

CHAPTER 3

METHODOLOGY

3.1 Introduction

The Chapter 1 and 2 have provided an initial understanding of the concepts explained in relation to the topic selected for the study. This chapter provides details of the research methodology, its purpose and how it was designed and implemented. In order to answer research questions posed, the researcher has considered the application of quantitative research methods and techniques.

This chapter thus provides details of the research methodology followed by how it has been designed and operationalized in order to undertake the topic selected for the study. The section has also incorporated the data collection techniques and also data analysis techniques in order to explain on how the research will be conducted. Based on this analysis, then general conclusions will be drawn.

3.2 Conceptual framework

The Theory of Planned Behaviour was applied to the conceptual framework to study goat milk consumption intention among Malaysians in Klang Valley. As shown in

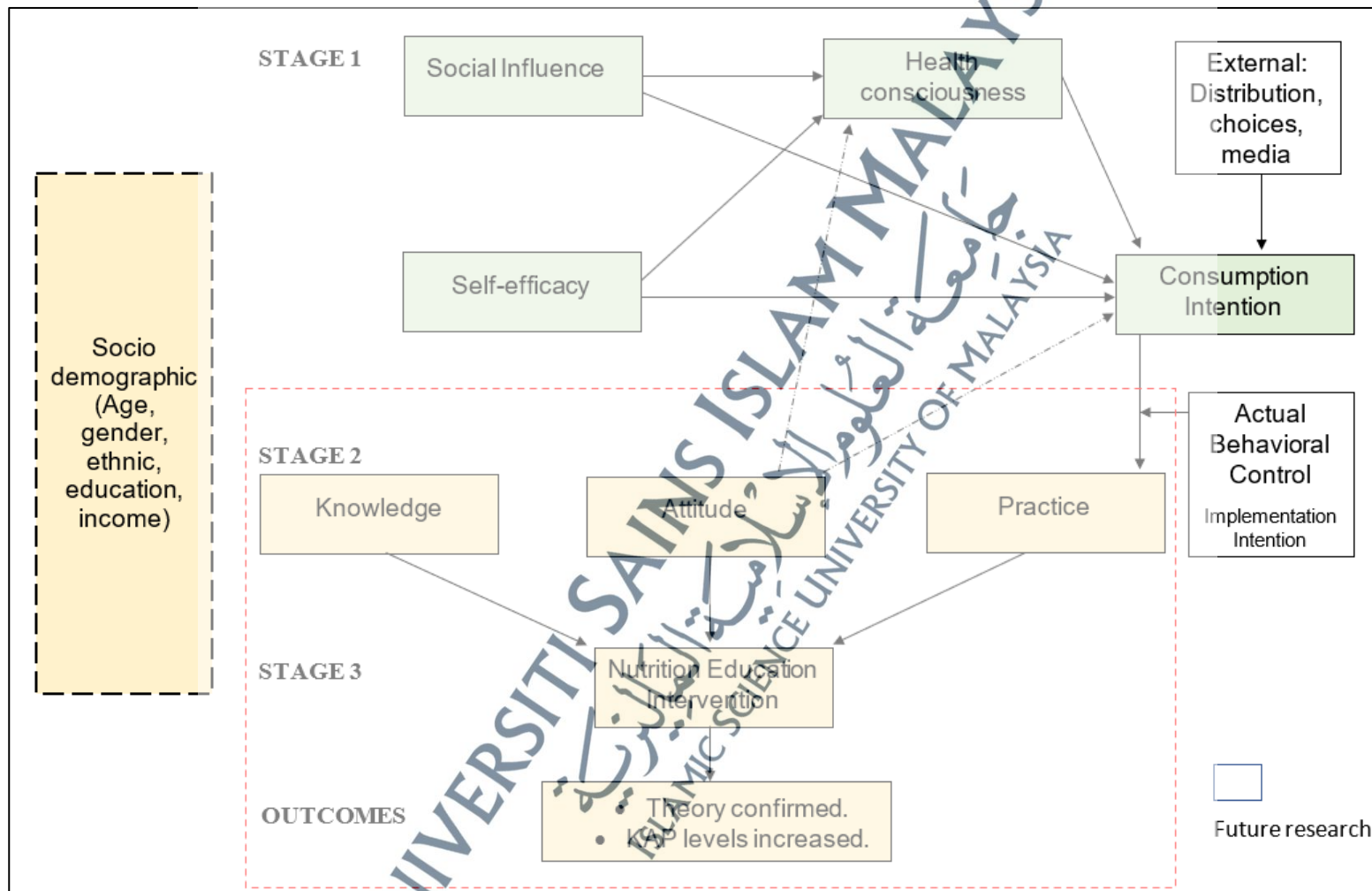


Figure 3.1: The Conceptual Framework

Figure 3.1, Stage 1 of the study relate the variables in TPB to goat milk consumption intention with health consciousness as the mediating variable. Stage 1 was conducted as preliminary study to Stage 2 where the level of knowledge, attitude, and actual practice of goat milk among Malaysians were determined. Information obtained from Stage 2 were used to develop a nutrition education intervention programme in Stage 3. However, due to impact of movement control order and Covid-19 pandemic, Stage 3 was conducted online, and participants were limited to undergraduate students who were well equipped and familiar with online learning gadgets. The researcher was not able to recruit participants from Stage 2 as continuation into Stage 3 intervention programme, and hence, was recorded as a limitation of this study. Outcomes of the study would include to confirm the extended TPB theory and effectiveness evaluation of the intervention programme.

There were two research objectives linked to Stage 1 which were to determine the direct and positive relationship between attitude, social influence, and self-efficacy towards goat milk consumption intention and secondly, to determine the mediation effect of health consciousness on attitude, social influence, and self-efficacy on goat milk consumption intention among Malaysian consumers. It was hypothesised that there is attitude, social influence, and self-efficacy positively influence goat milk consumption intention. Secondly, it was also hypothesised that consciousness mediates the relationship between attitude, social influence, and self-efficacy towards goat milk consumption intention. This is because health was one of the main reasons for dairy consumption (Kurařdová et al., 2015).

Next, Stage 2 was to determine the levels of knowledge, attitude, and practice of goat milk among ethnics in Malaysia. Previous research has shown that decisions to purchase and consume organic foods varies significantly among ethnics in Malaysia (Quah & Tan, 2010). Thus, it makes reasonable idea to hypothesise that there is statistically significant mean difference in knowledge, attitude, and practice score towards goat milk consumption among ethnics in Malaysia.

Research objective linked to Stage 3 was to evaluate the effectiveness of eight-week health education intervention programme based on knowledge, attitude, and practice score in intervention group pre- and post-intervention. Since it was hypothesised in Stage 2 that there is statistically significant mean difference in knowledge, attitude, and practice score towards goat milk consumption among ethnics in Malaysia, Stage 3 anticipated to increase the level of knowledge, attitude, and eventually practice of goat milk consumption using educational programmes in intervention. Thus, it was hypothesised that there is statistically significant mean difference for knowledge, attitude, and practice score on goat milk consumption in intervention group pre- and post-intervention.

3.2.1 Introduction to Research Design

Research designs are types of inquiry within qualitative, quantitative, and mixed methods approaches that provide specific direction for procedures in a research study (Denzin & Lincoln, 2011). A survey research design can produce outcomes on descriptive statistics, relationships between variables and predictive relationships between variables.

In contrast to working with routinely available data, surveys are designed to collect

information exactly from the individuals of interest. Surveys are more focused than descriptive studies, and as a result are a more-powerful means of investigating associations. The inclusion of information on a range of factors means that some allowance can be made for these in studying causal links (Bruce et al., 2018).

A quantitative, descriptive research design was chosen for this study to give a detailed description of the knowledge levels of consumers on goat milk consumption intention among Malaysian consumers. The quantitative, cross-sectional survey is designed to measure prevalence, and more particularly to study associations between intention to consume goat milk and various (possibly causal) factors.

3.2.2 Research Method

In this research, studies were divided and carried out in three stages: Stage 1 and 2 were cross sectional study and Stage 3 was an experimental study as shown below.

Stage 1: Cross sectional study based on Theory of Planned Behaviour with Health Consciousness as a Mediating variable.

Stage 2: Cross sectional study on Knowledge, Attitude, and Practice (KAP) towards goat milk consumption among multicultural Malaysians.

Stage 3: Experimental study design - nutrition education intervention programme to increase knowledge, attitude, and consumption of goat milk.

3.3 Research Framework

In an attempt to describe a conceptual framework, Creswell and Creswell (2018) portrays the conceptual frameworks as, is arranged from an established general beliefs and concepts which add a scholar to appropriately recognize the issues they are searching for building their enquiries and locate appropriate information. Most scholarly investigations begin with a conceptual framework to assist the investigator in simplifying his research difficulties and aims. This framework comprises ideas, explanations of those ideas, and preceding concepts that will be used in the investigation. The framework demonstrates an understanding of hypotheses and models relevant to the subject of the research and frequently compares it to the broader fields of knowledge one will be pursuing.

This study attempts to examine the influence of consumer attitude, social influence, and consumer self-efficacy on consumer intention to consume goat milk with the mediating variable of health consciousness among consumers in Klang Valley. According to the TPB, an individual's behaviour is governed by a composite of their intents to engage in that behaviour and their perceptions of control over that behaviour. Intentions, in turn are held to be predicted by attitudes, subjective norm (perceived social pressure) and perceived behavioural control (the degree to which the behaviour is perceived to be under the control of the individual) (Povey et al., 2000). The research is then expanded to Stage 2 to evaluate the levels of knowledge, attitude, and practice towards goat milk among multicultural Malaysians. The KAP theory presents a progressive relationship where knowledge is the foundation of behaviour change, and belief and attitudes are the

driving force of behaviour change (Fan et al., 2018). The outcome from Stage 2 study will be used to design materials for intervention programme in Stage 3. A knowledge, attitude, and practice survey is useful as a guide to design and evaluate an intervention programme (Hiew et al., 2015). Figure 3.2 shows the flowchart of the study.

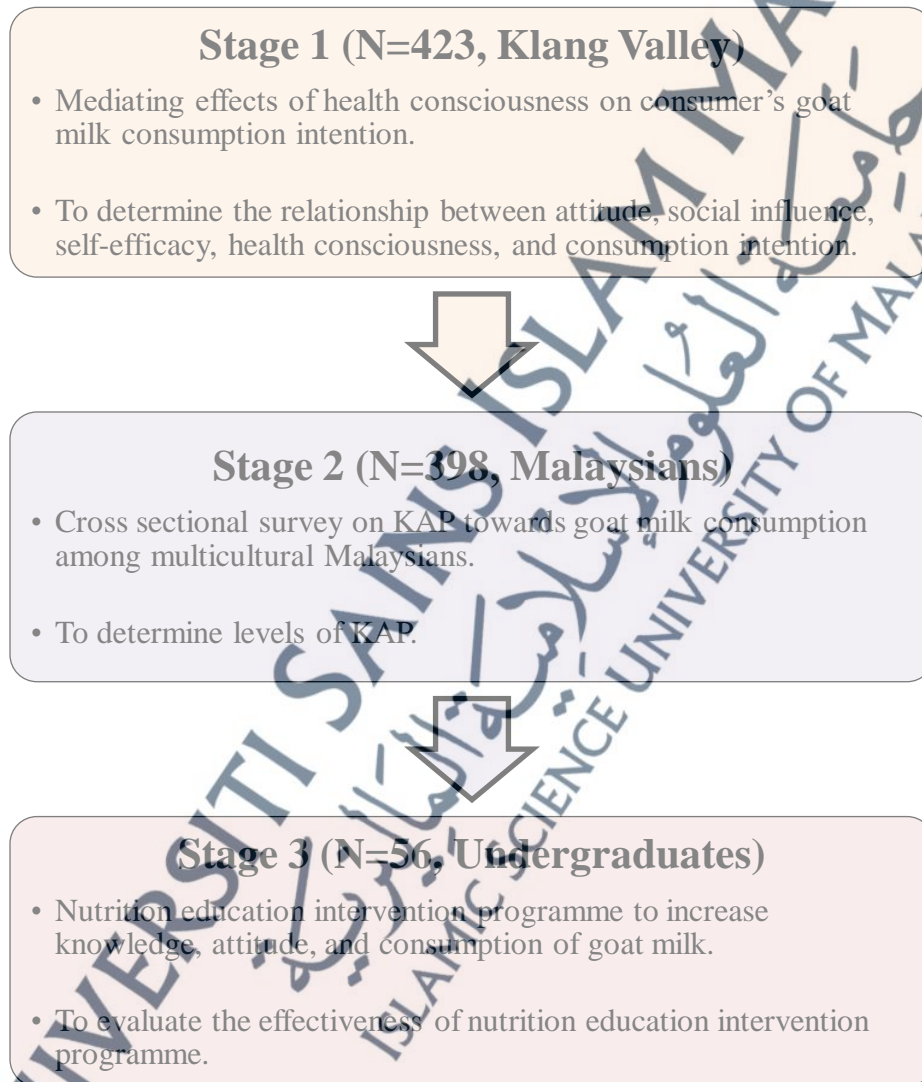


Figure 3.2: The Research Flowchart

3.4 Stage 1: Cross Sectional Study based on Theory of Planned Behaviour with Health Consciousness as a Mediating variable

3.4.1 The Study Setting and Locations of the Study

The survey was carried out in Giant Hypermarkets in Wilayah Persekutuan Kuala Lumpur, Selangor, and Putrajaya. These regions were chosen due to its strategic locations and high-density population that resembled the multi ethnicity and culture in Malaysia.

