who come to mind when you think about breastfeeding a baby?'. Finally, with respect to control beliefs, respondents were asked the following questions: 'What factors or circumstances might encourage you to breastfeed a baby?', 'What factors or circumstances would make it difficult or impossible for you to breastfeed a baby?' and 'Are there any other issues that come to mind when you think about the difficulties of breastfeeding a baby?'. In addition, participants were asked to supply information with respect to their age, previous exposure to breastfeeding and whether they themselves had been breastfed.

Each focus group was carried out following the guidelines of Kreuger and Casey[25] and lasted ~1 h. All focus groups were audio taped and transcribed verbatim. As is usual in TPB research, the data were analysed with the purpose of eliciting the indirect (belief-based) measures for all the TPB constructs (attitude, subjective norm and perceived behavioural control). The coding was guided using the procedure described by Francis *et al.*[18] The focus group responses were content analysed into themes (attitudinal beliefs, normative beliefs and control beliefs), which were then labelled. The transcripts were then re-read to develop and refine this code structure. Each set of beliefs was then converted into a set of statements. For attitudinal beliefs, the statements were related to outcomes associated with the behaviour of the target population, for normative beliefs the most commonly occurring sources of social pressure and for control beliefs the statements that might make it difficult to perform the target behaviour.[18] As recommended by these authors, a second researcher also repeated this entire process to increase the validity of the analysis. In addition to the TPB constructs, knowledge of and exposure to breastfeeding also emerged as recurring themes.

Results

General exposure to breastfeeding

Although almost half of the young people sampled were able to report that they were breastfed as babies, participants generally had limited exposure to breastfeeding, and this appeared to be restricted to family members or family friends.

I do not have any experience of breastfeeding so it's difficult to answer.
I saw my auntie breastfeed once when we went round to visit.
I can remember my mum breastfeeding my brother.

Furthermore, this exposure typically occurred in private settings and most frequently in the homes of the breastfeeding mother. That said, a couple of participants had observed people breastfeeding in public places, for example, in a restaurant, in a doctor's surgery and on a beach, but these were mainly isolated examples. A few participants did report to having seen breastfeeding on television or in a film, but again, these were isolated examples.

I haven't actually seen anyone breastfeeding for real but I have seen posters around which show a small baby and a mother and say everyone else can eat in public so why can't he?

Attitudinal beliefs (advantages and disadvantages of breastfeeding)

Participants were aware of some of the benefits of breastfeeding. For example, some were able to report that 'breast is best' for the baby as breast milk helps to prevent various childhood illnesses such as asthma and eczema and can strengthen a baby's immune system and help to develop their IQ.

Bottle-feeding is not as good as breastfeeding as breastfeeding has more nutrients.
I think I heard that babies that are breastfed are more intelligent.

There were also perceived benefits for the mother, such as helping to prevent breast cancer and regaining one's pre-pregnancy shape more quickly. Also, some participants felt the closeness would enhance the bonding process, which in turn would help a mother to understand her baby. Others focused on the normal, natural and beneficial aspects of breastfeeding, reporting that it was 'a natural thing' to do.

Breastfeeding is natural and should be allowed everywhere.
It's a natural thing and is healthier for the baby.
I strongly agree with breastfeeding and I think it is a natural and healthy way of feeding your child.
I think that it is natural and if someone breastfed their child in public I would not have a problem.

Breastfeeding was also seen as convenient as there is no need to make up or sterilize bottles, and some mentioned that it was cheaper to breastfeed as it eliminates the need to buy bottles or powdered milk.

It's much easier than having to make up bottles.
You don't have to buy milk so it ends up being cheaper.

With respect to the disadvantages, embarrassment and culture emerged as key issues, with many participants reporting that they would feel uncomfortable breastfeeding particularly in public places, as it would encourage people to stare.

I don't think I would like to do it in a public place.
I think I'd be embarrassed. I wouldn't want to do it in front of other people.
I think people are embarrassed by it. They don't know where to look.

