DETERMINANTS OF FOOD CHOICE AND OTHER BEHAVIOURS IN PREGNANT AND LACTATING INDONESIAN WOMEN

by

Allison Marie Tuffs

A thesis submitted to committee members at the University of Manitoba in partial fulfillment of the requirements for the degree of

Master of Science
in
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ABSTRACT

Designing nutrition interventions for the purpose of changing nutrition and health habits of pregnant and lactating Indonesian are difficult. Studies show that the impact of the posyandu service, an integrated community health post, on changing nutrition and health attitudes and food choice behaviours of pregnant and lactating women is not as effective as intended. Such ineffectiveness of current services as do occur, may be related to the methodology used to describe the beliefs, attitudes and behaviours of the women. Incomplete understanding may therefore leading to development of interventions that fail to meet the needs of the community.

A new semi-qualitative data collection tool, the Food Choice Map interview (FCM), was used in this study to obtain information on nutrition and health behaviours of pregnant and lactating Indonesian women who utilise posyandu services. During FCM analysis the recorder examined the food choice behaviours of pregnant and lactating women, from their perspective, to determine reasons for food choice behaviours and nutrition and health decision-making patterns.

A snowball sample of 34 pregnant and lactating women from two provinces in Java, Indonesia participated. Each

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woman completed a FCM interview with the researcher. The results were analysed using the FCM analysis procedure.

The analysis of the food choice map identified significant inter-provincial differences (p<.01) in the social environment of food consumption and in consumption of fish, red meat, fruit and extras (p=.0004, p=.0158, p=.0174, p=.0001). There were no significant differences in food restrictions between pregnant and lactating women by region in fruit, vegetable, meat and fish consumption (p=.2311, p=.3257, p=.2989, p=.0854). However, numerous food restrictions, which included the effect of fruit and vegetable consumption on pregnancy or lactation outcome, were reported. Adherence to fruit and vegetable restrictions were significantly different for pregnant women versus lactating women in the study area (p=.0022) and food restrictions for lactating women in Central and West Java differed for fruit and vegetable consumption (p=.0005, p=.0475).

In conjunction with the respondents' food beliefs, the FCM analysis generated decision-making patterns related to respondents' food-related behaviours. Cluster analysis of respondents' decision-making patterns identified groups of women with common decision-making patterns. This analysis indicated that women who feel confident about their ability

to manage their food environment appear to accept nutrition and health information given at the _posyandu_. However, women who perceive themselves as lacking control to make personal decisions are more likely to follow the health beliefs of others in the community. These results have important implications for the design of nutrition education programs that seek to provide culturally relevant nutrition information.

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1. RESEARCH BACKGROUND

1.1 Indonesian Ministry of Health

In 1994, Indonesia began its sixth five-year plan, Replita VI 1994-1999, which emphasises human development. The priorities of Replita VI include the reduction of child malnutrition, and of maternal, infant and child mortality. The goals for Replita VI contain the targets established at the 1990 World Summit for Children which include: reduction of infant mortality to 50/1000 live births by the year 2000; special attention to health and nutrition of the female child and to pregnant and lactating women; and access by all pregnant women to pre-natal care (UNICEF, 1994).

1.2 Posyandu Intervention Programs

Attempts to change food consumption behaviour in pregnancy and lactation are difficult in the developed world and become more complex in places where access to health care is limited and traditional food beliefs are deeply entrenched. In 1980, in response to the high infant mortality rate, the Indonesian government introduced an integrated health post that included immunisation, family planning, diarrheal disease management, and mother-child health interventions for women and children at the village level (Ministry of Health, Indonesia, 1990a). The

integrated health post, referred to as a posyandu is a health service unit provided by the community for the community, supported by the health center staff, puskesmas. The posyandu was introduced with the goal to reduce infant mortality and improve the health and nutritional status of children under five, as well as that of pregnant and lactating women (Ministry of Health, Indonesia, 1990a). The posyandu services are offered one day per month in each village or city subdistrict in both rural and urban areas (Ministry of Health, Indonesia, 1990a).

The posyandu system was established to improve the access of women and children to health services, in order to enhance their physical well-being (Ministry of Health, Indonesia, 1990a). Posyandu services were developed based on the assumption that by increasing health care services availability and accessibility, pregnant and lactating women will modify their health and nutrition behaviours to those recommended at the service.

Each posyandu has five tables providing different services; immunisations, growth monitoring for infants, oral rehydration salts and solutions to mothers, breastfeeding advice, and pre and post natal nutrition counseling to pregnant and lactating women. The objective of the nutrition counseling is to reduce health problems resulting

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from poor food choice behaviours during pregnancy and lactation.

Despite development of community-based health services in Indonesia, nutrition and health behaviours have been slow to conform to those recommended by the health services. Since the inception of this program the infant and maternal mortality rates in Indonesia remain the highest among the Association of South East Asian Nations (ASEAN) member countries (Biro Pusat Statistik, 1994b). A maternal mortality rate of 4.5/1000 live births and an infant mortality rate of 58/1000 live births may be associated with incomplete transfer of information from the poysandu to the target population (Biro Pusat Statistik, 1994a). Maternal and child health may be affected by genetics, economics, clean water supply, or any number of factors. However, statistics on maternal and infant mortality suggest further need to expand the health and nutrition knowledge of Indonesian women.

1.3 Nutrition Studies and Weight Gain

Poor nutritional status during pregnancy increases the risk of poor pregnancy outcomes, such as low birthweight infants, small size for gestational age, and pre-term infants (Kusin et al. 1991; Abrams et al. 1989). Poor food

choices and inadequate consumption lead to maternal malnutrition and poor health during pregnancy.

Indonesian studies in East, Central, and West Java (Thesis Appendix A) indicate that diet during pregnancy and lactation, measured using 24-hour recall, is generally no better than the pre-conception diet, with inadequate intakes of energy, protein, and iron as compared to the American recommended daily allowances (Kusin et al. 1991). Therefore, it is plausible that social, economic or environmental barriers exist that prevent women from following nutrition and health information given at the posyandu.

In 1990, a quantitative study in urban and rural Java, Indonesia, reported that approximately 35% of the pregnant and lactating women interviewed followed food taboos that were contrary to good nutrition guidelines during pregnancy and lactation (Ministry of Health, Indonesia, 1990b). Due to the quantitative nature of the study specific reasons for adhering to the taboos were not investigated.

A study by the Indonesian Ministry of Education and Behavioural Sciences, (1990) found that 40% of the two thousand pregnant women and women with children under-five years of age who attend the posyandu believe the posyandu is an unreliable source for prenatal examination or nutrition

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information. The study found that women believe posyandu attendance is useful for receiving immunisations, infant growth monitoring, and information about family planning and weaning foods good for their infants (Ministry of Health, Indonesia, 1990). These findings suggest that the posyandu provides ineffective nutritional advice and uncomfortable surroundings for pre-natal check-ups, which include, for instance a lack of a privacy during the examination (Ministry of Health, Indonesia, 1990). The reasons why women undervalue the nutrition advice received at the posyandu have not been explored. Therefore, the transfer of nutrition knowledge from the posyandu to the women remains unsatisfactory.

The results of a study that explores the reasons associated with maternal food choice (food choices of pregnant and lactating women) and health behaviours in Indonesia would facilitate the Ministry of Health (MOH) in tailoring the posyandu program to better meet the needs of women. When the nutrition and health actions of pregnant and lactating women are better understood it is likely that an intervention program that is valued by the recipients may be developed. This program could in turn reduce the infant and maternal mortality and morbidity rates in Indonesia.

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1.4 Objectives

This research describes three aspects of the food consumption environment of pregnant and lactating Indonesian women. First, it describes the nutrition and health beliefs of pregnant and lactating Indonesian women. Secondly, it describes how women use the recommendations and advice communicated by volunteer caders associated with the posyandu. Thirdly, it focuses on methods used to describe womens' reactions to the content and communication channels used in promoting healthy behaviour programs to the community.

Specifically, the research describes:

- A new interview technique, the Food Choice Map which provides accurate descriptions of dietary habits and food choice.

- Interpretations of nutrition health descriptions and identifies attitudes and barriers in social, economic, and service access contexts that explain compliance or non-compliance with recommended food choices.

- A comparison of behavioural choices made by respondents attending a posyandu.

1.5 Relevance

Results are expected to be useful for implementing nutrition education programs aimed at promoting healthy baby

and healthy mother lifestyles in Indonesia. At an
individual level, women will become empowered to make
informed food choices and health behaviour decisions.

2. LITERATURE REVIEW

2.1 Maternal Food Choice

Maternal food choice is affected by physiological,
food accessibility, and social cultural factors, and those
determinants related to women's attempts to improve the
outcome of pregnancy (Murcot, 1992). All influence the food
choices and eating habits of women and can lead to
restrictions, such as exclusion of foods or increased
consumption of foods deemed healthful (Krondl and Lau,
1982). For example, Indonesian women who follow traditional
customs believe that an expectant mother should avoid eating
certain foods during the pregnancy as consumption may
increase the risk of baby deformation.

The factors affecting maternal food choice may be more
clearly understood by examining the attitudes, beliefs and
knowledge that women associate with maternal food choice.
However, few Indonesian studies have attempted to measure
nutritional attitudes of women in pregnancy and lactation.
Kardjati (1988) examined reasons associated with a reduction
of food and nutrients including energy, calcium and iron

consumption during pregnancy in rural Indonesian women. The research suggested that many beliefs women have about pregnancy outcome are related to foods consumed in pregnancy. It is the knowledge and beliefs that pregnant and lactating women hold about pregnancy outcome which affect their food choice.

Food choice is further influenced by the knowledge and beliefs pregnant and lactating women have related to cultural food habits. Older community members, family relatives, and others important to the pregnant or lactating woman play a role in sustaining traditional beliefs about the foods to be eaten and avoided during pregnancy (Murcot, 1992). Sanjur (1982) states that food-related behaviours are rarely in complete separation from direct influence of others and environmental influences, such as food taboos. Foods are restricted due to a cultural belief that consumption of the food will bring harm to the consumer.

Maternal food choice may also reflect socialisation within the nuclear and extended family. Relatives may resemble each other due to a shared gene pool, environmental influences like modeling, reinforcement, restriction of available foods and social or cultural influences (Rozin, 1991). This implies that the perpetuation of traditional

food beliefs held by parents may be effected through the generations.

Food choice decisions are further complicated by the fact that food is a focus of social interaction; therefore, the consumption of particular foods may become an index of social status (Sanjur, 1982). It is possible that individual food choice may vary according to the combination of both internal (an individual's personal control) and external (control of others over an individual) perceptions present in individuals. These perceptions likely influence the actions a person deems to be acceptable and may affect an individual's ability to make healthy food choices.

Maternal food choice becomes more complicated by two interrelated issues: social support and its effect on meal pattern. van Schaik (1964) reported that a person living alone will often follow meal patterns of friends or counterparts. Therefore, complete investigation of an individual's food consumption patterns and food choice environment must include the relation between the person's surroundings, its composition, size, and the relation between the members in the family and in society (van Schaik, 1964). Simply put, an individual does not function as a sole entity, but considers multiple factors when making consumption decisions and these affect what is eaten and how

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often. Therefore a study of the determinants of food choice must address all issues related to the food choice environment.

It is understood that food is an essential component of life, without which our biological functions eventually cease. However, the processes through which people decide what foods they will consume are complex. The preceding review of maternal food choice indicates that food choice during pregnancy and lactating may be influenced by many factors, of which health is only one of the many considerations relevant to food choice.

For nutrition health education programs to be effective the program developer should understand the target population's food choice behaviours and their determinants. An understanding of reasons supporting food choice will improve the efficacy of programs tailored specifically to address the needs of a given community.

The complexity and difficulty in understanding reasons for food choice stem from a lack of effective tools to accurately assess peoples food choice environments. This is partly due to the linear thinking imposed by quantitative methodologies and partly from the inability to generalise using qualitative methods.

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The urgency for a new method that describes people's food consumption behaviours and reasons for individual food choice is the foundation of this thesis research. In addition, there is a further need to know what the current dietary habits and beliefs are of pregnant and lactating women in rural and urban areas of Java, Indonesia. This knowledge will be useful in the development of educational programs that positively influence the nutritional health knowledge of Indonesia's pregnant and lactating women. With increased nutrition knowledge, Indonesian women may make healthier food choices, and reduce Indonesia's high maternal and infant mortality rates.

2.2 Quantitative Methods

In quantitative data collection methodologies, all concepts for the study design are defined before data collection starts. The researcher uses statistical techniques to prove which predetermined variables are causally related (Steckler et al, 1992). In addition, quantitative results are based on numerical and quantifiable data that are deemed to yield objective results. Therefore, results are universally accepted because of the assumption that the interpretation of numerical data will be the same for all researchers (Achterberg, 1988).

Food choice behaviours and dietary intake of individuals are difficult to measure using quantitative tools. Food choice behaviours are complex and the recording of usual dietary intake patterns and quantification of nutrient intake data is poorly accomplished with current dietary assessment tools (Lee-Han et al., 1989). Diet records are often lengthy, expensive and difficult to administer.