According to Department of Statistics Malaysia, in 2010 there are 1,613,300 and 5,399,400 people residing in W.P. Kuala Lumpur and Selangor, respectively. Hypermarket is a main location preferred by consumers during shopping food and groceries. In research by Roslan et al. (2016), out of 63.75% of the respondent in his study chose hypermarkets as a major location for shopping compared to local retailer. Hypermarket has a large scale format that offers advantages such as prices; merchandise offered as well as functions as one stop centre compared to other local retailer (Roslan et al., 2016).

Giant Hypermarket is among the popular hypermarket chain stores in Malaysia. When compared to other chain store hypermarkets, Giant Hypermarkets were found to be more evenly distributed in most regions of W.P. Kuala Lumpur, Selangor and eventually, in Malaysia including Sabah and Sarawak. Giants are subsidiary companies of Dairy Farm International Holdings Limited which is known as GCH Retail (Malaysia) Sdn. Bhd. in Malaysia. There are a total of 37 outlets located in Selangor and 11 outlets located in different areas in W.P. Kuala Lumpur.

Random sampling was carried out using the fishbowl method to select the supermarkets and hypermarkets. For W.P. Putrajaya, there is no Giant outlets. Thus, sampling location in W.P. Putrajaya chosen at hypermarkets available in the region based on their popularity. Random sampling of the Giant outlets in other regions was done as primary units. Consumers who visited these supermarkets and hypermarkets were the major respondents in this research through a random sampling of secondary units.

The list of Giant Hypermarkets outlets in W.P. Kuala Lumpur and Selangor is shown in Appendix 8. Figure 3.3 shows the locations and participants sampling method.

3.4.2 Study Design

In this Stage 1 study, a quantitative cross sectional study design was employed to examine the relationship between constructs in Theory of Planned Behaviour and goat milk consumption intention with health consciousness as a mediating variable.

3.4.3 Study Sampling (Group 1, Klang Valley)

The sample population was Malaysian adults aged 20 years old and above who visited Giant Hypermarkets or supermarkets at the areas of study. Customers visiting these outlets were suitable group of respondents as they are commonly shoppers that purchase foods and groceries for their family. Thus, random sampling was carried out at chosen locations to obtain information and response towards their attitude, social influence, and self-efficacy on goat milk. The respondents were determined by using the inclusion and exclusion criteria.

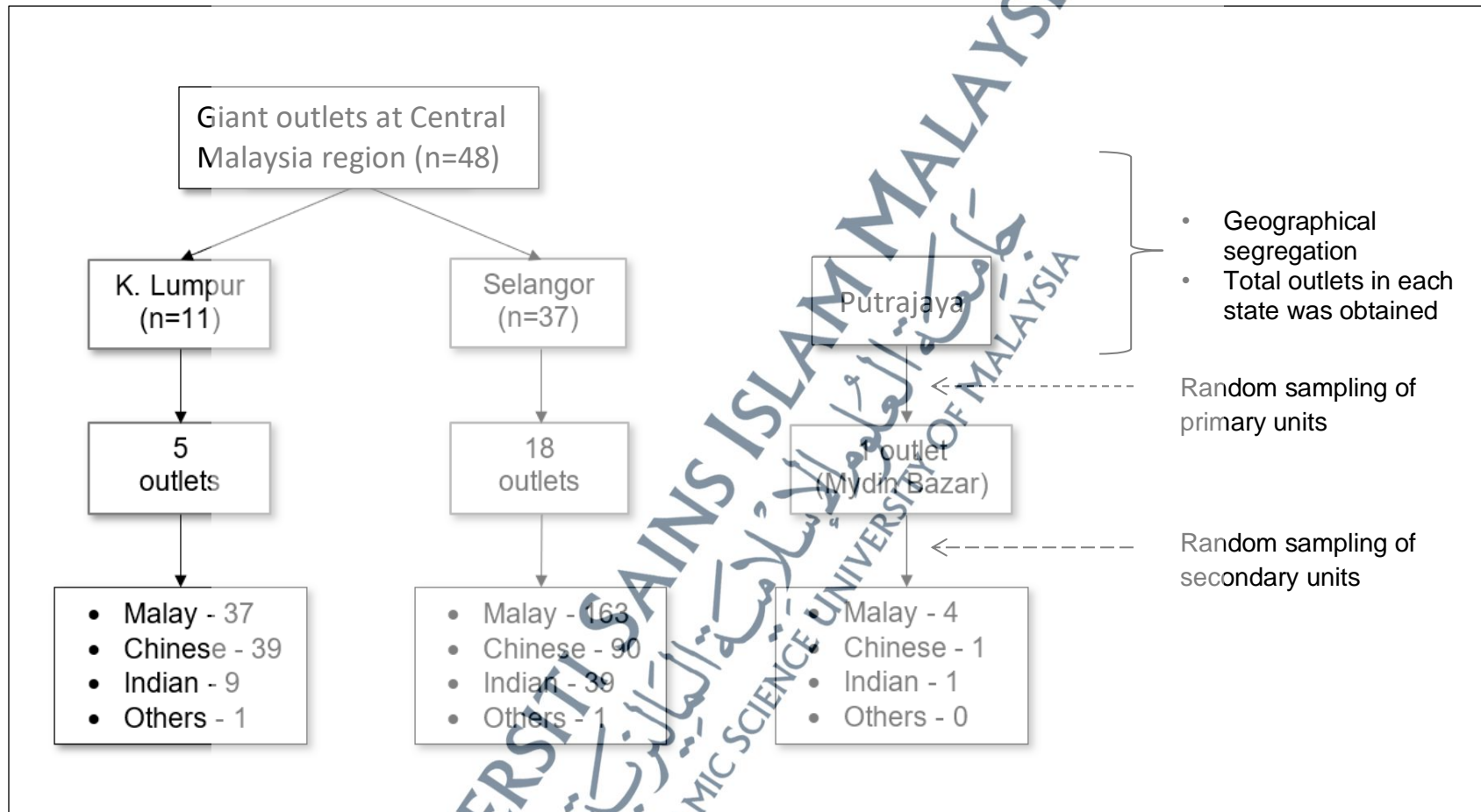


Figure 3.3: The Locations and Participants Sampling Method.

3.4.4 Inclusion and Exclusion criteria

Inclusion criteria:

- Adults aged 20 years old and above
- Malaysian citizen
- Able to understand Bahasa Malaysia

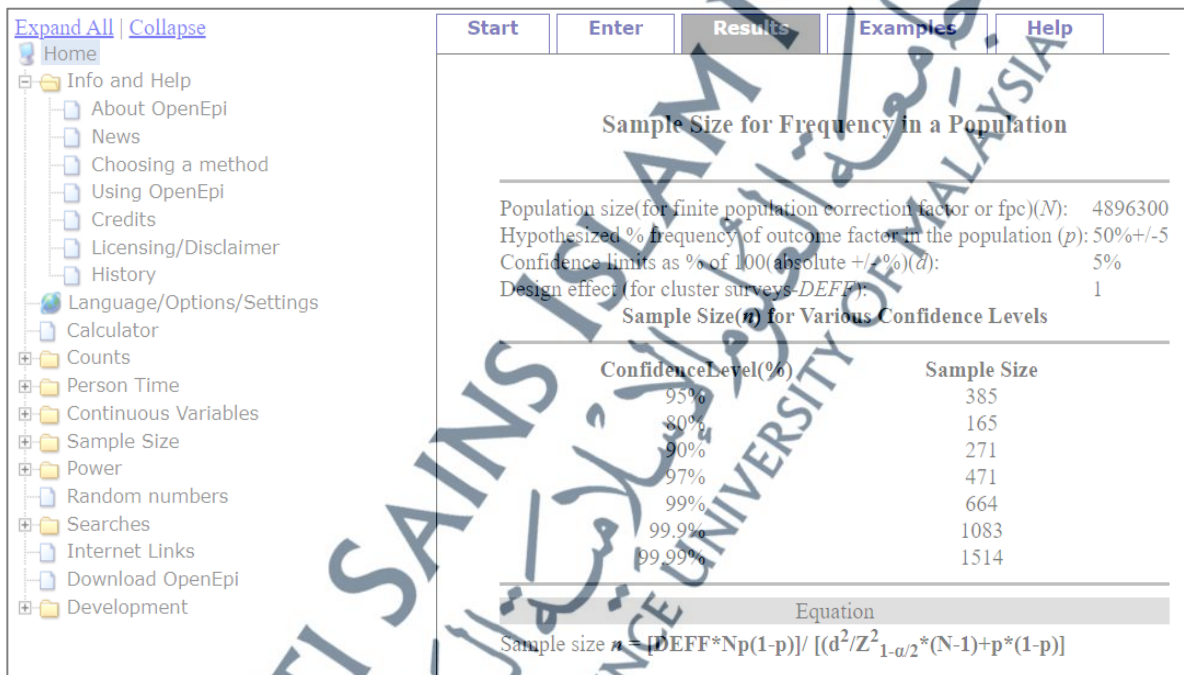
Exclusion criteria:

- Respondents who refused to give their consent to participate in the survey.

3.4.5 Sample Size Determination

The sample size was determined using Open Epi Software (Dean et al., 2013). According to Department of Statistics Malaysia, in 2016 there are 1,789,700 and 6,291,500 people residing in W.P. Kuala Lumpur and Selangor, respectively. Population size for adults aged 20 and above, excluding non-Malaysians in Selangor were 3,756,200. There were 55.4% Malays, 30.4% Chinese, 13.6% Indians, and 0.53% from other ethnicities. W.P. Kuala Lumpur is populated by 1,095,700 Malaysian adults aged 20 years old and above of which 43.0% are Malays, 45.8% are Chinese, 10.34% are Indians, and 0.9% other ethnics. In W.P. Putrajaya, there were 97.5% Malay, 0.5% Chinese and 1.8% Indians that made up 44,400 Malaysian citizens over 20 years old. The population characteristics of these areas combined closely resembles multicultural Malaysians. Hence, the population size for this Stage 1 study was 4,896,300.

The OpenEpi software to calculate sample size is widely used in many health sciences and epidemiological studies. It provides, among others, statistics for counts and measurements in descriptive and analytic studies, stratified analysis with exact confidence limits, matched pair and person-time analysis, sample size and power calculations (Dean et al., 2013). Using this software, the sample size calculated for this population was 385 at 95% confidence interval as shown in Figure 3.4.



(Source: Dean, Sullivan, & Soe, 2013)

Figure 3.4: The Calculated Sample Size using OpenEpi Software

Considering the dropout rate, 10% was added to the calculated sample size. In behavioural research, sample size of 30 to 500 can be justified (Balnaves & Caputi, 2001).