Participants felt that this situation was exacerbated by the fact that they themselves did not know how to react to someone breastfeeding, given their limited exposure. The physiological aspects of breastfeeding were also an issue of concern, especially tiredness. Some also remarked that it would be time-consuming and would limit their social activities, because they would not be able to go out and leave the baby. Furthermore, excluding the father from the feeding process was also an issue of concern for some as they thought it would affect his ability to bond with the baby.

It doesn't let the baby bond with its father and you have to do all the work rather than a shared parenthood.
Both parents can feed a baby with a bottle so they can share the feeding.

Normative beliefs (people who would approve/disapprove)
When asked if there were people whose opinions were likely to influence the decision to breastfeed or to encourage their partner to do so, specific reference was made to their mums, partners, family, close friends and the medical profession. Female participants especially felt their mothers were important role models, and it seemed that they would be more likely to breastfeed if their mothers had done so. It was felt that the partner/husband would be influential, although participants were almost unanimous in their belief that the final decision would be with the mother. Doctors and nurses were perceived to have an influence if they were to promote the benefits of breastfeeding, as well as best friends and siblings.

I think I will breastfeed as my mum breastfed me.
Most likely I will bottle-feed my baby, as my sisters and I were bottle-fed.

Control beliefs (factors that would encourage/make it difficult to breastfeed)
Factors that might make it difficult to breastfeed included the mother's health following child birth, the pain or tiredness that might be experienced and the exclusion of the father. Social factors were also cited, such as other people's opinions, negative reactions of others, feeling uncomfortable/embarrassed, not being allowed to breastfeed in a public place and it not being fashionable to breastfeed.

Knowledge of breastfeeding
Although not a direct focus of the TPB, participants frequently mentioned their lack of knowledge and suggested breastfeeding might be more likely if they knew more about it.

I don't think I will breastfeed my child, as I don't know a lot about it.
I don't really know any of the answers, as I haven't really talked about breastfeeding.
I haven't a clue about breastfeeding.
I am not very educated on this topic.

Phase 2: questionnaire development

Aim

The objective of phase 2 was to construct the measuring instrument. Thus, once the modal beliefs had been elicited, those considered to be most salient were selected for use in the main questionnaire. To this end, the belief statements identified and the extent to which they were endorsed were used to construct questionnaire items. A summary is provided in Table 1.

Measures

Two versions of the questionnaire were developed. Specifically, females were asked to consider the possibility that they would have a baby at some time in the future and then indicate the extent to which it was likely they would breastfeed. Males, on the contrary, were asked to indicate the extent to which they would encourage a partner to do so. Both versions of the questionnaire incorporated all key constructs contained within the TPB and as such used both direct (see Table 2) and indirect belief-based measures.

The indirect measure of attitude was based on 12 outcome evaluations and the corresponding behavioural beliefs. Thus, respondents were first required to evaluate each outcome on a good/bad dimension (–3 = extremely bad to +3 = extremely good). They were then required to indicate the likelihood that each of these outcomes would occur if they were to engage in breastfeeding (1 = extremely unlikely to 7 = extremely likely). Outcome evaluations were then multiplied by the corresponding behavioural beliefs, and the summed product served as the belief-based measure of attitude.

Table 1 Salient beliefs elicited about breastfeeding

Behavioural beliefs
Bonding with one's baby
Providing health benefits for one's baby
A convenient method of infant feeding
Regaining one's figure
Helping to prevent breast cancer
Saving money
A natural method of infant feeding
A time-consuming method of infant feeding
A feeling of embarrassment
Limiting social activity
Excluding the involvement of other people
An uncomfortable and painful method of infant feeding
Normative beliefs
Most people who are important to me would want me to breastfeed/encourage my partner to breastfeed
I think my mum would want me to breastfeed/encourage my partner to breastfeed
I think my family would want me to breastfeed/encourage my partner to breastfeed
I think my partner would want me to breastfeed/would welcome the encouragement to breastfeed
I think my close friends would want me to breastfeed/encourage my partner to breastfeed
I think the medical profession (doctors and nurses) would want me to breastfeed/encourage my partner to breastfeed
Control beliefs
The support of others
Having more knowledge about infant feeding
The intolerance of others to breastfeeding in public places
The embarrassment
The physical problems
The lack of public breastfeeding facilities
Having to do all the feeding myself
The tiredness I think I would experience/my partner would experience
The change in the shape of my breasts/my partner's breasts