Food frequency questionnaires have low respondent burden and high response rates, but their accuracy is lower than other dietary assessment methods. The 24-hour recall requires professionally trained interviewers and rigorous standardisation and analysis procedures. This method is likely to omit foods that are not eaten frequently (Young et al. 1952; Block, 1982; Gibson, 1990).

Quantitative dietary assessment methods have very defined uses and are beneficial when assessing and monitoring dietary status, estimating the incidence of dietary inadequacies and for assessment of dynamic food consumption patterns indicating absence or presence of disease (Pennington, 1988). However, while the designs of traditional dietary assessment methods record actual food intake or their frequency in the diet they often bypass exploring descriptions of the individual's perception of

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reasons for particular food consumption patterns (Lee-Han et al., 1989; Pao, 1989). These research data must be supplemented with additional information from other interviews, which not only increases the time of data collection, but also the cost of the research.

2.3 Quantitative Limitations

Quantitative dietary assessment methods collect information, which can be standardised and quantified from large numbers of people. This research format has several disadvantages. Designs have little built in flexibility that enable respondents to explain why or how certain dietary behaviours are subscribed to. This limits the ability of respondents to give personal explanations relevant to reasons for food choice. Since information about personal opinion may change the meaning of their answers, the survey information may mislead the researcher (Achterberg, 1988).

Further, traditional analysis employs linear regression models where results are reported as means of groups or group data. Linear models can not identify the combination of perceptions which cause an individual to choose a certain behaviour (Roering et al., 1986). Therefore, the individual perceptions and behaviours which may further explain and qualify the results presented on

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behaviour change are not investigated or reported. As a result, the researcher may make judgments about cause and association between variables based on assumptions. This increases the likelihood of the investigator formulating wrong conclusions based only on numerical data. In addition, the frame of reference of quantitative methods fits only those that the interviewer and interview method allows. Quantitative methods disregard additional detail or perceptions offered by the respondent; therefore, they are poorly designed to capture personal descriptions and explanations (Morse and Field, 1995).

2.4 Qualitative Methods

Qualitative data collection methods are used for identification, description and explanation. They provide rich, detailed descriptions that leave study participants' perspectives intact (Steckler et al., 1992). Qualitative methods are designed to describe a problem from the point of view of the people experiencing it. Therefore, qualitative methods are useful when exploring respondent reasons for exhibiting particular behaviours, and can reduce the number of assumptions needed to describe the problem.

Qualitative methodologies include the data collection and analysis process. Common qualitative collection methods include focus groups, open-ended in-depth interviews,

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participant observation and small group case studies (Helitzer and Kendall, 1992).

The use of content analysis with qualitative data facilitates the researcher's ability to elicit the individual's perspective and to gain a contextual understanding of health behaviours and program results (Steckler et al., 1992). Qualitative methods provide an understanding of barriers to health service use and health beliefs that is not possible through quantitative analysis. Interventions based on qualitative results may be effectively designed to fit the needs and values of the proposed users.

2.5 Limitations of Qualitative Methods.

One limitation of qualitative methods is that results are limited to describing and identifying patterns and concepts, identifying the relationship between concepts, creating theoretical explanations and formulating models of concepts that show the most common links mentioned by people (Morse, 1994). This does not maintain different contexts of decision-making which would add insight as to how to meet the nutrition education needs of different groups of people.

Results are often based on the researcher's subjective interpretations of the participant's comments, which may lead to incorrect interpretations. In addition, sample

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sizes of participant/groups are usually small, which limits the researcher's ability to use statistical inference and to generalise results to a larger population (Achterberg, 1988).

Another limitation is the cost associated with qualitative research data collection and analysis. Since most participants are either interviewed or observed in their own environment, the costs of tape-recording transcriptions or participant observation are high.

It is evident that reliance on a single method often results in less appropriate results and interventions than could be developed with the integration of both qualitative and quantitative methods (Helitzer and Kindall, 1992). The advantages of quantitative and qualitative methods can be combined. First, the quantitative element can define the problems that people experience, and provide the frame of reference for further work. Second, the qualitative element can describe the way in which individuals make decisions, which explain the observations and measurements in culturally and socially relevant terms. In this way, conclusions take a broader set of personal characteristics into account. These same conclusions can show implications for the use of resources by communities and can be used for intervention planning.

In summary, traditional data collection methods lack the ability to address reasons for food choice behaviours in study participants because questions such as "Why do you eat different foods in pregnancy?" and "Who influences the foods you eat?" have not been asked. These shortcomings lend support for an un-structured qualitative and quantitative interview technique that enables respondents to give detailed descriptions of their food choice environment as seen through their eyes. These descriptions will enhance the insight of the researcher and give clarification from the respondents' perspective about their food choice behaviours and associated reasons for those behaviours.

Many psychological models and theories have been developed which attempt to determine reasons for behaviour. The theoretical and conceptual framework for this study was based on models of individual behavioural change drawn from social and psychological models of motivation. The decision-making theories include the Theory of Reasoned Action (Ajzen and Fishbein, 1980) and the Social Learning Theory (Bandura, 1977). These models postulate that people will act in a specific manner, be that positive or negative, only if they believe the behaviour will elicit the desired response (Contento, 1995, Azjen and Fishbein, 1980). Another framework, the Precede-Proceed model, provides a context for

planning and evaluating behavioural and environmental change (Daniel and Green, 1995).

These theories are discussed below to provide an understanding of the various constructs that comprise each one. This knowledge is necessary because several constructs from the methods are adopted for use in the Food Choice Map, hereafter referred to as FCM, interview analysis method (discussed in detail in paper two). The FCM method does not include the actual theories, but the construct definitions they provide are part of the analysis procedures. For this reason, a discussion of how the theories have been used in nutrition research is not included.

2.6 Ajzen and Fishbein's Model of Reasoned Action

A model to determine behaviour is the Theory of Reasoned Action and Planned Behaviour developed by Fishbein and Ajzen (1975). It offers a framework to measure and determine congruence between beliefs, intentions and behaviours. The Theory of Reasoned Action has been applied extensively in food and health related behaviour research (Rappoport et al., 1992; Conner, 1993, Shepherd and Stockley, 1987)..

Ajzen and Fishbein (1980) stated the objective of the Theory of Reasoned Action and Planned Behaviour as: to

measure behaviour in an attempt to understand and ultimately predict future behaviour. The constructs that comprise the reasoned-action model include beliefs, attitudes, normative beliefs, subjective norms, intention and behaviour.

The building blocks of this conceptual framework are beliefs. They explain what information/knowledge a person has about an object or behaviour. Beliefs serve as links to certain attributes. For example, linking the belief that "drinking milk" (the object) "will make my bones strong" (the attribute). The object of beliefs may be persons, events, organisations, a behaviour or a policy. The associated attribute may be any object, trait, property, quality, characteristic or outcome.

This theory proposes that an individual's attitudes can be explained in terms of intention to perform a behaviour (Fishbein and Ajzen, 1980). Attitudes are described as a learned favorable or unfavorable response to a given object or action based on one's salient beliefs. The individual's beliefs lead to a set of intentions. Therefore, attitude is defined as an individual's positive or negative evaluation of the object or action.

Intentions are modified by how much an individual wants to comply with the wishes of others because normally an individual will have a small set of salient beliefs but

will be influenced by opinions, views, and expectations of 'important others'. The pressure an individual experiences from others who think that the person should or should not perform a particular behaviour are termed normative beliefs (Fishbein and Ajzen, 1975). As the individual considers the beliefs of others, normative pressures are transformed into subjective norms. Subjective norms are seen as pressures from the society or environment which influence the intent to act (Ajzen and Fishbein, 1980). Therefore, intention to act is determined by an individual's beliefs or by his or her perception of how others will view the act.

Behaviours are the observable acts that an individual performs. Overt behaviours may be used to learn more about the beliefs, attitudes or intentions of the individual. In the case of food choice, such behaviours would include buying, preparing, serving and eating particular foods or food types.

The Theory of Reasoned Action and Planned Behaviour makes three assumptions. First, it assumes a causal link from beliefs, through attitudes, norms, and intentions to behaviour (Saver, 1983). The links are initiated by a person's beliefs. Second, it assumes that most actions are under voluntary control. Therefore, non-voluntary behaviours, goals or outcomes are not explained (Ajzen,

1988). Lastly, the model assumes that behaviour intention is an intermediate determinant of an individual's behaviour, not the final determinant (Carter, 1990).

2.7 Precede-Proceed Model

The Precede-Proceed model involves an examination of behavioural and environmental factors to ascertain causal determinants of behaviours (Daniel and Green, 1995). The model strives to identify factors influencing or determining individual behaviour. As well, it identifies people and/or influential groups that may be capable of affecting the individual's behaviour by inducing either behavioural or environmental modifications.

This model defines three factors that collectively influence behaviours; predisposing factors, enabling factors and reinforcing factors. Each has a unique influence on behaviour, though a concept may occur in more than one of the factors. The three factors are defined as follows (Daniel & Green, 1995):

1. Predisposing factors are personal preference and related antecedents to behaviour that provide motivation for a behaviour, including knowledge, attitudes, beliefs, values, and perceptions that either support or inhibit a behaviour.

2. Enabling factors are antecedents to behaviour that enable a motivation realisation, including objective characteristics of an individual, community, or environment, that facilitate action for behavioural change.

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3.   Reinforcing factors are subsequent to a behaviour and provide continuing reward or incentive for the behaviour.   These include anticipated or actual social support mechanisms that contribute to the desired behaviour's persistence.

In general, the combined influence of the three factors as stated above assists in the explanation of any behaviour. The Precede-Proceed model specifies that the analysis process should include consideration of all three causal factors (Green et al., 1980).

2.8 Social Learning Theory

Related to all three causal factors of the PRECEDE-PROCEED model, in the context of improving nutrition and health behaviour, is social learning theory (Bandura & Schrenk, 1981, Bandura, 1977). This theory was designed as a framework for identifying factors that influence an individual's behaviour, emphasizing expectancy and reinforcement in a given situation. It postulates that to change behaviours based on lifestyle, people must:

1.   Have incentive to take action

2.   Feel threatened by their current behavioural patterns

3.   Believe that the behavioural change will be beneficial

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4. Consider themselves sufficiently competent to implement the change (Rosenstock & Stretcher, 1988)

The Social Learning Theory states the idea of reciprocal determinism whereby the person, their behaviour and the environment that the behaviour is performed in reflect a dynamic relationship. Thus, a change in one variable implies a change in the other two variables (Bandura, 1977; Perry et al., 1990).

Behavioural capabilities is a concept defined as the knowledge and skills to perform a task. This distinguishes between learning and just performing a behaviour, in as much as one may learn but not act based on what he or she has learned.

Expectations are described as the anticipations of the individual from acting in a certain way, while expectancies are incentives for that behaviour or the value one places on a given outcome (Perry et al., 1990; Contento, 1995),

Social Learning Theory includes the concept of self efficacy, described as one's ability and confidence to perform a behaviour. This may determine the amount of effort a person spends on a given task, so repeated acts indicate a level of confidence in performing that task (Boyle and Morris, 1994).

Self control is personal regulation of goal directed behaviour. The constructs of internal and external locus of control are indicative of the level of an individual's dependency on environment and important others (Bandura, 1977). Therefore, a person with an internal locus of control believes he/she has ability and control over a given situation or ability to perform an action and carry through on the action. However, a person with an external locus of control believes he/she lacks the ability to control higher personal environment, and believes that others have more control than themselves.

2.9 Applying the Theory

The theories discussed above employ models that force explanations upon observed behaviours. However, if individual behaviours or reasons for behaviours are allowed to deviate from those allowable in the models, new assumptions and conclusions may emerge which would otherwise have been disregarded. It is assumed that it is the constructs, not the actual theories, which facilitate the process of explaining individual food choice. For this research, only constructs from the three models will be used in the analysis of interview transcripts. However, not all constructs will be used, but only those that emerge from the responses of participants.

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In summary, little is known about the process by which pregnant and lactating women in Indonesian make food choice decisions. The constructs from behaviour change models are designed to facilitate understanding of the contexts and decision-making processes that Indonesian women use in determining food choice during pregnancy and lactation (Thesis Appendix B). The use of constructs is important for consistent procedures during analysis, for example by creating a starting list of constructs for coding transcripts (Miles and Huberman, 1994).

3. RESEARCH DESIGN

3.1 Research Questions

The following were the central questions addressed in this research, through integration of data collection and analysis techniques.

1. Do women discuss reasons supporting their food choices during pregnancy or lactation in the FCM interview?

2. Do women who utilise the posyandu for pre and post-natal nutrition advice have different attitudes and barriers to services that affect their health and food choice decision-making abilities than those who do not utilise the service?

3. Do pregnant and lactating women follow traditional food restrictions? If so, are the food restrictions similar in different geographic regions?

3.2 Respondent Selection

Data were obtained from pregnant and lactating women living in twelve non randomly selected villages in two districts of Indonesia: Bogor (West Java) and Wonosobo (Central Java)(Thesis Appendix A). The two districts were chosen to allow a comparison of possible rural and urban differences. The community health status of Central Java is superior to that of West Java, as shown by a lower infant mortality rate (65 per 1000 live births) and a longer life expectancy (62.9 years). The respective West Java figures are, 90 per 1,000, and 57.4 years (Sevenhuysen and Husaini, 1995).