3.4.6 Sampling Method

In Stage 1 study, using the multistage sampling method, the population is divided into groups of ethnics (strata), and sampling is carried out within these strata in proportion to the original strata as shown in Table 3.1. The detailed proportioning is shown in Appendix 9. A stratified sample should lead to a more-representative sample of presenting multicultural Malaysians population than a simple random sample of the same size, and it should lead to more-reliable results (Bruce et al., 2018).

Table 3.1: The Stage 1 Multistage Sampling Plan

Malaysian population by age 20 and above, in selected areas, 2016					
Areas	Malays	Chinese	Indians	Others	Population Size
					4,896,300 (100%)
Selangor	163	90	39	1	3,756,200 (76.7%)
W.P. Kuala Lumpur	37	39	9	1	1,095,700 (22.4%)
W.P. Putrajaya	4	1	1	Nil	44,400 (0.9%)
Sample size	204 (53.0%)	130 (33.8%)	49 (12.7%)	2 (0.5%)	385 (100%)

Following the stratified sampling plan and including the 10% expected dropout, a total of 480 questionnaires were distributed at hypermarkets outlets. Consumers who visit supermarkets and hypermarkets were the major respondents in this research. After a short introduction and explaining the purpose of the study, respondents were then requested to answer the questionnaire along with the consent form before returning to the researcher.

This study aimed to test the hypothesis whether a relationship between the variables of attitude, social influence, and self-efficacy on goat milk consumption among consumers in Klang Valley. A total of 423 questionnaires were returned with complete answers which makes the response rate 88.1% as shown in Table 3.2. Based on the data to be collected from each ethnic group, the consumption intention among Malaysian consumers can be obtained. This causality study is designed through quantitative approach using SmartPLS 3.0

Table 3.2: Response Rate from Respondents in Stage 1 Study

Particulars	Respondents
Number of questionnaires distributed	480
Number of questionnaires returned	437
Questionnaires with complete answers	423
Incomplete questionnaires	14
Response rate	91.0%
Response rate with complete answers	88.1%

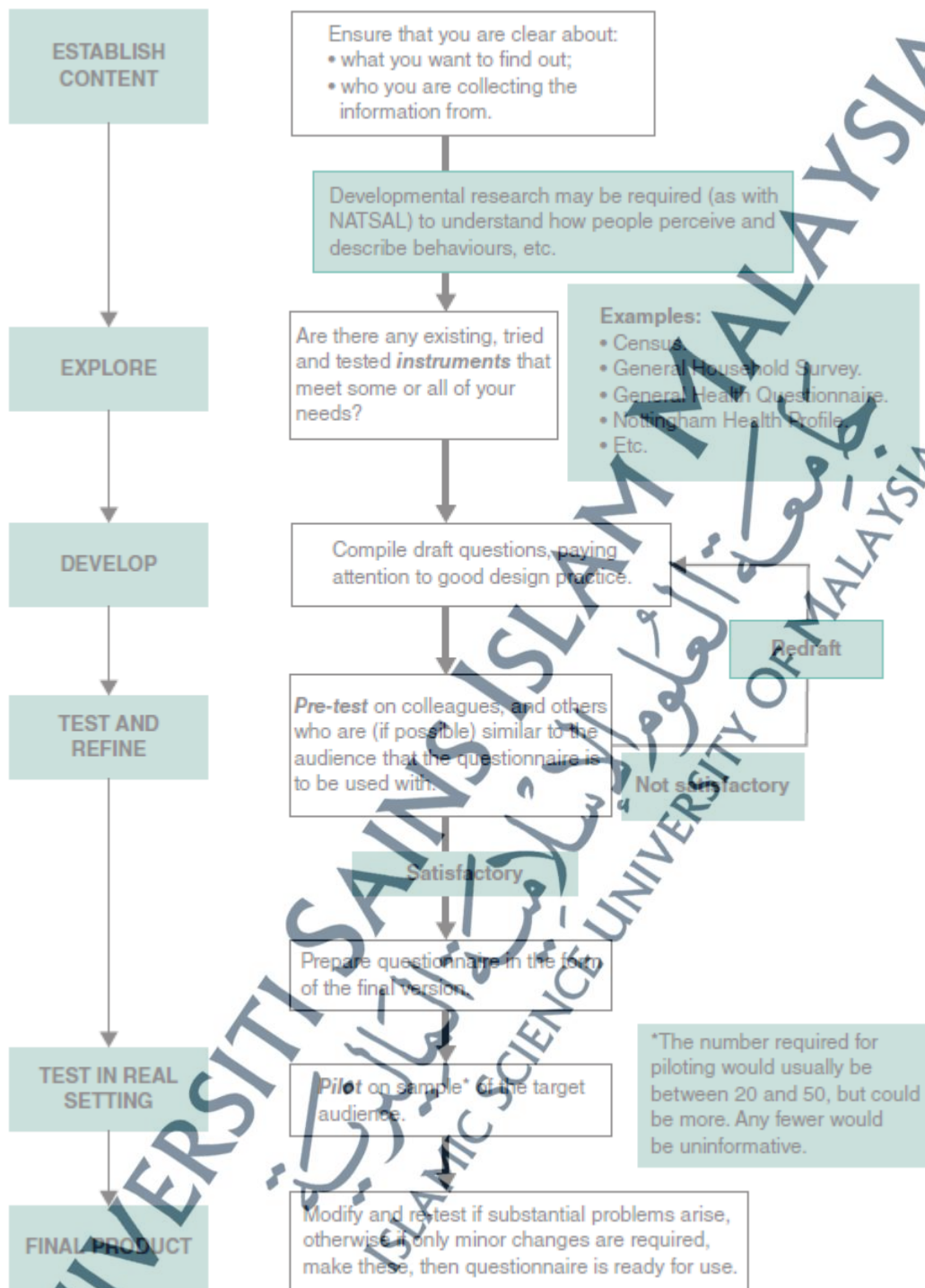
3.4.7 Study Instrument

Structured questionnaire was used as the instrument throughout the study in Stage 1. For the ease of distribution, the survey questions were compiled into booklets format. The constructs of the instrument were adapted from the Theory of Planned Behaviour and items used to measure the variables were adapted from past-established instruments. The

questionnaires were meant to be distributed and self-completed by respondents while assisted by researcher and enumerator when needed. The self-completed questionnaire has several advantages such as quicker and cheaper in booklet format, because large numbers can be distributed at the same time. Besides, it also avoids interviewer bias and allows respondents to record their responses privately (Bruce et al., 2018).

3.4.8 Phase of Instrument Development

A good questionnaire design involves carefully planned structures such as types of questions to use, length and clarity of the questions, sequences of the questions and general layout of the questionnaire. Figure 3.5 shows the flow chart of process in questionnaire development.



(Source: Bruce et al., 2018)

Figure 3.5: Process of Questionnaire Development.

Using the questionnaire development process suggested by Bruce et al. (2018) as a reference, the instrument in this study was developed in a structured manner as follow:

1. **Explore and develop.** Existing, tried and tested instruments were explored, and the questionnaire items were developed by adapting from past-established instruments.
2. **Validity Phase: Test and Refine.** The drafted questionnaire items were compiled into a draft instrument before it was pre-tested for face validity and checked for its content validity. The instrument was further refined and redrafted based on the outcomes of face validity and content validity.
3. **Pilot Test.** The instrument was tested on samples of the target respondents. Construct validity and construct reliability were obtained from the pilot test.
4. **Final Product.** The questionnaire was ready for use.

3.4.9 Explore and Development of the Questionnaire

The questionnaire consists of five constructs following the research framework. Variables in the constructs were as follow:

Independent variables: Attitude, Self-Efficacy, Social Influence

Mediating variable: Health consciousness

Dependent variable: Goat milk consumption intention

As shown in the conceptual framework of the study (Figure 3.1), in the Theory of Planned Behaviour, attitude, self-efficacy, and social influence are factors that influence intention (Ajzen, 1991b). As such, attitude, self-efficacy, and social influence are known as the independent variables, whereas consumption intention is known as the dependent variable because it is the outcome or result due to the influence of the independent variables. In this study, health consciousness is fitted as the mediating variable and is a new extension to the TPB theory. According to Creswell and Creswell (2018), a mediating variable stand between the independent and dependent variables, and it transmit the effect of an independent variable on the dependent variable.

There was a total of 26 adapted items to measure the attitude, social influence, self-efficacy, consumer's consumption intention and health consciousness. All items were adapted and developed in Bahasa Malaysia which is the Malaysians' national language. The structure of the questionnaire was arranged as follow:

- Demographic data
- Measurement 1: Attitude towards Goat Milk Consumption Intention
- Measurement 2: Social Influence on Goat Milk Consumption Intention
- Measurement 3: Self Efficacy on Goat Milk Consumption Intention
- Measurement 4: Goat Milk Consumption Intention
- Measurement 5: Health Consciousness towards Goat Milk Consumption Intention

3.4.10 Measurements of constructs

3.4.10.1 Measurement 1: Attitude towards Goat Milk Consumption Intention

In this study, customer attitude was measured by using 3 items adapted from Shih and Fang (2004) with Cronbach's alpha (0.89). The participants were asked to indicate their perception on a Likert scale (1-5) with response ranging from "strongly disagree" to "strongly agree". Points are given in an ascending order, with one point given for the response of "strongly disagree" and five points given for the response of "strongly agree" for the items. This results in a minimum value of 1.00 and a maximum score of 5.00 for each item in the attitude section. The higher the mean indicate a more positive attitude towards intention to consume goat milk. Items in the questionnaire are listed in Table 3.3.

Table 3.3: Items in the Questionnaire (Measurement 1: Attitude)

CODE	ITEMS	SOURCE
AT1	Saya berasa pengambilan susu kambing adalah idea yang bijak.	(Shih & Fang, 2004)
AT2	Saya berasa pengambilan susu kambing adalah idea yang bagus.	
AT3	Saya suka kerap meminum susu kambing.	

3.4.10.2 Measurement 2: Social Influence on Goat Milk Consumption Intention

Bearden et al. (1989) mentioned that an important determinant of an individual's behavior is others' influence. Portrayal of products being consumed in social situations and the use of prominent/attractive spokespersons endorsing products is evidence of this belief. In the context of this study, an individual's intention to consume goat milk may be influenced by people and society surrounding them.

All the 11 items in this construct were adapted from the Consumer Susceptibility to Interpersonal Influence Scale proposed by Bearden et al. (1989). According to Bearden, the influence of others has certain impact on a person's behaviour. Social approval is often sought by members of the community. People with lower self-esteem may feel greater influence by friends and family members as well as information around them. In this study, there are 4 items that measured the influence of information on respondent's goat milk consumption intention. Individuals may either search for information from knowledgeable others or make inferences based upon the observation of the behaviour of others (Bearden et al., 1989). In the questionnaire, these four items were included in between other items in the same construct as item SI1, SI4, SI6, and SI9. Another 7 items measured the tendency of the respondent to conform to the expectations of others. One item was dropped from the original instrument because it explicitly refers to purchasing the latest trend. This item was potentially distracting for our respondents and irrelevant to the investigation context.

Adapting the measurements from the original instrument, respondents were asked to rate the statements based on a seven-point Likert-type scale ranging from 1 ('strongly disagree') to 7 ('strongly agree'). Points were given in an ascending order, with one point given for the response of "strongly disagree" and seven points given for the response of "strongly agree" for the items. This results in a minimum value of 1.00 and a maximum score of 7.00 for each item in the Social Influence section. The higher the mean indicate a stronger social influence towards intention to consume goat milk. Items in the questionnaire are listed in Table 3.4.

Table 3.4: Items in the Questionnaire (Measurement 2: Social Influence)

CODE	ITEMS	SOURCE
SI1	Saya sering bertanya pendapat orang lain dalam memilih produk alternatif susu kambing.	(Bearden et al., 1989)
SI2	Sekiranya saya ingin menjadi seperti seseorang (yang saya minati), saya akan membeli produk susu kambing yang sama seperti pilihannya.	
SI3	Adalah penting untuk orang lain menyukai produk susu kambing yang saya beli.	
SI4	Untuk memastikan saya membeli produk susu kambing yang betul, saya sering memerhatikan produk yang dibeli dan digunakan oleh orang lain.	
SI5	Saya sering memahami orang lain dengan membeli produk susu kambing yang dibeli mereka.	
SI6	Sekiranya saya kurang berpengetahuan tentang produk susu kambing, saya akan bertanya kawan saya.	
SI7	Secara amnya saya akan memilih untuk membeli produk susu kambing yang saya rasa akan dapat diterima oleh orang lain.	
SI8	Saya ingin mengetahui produk susu kambing yang memberi tanggapan yang baik kepada orang lain.	
SI9	Saya sering mendapatkan maklumat berkenaan susu kambing daripada kawan atau keluarga sebelum membuat pembelian.	
SI10	Sekiranya orang lain dapat melihat saya mengambil susu kambing, saya akan membeli jenama yang mereka rasakan saya akan beli.	
SI11	Saya merasai semangat/kekitaan/rasa termilik apabila membeli produk susu kambing yang sama seperti orang lain.	