Table 2 Direct measures of the Theory of Planned Behaviour (TPB)

TPB construct	*n items*	*Sample items*	*Alpha coefficient (f)*	*Alpha coefficient (m)*
Intention	3	I intend (would try/have decided) to breastfeed/encourage my partner to breastfeed if I ever have a baby: likely/unlikely	0.93	0.85
Attitude, direct measure	3	I think breastfeeding a baby/encouraging my partner to breastfeed would make me feel: good/bad, happy/sad, pleasant/unpleasant	0.87	0.93
Subjective norm, direct measure	3	I think most people who are important to me would want me to breastfeed/encourage my partner to breastfeed if I were to have a baby: likely/unlikely	0.88	0.88
Perceived control, direct measure	3	How much personal control do you feel you have over breastfeeding a baby/encouraging your partner to breastfeed a baby?: complete control/no control	0.61	0.39
Self-efficacy, direct measure	3	If you were to have a baby, how confident are you that you would be able to breastfeed/encourage your partner to breastfeed?: not confident/confident	0.70	0.40

The belief-based measure of subjective norm was based on the expectations of five referents: partner, mum, family, close friends and members of the medical profession. Participants were first required to indicate the extent to which each of their significant others would endorse their intention to breastfeed/encourage their partner to do so. They were then required to indicate the extent to which they were motivated to comply with the wishes of these people, again on an

Table 3 Scores on breastfeeding knowledge items

Knowledge item	*Correctly answered (%)*	*Incorrectly answered (%)*	*Do not know (%)*
Breast milk and bottled milk are the same	76.9	0.8	22.3
Babies who are bottle-fed have more illnesses than babies who are breastfed	39.7	7.4	52.9
Breastfeeding helps bonding between mother and baby	77.7	3.3	19
Breastfeeding prevents a woman from returning to her pre-pregnancy weight	20.7	8.3	70.2
If breastfeeding a woman cannot return to work	53.7	12.4	33.9
Breastfeeding is unhygienic and can spread germs	60.3	3.3	36.4
Small breasts will not produce enough milk	32.2	10.7	56.2
Breastfeeding mums have less risk of breast and ovarian cancer	45.4	4.1	49.6
Breastfeeding contains antibodies which protect a baby from infection and strengthen his/her immune system	71.1	1.6	27.3
Most women make enough milk to breastfeed	63.6	3.3	33.1
Women who breastfeed should avoid certain foods	48.8	5.8	45.4
Exclusive breastfeeding is recommended for the first 6 months of a baby's life	39.7	4.9	55.4
Breast milk provides all the nutrients a baby needs	58.7	12.4	28.9
Breastfed babies have better mental development than babies fed on bottled milk	20.7	14.9	64.4

extremely likely (7) to extremely unlikely (1) dimension. Each normative belief was multiplied by the corresponding motivation to comply, and the summed product served as an indirect measure of subjective norm.

The belief-based measure of control was based on nine beliefs elicited from the focus groups (Table 1). Given the age of the sample, it was decided to base this measure on single items[26,27] as opposed to employing Ajzen's recommended two-part formulation,[33] as these are generally easier to operationalize. As a consequence, participants were required to indicate the extent to which each of the beliefs identified would encourage or make it more difficult for them to breastfeed/encourage a partner to do so. Again, the extremely likely (7) to extremely unlikely (1) dimension was employed.

Although the TPB incorporates many variables, which have been found to be important in the context of predicting health behaviours,[28] it does not include a measure of knowledge. In the light of the comments made during the focus groups and the importance attached to this variable in previous research, it was decided to include knowledge in this context. Fourteen statements were designed to assess knowledge of infant feeding, each with a response format of yes, no, or don't know (Table 3). These statements were taken from the literature.[3,29]

Phase 3: pilot study

Aim

The objective of phase 3 was to pilot the questionnaire to identify any issues regarding content, layout and the operationalization of variables and, depending on the achieved sample, to predict and explain young peoples' motivations to breastfeed.