At the household level, with assistance from local volunteers (caders) working in maternal and child nutrition, 62 respondents were identified using a snowball sampling technique within a sampling frame. The sampling frame consisted of all pregnant and all lactating women with infants from 3 days to 2 years old, identified from lists of women who attended the posyandu. In addition, since these lists were not complete a snowball sampling technique was used, which consisted of asking women who participated in

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interviews and caders whether they knew of other pregnant or lactating women who could participate.

A sample of 60 women who utilised the posyandu were selected for the FCM interview. However, less than 50% of the women utilised the pre-and post-natal nutrition services offered at the posyandu.

Following approval of the research procedures by the Faculty of Human Ecology Ethics Review committee, a letter was prepared by the Indonesian and Canadian research team outlining the objectives of the study and requesting authorisation to conduct the study in each village. The village leaders in each community provided assistance in making initial contact with participants in Central and Western Java.

Data from the first 23 respondents served as pilot data which were used to define two changes in the interview process. First, the actions of the interviewer were changed to reduce the time spent on recording and managing the information provided by the respondent. Second, the interview and question guides (Thesis Appendix D) were reviewed to include more of the experiences the women reported in daily living. Three respondents from the actual study group were excluded due to incomplete interview

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records.   Hence 34 respondents provided interview records for the interpretation of results.

4. DATA COLLECTION

1. Pre-test the FCM interview and question guide on 23 participants in Central Java.   During the interview additional questions were asked to document traditional health beliefs that were important in attaining an understanding of existing belief systems (Thesis Appendix D).

2. Interview 34 respondents, 17 from Central Java and 17 from West Java, using the FCM with the revised questionnaire (Thesis Appendix C).   During the FCM interviews, questions relating to reasons for food choice and use of health services were asked as these are important to the design of future educational programs (see section "Food Choice" in Thesis Appendix C .

3. Demographic information for all respondents were collected by members of an Indonesian research team, working the same areas during the same time period as this thesis research.   The team collected data on a wider set of health issues related to maternal and infant status and behaviour.   The information gathered

included the respondents age and religion of the household, as well as number of years of schooling, family income level and economic generating activities. For the purpose of this thesis research only age and religion of the mother were taken from the larger survey data.

4.1 FCM Interview Concept

The FCM interview is designed to record differences in food choice between people, together with their perceptions of the importance of the food items they report in daily life. The interview was conducted as a conversation, where the respondent saw their answers visually recorded and were able to change the record themselves in response to later questions adding internal validity checks as the interview progressed (Sevenhuysen, 1996).

The interview did not describe all foods eaten by an individual. It did depict frequencies of foods eaten and described those elements of an individual's environment which the individual chose to associate with their food-related behaviours such as the physical, social, economic and cultural contexts in which they occur.

The additional descriptions about situations and people were the key to predicting future health and nutrition

behaviours. Therefore, subsequent to the interview respondent descriptions enabled the researcher to create a "concept map", which included concepts mentioned or implied by the respondent. The concepts explained nutrition and health behaviours related to personal experience, knowledge, beliefs, physical, social, economic and other environments. The "concept map" identified the behaviours of interest to the respondent and the overt and/or implied determinants of the behaviour (see Thesis Appendix F for a sample concept map).

The FCM analysis was three-fold. First, the food maps and interview records described what foods the respondents ate, the frequencies with which they were consumed, food combinations and meal patterns of individuals, which can be compared to recommended food behaviours. Second, the analysis used respondents' beliefs and attitudes to identify respondents' reasons for a wide variety of behaviours. Lastly, these reasons for behaviours were used to identify basic motivations for the actions that respondents reported concerning their social, economic, physical and cultural situations.

The analysis maintained the unique combination of circumstances, perceptions and beliefs that individuals described; these combinations explained behavioural choice.

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The study assumed that the combination or pattern of factors itself was a determinant that was captured with cluster analysis. Since the analysis focused on patterns, rather than separate variables, regression analysis and other linear models were not adequate explanatory tools.

Only information from respondents was used to build the individual concept maps which provided the basis for grouping individuals. Any concepts introduced by the researcher during the analysis were discarded or maintained simply as comments in respondent transcripts.

4.2 Preparation for Food Choice Map Interview

Easily identifiable food pictures were prepared from Indonesian magazines and cookbooks. The picture size was approximately 0.7" by 0.7" so as to fit well on the map. In addition1 1" by 1" blank white paper was needed to write in any additional food items for which food stickers were not available.

Stickers were organised into a quick retrieval file by placing them on clear plastic sheets of paper with temporary adhesive. The use of temporary adhesive enabled one to move the stickers as needed. Coloured felt pens were needed to highlight meals that a respondent shared with others. Different colours indicated different groups that formed the social network of the respondent.

Photocopies of a 11" by 14" sheet of paper with grid lines were prepared as the base for the map. The horizontal scale was numbered from one to seven representing the number of days in a week (Thesis Appendix E).

A micro cassette recorder with charged batteries and a blank tape was needed for each interview. This enabled the translator to transcribe the data for use by the researcher.

4.3 Creating a Food Choice Map

Detailed descriptions of the research interview process are reported in paper two, section 7 of this thesis. Reported foods were recorded on a 11" x 14" grid sheet of paper which created a food map. The horizontal scale numbered 1 to 7, allowed the respondent to position pictures of food items according to their approximate weekly consumption. The vertical scale allowed the respondent to show time periods during the day during which the food was normally eaten. The meal periods were noted in the empty margins to the left or right of the grid.

To obtain an accurate recording of the interview conversation the researcher started the cassette recorder prior to the first question. The interview began with questions about what foods are eaten most often (Thesis Appendix C) and for each food mentioned, a food picture was placed on the map. The time of day and the relative

frequencies of the food consumed were discussed and a food
sticker was placed on the map (Thesis Appendix E). As the
map developed the respondent remembered or changed her mind
about a food item already on the map, the sticker was moved
or removed.

The next step in the interview process was a
conversation to record the social situations that foods on
the map were eaten in as well as how food choices change
during pregnancy and lactation and why (Thesis Appendix C).
Recording of the information was interactive and captured
the interest of the respondent which maintained the
conversation flow. The food map was checked by the
respondent for internal validity.

5. FOOD CHOICE MAP ANALYSIS

5.1 Interview Transcript Analysis

The facts and comments provided by the respondent were
the sole information needed in the analysis process. The
researcher did not assume that the respondent was using any
knowledge or psychological reaction during the interview,
other than what the respondent mentioned with actions and
situations described (Sevenhuysen, 1996, Sevenhuysen et al,
1995).

For an individual respondent, the analysis process was
intended to result in a list of several reasons which

explain a specific behaviour. The reasons included both those mentioned by the respondent, as well as reasons that related to the behavioural theory.

The FCM interviews were translated and transcribed from the respondents' language into English. The transcripts were analysed using content analysis to identify behaviours, reasons for the behaviours, as well as beliefs, attitudes and personal circumstances (Chenitz and Swanson, 1986).

For a group of respondents, the analysis process produced a list of categories based on reasons for behaviour. By assigning respondents to these categories, subgroups of respondents who differed in their behaviours were identified (Sevenhuysen, 1996).

5.2 Identification of Concepts and Constructs

Content analysis of transcripts was utilised in coding and identifying outcome behaviours. Holsti (1969) defined content analysis as a phase of information processing in which communication content (the transcript in this case) is transformed through objective and systematic application of categorisation rules, into data that can be summarised and compared.

The researcher reviewed the entire transcribed interview to get an overview of the content. During a

second read the researcher underscored passages in which wording or meaning indicated an outcome behaviour (OB), such as health service use.

The researcher identified outcome behaviours for all respondents. Only outcome behaviours that influence health or nutritional status of the individual were included in the study; others were not relevant for this research.

Following identification of OB, the transcripts were reviewed again to identify reasons or constructs associated with each OB. Respondents perceptions of positive and negative effects of the behaviour were noted to determine enhancing factors or barriers to health services and healthy behaviours.

A spreadsheet was created with six columns for displaying the OB and their related reasons in an organised form. The following six column headings were used:

Line/ Pg	Primary Behaviour	Secondary Behaviour	Reason or Action	FCM Outcome Behaviour	Assoc. Code

The columns displayed the categorised data into a format for coding. To illustrate this, a primary behaviour can be "breakfast" with the secondary behaviour noted as "I always have fried rice for breakfast". This would be categorised as "Food Intake" in the outcome category. The reason for the consumption of this food may have been "I

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make the rice for dinner, there are always leftovers, so it's easy for me to make the fried rice in the morning". The associated codes represented a concept or construct from the literature on behavioural theory. For example, the attitudinal behaviour construct was coded ATT-BEH. The associated codes were used later to display concept patterns and to form variable definitions (See Thesis Appendix B for concept definitions).

5.3 Mapping Constructs:

A concept map was prepared for each respondent for each OB to indicate the relationships between the constructs identified in the respondent transcripts and the OB (Miles and Huberman, 1984, 1994). Concept maps showed links between behaviours, reasons for behaviours, knowledge, beliefs, attitudes, physical, social, and economic circumstances. The links did not imply a 'cause-and-effect' direction between the constructs. Neither did any of the construct maps imply the existence of a generic model to explain behaviour.

The construct maps and the links identified by the analysis were used to determine common patterns of constructs and links across the entire group of respondents. The identification of patterns required that the construct maps contained the same construct links.

Presence of the concept patterns that emerged were checked across all maps. If present, the value associated with frequency of the link were counted. If absent, the value associated with the link was zero. All maps were standardised for the extent of interaction between the interviewer and respondent by dividing the total frequency of links between constructs in the respondent's transcript. The frequency associated with each common pattern was its apparent relative importance to the respondent.

Each common pattern was identified as a variable and standardised values entered for each respondent. K-means cluster analysis (NCSS statistical program, Hintze, 1995) clustered respondents by the variable values. Each cluster group represented a different process of decision-making between respondents. Further details on determining decision-making processes and groups are described in section six of this thesis in a paper titled: Mapping the Health and Nutrition Behaviours of Indonesian Women for Better Behaviour Change Strategies.

5.4 Interview Food Maps

Frequencies of foods consumed in seven days were identified from the food map. The recorded foods were recorded on a spreadsheet that identified each respondent and her respective food consumption. A review of individual

interview transcripts verified that all food items were reported correctly.

Reported foods were grouped into categories of consumption based on how the women discussed food and grouped food substitutes during their interviews. This was done by grouping frequencies of consumption for similar foods. For example, the frequency of tofu and tempe, both soybean derived products, reported in the week were grouped together and reported as soybean consumption. These categories served as the basis for grouping food items reported on the food maps. Based on pre-test data, it was assumed that food groupings would be uniform between provinces and that only frequencies among groups would vary. The student t-test was used to determine if food consumption patterns within food categories differed between respondents in Central and West Java.

In addition the food maps provide a recall tool that respondents referred to when describing food consumption during pregnancy or lactation and facilitated identification of food restrictions. The interview transcripts identified specific passages where the respondent reported food choice, including restrictions during pregnancy or lactation, and reasons for their food choices. Grouping of reported food restrictions according to food type and common reasons for

the restrictions enhanced the researchers understanding of respondent food beliefs, as well as identifying if differences in restricted food beliefs exist between provinces.

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6. **PAPER ONE:** Food Choice of Women Using Village Health Services in Indonesia

6.1 Abstract

The food consumption behaviours of 30 pregnant and lactating women in two provinces of Java, Indonesia were recorded using the Food Choice Map interview. During the interview each respondent created a visual map, referred to as a food map, of food choices during a usual week. Foods displayed on the map facilitated the development of conversation concerning usual food choice and food restrictions adhered to during pregnancy and lactation.

The analysis of the food map identified inter-provincial differences in consumption of fruits, vegetables, meat and fish. As well, numerous food restrictions which included the effect of fruit, vegetable and meat consumption on pregnancy or lactation outcome, were reported. Adherence to fruit and vegetable restrictions were significantly different for pregnant women vs. lactating women in the study area (p=.0022). Food restrictions for lactating women in Central and West Java differed for fruit and vegetable consumption (p=.0005, p=.0475). In addition, many women reported food restrictions to milk related to its high cost and general lack of availability.

The food beliefs and food choice behaviours of pregnant and lactating Indonesian women indicate that nutrition

education programs need to be designed to further develop and reinforce their nutrition knowledge.

6.2 Introduction

The nutrient needs of pregnant and lactating women are higher than those of women who are not pregnant (Rolfes et al.1990). During pregnancy and lactation women are encouraged to increase consumption of specific food groups to meet increased nutrient requirements. Recommended food choices are expected to provide an optimal nutrition environment for the mother and child. However, food choices during pregnancy and lactation are often affected by food beliefs, many of which may differ from the recommended choices promoted through health care systems. The food beliefs of pregnant and lactating Indonesian women may affect their food intake, and in turn adversely affect the health status of mother and child (Minister of Health, Indonesia, 1994).