3.4.10.3 Measurement 3: Self-efficacy

All the four items to measure self-efficacy were based on an instrument developed by Taylor and Todd (1995). With the items in the instruments the respondents were asked into indicate their perceptions about their confidence and behavioural intention towards goat milk consumption. Adapting from the original instrument, respondents were asked to rate the statements based on a seven-point Likert-type scale ranging from 1 ('strongly disagree') to 7 ('strongly agree'). Points were given in an ascending order, with one point given for the response of "strongly disagree" and seven points given for the response of "strongly agree" for the items. This results in a minimum value of 1.00 and a maximum score of 7.00 for each item in the Self-efficacy section. The higher the mean indicate a higher self-efficacy towards intention to consume goat milk. Items in the questionnaire are listed in Table 3.5

Table 3.5: Items in the Questionnaire (Measurement 3: Self-Efficacy)

CODE	ITEMS	SOURCE
SE1	Saya selesa mencari produk susu kambing di kedai.	(Taylor & Todd, 1995b)
SE2	Saya rasa berupaya untuk membelikan produk susu kambing dari kedai.	
SE3	Saya rasa yakin mencari produk susu kambing di dalam kedai.	
SE4	Saya rasa penting untuk berupaya membeli produk susu kambing tanpa bantuan orang lain.	

3.4.10.4 Measurement 4: Health Consciousness

Health consciousness assesses the readiness to undertake health actions (Michaelidou & Hassan, 2008). Health-conscious consumers are aware and concerned about their state of well-being and they are motivated to improve and/or maintain their health and quality of life (Gould, 1990; Kraft & Goodell, 1993). Being self-conscious regarding health and engaged in illness preventing behaviours are also commonly identified with health-conscious people. Health consciousness is identified as one important predictor towards health behaviours (Espinosa, 2018).

The five items used in this study were closely related to nutrition is re-conceptualized as health consciousness focusing on either one's self-health awareness, personal responsibility, or health motivation. All items were adapted from previous studies (Item no 1, 2, and 4 from Gould (1990); Item no 3 and 5 from Kraft & Goodell, 1993). These items were measured along a five-point Likert scale, ranging from "Strongly disagree" (1) to "Strongly agree" (5). Thus, the 5 items were averaged to form a "health consciousness scale". Points were given in an ascending order, with one point given for the response of "strongly disagree" and five points given for the response of "strongly agree" for the items. This results in a minimum value of 1.00 and a maximum score of 5.00 for each item in the health consciousness section. The higher the mean indicate a higher self-health consciousness. Items in the questionnaire are listed in Table 3.6.

Table 3.6: Items in the Questionnaire (Measurement 4: Health Consciousness)

CODE	ITEMS	SOURCE
HC1	Saya mempunyai kesedaran yang tinggi terhadap kesihatan saya.	(Gould, 1990)
HC2	Secara amnya, saya memberi perhatian kepada perasaan dalaman saya terhadap kesihatan.	
HC3	Saya sentiasa mengambil-peduli tentang kesihatan saya.	(Kraft & Goodell, 1993)
HC4	Saya sedar akan keadaan kesihatan saya sepanjang hari.	(Gould, 1990)
HC5	Saya memainkan peranan yang aktif dalam kesihatan yang baik.	(Kraft & Goodell, 1993)

3.4.10.5 Measurement 5: Consumer Consumptions Intention

The measurement scales for consumer consumption intention were adapted from Choe et al. (2008). Some minor modifications were done, including the wording of the items to make them applicable for goat milk context. These three items were measured along a five-point Likert scale, ranging from “Strongly disagree” (1) to “Strongly agree” (5). Points were given in an ascending order, with one point given for the response of “strongly disagree” and five points given for the response of “strongly agree” for the items. This results in a minimum value of 1.00 and a maximum score of 5.00 for each item in this section. The higher the mean indicate a higher the intention to consume goat milk. Items in the questionnaire are listed in Table 3.7.

Table 3.7: Items in the Questionnaire (Measurement 5: Consumption Intention)

CODE	ITEMS	SOURCE
CI1	Saya bercadang untuk meminum susu kambing.	(Choe et al., 2008)
CI2	Saya berniat untuk meminum lebih banyak susu kambing.	
CI3	Saya berniat untuk meminum susu kambing dengan lebih kerap.	

3.4.11 Validity Phase: Test and Refine

Validity of the instrument is referred to as the accuracy of an instrument. An instrument is said to be valid when it could measure for what it is supposed to (Sekaran & Bougie, 2016). Hence, a valid instrument reduces error and bias that might affect the conclusions (Balnaves & Caputi, 2001). At this stage, the researcher checked content validity and the face validity of the instrument.

3.4.11.1 Content Validity

Validity is the capacity of a test, instrument, or question to give a true result (Balnaves & Caputi, 2001) whereas content validity refers to the “adequacy with which a measure assesses the domain of interest” (Boateng et al., 2018). In other words, it is basically held to determine whether the specific instrument is able to cover the overall dimensions mentioned in the particular study.

Therefore, before going toward pilot study, the draft questionnaire was presented to the experts for their opinion regarding the content validity of the questionnaire. The panel of experts comprise of:

- An Associate Professor in Community Nutrition, Universiti Kebangsaan Malaysia, Kuala Lumpur.
- Two nutritionists, Hospital Kuala Lumpur
- A Lecturer in Bahasa Malaysia as Language Expert
- A Lecturer in Research Methodology

Using a quantitative method, the experts rated each item as “Not relevant”, “Somewhat relevant”, “Quite relevant” or “Highly relevant”, in consideration of the appropriateness of each item in the questionnaire. The relevance rating was recoded as 1 (relevance scale of 3 or 4) or 0 (relevance scale of 1 or 2). The content validity ratios (CVR) were then calculated using the Lawshe’s formula (Hiew et al., 2015) as shown:

$$CVR_i = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

where, CVR_i = value for an item on the test

n_e = number of experts indicating that an item is “Quite relevant” or “Highly relevant”

N = total number of experts in the panel

A CVR rating by five or less experts should be at least 0.99 when accepting or retaining a specific item (Hiew et al., 2015). All items fulfilled the minimum CVR and are retained

in questionnaire except for one item (SIM12) that was removed for not fulfilling the minimum acceptable ratio. The panels also gave minor suggestions regarding the wording and contents of the questionnaire. The draft questionnaire was then reviewed and modified following the suggestions and feedbacks from the experts.

3.4.11.2 Face Validity

According to Hiew et al. (2015) face validity aims to determine the perception of respondents on the appropriateness of a test. It is important to ensure that the items in the questionnaires are easily understood, clear and unambiguous. In this study, the questionnaire was distributed to 30 people that comprised of administration and supportive staffs, students, and lecturers in Tunku Abdul Rahman University College. People from different levels of community were included to gather feedback on the clarity and difficulty level of the questionnaire. After a short introduction and explaining the purpose of the study, respondents were then requested to answer and provide comments or suggestions on the questionnaire. This group of people were not included as research respondents later.

3.4.11.3 Refining the Questionnaire based on Experts Feedback

The experts gave on overall positive comments on the questionnaire items. The experts commented on the format and layout of the questionnaire booklet that seemed too crowded. Besides, some wordings were also suggested to be changed. Table 3.8 shows the comments and recommendations from the experts and decisions taken by the researcher.

Table 3.8: Comments from the Experts Panel

Experts	Comments/Recommendations	Decision
Community Nutrition Expert	Item SIM12 is not relevant to goat milk consumption intention. Suggested to omit the item.	Item omitted.
	Suggested to replace rasa hati to perasaan dalaman for item CA2.	Replaced.
	Suggested to replace “prihatin” to “mengambilpeduli” for item CA4	Replaced.
Nutritionists	Suggested to change “meminum” to “pengambilan”.	Replaced.
	Suggested to change “gantian” to “alternatif” for item SIM1.	Replaced.
	Item SIM12 is not relevant to goat milk consumption intention. Suggested to replace or omit the item.	Item omitted.
Bahasa Malaysia Language Expert	Suggested to replace “rasa kekitaan” to “semangat kekitaan”	Replaced
	Suggested to replace “Saya berasa berupaya” to “Saya rasa berupaya” for items SEM2, SEM3 and SEM4.	Replaced.
	Item SIM12 is not relevant to goat milk consumption intention. Suggested to omit the item.	Item omitted.
Research Methodology Expert	The layout of the questionnaire booklet is too crowded. Suggested to relook into the layout.	The questionnaire font size was increased from 11 to 14 and lesser questions were put up on each booklet page.
	Font size is too small to read comfortably especially when in the field.	Font size increased from 11 to 14 Times New Roman.

The questionnaire was revised according to the experts’ comments and recommendations.

3.4.12 Pilot Test

The measurements that have been utilized in this current study were adapted from past-established instruments. It was acknowledged in research by Fan et al. (2018) that at least 100 samples are required to establish an accurate inference in exploratory factor analysis. Hence, a total of 150 questionnaires were distributed to 150 respondents from the local community in Cheras and Setapak. Data from 145 completed questionnaires were analyzed for questionnaire construct validity. 5 incomplete questionnaire data were excluded. These respondents were not included in the actual study. The respondents were 50.3% Malays, 34.5% Chinese, 11.0% Indians, and 4.1% Others. Majority of the respondents were female at 64.8% and overall respondents were prominently from the age group 35-44 years old (37.9%).

3.4.13 Factor Analysis

Exploratory factor analysis (EFA) is used to determine how many latent variables underlie the complete set of items (Tabachnick & Fidell, 2007). Prior to conducting the factor analysis, the Kaiser- Meyer-Olkin (KMO) or Measure of Sampling Adequacy (MSA) and the Bartlett's Test of Sphericity were used to ensure that the data collected were appropriate for conducting factor analysis. The factor analysis was based on the following criteria:

- a) KMO value: KMO value should be between 0 and 1, the greater its value the better factor analysis results. If KMO value is < 0.5 , it is unsuitable for factor analysis (Fan et al., 2018).

b) Significant Bartlett ball test ($p < 0.05$), which was used to examine whether the factor was independent (Fan et al., 2018).

In this study, the KMO value was 0.886 (> 0.5) which is meritorious and above the minimum requirement and Bartlett's Test of Sphericity which stands at significant level of 0.000 ($p < 0.05$) which means there are meaningful correlations among the items, thus, making the factor analysis permissible (J. Hair et al., 2010).

From EFA, five factors were retained using Eigenvalue greater than 1.0 as cut off point. The five factors explained 72.241% of total variance. Explained variance is used to measure the difference between a model and the actual data collected by researcher. Higher percentages of explained variance indicates a stronger strength of association and makes better predictions (Rosenthal & Rosenthal, 2011). There were no cross-loading of the questionnaire items and the factor loading values were ranging from 0.504 to 0.955. The threshold value for loading factors was above 0.4 which followed recommendation by Pituch and Stevens (2016). The results of the EFA are compiled in Appendix 10.

Factor 1 which represents consumer Attitude (AT) contains three items, was originally proposed. All the items found consistent with this construct. Factor 2 which represents Social Influence (SI) contains eleven items and Factor 3 consists of four items relating to perceptions and confidence which represented Self efficacy (SE). All the items were consistent with this construct. Factor 4 has five significant items which represent Health Consciousness (HC). All the items were found consistent with this construct. Factor 5 represents the items for Consumption Intention (CI) which is represented by all the three original items. All the items were found consistent with this construct.