Participants and procedure

One hundred and twenty-one, year 10 schoolchildren (aged 13–14) attending one post-primary school in Northern Ireland participated in the pilot study. Of these, 60 were males and 61 were females. The questionnaire took ~20 min to complete and was administered in a lecture theatre within the school. The researcher remained present for the duration to address any issues of concern. On completion of the questionnaire, respondents were requested to complete a series of follow-up questions regarding the content and layout.[18]

The questionnaire

The questionnaire was divided into four sections. In addition to the key TPB constructs and knowledge statements, there were a series of questions designed to elicit demographic information from the sample and another section exploring (i) previous exposure to breastfeeding and (ii) attitudes to breastfeeding in public places. It is acknowledged that with respect to layout, Ajzen[24] recommends mixing questions designed to measure the different constructs. However, face validity of the questionnaire took precedence over response set, and questions designed to measure variables directly were mixed, but indirect beliefs were grouped by construct.

Results

Data input and analysis

Questionnaire data were scanned into FORMIC and inputted into the SPSS statistical package (version 11.0). Results were analysed using SPSS frequencies, correlation coefficients and multiple regression.

General evaluation Following the advice of Francis *et al.*,[18] a series of questions were employed to evaluate the questionnaire. For example, respondents were asked to identify ambiguous items or items that were difficult to answer. Although some of the participants reported to have limited knowledge of breastfeeding and therefore found these questions difficult, no specific items related to the TPB were identified. Furthermore, 86% found the questionnaire layout easy to follow and 78% found the questions easy to understand/mostly easy to understand. However, 31% of respondents thought the questions were repetitive or too similar, and 17% thought the questionnaire in general was too long. Although it was anticipated that respondents would find the 7-point scale problematic, during data coding and entry, no inconsistencies were identified and no questions were consistently missed. Furthermore, most scales showed good reliability. Admittedly, this was not the case for perceived control and self-efficacy with respect to males. However, here, it must be acknowledged that although every effort was made to adapt the questionnaire accordingly, breastfeeding is not a male behaviour, and hence, these items are most probably difficult for them to conceptualize.

A test of the TPB

Descriptive findings Of those sampled, 44% were breastfed as children. However, only 26% of females (53% of males) reported that they had previously been exposed to a breastfeeding mother, of whom only 12.5% (9.4% of males) acknowledged that this had occurred in a public place. Furthermore, although 72% of females reported that it was quite/extremely likely they would breastfeed a baby (60% of males acknowledged that they would encourage their partner to do so), those who had previously been exposed to a breastfeeding mother were significantly more likely to intend to breastfeed than those who had not [$t(59) = -4.10$, $P < 0.001$]. Similarly, those who were breastfed themselves as children were significantly more likely than those who were not to declare an intention to breastfeed [$t(44) = -5.19$, $P < 0.001$].

None of the participants sampled had received breastfeeding education in school, and perhaps as a consequence, knowledge of breastfeeding was somewhat restricted. For example, although many were aware that breast and bottle milk are not the same (76.9%), that breastfeeding can enhance the bonding process (77.7%) and that breast milk contains antibodies that protect a baby from infection (71.1%), the majority either answered incorrectly or did not know that bottle-fed babies are more susceptible to illness (Table 3).

Prediction of intention Correlation analyses were conducted to explore the relationships between intention and each of the measured variables. The results of these analyses are summarized in Table 4.

For males, the most significant correlation with intention was with subjective norm, followed by attitude, perceived control and self-efficacy. The normative component also produced the most significant correlation with intention for females, followed by attitude, self-efficacy and perceived control. Although these relationships were confirmed in subsequent regression analyses where 79% of the variance in intention was explained for males [$F(4, 55) = 51.23$, $P < 0.01$; $\beta = 0.548$ (subjective norm), $\beta = 0.192$ (attitude), $\beta = 0.145$ (perceived control) and $\beta = 0.116$ (self-efficacy)] and 58% for females [$F(4, 56) = 19.57$, $P < 0.01$; $\beta = 0.428$ (subjective norm), $\beta = 0.342$ (attitude), $\beta = 0.139$ (self-efficacy) and $\beta = 0.051$ (perceived control)], the achieved sample was really too small to draw anything conclusive from the data (i.e. males 60, females 61).

