CHAPTER III

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter provides a detailed report of the research methodology utilized to explore the security knowledge, awareness security functionality, training, attitude and behavior among users of smart phone. This chapter also discusses the specific steps of the research methods: population and sampling technique and sample size, research instrument development and design, the pilot study, the psychometric properties (reliability and validity), data collection procedures, and the data analysis plan. The description of this research process is shown in Figure 3.1.

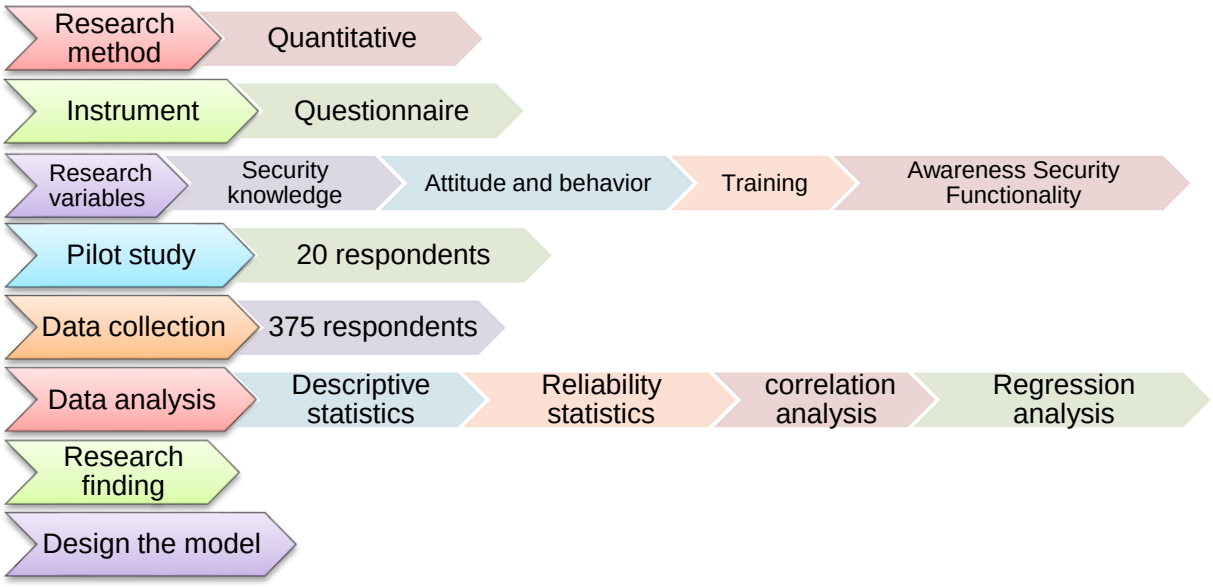

Figure 3.1 Research Process

3.2 RESEARCH METHOD

A quantitative research method was used to explore the security knowledge, awareness security functionality, training, attitude and behavior among the users of smart phones. Data were collected from students (smart phone users) in USIM by using a survey questionnaire. The numerical data collected from smart phone users in USIM were statistically and descriptively analyze by using SPSS.

3.3 DATA COLLECTION PROCEDURE

A questionnaire was adopted from (Androulidakis and Kandus, 2011) and employed to collect data for the purpose of examining security knowledge, security functionality, training, attitude and behaviour. Questionnaire items were restructured and revised to make them appropriate to the present study. Prior to the actual data collection, a pilot study was conducted to test the suitability of the questionnaire among students who are smart phone users in USIM. The main objective of the pilot study is to validate and review the reliability of the questionnaire. The survey took about three weeks of January 2015. The responses were collected randomly from students of all the faculties who range from 20 to 35 years.

3.4 POPULATION

The population of the study covers elements that fulfil the conditions required to achieve the study objectives (Burns and Grove, 2003). The population comprises of all registered students studying at USIM.

3.4.1 Sampling Technique and Sample Size

Given that the present study is quantitative in nature, it is appropriate that 375 samples are selected from the student population at USIM. Sample size determination and tackling the non-response bias is crucial in collecting data from the population sample (Sekaran, 2006). The sample was randomly selected in order to provide every student at the university with an equal chance of being selected.

3.5 RESEARCH INSTRUMENTS

The study employed questionnaire as an instruments. The questionnaire can be described as a simple and rapid instrument for data collection that involves less time along with less effort. Through this instrument, a significant number of individuals can be included (Khan, 2009). Hence, it is crucial to develop a set of questionnaires that can capture the relevant information to fulfill the aims of the study. In the present study, a questionnaire is primarily employed to examine knowledge awareness level, security

knowledge, awareness security functionality, and training, attitude and behavior in the realm of knowledge awareness, among smart phone users.