3.4.14 Construct Reliability

According to Tavakol and Dennick (2011), internal consistency describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the test. In the literature, there are various reports about the acceptable alpha values. According to Hinton et al. (2004), alpha values of 0.90 and above is excellent, 0.70 – 0.90 represent high reliability, 0.50 – 0.70 means moderate reliability and cut-off points of lower than 0.50 is consider low reliability. A common rule-of-thumb mentioned in Mat Nawi et al. (2020) stated a “value of Cronbach’s alpha between 0.60 and 0.80 is acceptable”. Specifically, it was recommended that the reliability result in the pilot study phase be equal to or greater than 0.60 (Straub & Gefen, 2004; Taherdoost, 2016).

Using pilot study, the questionnaire construct reliability was determined. As shown in Table 3.10, all measures achieved Cronbach’s alpha level above the recommended reliability coefficient of 0.60 and above (Straub & Gefen, 2004).

Table 3.10: Cronbach’s Alpha Value

Construct	Cronbach’s alpha
Consumer Attitude (AT)	0.868
Social Influence (SI)	0.950
Self-efficacy (SE)	0.624
Health Conciousness (HC)	0.609
Consumption Intention (CI)	0.863

3.4.15 Data Collection

Stage 1 data collection was done in 2016, in which the self-administered questionnaires were handed out to participants face-to-face, one-to-one, and collected on the spot after completion. A short introduction and explanation on the purpose of the study, respondents were then requested to answer the questionnaire along with the consent form before returning to the researcher. For elderly respondents or respondents who had lower reading comprehension, instructions and items in the questionnaire were read out aloud without supplementary interpretation.

3.4.16 Assessment of the Measurement Model

In general, PLS-SEM has ability to assess measurement models for both types of constructs, reflective and formative constructs. Because reflective measurement models should be evaluated in terms of their validity and reliability, the researcher assessed the measurement models focusing on reliability and validity required in PLS-SEM, such as, construct reliability, indicator reliability, convergent validity, and discriminant validity, discussed in Chapter Four of the study.

3.4.17 Assessment of the Structural Model

The PLS-SEM analysis provides information into the structural model and measurement of the proposed framework. The testing of the measurement model includes internal consistency reliability, indicator reliability, and the convergent and discriminant validity of the instrument items are the statistical test included in testing the measurement model. The outcomes will decide whether the instrument is ready for use. Once a satisfactory

validation of the measurement model has been performed, the structural model can be examined. Hypotheses generated from the structural model are tested for its significance and mediating relationships is assessed following guidelines proposed by Zhao et al. (2010).

3.4.18 Data Transformation

Data transformation is a process through which the original data is converted into a suitable format, preparing the data ready for analysis to meet the research objectives (Balnaves & Caputi, 2001). The original data was collected on hard copies of questionnaires distributed among the sample population and then it was being converted into digital form by using SPSS (25.0 window versions).

3.4.19 Justification for using PLS-SEM in the Study

Structural equation modeling technique (SEM) has been commonly used in the empirical research to test theoretical assumptions (Haenlein and Kaplan 2004). Multivariate statistical approaches such as this SEM enables the investigation of the direct and indirect links between one or more independent latent variables and one or more dependent latent variables (Gefen et al., 2000). SEM encompasses a variety of statistical models, further divided into two main branches; covariance-based SEM (CB-SEM) and a component-based approach such as partial least square SEM also called PLS-SEM.

Summarized here are the reasons why PLS-SEM was selected as the statistical method for evaluating the research model in this study:

1. The objectives of this study involved predicting the key target constructs. The focus of this study is on prediction factors related to consumers' goat milk consumption intention. Hence, the use of PLS-SEM is important to examine the underlying relationship between the variables.
2. The research goal is an exploratory of an extension of an existing structural theory. This study follows the Theory of Planned Behaviour with Health consciousness as a mediating variable to explain the Consumption Intention.
3. PLS-SEM has few requirements on its data characteristics and algorithm such as data does not meet distributional assumptions, small sample size consideration, and does not require normality assumption in its analysis.

Chin (2010) recommends that the selection of any SEM method may be done on the basis of merits and demerits of each method.

3.5 Stage 2: Cross sectional survey on Knowledge, Attitude, and Practice (KAP) towards goat milk consumption among multicultural Malaysians

After the completion of Stage 1, the research in Stage 2 investigates the following research question: What are the levels of knowledge on goat milk health benefits, attitude, and practice of goat milk among multicultural Malaysians?

3.5.1 The Study Setting and Locations of the Study

In this stage, the highlight of the study was on the level of knowledge, attitude, and practice among multicultural Malaysians towards goat milk consumption. The cross-sectional survey was carried out in Giant Hypermarkets and supermarkets situated in cities in Peninsular Malaysia and East Malaysia. Literally, it is difficult to reach all the places and locate the hypermarkets or supermarkets and do the survey. Hence, the targeted survey region is divided into central, east, north, south, and Sabah and Sarawak.

Giant hypermarkets and supermarkets in each state in the region were listed before random sampling was carried out to select the supermarkets and hypermarkets. Data collections were carried out at the selected outlets in each region following the sampling plan. Consumers who visited Giant supermarkets and hypermarkets were considered as the targeted respondents in Stage 2. The generated list of Giant hypermarkets and supermarkets outlets in each state of each region is available in Appendix 8.

3.5.2 Study Design

Commonly, from the context of medical science research there are three main types of survey, namely the epidemiological surveys, surveys on attitudes to a health service or intervention and questionnaires assessing knowledge on a particular issue or topic (Jones et al., 2013). The Knowledge, Attitude and Practices (KAP) theory is recognized as a health behaviour change theory, proposed by western scholars in the 1960s (Fan et al., 2018). It describes that the change of human behaviour is divided into three consecutive processes: the attainment of knowledge, the generation of attitudes, followed by the

development of behaviour. The KAP theory depicts the progressive relationship among knowledge, attitudes and behaviour as follows: “knowledge is the foundation of behaviour change, and belief and attitudes are the driving force of behaviour change” (Fan et al., 2018). According to Rav-Marathe et al. (2016), KAP has certain advantages such as being highly focus on its measurements and cost-effective. The KAP survey carries a framework that has been widely adopted in the nutrition education field as a guide to better understand the mechanisms of behavioural changes.

Particularly in this Stage 2 study, a quantitative cross sectional study design was adopted to determine the level of knowledge towards goat milk health benefits: the attitudes towards goat milk consumption intention and practice of goat milk consumption among multicultural Malaysians. According to Jones et al. (2013), surveys are essential tools used to collect information on individual viewpoints in a large cohort.

3.5.3 Sample population

Malaysia is well-known for its harmonious multi-cultural people. According to the Department of Statistics Malaysia, there were 18,326,600 Malaysians adults from multi-ethnicities in year 2016. The population size comprised of 65.2% Malay, 26.5% Chinese, 7.6% Indians, and 0.8% from other ethnicities.

Population can be described as an “aggregate or totality of all the objects, subjects or members that conform to a set of specifications” (Polit & Hungler, 1999). It is the totality of all subjects that conform to a set of specifications, comprising the entire group

of persons that is of interest to the researcher and to whom the research results can be generalized.

The sample population was Malaysian adults aged 20 years old and above who visited Giant Hypermarkets or supermarkets in each state of each region of study. The respondents were determined by using the inclusion and exclusion criteria.

3.5.4 Inclusion and exclusion criteria

Inclusion criteria:

- Adults aged 20 years old and above
- Malaysian citizen
- Able to understand Bahasa Malaysia

Exclusion criteria:

- Respondents who refused to give their consent to participate in the survey.

3.5.5 Sample Size Determination

Selecting the research population is a difficult and challenging task. According to Balnaves and Caputi (2001), researchers must ensure the research population will facilitate a comprehensive study of the research questions. Furthermore, the research population selected should ensure the validity and reliability of the research findings (Balnaves & Caputi, 2001).

The distributions of Malaysians are generally well spread across the five regions of study with the Central region being the most densely populated region. This could be because the capital of Malaysia, which is also the federal territory (Wilayah Persekutuan Kuala Lumpur); the federal administrative capital of Malaysia (Putrajaya) and Selangor being the most developed state that has the largest economy, are all strategically located in the Central region. The Central region boasts a total of 26.7% of Malaysian adults, followed by the Northern region that holds 22.6% of Malaysian adults. Perak which is the fourth largest state among the 13 states in Malaysia, contributes 38.4% to the Northern adult population. The Southern and East coast regions were populated by 18.4% and 14.3% of Malaysian adults, respectively. Largely, the adult population in the Southern region was contributed by Johor state (63.4%). Johor has the third largest gross domestic product (GDP) among the Malaysian states after Selangor and Sarawak (Ruban, 2017). Johor also strategically shares maritime boundary with Singapore.

The allocation of samples to each state of the five regions was done in proportionate to the population size. With that, Selangor and Johor were allocating bigger number of samples due to the larger population size. On contrast, lesser number of samples were allocated to states with smaller population size such as Melaka and Perlis. From the population size, the sample size for this particular Stage 2 study was determined using Open Epi Software. Using this software to calculate sample size is widely used in many health sciences and epidemiological studies (Dean et al., 2013). The sample size was cross-checked with Krejcie and Morgan (Krejcie & Morgan, 1970) which yield the same recommended sample size. Thus, at 95% confidence level, the sample size

determined was 385 as shown in Figure 3.6. Considering the drop out rate, 10% was added to the calculated sample size.



(Source: Dean, Sullivan, & Soe, 2013)

Figure 3.6: The Calculated Stage 2 Sample Size Using OpenEpi Software

3.5.6 Stage 2: Sampling Method

Since the sample populations are separated and access to all was difficult due to many distant regions, the sampling technique applied in this study was the probabilistic cluster sampling where the 13 states (and two federal territories) were clustered based on geographical locations into 5 clusters. The clusters were identified as:

- Cluster 1 (Northern regions): Perlis, Kedah, Pulau Pinang, Perak
- Cluster 2 (East Coast Region): Kelantan, Terengganu, Pahang

- Cluster 3 (Central region): Selangor, W.P. Kuala Lumpur, W.P. Putrajaya
- Cluster 4 (Southern region): Negeri Sembilan, Melaka, Johor
- Cluster 5 (East Malaysia): Sabah and Sarawak

In each cluster, a cross-sectional study using stratified sampling followed by random sampling was conducted. Using the multistage sampling method, the population is divided into groups of ethnics (strata), and sampling is carried out within these strata in proportion to the original strata in each of the cluster as shown in Table 3.11. The detailed proportioning is shown in Appendix 13.

Table 3.11: Stage 2 Multistage Sampling Plan

Regions	Proportionate to total population	Malay	Chinese	Indian	Others	Total
Northern	(22.6%)					
Perlis		2	1	0	0	
Kedah		16	8	3	0	
Pulau Pinang		14	7	2	0	
Perak		20	10	4	0	
		52	26	9	0	87
East Coast	(14.3%)					
Kelantan		19	2	1	0	
Terengganu		12	1	0	0	
Pahang		18	2	0	0	
		49	5	1	0	55
Central	(26.7%)					
Selangor		42	27	10	1	
W.P. Kuala Lumpur		12	8	3	0	
W.P. Putrajaya		1	0	0	0	
		55	35	13	1	104

Table 3.11, continued.

Regions	Proportionate to total population	Malay	Chinese	Indian	Others	Total
Southern	(18.4%)					
Negeri Sembilan		8	4	1	0	
Melaka		7	4	1	0	
Johor		27	14	4	0	
		42	22	6	0	70
East M'sia	(18.0%)					
Sabah		27	7	0	0	
Sarawak		27	7	0	1	
		54	14	0	1	69
Sample size		252 (65.2%)	102 (26.5%)	29 (7.6%)	2 (0.8%)	385

Since the researcher places great emphasis on the participants' commitment and suitability for the research topic, random sampling is used according to the inclusion criteria set in this Stage 2 study. This technique is most suitable because it focuses on who are the most advantageously placed and are in the best position to furnish the data required (Sekaran & Bougie, 2016).

Following the stratified sampling plan in Table 3.11, a total of 425 questionnaires were distributed at hypermarkets outlets randomly selected in each state in the clusters.