Explaining intention To gain some insight into the factors influencing the decision-making process of schoolchildren regarding breastfeeding and in an attempt to substantiate some of the findings that emerged from the focus groups, we correlated the indirect beliefs of each of the measured constructs (i.e. the product of outcome evaluation × behavioural belief for attitude × normative belief × motivation to comply for subjective norm) with intention.

Consistent with the findings of the focus groups, these results suggested that the naturalness of breastfeeding was an important consideration ($r = 0.624$, $P < 0.001$ for males;

Table 4 Zero-order correlations between selected Theory of Planned Behaviour variables

Variables	*1*	*2*	*3*	*4*	*5*
Females					
Intention	–				
Attitude	0.653**	–			
Subjective norm	0.667**	0.361**	–		
Self-efficacy	0.422**	0.317*	0.304*	–	
Perceived control	0.400**	0.340**	0.327*	0.516**	–
Males					
Intention	–				
Attitude	0.686**	–			
Subjective norm	0.863**	0.646**	–		
Self-efficacy	0.623**	0.452**	0.601**	–	
Perceived control	0.661**	0.447**	0.640**	0.539**	–

*$P < 0.05$, **$P < 0.01$.

$r = 0.677$, $P < 0.001$ for females) as was the perceived bonding process ($r = 0.593$, $P < 0.001$ for males; $r = 0.581$, $P < 0.001$ for females). The intention to breastfeed was also significantly associated with knowledge ($r = 0.591$, $P < 0.001$ for males; $r = 0.519$, $P < 0.001$ for females), therefore reinforcing the finding that breastfeeding might be more likely if knowledge of the potential benefits was enhanced. Males also appeared to attach much importance to the potential health benefits not just to the baby ($r = 0.669$, $P < 0.001$) but also to the mother ($r = 0.501$, $P < 0.001$). However, although the potential health benefits did emerge as significant predictors for females (e.g. 'would provide health benefits for my baby', $r = 0.378$, $P < 0.001$), they were equally concerned that breastfeeding would limit their social activity ($r = 0.391$, $P < 0.001$) and would be embarrassing ($r = 0.374$, $P < 0.001$). Furthermore, although social support emerged as an important issue for all participants, particularly in relation to the young person's mother ($r = 0.705$, $P < 0.001$ for males; $r = 0.771$, $P < 0.001$ for females), males were also influenced by the opinions of the medical profession ($r = 0.732$, $P < 0.001$).

Discussion

Main finding of this study

The overriding aim of this study was to design and pilot a questionnaire for subsequent use in a large-scale attitude survey. In this respect, the study appeared to work well. The questionnaire proved to be reliable, and the analysis, although preliminary, provided strong support for the predictive power of the TPB. The evaluation led to only minor changes in the format and wording of the questionnaire, such that a second elicitation study with a different sample was deemed not to be necessary.

What is already known on this topic

The TPB has emerged as one of the most influential and popular conceptual frameworks for the study of human behaviour, and much support has been obtained for the efficacy of the theory as a predictor of both intentions and behaviour.[17] It is also recognized as having the potential to shape behaviour change interventions,[13] with the result that some guidelines regarding the operational manipulation of the theoretical constructs are beginning to emerge in the literature.

What this study adds

However, currently, the relevant literature reveals a lack of research that utilizes empirically validated theories in the field of infant feeding choice. Moreover, in general, the theoretical and research literature surrounding the TPB is often confusing as it contains diverse views about how to operationalize the theory.[18] There is therefore a need to consider some of the more practical issues that emerge when applying the theory, which should be of particular interest to those working with the TPB for the first time.

For example, it may be of interest to note that although the data elicited from the focus groups were sufficient to be able to design the questionnaire, responding was somewhat restricted such that much probing was required. This would cause one to question whether one of the fundamental assumptions of focus group methodology, that individuals have the ability to provide a rich source of information about a topic, was in fact violated.[30] If this was the case, it is difficult to conceive of another method that would have been more appropriate, given the limited knowledge of the respondents in respect of breastfeeding. Alternatively, it may have been that the young people were reluctant to divulge their private thoughts and feelings on what is a potentially embarrassing topic to a stranger. In this respect, Lange[31] questions why people would want to confide in a moderator they had never met before. This would lead one to conclude that the characteristics of the moderator are an important consideration when conducting focus groups with this age group.