The adherence to traditional food beliefs by pregnant and lactating women is of concern to nutrition educators since not all beliefs may be nutritionally sound or correct food (Djazayery, et al. 1991a). Excluding foods may increase the risk of inadequate nutrient intake and poor pregnancy outcome. If changes to the diet during pregnancy and lactation are merely idiosyncrasies of the individual, they may have little nutritional significance for the population as a whole (Landman and Hall, 1983, Messer,

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1989). However, if the changes are due to cultural restraints or traditional customs, then the changes may be a more significant public health concern. For example, if the consumption of milk is limited by its availability, then it may pose a significant public health concern.

Information available on food habits in Indonesia suggests that traditional dietary customs are prevalent among women (Minister of Health, Indonesia, 1990). Research indicates that some foods are excluded from the diet during pregnancy or lactation due to beliefs or habits (Kardjati, 1988). However, little description is available of the food beliefs that explain reasons for food exclusions. Information on dietary choices during pregnancy and lactation, as well as the associated reasons for those choices, may enable nutrition educators to tailor education programs more adequately to the needs of women.

A recently proposed qualitative interview technique, the Food Choice Map (Sevenhuysen et al., 1995), hereafter referred to as FCM, was used in this study to provide descriptions of food choice and food restrictions adhered to by pregnant and lactating women in two locations in Java, Indonesia. The FCM interview was designed to record differences in personal food choice between people, together with their perceptions of the importance of the food items

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they report in daily life. During the interview, respondents produce a visual food map that represents their food choices during a typical seven day period. The food map is unique because it visually represents an individual's food choices by mapping food behaviours. The food map has built in internal validity checks that enable respondents to change their recorded food choices in response to later questions (Sevenhuysen, 1996).

The FCM interview is a tool that facilitates an understanding of a respondent's food choice behaviours from the respondent's perspective. The interview identifies food choice behaviours and reasons for those behaviours, as well as the beliefs and attitudes that support an individual's food choice. (Sevenhuysen et al., 1996). Knowledge of respondent food choice behaviours adds to the researcher's insight and understanding of respondent food choices. Therefore, this study employed the FCM interview technique to investigate food choices and reasons associated with the choices in pregnant and lactating Indonesian women.

6.3 Methods

6.3.1 Respondent Selection:

Respondents were identified using a snowball sampling technique. An initial group of 60 pregnant or lactating

women from six communities in two areas of Java, Indonesia were contacted for participation by health care volunteers living in the same communities. Of the 60 respondents, 23 served as pre-test pilot participants. Three of the 60 women approached declined to participate due to time constraints resulting from commitments outside the home. The data collected from four women was deemed incomplete because of inconsistent comments about personal situations and food behaviours. Thus, FCM interviews were carried out with 34 women. During four of the interviews the tape recorder malfunctioned due to heat, humidity, therefore study results are presented for 30 women.

The pre-test pilot data were used to define two changes in the interview process. First, the interviewer's actions were changed to reduce time spent on recording food choice and managing the information provided by the respondents. Second, the interview and question guides were reviewed to include more of the experiences the women reported in daily living.

6.3.2 Data Collection:

In each province local volunteer health representatives (caders) introduced the researcher and translator to individual respondents. All interviews were conducted in the respondents home as conversations between the Canadian

nutritionist, one translator (Indonesian nutritionist) and the respondent. Interviews were conducted in the language of the respondent, Javanese, Sundanese or Bahasa Indonesia, and required approximately forty-five minutes of the respondent's time. Participants gave verbal consent for the interviewer process to be tape recorded. However, one interview was not recorded because the woman was uncomfortable with the tape recorder. All research procedures were approved by the Ethics Review Committee of the Faculty of Human Ecology, University of Manitoba.

The context of the FCM conversation was the same for all interviews; the personal experience and perceptions of the respondent's own food consumption and food beliefs during pregnancy, lactation and recovery (Paper One Appendix A). A similar interview context, for all interviews served to facilitate the process of collecting information related to the food choice environment.

A pre-defined question guide for the FCM was used to orient the conversation and to reveal respondent food choice and food-related behaviours, with the reasons for those behaviours. The question guide was designed by Indonesian and Canadian researchers and modified during initial training of the interviewer and translator. The translator assisted in the interview process as well as in translating

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the interview dialogue tapes from the respondents' language to English. Another Indonesian nutrition professional, not present during the interview conducted translation reliability checks on the English transcripts to ensure translations were accurate.

During the FCM interview respondents helped to create a food map that recorded open-ended information of food choice using stylised pictures of food items. The respondent was allowed to modify the food map as the conversation progressed and as later topics of conversation brought about recall of details that changed or complemented previous responses.

The food map enabled respondents to visualise food patterns and facilitated respondent recall of food consumption. In addition it provided a basis for an open-ended conversation that enabled the researcher to ask about food choices as depicted on the map. For example, if a map indicated that the respondent ate many vegetables, the interviewer asked " Is there a reason why you eat many vegetables?". The respondent was able to respond openly, to explain her personal beliefs and reasons for the behaviour.

6.4 Analysis:

Frequencies of foods consumed during a seven day period were identified from the food map. A review of interview

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transcripts provided explanations of respondent food choice and verified that all food items were correctly reported.

Reported foods were grouped into categories of consumption based on the women's perception of it as well as on how women discussed and grouped food substitutes during their interviews. This was accomplished through grouping frequencies of consumption for similar foods. For example, the frequency of <u>tofu</u> and <u>tempe</u>, both soybean-derived products, reported in week were grouped together and reported as soybean consumption. The same food groups were used for grouping foods reported by respondents in both West and Central Java. The student t-test was used to determine whether food frequencies within food categories differed between respondents in Central and West Java.

The food maps also served as an internal check in that respondents referred back to the map to help them recall how their normal food choice was affected by pregnancy and lactation. Hence, food maps facilitated respondent identification of food restrictions.

The interview transcripts identified specific passages where the respondents reported food restrictions during pregnancy or lactation and reasons for the restrictions. Respondent explanations of food restrictions were classified by common theme among the participants. Foods women

reported as having a positive or negative effect on pregnancy outcome were grouped. Grouping of reported food restrictions according to food type and common reasons for the restrictions enhanced the researchers understanding of respondent food beliefs, and facilitated the identification of differing food restriction practices and beliefs between the provinces.

6.5 Results

The mean age of the 9 pregnant and 21 lactating women in both study areas was 28.7 (SD 5.7) years, with 15 respondents from the province of Central Java and the same number from the province of West Java. All respondents lived in Muslim households. However, food cultures are known to differ between geographical areas in Indonesia.

The food maps provided information that confirmed differences in food consumption patterns of women in West and Central Java (Table 1). Respondents living in West Java consumed significantly more red meat, fruit and extras (p=.0158, p=.0174, p=.0001) than those living in Central Java. Women in Central Java consumed significantly more fish than women in West Java (p=.0042).

Table 1: Comparison of food consumption between provinces (n=30)

FOOD CATEGORY	n = 15 Central Java	n = 15 West Java	SD Central Java	SD West Java	t-value	p
RICE	18.4	19.5	3.2	2.7	-1.0	0.3
EXTRAS	11.7	31.0	8.4	10.2	-5.6	0.0*
SOYBEAN	15.3	15.8	7.9	8.7	-0.1	0.8
FISH	10.0	3.6	4.7	4.1	4.0	0.0*
EGG	5.7	5.8	4.9	3.2	-0.1	0.9
CHICKEN	1.2	2.4	1.8	2.3	-1.7	0.1
RED MEAT	2.0	6.0	2.2	5.7	-2.6	0.0*
VEGETABLE	19.2	22.6	6.3	11.0	-1.0	0.3
FRUIT	5.7	11.2	5.0	6.7	-2.5	0.0*
MILK	4.1	3.8	6.4	4.6	0.1	0.9

*is significant for p<.05

Respondent food consumption patterns differed between provinces for four of the ten food categories (Table 1). However, an analysis of food restrictions between provinces failed to identify significant differences between pregnant and lactating women in the consumption of fruits, vegetables, meat and fish, when analysed using the chi square test (p=.2311, p=.3257, p=.2989 and p=.0854).

The grouping of food restrictions for pregnant (n=9) and lactating (n=21) women identified differences dependent on physiological status but not the region. Chi square values for restrictions relating to both fruit and vegetable consumption during pregnancy and lactating indicated that pregnant women in both regions reported significantly more restrictions (p=.0022) to fruits and vegetables than lactating women.

It was noted that food restrictions reported by lactating women differed by province. Specifically, food restrictions related to the consumption of fruits and vegetables were significantly different between lactating women in Central and West Java (p=.0005 for fruit & p=.0475 for vegetables). Lactating women in West Java have more food taboos related to the consumption of fruits and vegetables than women in Central Java. However, a comparison of fruit and vegetable restrictions reported by pregnant women in Central and West Java did not find a significant difference between the provinces.

The reasons supporting differences in food restrictions are more completely understood when respondent explanations of food choice are included. Respondents in both regions differed in their beliefs of restricted foods for consumption during pregnancy and lactation as well as in their reasons for food consumption behaviours. The explanations for food restrictions during pregnancy and lactation as explained by the women are shown in Table 2. Some women discussed multiple food restrictions or identified several foods from the same category as having different effects. For example, "I don't eat bananas because I will have problems in delivery" and "Durian isn't allowed because it will cause me to miscarry". From

respondent transcripts it was found that fruit is often restricted during pregnancy and lactation.

Table 2. Food restrictions reported by 9 pregnant women

Food Restrictions in Pregnancy	Examples of Food Restrictions in Pregnancy	Reported Frequency of Comments
fruit	- problems in delivery, increased bleeding, weak uterus, baby's skin affected, miscarriage, increase in mothers weight	8
fish	- problems in delivery, blood smells, itching, infant diarrhea	8
meat	- delivery problems, baby too big, miscarriage	4
vegetables	- slow delivery, urine smells, bleeding in delivery	3
high fat foods	- upset stomach	1
spicy food	- acts as a laxative	1
sugar	- pain in delivery	4
rice	- hard to deliver, too cold in delivery lack energy	2

Food restrictions reported by 21 lactating women

Food Restrictions in Lactation	Examples of Food restrictions in Lactation	Reported Frequency of Comments
fruit	- breast milk smells, causes upset stomach, baby will have scabies	6
fish	- breast milk will have bad smell	1
vegetables	- breast milk will have bad smell, causes upset stomach	5
high fat foods	- causes pain inside	3
spicy food	- baby will have diarrhea, baby will have dirty eyes	5
ginger -	- decreases breast milk	1

The respondents' comments about food choice indicated that food restrictions are derived from beliefs related to the physiological effect of certain foods during pregnancy

and lactation. Pregnant women described fish consumption as causing problems in delivery and itchiness, etc. On the other hand, lactating women described fish consumption as causing breast milk to smell bad, making it unpalatable for the infant.

All women who discussed cow's milk consumption made reference to the health benefits achieved therein. However, women who described milk as having a positive health effect explained that it is expensive and not readily available, thus making its consumption difficult. Therefore, milk was considered a restricted food because of its limited availability in the community.

6.6 Discussion

Though the food cultures between Central and West Java are known to differ, the extent of the differences have not been examined in terms of food beliefs and food restrictions adhered to during pregnancy and lactation (Kardjati, 1988). Employing the FCM interview, this research identified and described differences in both food choice beliefs and food restriction behaviours in pregnant and lactating Indonesian women.

Lactating women in West Java reported more restrictions to the consumption of fruits and vegetables than lactating

women in Central Java. The respondents' concerns about the negative physiological impact of fruits and vegetables on pregnancy and lactation contrast with the position of Durjati's (1991) that food restrictions practised by pregnant and lactating women living in West Java may be due to the higher cost of foods associated with the close proximity to Jakarta (the nation's capital).

The study found that pregnant women in both Central and West Java follow more food restrictions pertaining to the consumption of fruits and vegetables than lactating women. Fruits and vegetables are believed to cause painful miscarriage, pain during delivery, and slowing of the delivery process. The perceived negative effect of fruits and vegetables in the present study are consistent with previous findings for pregnant women in other developing countries (Ferro-Luzzi, 1990, Landman and Hall, 1983, and Djazayery, et al. 1991b)

The food beliefs identified by study participants are similar to those reported by Landman and Hall (1983) in their study on dietary habits and knowledge of folklore in pregnant Jamaican women. However, the FCM method identified actual descriptions as reported by respondents about the beliefs surrounding their food consumption. Therefore, respondent openness in describing reasons and influences

behind food choice behaviours the FCM interview enhanced the researcher's understanding of respondent food choice environment and limited the researcher's introspection.

Potential health-threatening behaviours emerged from the respondents' descriptions of food restrictions in both pregnancy and lactation. Although this research did not include blood analysis, the findings suggest that following restrictions to fruit, vegetables, meat and fish in pregnancy and lactation, respondents may be at risk for nutritional deficiencies. This is supported by the findings of Husaini and Sevenhuysen, (1995) that the prevalence of iron deficiency in a sample of 228 pregnant and lactating women was 42% in Central Java and 58% in West Java. Suharno et, al. (1992) also found the prevalence of anemia to be greater in West Java than in Central Java.