Table 3.1 Design of the questionnaire

Sections	Subjects
A	Demographic Profile of Respondents
B	Security Knowledge
C	Awareness Security Functionality
D	Training, Attitude and Behavior

Accordingly, the questionnaire is categorized into four sections from A to D. The sections and their contents are presented in Table 3.1. According to the table, the variables that were examined include security knowledge, awareness security functionality, training, attitude and behavior. In order to guarantee that the content validity of the study scales, the items measuring the constructs should be able to reflect the concepts upon which the generalizations are developed. As a result, the items that are chosen for the study constructs were adopted from past studies to ensure their content validity.

3.6 Pilot Test

As mentioned above, the survey questionnaire was piloted with 20 respondents from USIM students. These numbers of respondents were deemed suitable

for the pilot study as data collection at this phase is focused on updating the survey to align it to the preferences of a small group of respondents. The result from the pilot study is to validate the survey instrument and its answer ability. The pilot study was conducted to enhance the questionnaire quality and efficiency. Additionally, the pilot study was conducted to highlight the ambiguity in the questionnaire design which has to be addressed prior to the carrying out of the actual data collection.

3.7 Data Analysis

Analysis of the data requires the data transformation into usable information following its collection. Accordingly, data collected from the USIM students were analysed with the help of descriptive statistics, reliability statistics, Pearson Correlation Analysis and Regression analysis. The descriptive statistics test was employed to provide an insight into the main features of the collected data from the students through the provision of a simple summary utilizing frequency, proportion and central tendencies (means and standard deviations). Moreover, reliability statistics test was employed to gauge the reliability score – a measure of the score's internal consistency based on coefficient alpha level of 0.50 (Cronbach, 1951) as proposed by (Sekaran, 2000). Furthermore, a correlation analysis was conducted on the entire variables to determine the occurrence of multicollinearity and regression analysis was to examine the variables relationships. In short, the above analyses function comes in the following way;

1. Descriptive statistics provide a description of the fundamental data features, provide summaries of the sample and measure simple graphics analysis that is distinct from inferential statistics.
2. Cronbach alpha provides a measurement of the internal consistency and the reliability of the items in light of the ratio of true score variance in order to observe the score. Reliability and validity test through Cronbach alpha was conducted, with the minimum accepted level as 0.50.
3. Pearson correlation analysis was employed to measure the level of the relationships among the study variables. The accepted level of Pearson correlation significance is 0.05.
4. Regression analysis is a statistical process for estimating the relationships among variables; the use of regression is to make quantitative predictions of one variable from the values of another.

3.8 Proposed Model

In this study, research model and hypothesis were set to analyze the relationship between the dependent and the independent factors that may impact the level of security functionality awareness. Each of the factors of the security functionality awareness model is aimed at producing a specific type of effect on security awareness. Each type of effect is an essential aspect of good security awareness. The purpose is to find the factors that

might affect the level of security functionality awareness. After reviewing the relevant work, the factors are as follow:

3.8.1 Security Knowledge (what users know)**:** is the ability of users to distinguish threats or attack they might encounter while using their smart phones and how far they care to protect their data (Ahmed and Arash, 2011). According to previous studies, the factors that affect security knowledge lead us to the model presented in Figure 3.2.

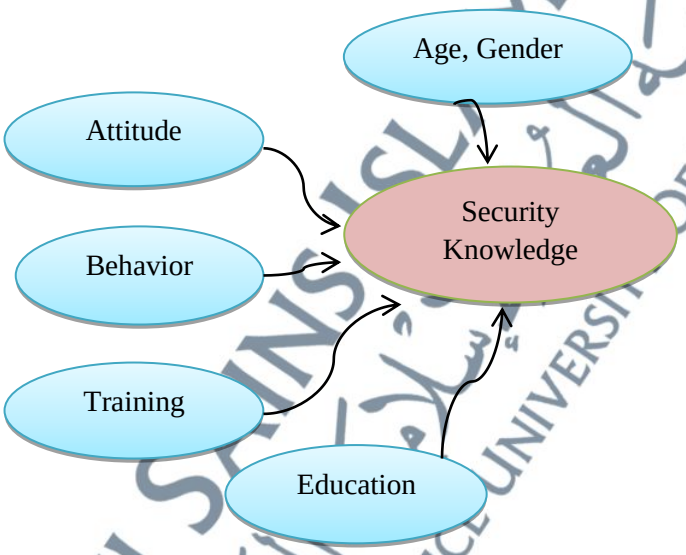

Figure 3.2 Factors affecting Security Knowledge.