As is often the case with the TPB questionnaire,[32] the participants thought the questionnaire was rather long. This is important, given that lengthy questionnaires can impact on data quality through reduced response/completion rates due to factors such as lowered participant motivation (or reading ability). It was felt that the length of the questionnaire could be accommodated in the present context by requiring the researcher to administer the questionnaire personally to large groups at set points in time, thereby encouraging participation. More radical solutions may be required for other forms of data collection, for example, postal surveys typically produce response rates in the region of 20–30%, which may be considerably less if the questionnaire is long. In such instances, researchers could make use of planned missing data strategies based on the use of multiple questionnaire forms containing different subsets of items.[33]

Another criticism often levied at the TPB questionnaire is that it appears rather repetitive, particularly with respect to the expectancy-value formulations. Indeed, responses received in the present context included 'we've answered that already' which of course is not the case. With respect to attitude, for example, respondents are first required to evaluate the various outcomes of a particular behaviour on a good/bad dimension. They are then required to indicate the likelihood that each of these outcomes will occur if they were to engage in the behaviour under investigation. However,

unfortunately, respondents are often unable to comprehend the subtle difference. Perhaps one way to address this is, as Ajzen[34] suggests, to mix questions designed to measure different constructs. This would certainly seem advisable with respect to the direct measures such as attitude, where groupings of semantic differential items can result in missing data or response set if the poles are not randomized. Alternatively, it may be better to group the outcomes and behavioural belief statements and address the issue of similarity in the explanation provided.

It may also be of interest to note that the indirect measures were scored following the advice of Francis *et al.*[18] Specifically, unidirectional concepts such as behavioural beliefs were treated as probabilities, and a unipolar response format (1–7) was applied. However, bipolar response scales were employed for bidirectional concepts involving some sort of evaluation. This may however require the scales to be operationalized differently, because the original response categories do not have the same meaning on a unipolar continuum.[18,19] For example, the term 'neither' (i.e. likely/unlikely) is clearly bipolar and therefore not appropriate for unidirectional concepts. As such, it is recommended that the traditional response categories are replaced with numbers, and only the endpoints are labelled. Although this solution to the problems identified with the scoring of the indirect measures may be controversial, it is important given it will influence the size and nature of the correlation coefficients obtained. Moreover, it offers a very practical solution to what is a very complex issue and should serve to help those researchers keen to operationalize the model but hindered by the lack of detail provided in much published material.

Although the key purpose of this study was to develop and pilot a questionnaire and not to generalize its findings, it is of interest to note that only 26% of females sampled had witnessed a mother breastfeeding her baby, and these pupils were significantly more likely than those who had not to declare an intention to breastfeed themselves. This finding together with the significant influence of social support within the TPB framework would seem to strengthen the view that increasing young peoples' exposure to breastfeeding may encourage more positive attitudes and implies that contact with nursing mothers may encourage young people to breastfeed themselves. It also adds weight to the suggestion that breastfeeding education should form part of the secondary school curriculum and, as such, supports the view that breastfeeding intervention programmes are required.[6,35–37]

Limitations of the study

Taken together, the findings from the focus groups and questionnaire survey seem to corroborate previous research by suggesting that knowledge is a key issue to be addressed in any education programme, as is the 'naturalness' of breastfeeding.[19,38–40] As such, it would seem that efforts should be made to enhance knowledge and in particular to highlight the potential benefits of breastfeeding for both mother and child. However, although these findings serve to highlight what might form the basis of an intervention, there is a need to replicate the findings in a larger sample.

Conclusions

The TPB can provide a useful framework for developing and evaluating interventions and as such was selected to shape an intervention designed to increase young people's motivations to breastfeed. This article describes the first three phases of a research programme employing the theory: belief elicitation, questionnaire development and a pilot study which it is hoped will be of particular use to other researchers involved in developing instruments using the TPB. The fourth phase will utilize this questionnaire in a major, cross-sectional study of year 10 schoolchildren with the aim of informing the design of effective educational programmes to help young people make informed choices regarding infant feeding.

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