The negative physiological effects reported by respondents form the basis for food avoidance during pregnancy and lactation. This knowledge may enable nutritionists to develop nutrition education tools that focus on current health beliefs and practices which may be harmful or reinforce beneficial beliefs.

6.7 Conclusion

During the interview, respondents created a visual food map of usual food consumption during a seven day period.

The food map provided frequency data for food consumption, as well as the context for discussions exploring why particular foods were or were not consumed during pregnancy or lactation. The respondents described their food choices and supporting motivations, and they described cultural aspects of food that directly influenced their food choice. For example, one woman suggested that support for her current food beliefs are provided by the dukun (traditional birth attendant), "The dukun and my mother say pineapple should not be eaten after delivery because the baby may have scabies; I don't believe this, but I still don't eat it because I worry". Therefore, the food map identified in-depth and comprehensive information related to the respondent's food consumption environment.

The data suggests that food avoidances are related to negative physiological effects of food on pregnancy and lactation. The food restrictions reported by respondents may have a detrimental effect upon the nutritional status of these women and their pregnancy outcome. Therefore, nutrition education that targets the food beliefs of pregnant and lactating women is warranted. Future nutrition education programs should make great efforts to inform pregnant and lactating women about culturally acceptable

ways to improve their diets, thus increasing the likelihood

of having a positive pregnancy outcome.

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Paper One Appendix A

Food Choice Interview Guide

Food Frequency

1. What food do you eat often?

2. When in the day do you usually eat that (mentioned) food?

3. Which meal (s) or snack (s) does that food usually belong to?

4. Which other foods do you usually eat at this meal or snack?

5. How often during a week do you eat these mentioned foods during this meal / snack - do you eat these foods more often, less often or the same number of times as the first one?

6. What other meals or snacks do you eat during the day?

Repeat the next 2 questions for every meal and snack until the interviewed person agrees that this is the food pattern for one week.

7. What foods do you usually eat at this (newly mentioned) meal or snack?

8. How often during a week do you eat these mentioned food during the meal or snack?

FOOD CHOICE

9. What about the first food you mentioned, are there other foods that could take its place in that meal?

10. How often do you eat the(se) alternative food(s) - more often, less often or as frequent as the food you first mentioned?

11. Are there alternative choices for each of the foods in their respective meals?

12. How often do you eat these alternative foods - more often, less often or as frequent as the food you first mentioned?

13. Why do you actually choose the first mentioned food more often than the alternative food(s)

14. The foods you eat most often are very important for you. Why?

15. Which meals or snacks do you eat alone or with others?

16. Who do you eat with?

17. What relationship are the people to you?

18. How often do you eat this meal (snack) with these persons?

19. Do you share the money for the foods/meals? With whom/who contributes?

20. Who decides what foods will be purchased?

FOOD PREPARATION

21. Where is the meal prepared (ask for every meal of the day)?

22. Do you prepare meals alone or do you have help?

23. How often do you prepare meals each day?

24. Where do you buy your food?

25. Who decides which foods are purchased?

26. Have you recently changed the amount or type of food(s) you eat. Why?

27. Why do you eat this food more than that food?

28. Where do you get food information from?

These questions are asked if the respondent makes reference to using the posyandu or other health services during pregnancy or lactation. If no reference is made to information received from health services then these questions are eliminated.

1. What information do you hear from the Minstry of Health?
2. Do you use the information in your daily life?
3. Can you follow the nutrition recommendations you receive at the posyandu? If so, in what way? If not, why not?
4. Do you receive health information from anyone else?If so, What do you hear?
5. Do you follow the nutrition and health information you hear from others? If so, Why?
6. Do you ever receive infant weaning information from the Ministry of Health? If so, do you follow the information?
7. What foods will you feed your baby from birth to one year of age?
8. Why do you feed these foods?

7. PAPER TWO: Mapping the Health and Nutrition Behaviours of Indonesian Women for Better Behaviour Change Strategies

7.1 Abstract

The food behaviour of 30 pregnant and lactating women in Java, Indonesia, was recorded during interviews where each respondent created a visual map of food choices during a usual week. Detail in the map facilitated the conversation about other personal health and nutrition related behaviours. The resulting transcripts were analysed for the reasons that women used to explain the reported behaviours, using anthropological, linguistic and statistical techniques. The analysis showed different personal reasons that women expressed for their food choices and health related behaviours. Each behaviour, such as the mother's use of maternal and child health services revealed several different patterns of reasons among the women. Mother's use of maternal and child health services was characterised by external influences that support healthy practices, personal management of health, coping strategies and availability of resources. Patterns related to infant feeding behaviour were characterised by strong influences of the social and physical environment, confidence in personal actions and how information from health and non-health professionals is ranked by the women. The common patterns of reasons were taken to reflect similar types of decision-making related to health behaviour among the respondents. Grouping the women

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by common patterns of reasons showed different types of decision-making related to health care and infant feeding behaviours. The types of decision-making were seen as relevant to choosing communication channels and content for messages aimed at changing health behaviours.

7.2 Introduction

For a pregnant woman to change a familiar behaviour that might damage her own health or that of her fetus, she needs to perceive the expected benefit as personally relevant and it must outweigh the benefits of other choices. Professionals planning to prompt her change in behaviour require details about her perceptions, which can guide their choice of strategies for communication and support.

It is difficult to obtain detailed descriptions of the unique decision-making process that each individual uses to choose one behaviour over another (Rappoport et al., 1992). Such detail may be available through counseling activities where learning about the person is part of the support process. However, such work is expensive. A lower cost approach is to talk with a number of people about the decisions they make and the reasons for these decisions. Although these conversations can show the reasons for individual decision, it is not possible to draw conclusions from such conversations without making subjective choices from among the details.

Yet another approach to determining reasons for people's decisions is to create a questionnaire which surveys the attitudes, beliefs and behaviours found amongst large numbers of people. Though survey data can be

carefully standardised and quantified, it has several important disadvantages. People will answer questions about perceptions that may not be particularly important to them personally. They lack the opportunity to explain how their own living situation differs from the context of the question. Since such explanations would change the meaning of their answers, the survey information can mislead the researcher (Achterberg, 1988).

In addition, the traditional regression analysis of survey data only shows associations between perceptions and behaviours among the group. Linear models cannot identify the combination of perceptions that cause an individual to choose a certain behaviour or how often that effect occurs in the group (Roering et al., 1986). Professional judgments are then often used to assume 'causal' relationships.

A personal explanation for a given decision shows the combinations of perceptions that prompt a woman to choose one behaviour over another. Losing the connections individual women make between their perceptions and behaviours will likely lead to a misunderstanding of their health care decisions. These connections can determine the choice of one particular program activity over another, because they show the likelihood that women will respond to new situations when faced with certain decisions.

In order to avoid a loss of both detail and context, managers can use a technique called 'mapping'. This paper reports on two aspects of the mapping process. First, a recently proposed mapping technique (Sevenhuysen et al., 1995), called the Food Choice Map (FCM) is used to capture and link individual perceptions relating to health care use. Second, a process of Behavioural Mapping, hereafter referred to as BM, is used to interpret individual perceptions and the relationships of those perceptions with behaviours.

Health service use and infant feeding behaviours among women in two locations in Java, Indonesia, are described to demonstrate the method. The information on individual health care decisions among Indonesian women is shown in relation to potential strategies for the delivery of maternal and child services in small towns and rural areas of Indonesia.

7.3 Methods

7.3.1 Respondent Selection:

All respondents were pregnant or lactating women from six communities in two areas of Java, an Indonesian island. Women were identified using a snowball sampling technique. An initial group of women were contacted for participation by health care volunteers living in the same communities.

These respondents also identified other pregnant and lactating women who were recruited. Of the 60 women approached, three refused to participate because of commitments outside the area or due to physical discomfort with the interview process. The data collected from four women were deemed incomplete because of inconsistent comments about personal situations and food behaviours.

Data from the first 23 respondents served as pilot data which were used to define two changes in the interview process. First, the actions of the interviewer were changed to reduce the time spent on recording and managing interview responses. Second, the interview and question guides were reviewed to include more of the experiences the women reported in daily living. Hence, 30 respondents provided interview records for the interpretation of results. All procedures were approved by the Ethics Review Committee of the Faculty of Human Ecology, University of Manitoba.

7.4 Data Collection:

The researcher and the translator carried out one interview with each woman in her home. All interviews were conducted as conversations between the interviewer, translator and respondent. The context of the conversation was the same for all interviews: the usual food choices, personal experience and perceptions of the respondent's own

health and that of her infant during pregnancy, delivery, recovery and lactation. A pre-formulated question guide prompted conversation topics, including the respondent's use of health services, infant care and a wide range of food-related behaviours in the context of her social, economic and cultural circumstances (Paper Two Appendix A). Respondents were able to expand on topics which they felt important. The question guide was designed by Indonesian and Canadian researchers and modified during initial training of the interviewer and translator. All FCM interviews were conducted by a Canadian nutritionist, working with one translator. The interviews were conducted in the language of the respondent, Javanese, Sundanese or Indonesian.

During the FCM interview the respondent helped to record open-ended information on food choice using stylised pictures of food items. The process, which created a visual representation of responses called the FCM, is described in a previous paper (Sevenhuysen and Gross, 1997). The respondent also provided perceptions about food and the extent to which food contributes to friendships, working or emotional relationships, both within and outside the family. Some of these perceptions were recorded on the map, while others were recorded verbatim on audio tape. The visual

representation of food patterns helped the respondent to reflect on her given statements and to change the record as the conversation progressed and later topics of conversation brought about recall of details that changed or complemented previous responses.

7.5 Data Analysis:

Content analysis was used to identify behaviours, reasons for the behaviours, as well as beliefs, attitudes and personal circumstances in FCM transcripts (Chenitz and Swanson, 1986). Prior to the FCM interview transcript analysis a number of constructs and construct definitions were defined based on those reported in health promotion literature and behaviour change models (Ajzen and Fishbein, 1975, 1980; Bandura, 1977, Daniel and Green, 1995). The construct definitions were expanded to include words, phrases and sentences that respondents used to express the construct during a conversation (Miles and Huberman, 1984). The transcript text was used to identify each instance that wording or meaning of the comment matched the definition of a construct. The map and transcript of any one respondent may not have included reference to all of the predefined constructs and the missing constructs, were deemed to have no importance in the decision-making of that individual. Conversely, the respondent might refer to constructs not

defined prior to the interviews. In these cases construct definitions were formulated on the basis of comments from as many respondents as made reference to them. All transcripts were then checked for reference to the new constructs. In cases where the respondent mentioned two or more constructs in the same explanation or sentence, the constructs were recorded as being linked by the respondent.

A concept map was prepared for each individual to show the relationships between the constructs evident in the transcript as part of the Behavioural Mapping process (Miles and Huberman, 1984, 1994). These maps consisted of a separate box for each construct and a line between the boxes for each connection the respondent perceived. Hence concept maps showed connections between behaviours, behavioural reasoning, knowledge, beliefs, attitudes, physical, social, and economic circumstances.

The unique combination of constructs and links in the concept map of each respondent was used to find the most common patterns of constructs and links between them for the entire group of respondents. Concept maps for health service use and infant feeding practices were pile sorted to facilitate the identification of common patterns among the group of respondents. Each common pattern required the same constructs and the same links to be present in respondent

concept maps (Weller and Romney, 1988).

Respondent concept maps were likely to show only some of the common patterns and each map was checked for the presence of each pattern. If present, the link was associated with the frequency with which any of its subsidiary links occurred. If absent, the value associated with the link was zero. All values were divided by the total frequency of links between constructs in the respondent's transcript in order to standardise for the extent of interaction between interviewer and respondent. The frequency value associated with each common pattern was its apparent relative importance to the respondent.

Each common pattern was identified as a variable and values were recorded and entered for each respondent. K-means cluster analysis (NCSS statistical program, Hintze, 1995) was used to cluster respondents by these variable values. K-means clustering generates clusters based on the mean of each variable and each variable is assigned to a cluster by the smallest distance to the mean which is the centroid of that minimising within cluster sum of squares (Lorr, 1983). Each cluster represented a different process of decision-making among respondents for behaviour, taking into account the wide variety of determining factors of importance to the individual

7.6 Results

The mean age of the 9 pregnant and 21 lactating women was 28.7 (SD 5.7) years, with 15 respondents from the province of Central Java and the same number from the province of West Java. All respondents lived in Muslim households. Food cultures are known to differ between different geographical areas in Indonesia. The information provided by the women confirmed such apparent differences between West and Central Java, by showing more tempeh and tahu (traditional soybean products) eaten in Central Java. For more information on the respondents food choices see paper one: Food Choice of Women Using Village Health Services in Indonesia. Other differences were noted in the use of raw vegetables and the frequent use of sugar as an ingredient in tea and coffee.

In addition to food cultures, differences were noted in the main economic activities between the two provinces that may have determined some of the behaviours reported by the respondents. Economic activities Central Java were primarily agricultural, while in West Java, manufacturing industries employed a greater number of people. As a result, differences were observed in employment, time and information use by families between the two areas, which may have determined the time that family members were at home.

For example, the frequency of eating meals and snacks with family members that women reported differed between the two areas (Table 1).