Consumers who visit supermarkets and hypermarkets were the major respondents in this research. After a short introduction and explaining the purpose of the study, respondents

were then requested to answer the questionnaire along with the consent form before returning to the researcher. This process was repeated to every cluster and helped by trained enumerators. This study aimed to determine the level of health benefit knowledge of goat milk, attitude towards goat milk consumption intention and practice of goat milk consumption among multicultural Malaysians in each cluster. Overall, a total of 407 completed questionnaires were returned which makes the response rate with complete answers 93.6% as shown in Table 3.12.

Table 3.12: Response Rate from Respondents in Stage 2 Study

Particulars	Respondents
Number of questionnaires distributed	425
Number of questionnaires returned	407
Questionnaires with complete answers	398
Questionnaires with incomplete answers	9
Response rate	95.7%
Response rate with complete answers	93.6%

3.5.7 Stage 2: Study Instrument

In Stage 2 study, questionnaire survey was used as the instrument to gather information to answer the research questions posed in this stage. For the ease of distribution, the survey questions were compiled into booklets format. Items were arranged into three constructs; namely the Knowledge, Attitude, and Practices of goat

milk. All items were adapted from past-established instruments. The questionnaires were distributed and self-completed by respondents while assisted by researcher and enumerator when needed.

3.5.8 Stage 2: Instrument Development

The questionnaire was prepared according to the developmental phases as mentioned by Bruce et al. (2018). Items in the questionnaire were meant to measure three constructs as follow:

- Measurement 1: Knowledge levels on goat milk health benefits
- Measurement 2: Attitude towards goat milk consumption
- Measurement 3: Practice of goat milk consumption

3.5.9 Stage 2: Measurements of Construct

3.5.9.1 Measurement 1: Knowledge Levels on Goat Milk Health Benefits

A knowledge, attitude and practice survey is able to assess a target group's current knowledge, attitude and practice on a specific health topic (Hiew et al., 2015). The Oxford's English dictionary defines knowledge as "facts, information, and skills acquired through experience or education". Similarly, in a review on KAP-O model, Rav-Marathe and her team defined the knowledge construct as "the acquisition, retention, and use of information or skills. Knowledge accrues from both education and experience" (Rav-Marathe et al., 2016).

In this study, there were 6 items in Measurement 1 that assess the knowledge of respondents on health benefits of goat milk including the comparison with breast milk, digestibility, and nutrient contents. Respondents were asked to rate the items based on five points Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total mean score value was used to determine the knowledge levels of the respondents. In other words, respondents who scored above the total mean score were considered to have good knowledge of goat milk health benefits. Items in the questionnaire are listed in Table 3.13.

Table 3.13: Items in the Questionnaire (Measurement 1: Knowledge)

CODE	ITEMS	SOURCES
K1	Susu ibu lebih baik daripada susu kambing.	Items 1 – 6 adapted from (Rani, et al., 2016); and (Umar, 2018)
K2	Susu kambing lebih mudah dihadam berbanding susu lembu.	
K3	Susu kambing sesuai diambil oleh pelbagai tahap umur.	
K4	Susu kambing dapat membantu melancarkan sistem penghadaman.	
K5	Susu kambing mengandungi pelbagai zat yang diperlukan badan.	
K6	Susu kambing dapat membantu menguatkan tulang.	

3.5.9.2 Measurement 2: Attitude Towards Goat Milk Consumption

Attitude relates to an individual's thinking or feelings which is translated into the tendency towards certain things (Hiew et al., 2015). Furthermore, attitudes towards behaviour "measure the extent to which an individual has a favourable or unfavourable evaluation of the behaviour in question" (Jerop & Kosgey, 2014). To relate to this particular study, the items in this construct measured the respondent's thinking or level of tendency towards the idea of goat milk consumption.

In Measurement 2, attitude levels towards goat milk was measured by using 3 items where respondents were asked to indicate their perception on a Likert scale (1 – 5) with response ranging from 'strongly disagree' to 'strongly agree'. A more positive attitude is reflected by a higher score. Respondents who scored above the total mean score were considered to have good attitude towards goat milk consumption. Items in the questionnaire are listed in Table 3.14.

Table 3.14: Items in the Questionnaire (Measurement 2: Attitude)

Code	Items	Source
A1	Saya berasa pengambilan susu kambing adalah idea yang bijak.	(Shih & Fang, 2004)
A2	Saya berasa pengambilan susu kambing adalah idea yang bagus.	
A3	Saya suka kerap meminum susu kambing.	

3.5.9.3 Measurement 3: Practice of Goat Milk Consumption

In the KAP model, practice “demonstrates the acquisition of knowledge” (Rav-Marathe et al., 2016) that can be observed in an individual due to increased understandings on a certain topic (Contento, 2008).

Measurement 3 consists of 4 items that were adapted from Food Frequencies Questionnaire for determining food consumption patterns of adults. The 4 items were arranged with a purpose to determine the level of goat milk consumption among multicultural Malaysians. The items covered questions on consumption experience, consumption frequency, and serving size as listed in Table 3.15.

Table 3.15: Items in the Questionnaire (Measurement 3: Practice)

Code	Items	Response categories	Sources
1.	Pernahkan anda meminum susu kambing?	1 = ya, 2 = tidak	Item 1,2, 3 adapted from (Norimah et al., 2008)
2.	Berapa kerapkah anda meminum susu kambing?	1 = Minum hampir setiap hari (lebih dari 3 kali seminggu), 2 = sekali dalam seminggu, 3 = sekali dalam sebulan, 4 = sekali dalam setahun, 5 = hanya beberapa kali dalam sebulan, 6 = Hanya beberapa kali dalam setahun, 7 = lain-lain	
3.	Berapa banyak susu kambing yang anda biasa minum dalam setiap kali hidangan?	1 = kurang dari secawan, 2 = 1 – 1.5 cawan, 3 = lebih dari 1.5 cawan	
4.	Apakah pandangan anda terhadap rasa susu kambing?	1 = rasa sedap, 2 = rasa pekat, 3 = manis, 4 = tidak suka baunya, 5 = rasa pelik, 6 = tidak ingat, 7 = lain-lain	(Ozawa et al., 2009)

3.5.10 Stage 2: Content Validity

Content validity is an important phase in establishing a trusted instrument that can measure what is it supposed to measure. Content validity provides information on the “representativeness and clarity of items and help improve an instrument through achieving recommendations from an expert panel. If an instrument lacks content validity, it is impossible to establish reliability for it” (Zamanzadeh et al., 2015). The expert panel will be able to provide cross-checking on the important aspects of the questionnaire and give constructive opinions to improve the overall design of the instrument. Therefore, before going toward pilot study, the draft questionnaire was presented to the experts for their opinion for the content validity of the questionnaire. The panel of experts were similar to the experts in Stage 1 study.

Using a quantitative method, the experts rated each item as “Not relevant”, “Somewhat relevant”, “Quite relevant” or “Highly relevant”, in consideration of the appropriateness of each item in the questionnaire. The relevance rating was recoded as 0 (relevance scale of 1 or 2) or 1 (relevance scale of 3 or 4). The content validity ratios (CVR) were then calculated using the Lawshe’s formula.

Based on feedbacks from the experts, all items fulfilled the minimum CVR and are retained in questionnaire. The panels also gave minor suggestions regarding the wording and contents of the questionnaire. The draft questionnaire was then reviewed and modified following the suggestions and feedbacks from the experts.

3.5.11 Stage 2: Face Validity

In Stage 2, the questionnaire was distributed to 30 people that comprised of administration and supportive staffs, students, and lecturers in Tunku Abdul Rahman University College that were not involved in Stage 1 face validity. People from different levels of community were included to gather feedback on the clarity and difficulty level of the questionnaire. After a short introduction and explaining the purpose of the study, respondents were then requested to answer and provide comments or suggestions on the questionnaire. This group of people were also not included as research respondents later.

3.5.12 Refining the Stage 2 Questionnaire based on Experts Feedback

The experts gave on overall positive comments on the questionnaire items. The experts commented on the format and layout of the questionnaire booklet that seemed too crowded. Besides, some wordings were also suggested to be changed. Table 3.16 shows the comments and recommendations from the experts and decisions taken by the researcher.

Table 3.16: Comments from the Experts Panel

Experts		Comments/Recommendations	Decision
Community Expert	Nutrition	Suggested to include a sub question for respondents to put in their reason(s) for item 5 Adakah anda akan meminum susu kambing lagi?	Sub question added in for item 5.
Nutritionists		Suggested to replace “1½ cawan” to wordings as “satu setengah cawan”	Replaced.
Bahasa Language Expert	Malaysia	Suggested to replace “Susu kambing sesuai diambil oleh pelbagai tahap umur” to “ <i>Susu kambing sesuai untuk pelbagai tahap umur</i> ”.	Replaced
		Suggested to replace “Adakah anda pernah minum susu kambing?” to lesser formal expression “Pernakah anda meminum susu kambing?”	Replaced.
Research Expert	Methodology	Font size is too small to read comfortably especially when in the field.	Font size increased from 11 to 14 Times New Roman.

The questionnaire was revised according to the experts’ comments and recommendations.

3.5.13 Refining the Stage 2 Questionnaire based on Respondents Feedback

After a short introduction and explaining the purpose of the study, respondents were then requested to answer and provide comments or suggestions on the revised questionnaire. All the respondents managed to complete the questionnaire within the timeframe of 8 to 12 minutes without assistance suggesting that the items in the

questionnaire were straightforward and easy to comprehend. The respondents were satisfied with the layout and content of the questionnaire and commented that the questionnaire is easy to understand, straightforward and not complicated to fill up. Thus, the questionnaire was retained.

3.5.14 Pilot Test

A total of 150 questionnaires were distributed to respondents from the local community in Setapak. Data from 147 completed questionnaires were analyzed for questionnaire construct validity. 3 incomplete questionnaire data were excluded. These respondents were not included in the actual study. The respondents were 63.9% Malays, 27.2% Chinese, 7.5% Indians, and 1.4% Others. Majority of the respondents were female at 55.8% and overall respondents were prominently from the age group 18-24 years old (42.9%).

3.5.15 Factor Analysis

Before the exploratory factor analysis was carried out for this instrument, the considerations of the data were checked following the criteria in Stage 1 as below:

- a) KMO value: KMO value should be between 0 and 1, the greater its value the better factor analysis results. If KMO value is < 0.5 , it is unsuitable for factor analysis (Fan et al., 2018).

b) Significant Bartlett ball test ($p < 0.05$), which was used to examine whether the factor was independent (Fan et al., 2018).

In Stage 2 study, KMO value was 0.890 (> 0.5) which is meritorious and above the minimum requirement and Bartlett's Test of Sphericity which stands at significant level of 0.000 ($p < 0.05$) which means there are meaningful correlations among the items. In other words, the null hypothesis in Bartlett's Test was rejected, the correlation matrix is not an identity matrix. Hence, the data proceeded to EFA.

From EFA, two factors were extracted using Eigenvalue greater than 1.0 as cut off point. The two factors explained 86.329% of total variance. There were no cross-loading of the questionnaire items and the factor loading values were ranging from 0.839 to 0.963. The results of the EFA are compiled in Appendix 14.

Factor 1 which represents the Knowledge construct contains six items, was originally proposed. All the items found consistent with this construct. **Factor 2** which represents Attitude construct contains three items. All the items were found consistent with the constructs.

3.5.16 Construct Reliability

Using pilot study, the questionnaire construct reliability was determined by Cronbach's alpha values and the corrected item-total correlation scores. As shown in Table 3.17, all measures achieved Cronbach's alpha level above the recommended reliability coefficient of 0.6 (Straub & Gefen, 2004). Furthermore, the corrected item-total correlation for each item fulfilled the recommended threshold of 0.3 and above (Garson, 2013).