3.8.2 Awareness of Security Functionality

Security functionality is the functions through which smart phones can be protected. For this purpose, the factors that can affect the awareness in these functions are the amount of security knowledge, and authentication method**.**

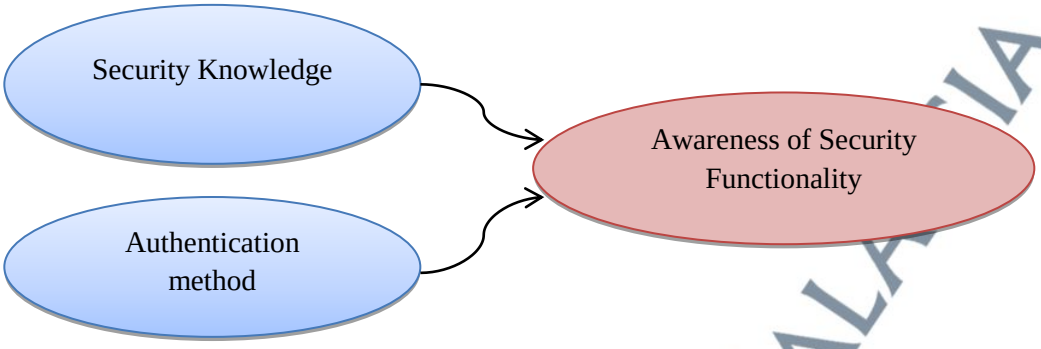

Figure *3.3* Factors that affect awareness of security functionality.

3.8.3 Attitude, Behavior and Training

Attitude (what users think) is one of the determining factors in predicting people's behavior (Kutluca, 2011). Attitude affects user's security smart phone in everything they do. Therefore, attitude is an individual's degree of like or dislike for an item or service.

On the other the behavior (what users do) is a technique that is followed by the user in the protection of mobile devices and how to deal with risk and threat in order to keep their device protected.

Training is a method of educating users, and the purpose of this study. Security awareness training is educating users about smart phone on how to protect their information and their smart phone. A goal of security awareness training is user perception and attention to the dangers that surround it from all sides (Lamour, 2008).

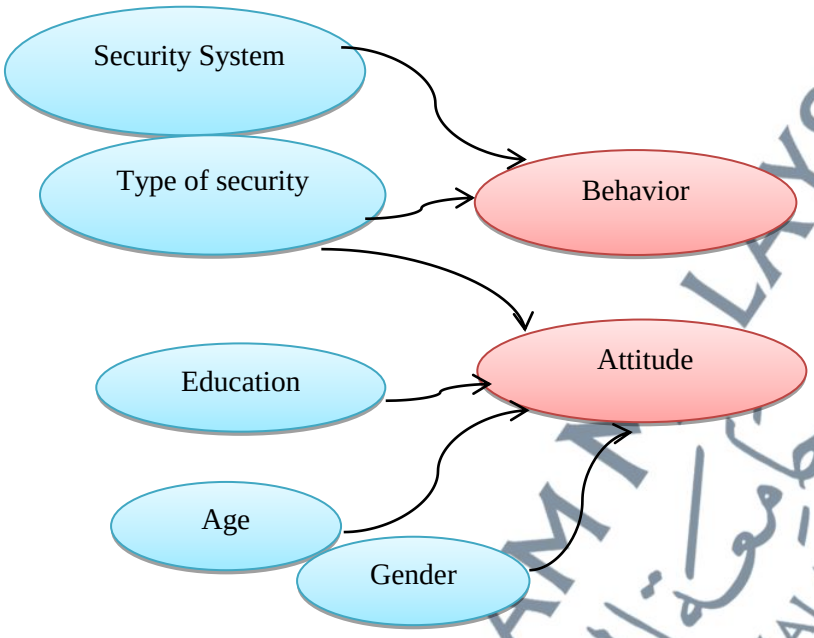

Figure *3.4* Factors that affect attitude and behavior.

Considering the proposed factors that are impacted the level of security functionality awareness model, including the security knowledge, security functionality, attitude, behavior, and training as they relate to smart phone security, which might affect users' security level, so that a model concept for the security functions of the smart phones is proposed in Figure 3.5. This model helped to achieve the study goals, as well as in the detection of relations between the variables of the study. This model has been designed after studying related factors. The main objectives of the design of the form are to discover the relationship between the variables of the study and the impact of each variable on the others.