Respondents provided unique combinations of reasons for their food choices and a number of other health related behaviours. The analysis presented here is limited to two types of behaviour, which include the respondent's use of health services and the respondent's infant feeding and care behaviours. For either of these behaviours, respondents of both provinces differed in their reasons for the behaviour, and in particular, the connections between these reasons.

Table 1.
Social environment of meals eaten by respondents (n=30).
(% of all meals reported by respondent for a usual week)

	% Combined	% Central Java (n=15)	% West Java (n=15)
alone	9	14	3
with children only	18	27	8
with husband only	18	2	37
with household	49	52	45
with others	6	5	8

Chi-square p-value comparing Central and West Java percentages of 'alone + with children' versus 'with husband': p < 0.01

The respondents' discussion of health care use and infant feeding behaviours identified connections between behaviours and reasons for behaviour. These connections were used to identify common patterns of reasons, or construct links, for these behaviours among respondents. Application of fixed rules for pile sorting led to variable

identification. For example, all maps for the OB health service utilisation were gathered and sorted into piles that contained maps with similar construct links (Weller and Romney, 1988). Each pile contained maps with construct links that were distinct from the other piles. The mapped construct links in each pile determined a variable The constituent construct links in each variable, that were identified from the respondent transcripts, reflect the common patterns of respondent reasoning. Examples of constructs are listed in the appended table 4. The common variable patterns for health service utilisation among the respondents are listed in Table 2.

Respondents differed not only in their reported use of health services, but also in the reasons for such use. Two women did not mention using any form of health service, which reduced the number of transcripts included in the analysis to 28. Although the two women didn't refer to health services in their interview this does not imply that the women do not use health services. Interview questions related to health service use were only asked if a respondent stated their use of such service with out any prompts from the interviewer. These two women made no such reference, therefore their data was excluded from the analysis process.

The common patterns identified with cluster analysis, shown in Figure 1, demonstrate differences between groups of respondents. These can be viewed as nine distinct decision-making groups in relation to their use of maternal and child health service. For example, decisions on using health services among group 1 is characterised by the reasons related to the variable 4 in particular, but also to variables 3 and 6, whereas those of group 8 are characterised by variable 8, with variables 1 and 7 also present.

Results on infant care and feeding behaviours, the second type of behaviour reported by women, were expressed

in the same manner as the results on the use of health
services behaviour. Respondents differed in their
perceptions of the reasons for infant care and feeding
behaviour and in particular the connections between these
reasons. The common patterns for health service utilisation
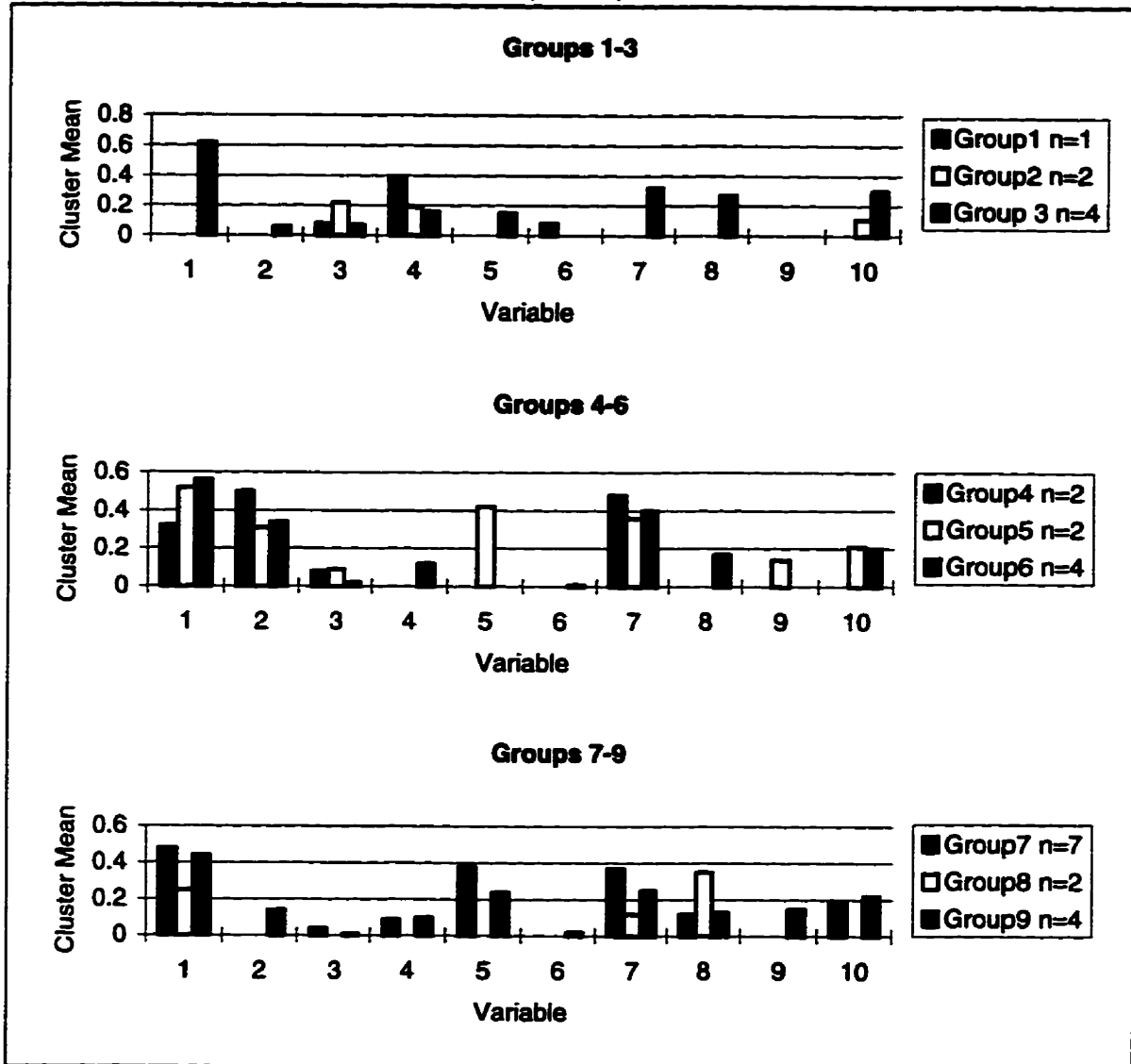among the respondents are listed in Table 3.

Respondents differed not only in their reported infant
feeding choices, but also in the apparent importance of the
patterns of reasons for their use. Two pregnant women did
not discuss infant weaning, limiting the number of
transcripts included in the analysis to 28. The common
patterns identified with cluster analysis, shown in Figure
2, show differences between groups of respondents, which
describe distinct decision- making groups in relation to
infant care and feeding. For example, decisions regarding
infant care and feeding within group 7 are characterised by
the reasons related to variable 1, whereas those of group 8
also depend on variable 1, but are also characterised by
variable 5.

The results show that common patterns of reasoning
grouped respondents according to the relative importance of
the choices they expressed in health services and in infant
feeding behaviours. The eight groups of women with similar
decision-making patterns showed differences between the

groups in the combinations of constructs that they perceived
as influencing food and health behaviour choices.

Figure 1.
Mean variable values by cluster group* for respondents'
health service utilisation (n=28).

Groups 1-3

Groups 4-6

Groups 7-9

Variable Legend

1 = health service information practiced	2 = barriers exist to control personal health	3 = access to resources important to utilise health services	4 = chooses to adapt to others' beliefs	5 = manages issues related to health
6 = confident about personal management of resources	7 = health beliefs of others influence action	8 = perceives opinions of others as important	9 = perceives resource spending on health important	10 = knowledge of health and nutrition acquired through health services

* K-means cluster model within sum of squares is 78% of no
cluster sum of squares.

Table 3.
Common construct links defining infant feeding variables.

Infant Feeding Variables	Construct Links Identified by Participants[2]
1. knowledge of infant feeding practices acquired from health services	information from Ministry of health knowledge about health services normative belief control internal
2. relies on beliefs of non-health professionals for knowledge of infant feeding practices	normative belief control internal subjective norm
3. manages available food sources for infants consumption	behaviour belief control internal coping
4. beliefs of infant feeding practices are influenced by others	normative belief behaviour belief control internal subjective norm
5. confident about infant feeding behaviours	behaviour belief control internal attitude to behaviour
6. follows advice of family and friends for foods important to infants	normative belief behaviour belief control internal coping subjective norm
7. belief that adequate resources exist to purchase commercial infant foods	resource access resource finances behaviour belief
8. responses to children's' food preferences	control external coping subjective norm
9. self-confident in control of feeding infant	knowledge general control internal

[2]see references Ajzen and Fishbein, 1975,1980, Bandura, 1977, and Daniel and Green, 1995 for origin of constructs.

Figure 2.
Mean variable values by cluster group* for respondents'
infant feeding behaviours (n=28).

Groups 1-4

Groups 5-8
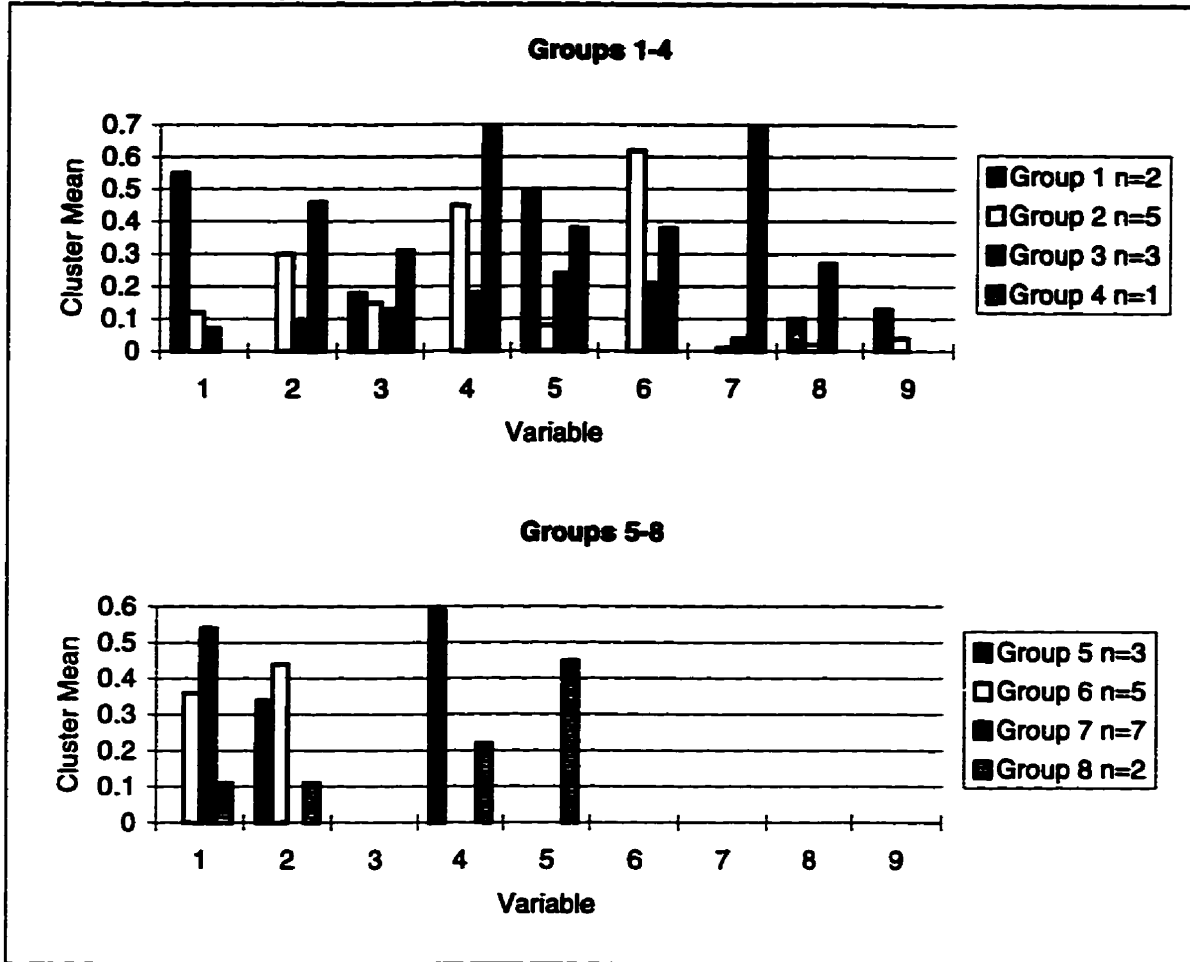
Variable Legend

1. knowledge of infant feeding practices acquired from health services	2. relies on beliefs of non-health professionals for knowledge of infant feeding practices	3. manages available food sources for infants consumption
4. beliefs of infant feeding practices are influenced by others	5. confident about infant feeding behaviours	6. follows advice of family and friends for foods important to infants
7. belief that adequate resources exist to purchase commercial infant foods	8. responses to children's' food preferences	9. self-confident in control of feeding infant

* K-means cluster model within sum of squares is 78% of no cluster sum of squares.