Table 3.17: Construct Reliability for Stage 2 Pilot test

Construct	Item Code	Factor loading	Corrected item-total correlation	Cronbach's alpha if item deleted	Cronbach's alpha
Knowledge on Goat Milk health benefits	K 1	0.938	0.911	0.975	0.977
	K 2	0.955	0.933	0.972	
	K 3	0.939	0.910	0.974	
	K 4	0.961	0.948	0.970	
	K 5	0.959	0.939	0.971	
	K 6	0.943	0.923	0.973	
Attitude towards Goat Milk consumption	A1	0.913	0.786	0.735	0.852
	A2	0.894	0.750	0.772	
	A3	0.836	0.647	0.875	

3.5.17 Data Collection

The self-administered questionnaires were handed out to participants face-to-face, one-to-one, and collected on the spot after completion. Since the data collection took place in different regions across the country, trained enumerators assisted in the collection of data. Training and briefing were provided to the enumerators to ensure common understandings of the research objectives and data collection. After a short introduction and explanation on the purpose of the study, respondents were then requested to answer the questionnaire along with the consent form before returning to the researcher. For elderly respondents or respondents who had lower reading comprehension, instructions and items in the questionnaire were read out aloud without supplementary interpretation.

3.5.18 Statistical Techniques to Test the Hypotheses of the Study

Data and information obtained from the questionnaires were analyzed using the IBM Statistical Package of Social Science software (IBM SPSS Inc., Chicago) version 25. Descriptive analysis such as sociodemographic background data were compiled for analysis. Levels of knowledge, attitude and practice of goat milk were analyzed and compared across multiethnicities among the respondents by crosstabs. Empirical statistics such as the mean, standard deviation, median, and range were used to describe knowledge and attitude towards goat milk consumption. Binary logistic regression was used to determine significant predictors influencing goat milk consumption. The analyses were set at 95% confidence intervals and p -value = 0.05.

3.6 Stage 3: Nutrition Education Intervention

The Stage 3 Nutrition Education Intervention programme took off in year 2020 during the onset of Covid-19 pandemic. In times when people are threatened by the risks of illness and diseases, good healthcare and strong body immunity is increasingly important. Goat's milk contains high protein, calcium, and selenium. Selenium is essential to enhance body's immune response to better overall health. The practice of taking goat milk is not new but the rate of goat's milk intake among our society could be still low. According to a study conducted by Umar et al. (2017) just 11.8% of the 221 respondents in their study take goat milk on daily basis. The knowledge and awareness of the benefits of goat milk are among the contributing factors that are important to increase the consumption of goat milk. Thus, health campaigns that provide knowledge and awareness on the benefits of goat milk should be held to improve acceptance and practice of goat milk.

In Stage 3 of the study, an intervention programme was implemented to determine the effectiveness of educational intervention on increasing the practice towards goat milk consumption by improving goat milk health benefits knowledge and attitudes towards goat milk consumption intention. This stage was carried out to answer to the following research question: Does nutrition education intervention programme increase knowledge, attitude, and practice towards goat milk in the intervention group?

This nutrition education intervention use campaign as a strategy to achieve its objectives. The campaign was held as a web-based online intervention programme using the Internet and smartphone or laptop. In accordance with Li et al., (2020) "participants

tended to obtain knowledge on health issues and information through Internet and social media by cell phone as the currently preferred information-seeking strategy”. “The use of smartphones across the globe is overwhelmingly associated with our daily routines and equally an essential part of present-day life, making it realistic as an effective means of delivering nutrition education intervention and conducting prospective surveys among participants using smartphones. Therefore, data collection through smartphones may proffer a great and better avenue to carry out surveys and deliver education interventions among participants” (Goni et al., 2020).

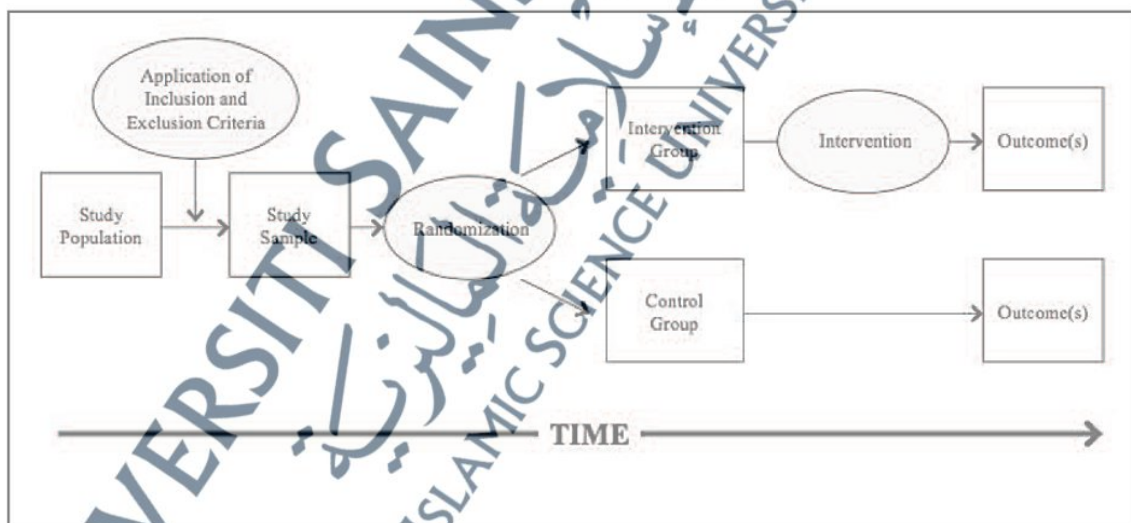
Contento (2008) defined nutrition education intervention as any combination of educational strategies, accompanied by environmental supports, designed to motivate and facilitate voluntary adoption of food choices and other food-and-nutrition-related behaviours conducive to health and well-being. Therefore, a series of web-based educational activities were arranged for the intervention programme with focus on improving knowledge and creating opportunities for participants to get exposed to goat milk health benefits and its consumption.

3.6.1 Study Design

The intervention programme was planned as a randomized controlled trial (RCT) design as the intervention participants were randomly assigned into control group and intervention group and followed for eight weeks. The control group will be known as waiting list group to the participants. The RCT is regarded as “one of the most valued

research methodologies for examining the efficacy or effectiveness of interventions” (Houle, 2015). Houle (2015) mentioned that it is consensus that RCT provides a design to make evaluation of causal relationships between variables possible and randomization approach in this design attempted to balance out between known and unknown confounding factors between the groups. Figure 3.7 shows the schematic diagram for the design of randomized controlled trials.

This Stage 3 nutrition education intervention took place over a span of eight weeks. Shapu et al., (2020) in a systematic review on “Effect of Health Education Intervention on Improving Knowledge, Attitudes and Practices of Adolescents on Malnutrition” found effective intervention programme varied significantly and could be as short as three weeks.



(Houle, 2015)

Figure 3.7: Schematic for the Design of Randomized Controlled Trials

All participants in control group and intervention group were asked to complete the questionnaire developed in Stage 2 of the study (pre-test). Each session of the intervention programme was conducted within 60 minutes, once per week, continuously for eight weeks. Only participants in the intervention group were exposed to the series of intervention programme and the control group were directed to carry on with their daily activities like normal. At the end of eight weeks, all participants were asked to complete the same set of questionnaires again (post-test). The outcomes from pre-test and post-test were used to assess the changes in knowledge, attitude, and practice towards goat milk.

3.6.2 Study Sampling (Group 3, Undergraduates from USIM and KUTAR)

The study population in this stage were university students from Universiti Sains Islam Malaysia (USIM) and Kolej Universiti Tunku Abdul Rahman (KUTAR). University students are largely the population in their late teens. It is important to gauge the KAP of this group of population as they will be entering adulthood and start making dietary decisions for themselves and their family in the near future. According to Salama and Ismael (2018), "identification of teen dietary practices is the first step towards promotion of adopting healthy eating habits. Good eating habits will help undergraduates not only to improve their nutritional well-being, but also to prevent nutrition-related diseases" (Salama & Ismael, 2018).

Recruitment posters were disseminated to USIM and KUTAR students using online platform such as the Facebook and WhatsApp groups. Interested students were invited to register themselves via Google form link provided in the posters. The

researcher then randomly assigned the participants into either the control or intervention group.

3.6.3 Inclusion and Exclusion Criteria

The interested students who registered themselves were filtered by using the inclusion and exclusion criteria as follow:

Inclusion criteria:

- Malaysian students studying in Universiti Sains Islam Malaysia (USIM) and Kolej Universiti Tunku Abdul Rahman (KUTAR)
- Aged 18 and above
- Must owned smartphone or laptop
- Students who have internet connection at least 20 min to 60 min once per week

Exclusion criteria:

- Students who do not give their consent to participate in the intervention programme.

Registered students who fulfilled the criteria were then randomly assigned into either the control or intervention group.

3.6.4 Sampling Size Determination

The sample size was determined using Open Epi Software (Dean et al., 2013).

From the software, the recommended minimum number of participants for intervention

programme using the RCT design were 34. However, taking into consideration that half of the total participants may actually dropped out during the course of educational intervention programme, the sample size was doubled up. Figure 3.8 shows to sample size calculated by Open Epi Software, Version 3.01

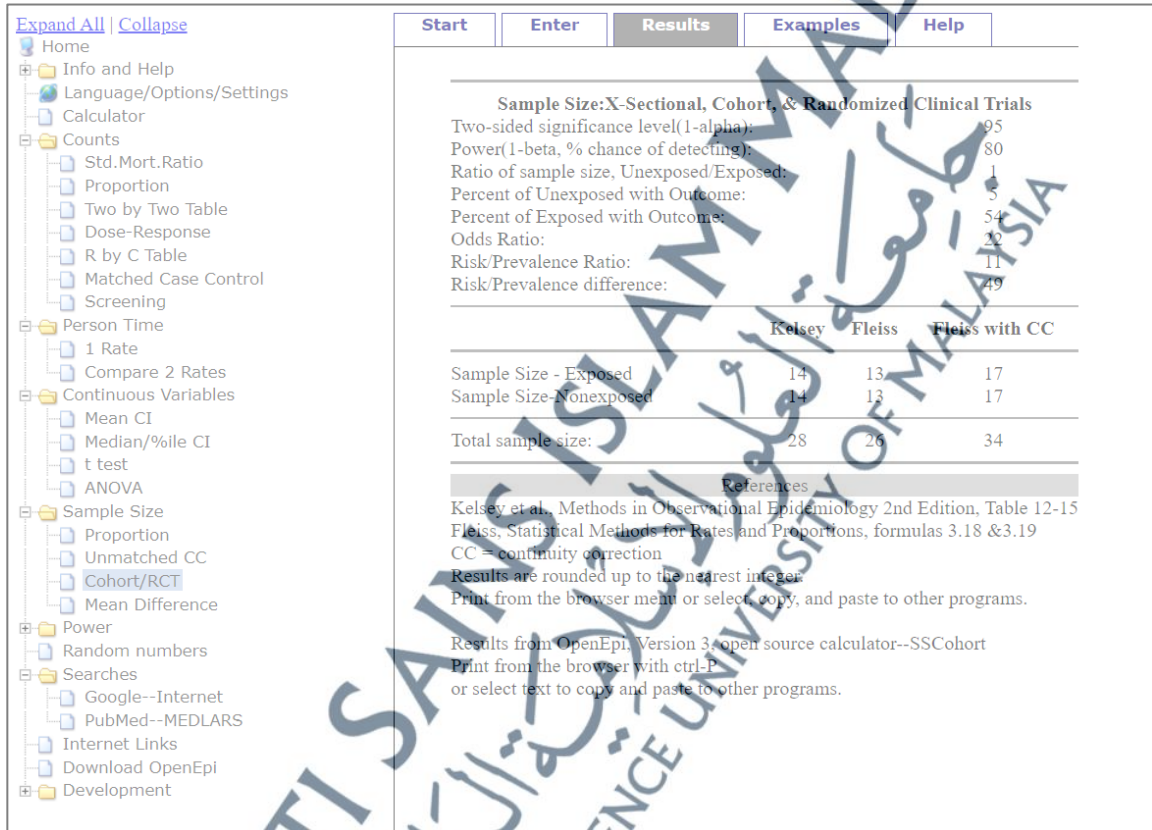


Figure 3.8: The Calculated Sample Size for Invention Programme

3.6.5 Sampling method

In order to recruit participants from USIM and KUTAR, recruitment posters were prepared with information such as inclusion criteria, campaign activities and mode of

delivery, what are expected from participants and enrolment details were included. Figure 3.9 shows the poster disseminated for recruitment purpose.