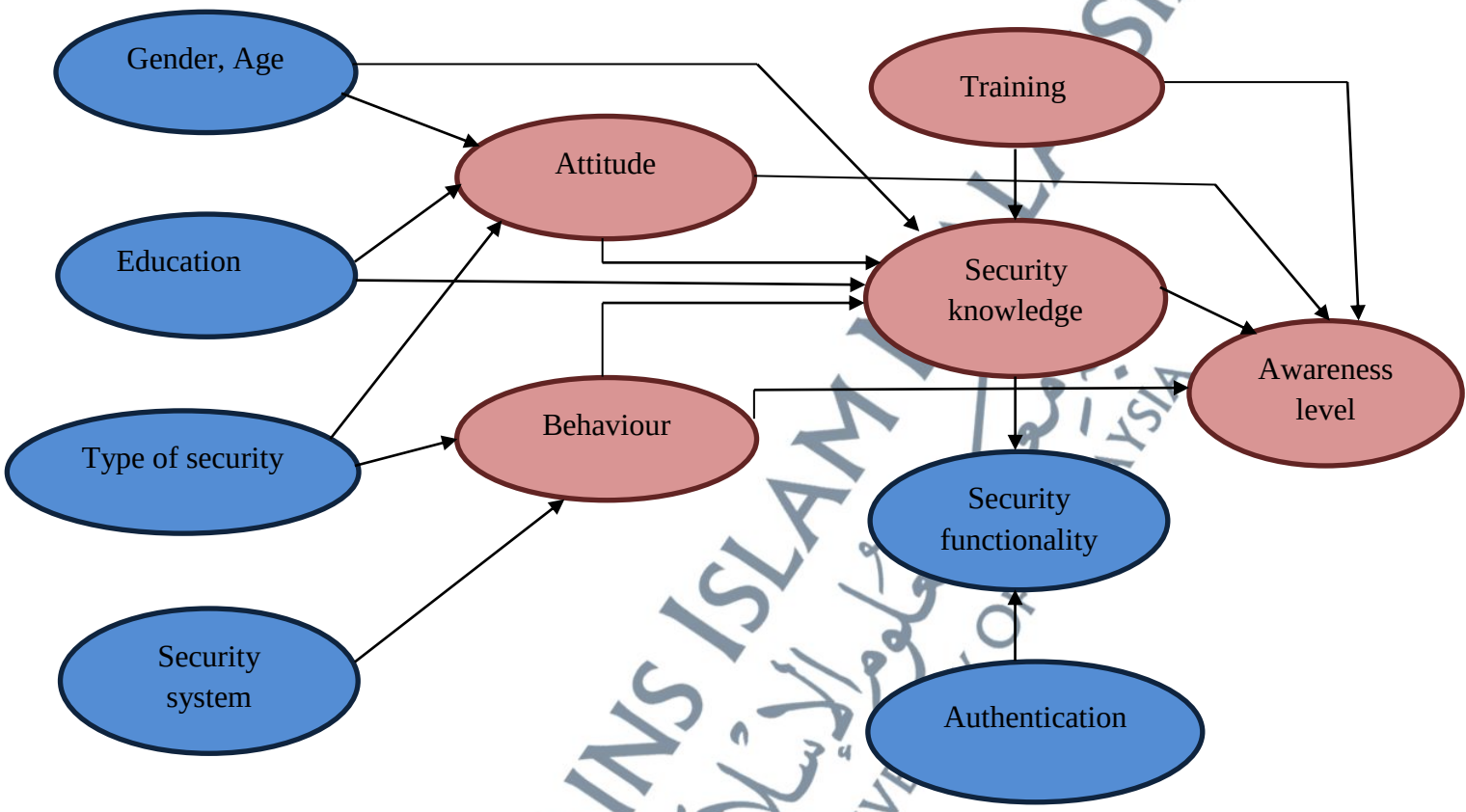

Figure 3.5 Relationship between variable

3.9 Stages to Achieve the Objectives of the Study

As described in table 3.2, the first objective is to identify the current level of awareness security functionality in smart phone; a survey study was adopted to achieve the first objective, where data is collected by questionnaire.

The second objective is to identify the relationship between the factors that might affect the level of awareness.

The third objective is to design a model of smart phone security functionality awareness. Through reviewing previous studies which has been proposed models on smart phone security functionality awareness. This model examines the factors affecting the level of awareness security functionality in smart phone security functionality

Table 3.2 Stages to achieve the objectives of the study

Objectives	Approach	Data collection	Data analysis type
1- To identify the current level of awareness security functionality in smart phone	Quantitative	Questionnaire	Mean
2- To identify the relationship between the factors that might affect the level of awareness.	Quantitative/ Proposed model	Questionnaire	Correlations Analysis
3- To design a model of smart phone security functionality awareness.	Study the factors	Literature review/ Questionnaire	Regression Analysis

3.10 SUMMARY

This chapter clarifies the study methodology utilized to examine knowledge awareness level, security knowledge, awareness security functionality, training, attitude and behavior among the users of smart phone on the basis of the collected and analysed data. Specifically, a quantitative method of data collection was employed, which involved the use of a survey questionnaire. The questionnaire collected numerous data from USIM students. Prior to the actual survey, a pilot study was conducted to validate the questionnaire items. The next chapter explains the result and fining for this methodology.