7.7 Discussion

During the conversations respondents focused on creating a FCM where they recorded a great variety of food and health information that was of direct interest to them. In addition, the behaviour maps of respondents revealed aspects of decision-making which respondents were not fully aware they were describing. The process of creating Food Choice and Behaviour Maps therefore yielded in-depth and comprehensive information.

Behavioural maps identified the unique combinations of perceptions that each respondent used to explain her health related decisions. As the statistical calculations of frequencies of these combinations among the group maintained the cause-and-effect relationships between reasons and behaviours for individual respondents, results were taken to indicate the relative importance of these combinations for decision-making among the respondents.

In the interpretation of conversation transcripts, the beliefs, attitudes and other constructs underlying food behaviour were taken to be the same constructs explaining the beliefs and attitudes regarding general health and other health behaviours. The reasons for food-related behaviours were taken as the indicator reasons for a wider set of behaviours for several reasons. Food was assumed to

function as an indicator, because all respondents interacted with food several times a day and their food choice was subject to a wide variety of social, economic, cultural and physical influences in the life of the respondent.

Most women expect to use a variety of health services during pregnancy, delivery and recovery afterwards. The use of service depends on a number of factors, which include the woman's experience in previous pregnancies, the influence of family and neighbours, the feelings of obligation to traditional providers, and the ability to pay. Though it is reasonable to expect that the balance in these factors changes for most women during the pregnancy, delivery and subsequent time of recovery and adjustment to the infant, the underlying decision-making was captured in the transcripts the women provided. Table 4 in paper two appendix B outlines some of the reasons women gave for their use of health services.

As shown in Figure 1 members of Group 1 demonstrated a greater level of control over their choices of health service than the women who belonged to Group 8. For example, women in Group 8 are more dependent on the opinions of their social environment and followed health service advice readily. These characteristics strongly influenced the women's personal management of health. However, women

in Group 1 relied on the availability of resources and managed their resources to optimise health. These women managed their health though adaptation and use of coping strategies. Similar differences were identified between all of the groups.

As a result the response of women to information about health services depends on the type of decision-making process they employ. The description of the variables that define the groups, and the comments of women in those groups, can guide the choice of messages, communication channels and appropriate target groups for community interventions aimed at behaviour change for improved pregnancy outcome in the population. Similarly, infant feeding behaviour depends on the mother's experience, beliefs and skills, and the underlying reasons for her choices were captured in the transcripts. Her beliefs, and the attitudes associated with different behaviours, come partly from her, but also to a great extent from her current social environment. Both the mother's own nuclear family (husband and possibly older children), and her extended family (mother in-law, grandmother, mother, aunts, sisters), try to influence infant care and feeding behaviour in accordance with their beliefs in the benefits of activities to protect and nurture the infant. Table 5 in

paper two appendix B gives examples of the respondents'
reasons supporting their infants food choices.

Differences in decision-making on infant feeding is
evident between the groups of women as seen in figure 2.
Members of Group 7 can be expected to interpret information
on infant feeding more independently than others in Group 8.
Some may depend to a greater extent on the opinions of other
people important to them in their near environment. This
insight, combined with the specific comments that the women
in each group make about infant feeding, would alter the
design of communication strategies to reach them. Two or
more communication strategies can be used in one program
aimed at behaviour change. Each strategy would be based on
the characteristics of distinct decision-making groups.
Such an approach could also increase the participation of
women in two-way communication because of a better
understanding of the reasons for such participation.

7.8 Paper Two References

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Paper Two Appendix A

Food Choice Interview Guide

Food Frequency

1. What food do you eat often?

2. When in the day do you usually eat that (mentioned) food?

3. Which meal (s) or snack (s) does that food usually belong to?

4. Which other foods do you usually eat at this meal or snack?

5. How often during a week do you eat these mentioned foods during this meal / snack - do you eat these foods more often, less often or the same number of times as the first one?

6. What other meals or snacks do you eat during the day?

Repeat the next 2 questions for every meal and snack until the interviewed person agrees that this is the food pattern for one week.

7. What foods do you usually eat at this (newly mentioned) meal or snack?

8. How often during a week do you eat these mentioned food during the meal or snack?

FOOD CHOICE

9. What about the first food you mentioned, are there other foods that could take its place in that meal?

10. How often do you eat the(se) alternative food(s) - more often, less often or as frequent as the food you first mentioned?

11. Are there alternative choices for each of the foods in their respective meals?

12. How often do you eat these alternative foods - more often, less often or as frequent as the food you first mentioned?

13. Why do you actually choose the first mentioned food more often than the alternative food(s)

14. The foods you eat most often are very important for you. Why?

15. Which meals or snacks do you eat alone or with others?

16. Who do you eat with?

17. What relationship are the people to you?

18. How often do you eat this meal (snack) with these persons?

19. Do you share the money for the foods/meals? With whom/who contributes?

20. Who decides what foods will be purchased?

FOOD PREPARATION

21. Where is the meal prepared (ask for every meal of the day)?

22. Do you prepare meals alone or do you have help?

23. How often do you prepare meals each day?

24. Where do you buy your food?

25. Who decides which foods are purchased?

26. Have you recently changed the amount or type of food(s) you eat. Why?

27. Why do you eat this food more than that food?

28. Where do you get food information from?

These questions are asked if the respondent makes reference
to using the posyandu or other health services during
pregnancy or lactation. If no reference is made to
information received from health services these questions
are eliminated.

1. What information do you hear from the Minstry of
   Health?

2. Do you use the information in your daily life?

3. Can you follow the nutrition recommendations you
   receive at the posyandu? If so, in what way? If not,
   why not?

4. Do you receive health information from anyone else?If
   so, What do you hear?

5. Do you follow the nutrition and health information you
   hear from others? If so, Why?

6. Do you ever receive infant weaning information from the
   Ministry of Health? If so, do you follow the
   information?

7. What foods will you feed your baby from birth to one
   year of age?

8. Why do you feed these foods?

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Paper Two Appendix B:

Table 4.

Examples of Reasons for Health Service Utilisation Choices

- I eat many vegetables to increase my breast milk production, the posyandu to do this - The posyandu told me to eat banana because it is high in vitamins and can make me and my baby healthy - I give women the iron pill; the health service at the puskesmas tell me that pregnant women should take iron pills because they always have anaemia, the pill prevents anaemia if taken 1/day from 7-9 months
- I always go late to posyandu after the mosque. I never receive the health information from posyandu because I'm late
- When I go to the posyandu I receive additional food there - I delivered my baby in the hospital, the Doctor helped me
- When I was pregnant I didn't drink milk because I wanted a healthy baby with a normal weight when it was born. When my first child was born it weighed 2.7kg. I wanted the second baby to be bigger. - We have saltfish with sambal almost everyday because the meal is not complete without the saltfish; we fry enough fish that it lasts for 3 days. - I don't eat tempeh and tofu in same meal; I change the tempeh and tofu daily, if I eat both in the same meal I'll get bored.
- I checked my pregnancy at the posyandu because it is inexpensive; I just pay Rp500 in the posyandu for health pills. I went to the bidan twice and paid Rp4000 for the same pills. - The bidan helped with my delivery, but I have more faith in the doctor. When I was pregnant I went to the doctor. It didn't matter if I had to pay more to see a doctor.
- I went to the doctor every month in pregnancy because he is a gynecologist; the bidan told me I should go. - My aunt is a bidan; she suggested that I should have the doctor check my pregnancy, also my friend in the Women's Welfare Movement who has experience suggested it; I went.

- In pregnancy I received medicine from the posyandu, they
gave me yellow pills; I thought they were to make the
delivery easier. The village leader gave me 30 yellow
pills, I took one a day.
- I buy the special milk for pregnant women from the
bidan. When I first checked my pregnancy to bidan she
gave me the lactonal and lactamil in chocolate and
strawberry flavor, she said that's good for the pregnant
women and helps to increase the amount of breastmilk after
delivery.

-I feel safe delivering my baby with the help of the
bidan. The bidan is a woman, I think the bidan and Doctor
have the same skills. The doctor charges more to deliver
the baby than the bidan.

- I lived here for 4 months when Cadre and her friend came
and told me to bring my baby to posyandu every month.
- I checked my pregnancy with the bidan, she told me to
eat good food during my pregnancy.
- During my pregnancy I didn't go to posyandu, I went to
the doctor and the bidan. The doctor gave me medicine to
help my blood.

8. DISCUSSION

The food map provided results answering the first thesis research question: Do women discuss reasons supporting their food choices during pregnancy or lactation in the FCM interview? The respondent food maps showed food frequencies and indicated that the reasons for food restrictions vary during pregnancy and lactation. The frequencies suggest that respondents are not meeting current Indonesian nutrition guidelines for pregnant and lactating women, which include foods from five food groups on a daily basis; fruits, vegetables, protein, carbohydrates, and dairy (Department of Health, Indonesia, 1995).

This research question was also posed: Do pregnant and lactating women follow traditional food restrictions? If so, are the food restrictions similar in different geographic regions? This thesis research found that pregnant women in both Central and West Java follow more food restrictions pertaining to the consumption of fruits and vegetables than lactating women. This suggests that pregnant women are either not accepting or not receiving nutrition information given at the local posyandu by volunteer caders. Soemardjan (1985) has suggested that for a health program to be effective, it has to be institutionalised to the extent that its values and norms

create guiding beliefs that form people's behaviour patterns regarding food and nutrition.

The researcher agrees with Soemardjan (1985). However, the food practices and supporting reasons given by respondents were similar to those reported by the Indonesian Ministry of Health. That is, women don't regard the posyandu as a provider of acceptable nutrition information during pregnancy, but more readily accept nutrition information pertaining to lactation (Ministry of Health, 1990b).

As seen from the food maps, respondents reported decision-making strategies related to health service use and infant weaning behaviours. Women who were confident about their ability to interpret health information emerged as having a greater internal locus of control, and reported health behaviours in line with those recommended at the posyandu. This was contrasted by those with external locus of control, wherein powerful others largely determined their food-related behaviours. The various respondent decision-making groups demonstrated that relationships exist between the respondent's concept of self and their nutrition and health behaviours. Therefore, these thesis findings suggest that women who utilise the posyandu for pre and post-natal nutrition advice have different attitudes and barriers to

services that affect their health and food choice decision-making abilities than those who do not utilise the service. The constructs which determine the decision-making groups lend support Pender (1987) and Walker et al., (1987) who conclude that the likelihood of engaging in health promoting activity is influenced by a number of personal perceptions.

Two respondent decision-making groups identified variables which included coping strategies and limited financial resources. Women in these groups identified lack of time and money as important barriers to adhering to health behaviours recommended at the posyandu. This finding is consistent with the study by Nelson (1997) that identified time constraints as barriers to health in low-income women.

Findings in this study have shown that food choice behaviours are complex and multi-faceted. Since people are individuals and as such have different levels of economic status, time available, and personal development, future nutrition education programs should be developed that provide culturally acceptable nutrition information that reaches people with diverse lifestyles.

9. CONCLUSION

The two papers in this thesis describe different results achieved using the FCM interview. The combination

of these results contributes to a greater understanding of the food choice environment as well as how respondents make decisions about health and nutrition behaviours. The results presented in the thesis papers maintain the respondents' descriptions of their food choice behaviours and the associated reasons for those behaviours.

The analysis also allowed for grouping of respondents into decision-making groups, as well as a comparison of behavioural choices made by respondents attending a posyandu. These groupings identified sets of women who use the posyandu as a source of health and nutrition information, why they do so, and it identified groups of women who fail to view the posyandu as an acceptable source of reliable nutrition and health information. The identification of acceptable sources of nutrition information for different sub-groups of women may be useful in the development of new nutrition education interventions in Indonesia.

We can conclude that the Food Choice Map provided accurate descriptions of respondents' dietary habits and food choice behaviours. The research found that significant differences in food consumption patterns exist between women in West and Central Java($P < .05$). Women in Central Java had different attitudes towards nutrition and health

behaviours during pregnancy and lactation than those from Central Java.

The results indicate that women concerned about their personal health and that of their infant use different constructs when describing the decision-making behind their food choices as compared to women who are less concerned about their personal health. The attitudes of women and barriers women experience in terms of social, economic, and service access contexts help to explain compliance to recommended food choices.

These differences were found to depend on the social and environmental contexts within which the respondent lived, as well as the unique perception of each respondent of their ability to affect their own surroundings. This finding implies that for nutrition interventions to be effective for all women in the community the communication channels and strategic approaches used may need to vary so that all women in the community may be effectively targeted for the dissemination of nutrition and health information.

In summary, the culmination of knowledge from the food and behaviour maps can guide the development of effective nutrition education intervention programs that communicate through information channels appropriate for the target groups. In turn, the people of the community may be more

willing to accept the information and make the required behavioural changes that will lead to healthy pregnancy outcome.

10. FUTURE RESEARCH

The results of this study identified food beliefs of pregnant and lactating Indonesian women who utilise the posyandu. In addition, the research was able to determine patterns of decision-making determinants among the women for different outcome behaviours.

A study that randomly selects study participants from different geographic areas of Indonesia would lend insight into the similarity of food beliefs and decision-making behaviours in pregnant and lactating women. This research would facilitate the Indonesian Ministry of Health in developing nutrition education tools that target the areas where traditional nutrition and health are strong.