RECRUITMENT
(October - December 2020)

**Immediate vacancies:
Home-based
participants**

for Health Education
Intervention activity: Goat
Milk Benefits Awareness
Campaign

Come join us if you are:

- 18 years old and above
- Students in USIM or KUTAR
- Own a smartphone or laptop
- Have at least 20 minutes of internet access everyday

Where, When, What you get?

Where?	When?	What you get?
Stay Safe, At home No travelling needed	At your own time Campaign period Nov - Dec 2020	Free samples of Karlhome goat milk powder High quality mysterious gifts

How to participate?

Step 1 • Sign up, complete questionnaire via the QR code/URL

Step 2 • Engage in campaign activities (such as webinar, view videos, contest)

Step 3 • Complete exit questionnaire
• Get your free sample and mysterious gifts

To register or for more details, go to: <https://forms.gle/9t9e9p5chh1tCSR3> or scan the QR code here

For further, please contact Associate Professor Dr. Hani Ibrahim Mustafae
Faculty of Health Sciences, Health Sciences
University Sains Malaysia
Email: hani@hsf.usm.edu.my

Dr. Lee Cheng (PhD student) @ leecheng@usm.edu.my

Figure 3.9: Participants Recruitment Poster

The recruitment posters were disseminated to USIM and KUTAR students using online platform such as the Facebook and WhatsApp groups. Interested students were invited to register themselves via Google form link provided in the posters. A total of 152 participants were eligible. The researcher then randomly assigned the participants into

either the control or intervention group using simple randomization method. A free online random-picker tool known as “Picker Wheel” was used to achieve randomization. Figure 3.10 shows the interface of the Picker Wheel at randomizing the assignment of participants into control group and intervention group.

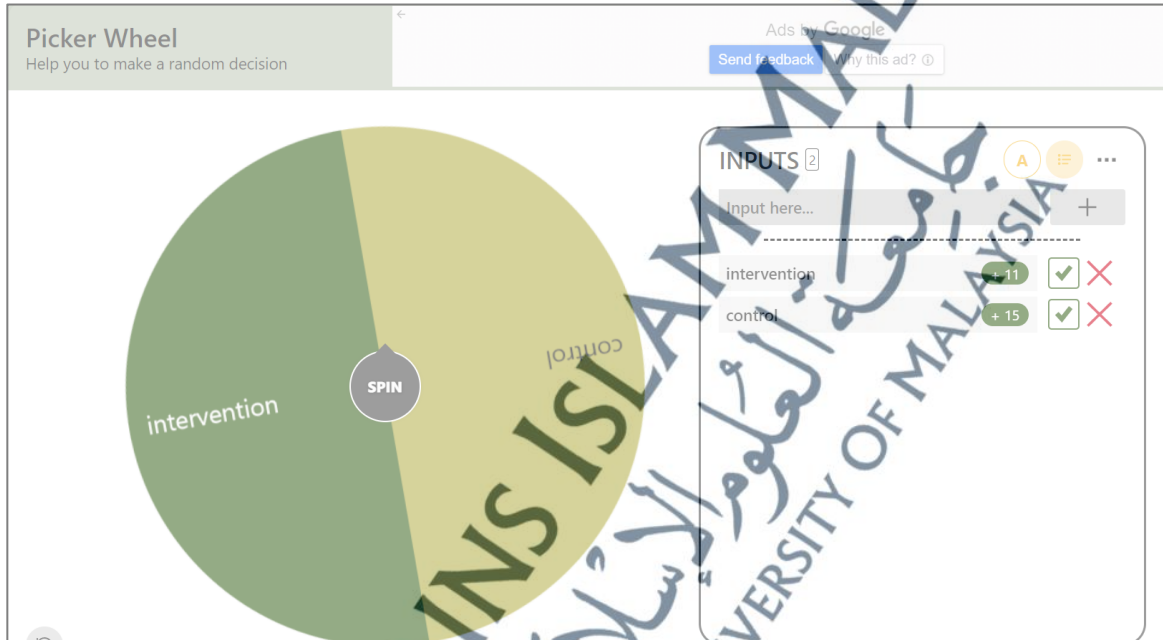


Figure 3.10: The Picker Wheel

3.6.6 Development of the Nutrition Education Intervention

“Eating well needs to be learned” is a phrase mentioned by Contento (2015) in her book *Nutrition Education: Linking Research, Theory, and Practice*. The general aim of nutrition education is to improve health and well-being among people. Nutrition education enhances people’s motivation, ability, and opportunity to take action. However, this good intention to educate the people comes with many challenges due to factors

affecting their dietary choice such as taste preference, cultural and social context, family and community motivation, time, price and food marketing practices (Contento, 2015). To minimize these challenges, a more meaningful nutrition education intervention was developed in this Stage 3 study by adopting the **DESIGN** method as suggested by Contento (2015). There were six steps in developing the intervention programme as follow:

Step 1: Deciding Behaviour Change Goals of the Intervention Based on Assessing Issues and Behaviours of Audience

- The targeted audience were university students from USIM and KUTAR who were willing to take part in the intervention programme.
- Dairy intake of Malaysians are below recommended level (Boniface & Umberger, 2012) to fulfil the balanced diet intake requirement, especially intake of goat milk is still low (Umar et al., 2017).
- Stage 2 study has shown that averagely about 53.8% of the respondents (N=398) has experience taking goat milk with 5.5% (n=22) of the respondents consume goat milk almost every day. The percentage of overall Malaysians taking goat milk on regular basis was presumed even lower.

Step 2: Exploring Determinants of Intervention Behaviour Change Goals

Summarizing from Contento (2015), there are three groups of determinants of food choice and dietary change as follow:

- Food-related determinants (taste preference, experience with foods, and social conditioning)
- Person-related determinants (such as perceptions towards foods, attitude, knowledge, and skills)
- Social and environmental determinants (food availability, accessibility, cultural, price, marketing activities, media influence)
- Knowledge of goat milk health benefits and attitude towards goat milk were chosen as possible determinants of goat milk consumption. Literature review has shown that educational interventions improve knowledge and attitude, and the improved knowledge enhances practice (Rav-Marathe et al., 2016).

Step 3: Selecting Theory and Clarifying Intervention Philosophy

- Based on the determinants in Step 2, the Knowledge, Attitude, and Practice model was selected to study the correlation and effects of knowledge of goat milk health benefits, attitude towards goat milk, and practice of goat milk consumption.

Step 4: Indicating Objectives: Translating Behavioral Theory into Educational Objectives

After completing the intervention programme, participants should be able to:

- demonstrate an increased in knowledge by having a higher total mean score in post-test compared to pre-test.

- demonstrate a more positive attitude towards goat milk by having a higher total mean score in post-test compared to pre-test.
- Demonstrate a higher goat milk consumption behaviour by having an increased in practice total mean score in post-test compared to pre-test.
- Short Term Impact: Knowledge, attitude and consumption of participants significantly increase.
- Long Term Impact: The consumption of goat milk significantly increases.

Step 5: Generating Educational Plans: A Focus on Enhancing Motivation for Behaviour Change and Taking Action

The Online-based campaign activities were shown in Table 3.18

Table 3.18: Online-based activities for the Intervention Programme

Time	Online-based activities	Platform	Targeted Determinants/ Constructs
Week 1	<ul style="list-style-type: none"> • Introduction and briefing about the campaign. • Pre intervention survey • Pamphlet dissemination 	WhatsApp, Google Form	Knowledge
Week 2	<ul style="list-style-type: none"> • Online webinar entitled: <i>Karihome®: Goat Milk Benefits</i> by Nutritionist from Orient Europharma (M) Sdn Bhd (Karihome®) • Q&A session at the end of webinar. • Prizes were given to participants who won the Quiz based on the webinar. • Participants were invited to share their view about the webinar in WhatsApp group for this week. 	Google Meet, WhatsApp	Knowledge, Attitude

Table 3.18, continued.

Time	Online-based activities	Platform	Targeted Determinants/ Constructs
Week 3	<ul style="list-style-type: none"> • Video on goat milk production, processing, and quality control • Participants were invited to share their view about the video in WhatsApp group. 	Goat Milk Campaign YouTube Channel https://youtu.be/mPHZ8aL75ng https://youtu.be/8NsrUWnNcM0 https://youtu.be/rnvQale0dWY	Attitude: To cultivate positive attitude in participants towards goat milk quality and nutrition
Week 4	<ul style="list-style-type: none"> • Animated PowerPoint video summarizing goat milk benefits. 	WhatsApp	Knowledge: To strengthen knowledge
Week 5	<ul style="list-style-type: none"> • Testimonial videos from satisfied goat milk users. • Survey on participants interested to try goat milk through WhatsApp. 	Goat Milk Campaign YouTube Channel	Attitude: To foster a positive attitude towards goat milk consumption.
Week 6	<ul style="list-style-type: none"> • Posters of goat milk benefits • Karihome® commercials 	WhatsApp, Goat Milk Campaign YouTube Channel	Knowledge To increase the intention to consume goat milk.

Table 3.18, continued.

Time	Online-based activities	Platform	Targeted Determinants/ Constructs
Week 7	<ul style="list-style-type: none"> Participants receive free samples. Post selfie with goat milk and short description of tasting experience. Participants with >50 likes in social media gets special prize. 	WhatsApp, Facebook, Instagram	<p>Practice:</p> <p>To provide opportunity to try goat milk.</p> <p>To increase goat milk consumption.</p>
Week 8	<ul style="list-style-type: none"> Prize giving to “most likes” winners. Karihome online sales, special discount code. Evaluation, Post-intervention survey 	WhatsApp, Google Form	<p>Attitude, Practice:</p> <p>To cultivate positive attitude towards goat milk.</p> <p>To provide access to goat milk availability.</p>

Step 6: Evaluation

After the end of Goat Milk Health Benefits Awareness Campaign, participants from intervention group and control group were required to answer the questionnaire in post-test. There were a total 58 participants from intervention group and 58 participants from control group completed the whole intervention programme. Participants numbers for each group at the beginning and number of participants that completed the intervention programme were as shown in Table 3.19.

Table 3.19: Participants numbers for intervention programme

	Control group	Intervention group
Recruited (pre-test)	74	78
Completed the intervention programme (post-test)	58	58
Response rate	78.4%	83.3%

3.6.7 Demographic variables

Demographic variables such as gender, literacy and age were included in the study. The participants' names were set as optional to allow for anonymity and confidentiality of the sample. Proper coding was utilized to facilitate the data analysis.

3.6.8 Data Analysis

Data collected from participants at the pre-test and post-test stage after eight weeks were analyzed using SPSS version 25.0. In order to answer to the research question, the total mean score for each variable were calculated and compared using

paired t-test. Independent t-test was used to compare mean differences between the control group and the intervention group.

3.7 Ethical Approval

Ethics approval was obtained from the Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia (NMRR-14-1550-22905). The study was part of project under the Niche Research Grants Scheme (USIM/NRGS_P11/FPSK/8411/52113) supported by the Ministry of Education. Refer Appendix 1.

3.8 Conclusion

The chapter started discussing the different types of research methodologies by explaining the appropriate research method and research design of the study. The study is a mixture of correlation and causal research. Research methods and the study sample have been selected according to the guidelines of previous studies.

Stage 1 of the study focused on mediation effect of health consciousness in a TPB model. Self-administered questionnaires were used as the source of data collection from W.P, Kuala Lumpur, Putrajaya and Selangor. The collected data were transformed in digital form by using SPSS (25 windows version). Moreover, the researcher utilized SPSS 25 and SmartPLS 3.0 for the data analysis. It also reported the criteria for validating the measurement and structural models.

In a nutshell, Stage 2 used stratified sampling technique and data were collected from the 5 regions of peninsular Malaysia and Sabah and Sarawak region of East Malaysia. Data analyses were guided by the KAP model and performed using

SPSS version 25.0. The phases in development and validation of the questionnaire were also reported in detail.

Lastly, in Stage 3 nutrition education intervention was conducted through web-based campaign. Development and delivery of the goat milk health benefits campaign were meticulously reported in this chapter. Questionnaire used in intervention pre-test and post-test were similar to Stage 2.

In summary, the Chapter 3 is closed by summarizing the overall research design of the study. The analyzed results are discussed in Chapter 4 and discussions and conclusions are summarized in the final chapter of the study.