Future research directed at designing culturally acceptable nutrition programs can determine if intervention messages are adopted when designed with the decision-making strategies of the target population in mind. These studies can also determine the cost-benefit of a new data collection and analysis procedure with the advantage of more influential intervention design.

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THESIS APPENDIX A - Map of Indonesia
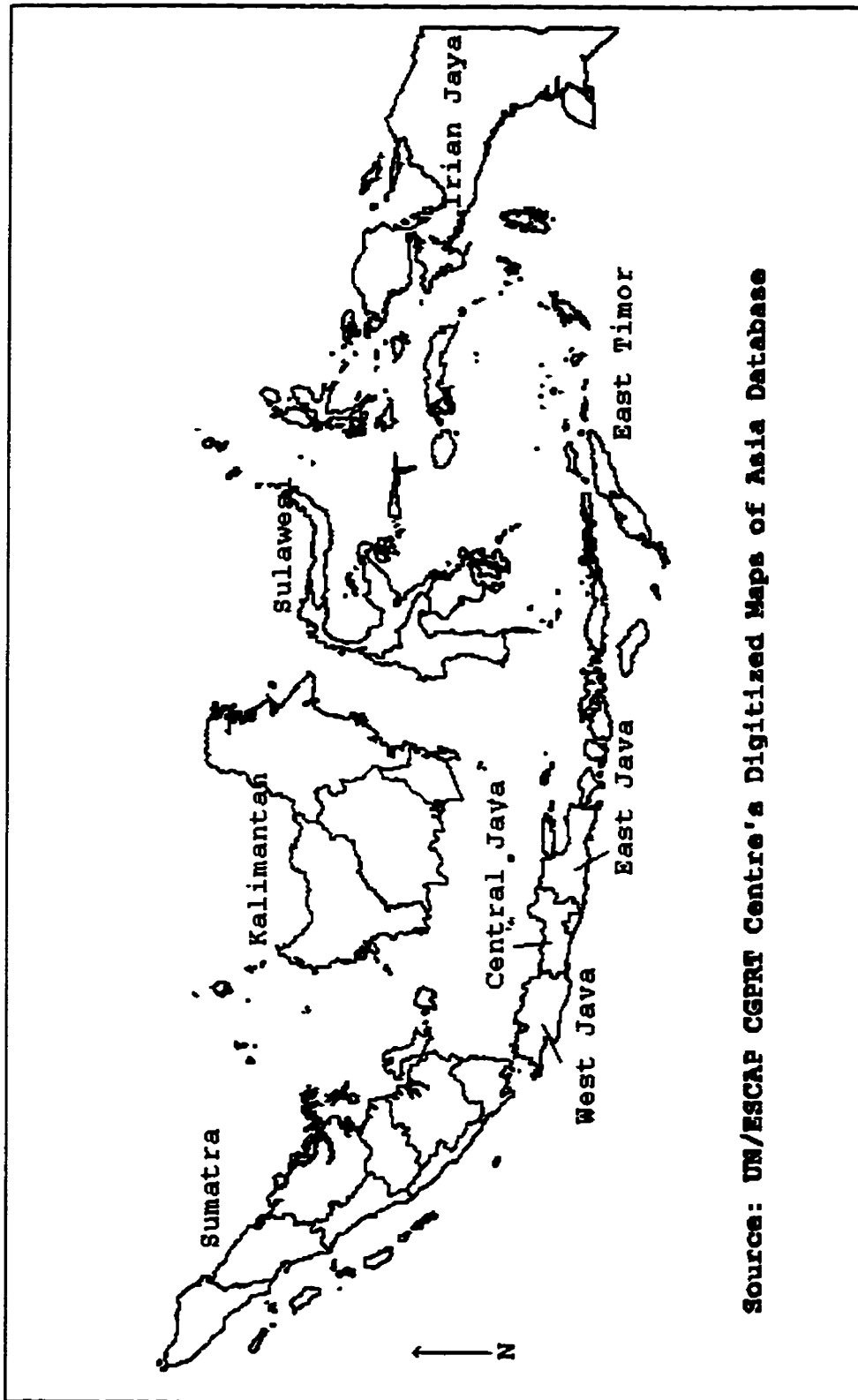
Source: UN/ESCAP CGPRT Centre's Digitized Maps of Asia Database

THESIS APPENDIX B - Construct Definition List

APPENDIX ₽
Construct Definition List

Construct	Construct Definition	Application	Examples
Con-int / Con-ext	Control Internal:Personal regulation of goal directed behavior or performance or person's belief as to how easy or difficult performance of the behavior is likely to be (Ajzen & Madden, 1986)Personal control over outcomes; self efficacy (Bandura, 1977)	Perception of Personal controlInternal control:Attributes agency to oneselfExternal control:Attributes agency to others, environment or fate	I make what I like to eat. I have to make the chicken for my husband. He buys it and I make it, I don't like chicken
Con-bar	Control barriers:Perceptions of barriers to performing a behavior (FCM working group)	Limitations and situations that the individual finds difficult to overcome or deal with	In lactation I drink milk only once a week because I don't have enough money.
Cop	Coping:Effort made to master, tolerate or reduce demands that tax or exceed a person's resources in terms of physical, social and psychological resources (Cohen and Lazarus, 1979 in Kessler et al., 1985)	Efforts include strategies and individual puts into place when faced with such demands	I change the vegetables everyday because if I don't the children don't want to eat it anymore.

Construct Definition List

Construct	Construct Definition	Application	Examples
Frb	Family resource balance:Household resources (money, time, information, health) and proportion of resources available for food acquisition	Income coming into household*family, land, social services*employmentSee appended description of entitlements, application of family resource balance	The money for food is from my husband.
Res-acc	Resource access:The availability of food and the ability to acquire available food (Campbell, 1991; Reutlinger et al., 1986)	Food security, accessibility, availability as well as service accessibility.Food Security:Access by all people at all times to enough food for an active healthy life, and at a minimum includes; 1) Ready availability of nutritionally adequate safe food	We eat daun suring only once a week because I have to go to the market to buy it.
Res-fin	Resource Finance:Availability of food markets, quantity and quality of food present in those markets related to financial ability to acquire foods that are available (Campbell, 1991)	Limitations or restrictions to food and services due to finances - Ability to command resources	We eat tempe more than salt fish because if I always prepare the fish I'll run out of money for food.

Construct Definition List

Construct	Construct Definition	Application	Examples
Res-tim	Resource time:Time is a commodity, a resource, a measure. The functionalist view of time (Adam, 1995)	the how long, when, what order, or speed of a given task or situation- Time integrates experiences in everyday life	I don't have time to go the the posyandu because I have to help my husband in the field.
Soc-sup	Social support:- Perceived support by the individual- The emotional, instrumental and financial aid that is obtained from one's social network (Berkman, 1994	Physical, emotional and spiritual support - Categories of support / assistance:*spouse, significant other, relatives friends, siblings, community and others*two components of social interaction and social resources	If my money for food runs out my mother gives me vegetables.
Em	Emotion:Expressing a feeling towards an action, person, thought or object (FCM working group)		I don't use the dukun for delivery because I worry if she is clean.
Phys	Physiology:Physiological factors that affect intake (FCM working group)	A person's subjective probability judgment concerning some aspect (i.e. any physiological response) of their world (Ajzen & Fishbein, 1975)	I don't eat as much rice in pregnancy because I feel sick when I eat it.

APPENDIX B

Construct Definition List

Construct	Construct Definition	Application	Examples
Know-bel	General knowledge belief:Correct or incorrect facts that explain their world; a situation or an object (FCM working group)	A person's subjective probability judgment concerning some aspect (any behaviors and non-behaviors) of their world (Ajzen & Fishbein, 1975)	The posyandu tells me about the good food for the baby.
Inf-osf	Information outside the family:information received outside health services or family (FCM working group)	Includes media, friends, work colleagues.Other information sources, libraries, schools	I know about foods good for my baby from the magazines I read.
Info-hs	Information health services:Information received from health services (FCM working group)	Including messages, advice and directions offered by medical or other health professionals outside or within a health service premise	The women at the posyandu tells me I should eat more fruits and vegetables in pregnancy.
Ss-cur	Social services-curative:treatment programs that are targeted at specific individuals delivering personal health services to control or cure disease episodes (Remington, 1990)	Could use the contruct health services-curative	If my baby has a fever I take him to the doctor

Construct Definition List

Construct	Construct Definition	Application	Examples
Ss-prev	Social services-preventative:Disease prevention and health promotion efforts/strategies that benefit the entire community (Remington, 1990)	May relate to the individual or the whole community	I receive medicine from the posyandu every month. They give me the yellow and white pills, but I don't know what they are for.

Additional Definitions required to understand the constructs

Attitude: A general predisposition, the person is not required to perform any specific behavior, rather it leads to a set of intnetions that indicate a certain amount of affect toward the object in question (Ajzen & Fishbein, 1975).

Normative nature: Beliefs that certain referents think the person should or should not perfor the behaviour in question (Ajzen & Fishbein, 1975).
Note: the totality of normative pressure is subjective norm

Self efficacy
Note: "this and related research thus provides further evidence that although personal control over outcomes (i.e. self efficacy) is important, it is not sufficient for intrinsic motivation. The feelings of competence must be accompanied by perceived autonomy for people to be intrinsically motivated (Deci & Ryan, 1991; Ryan, 1993). Therefore, behavior must also be self determined.

Entitlements
A semi legal concept, focusing on the bundles of goods and services that a person can legitimately establish command over, using the laws, regulations, conventions, opportunities and rights ruling in the society in question. This also reflects ownership, on the one hand, and opportunities of production and exchange on the other (Sen, 1984). This generic construct is further divided into family resource balance (frb) and food security which encompasses resource access (res-acc) and resource finance (res-fin).

Food Security
1. The definition explicitly includes every person at all times, even though defining a situation that seems to be unattainable may seem counter productive, a less inclusive definition cannot be justified on either ethical or nutritional basis.

2. Two dimensions accessibility are differentiated; the availability of food and the ability to acquire food

3. Enough food for and active, healthy life implies a diet with sufficient energy, nutritional quality and safety to prevent diet mediated malnutrition or limitations in activity level.

4. Food insecurity includes limited or uncertain access to food in socially and personally acceptable ways.

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THESIS APPENDIX C - Food Choice Interview Guide

Food Choice Interview Guide

Food Frequency

1. What food do you eat often?

2. When in the day do you usually eat that (mentioned) food?

3. Which meal (s) or snack (s) does that food usually belong to?

4. Which other foods do you usually eat at this meal or snack?

5. How often during a week do you eat these mentioned foods during this meal / snack - do   you   eat   these foods more often, less often or the same number of times as the first one?

6. What other meals or snacks do you eat during the day?

Repeat the next 2 questions for every meal and snack until the interviewed person agrees that this is the food pattern for one week.

7. What foods do you usually eat at this (newly mentioned) meal or snack?

8. How often during a week do you eat these mentioned food during the meal or snack?

FOOD CHOICE

9. What about the first food you mentioned, are there other foods that could take its place in that meal?

10. How often do you eat the(se) alternative food(s) - more often, less often or as frequent as the food you first mentioned?

11. Are there alternative choices for each of the foods in their respective meals?

12. How often do you eat these alternative foods - more often, less often or as frequent as the food you first mentioned?

13. Why do you actually choose the first mentioned food more often than the alternative food(s)

14. The foods you eat most often are very important for you. Why?

15. Which meals or snacks do you eat alone or with others?

16. Who do you eat with?

17. What relationship are the people to you?

18. How often do you eat this meal (snack) with these persons?

19. Do you share the money for the foods/meals? With whom/who contributes?

20. Who decides what foods will be purchased?

FOOD PREPARATION

21. Where is the meal prepared (ask for every meal of the day)?

22. Do you prepare meals alone or do you have help?

23. How often do you prepare meals each day?

24. Where do you buy your food?

25. Who decides which foods are purchased?

26. Have you recently changed the amount or type of food(s) you eat? Why?

27. Where do you get food information from?

Health Service Use

These questions were asked if the respondent made reference to using the _posyandu_ or other health services during pregnancy or lactation. If no reference was made to information or service use then these questions were eliminated.

Why do you eat this food more than that food?

What information do you hear from the Minstry of Health?

Do you use the information in your daily life?

Can you follow the nutrition recommendations you receive at the _posyandu_? If so, in what way? If not, why not?

Do you receive health information from anyone else?
If so, What do you hear?

Do you follow the nutrition and health information you hear from others? If so, Why?

Do you ever receive infant weaning information from the Ministry of Health?
If so, So you follow the information?

What foods will you feed your baby from birth to one year of age?
Why do you feed these foods?

THESIS APPENDIX D - Additional Pre-test Interview Guide Questions

1. In pregnancy or lactation do you believe in any non-food traditions that may affect your baby or yourself? If so, what are they?

2. Who tells you about these effects of your behaviour on your pregnancy, delivery and/or infant?

3. Do you follow these traditions?

4. What do you do with the placenta after the baby is born?

THESIS APPENDIX E - Completed Food Choice Map

THESIS APPENDIX F - Infant Weaning Construct/Concept Map

3W Infant Weaning

info-wf