A Non-Parametric Analysis of the Effects of Religious Belief on Health Risk Perception – A Case Study of Asikuma-Odoben-Brakwa District.

By

Selasi Kwaku Ocloo

(10513130)

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DECLARATION

I, Selasi Kwaku Ocloo, hereby declare that this thesis is my own work produced from research undertaken under supervision and that all the sources that I have used or quoted have been indicated and duly acknowledged by means of complete references. Finally, I wish to assert that this work has neither been published nor submitted to any other institution for an academic award.

SELASI KWAKU OCLOO

Signature: ……

Date: ……

CERTIFICATION

We, the undersigned, certify that we have read through this research work and recommend for the acceptance of this thesis entitled "A Non-Parametric Analysis of the Effects of Religious Belief on Health Risk Perception - A Case Study of Asikuma-Odoben-Brakwa District", written and submitted by Selasi Kwaku Ocloo (10513130) to the Academic Board of the Graduate School of University of Ghana in partial fulfillment of the requirements for the award of Master of Philosophy degree in Statistics.

Supervisor: Prof. J.B. Ofosu

Signature.....

Date: .....

Co-Supervisor: Prof. O.A.Y. Jackson

Signature: .....

Date: .....

Head of Department: Mr. C.A. Hesse

Signature: ……

Date: ……...

DEDICATION

This research work is dedicated to the Almighty God for His guidance throughout my studies. It is also dedicated to my Dad, Mr. Percy Ocloo, who has been very supportive to me through constant prayers, encouragements and finance.

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ABSTRACT

Risk research has found significant differences in perceptions among groups of individuals divided by gender, age, religion, etc. Successful research in risk perception improves risk communication, as it helps policy makers and stakeholders direct education efforts appropriately.

In this study, we evaluate the effect of religious belief on health risk perception in order to justify reasons for further research.

A total of 343 public sector workers from the Asikuma-Odoben-Brakwa district in the Central Region of Ghana participated in the study. The hypotheses tested focused on the effect of religious belief on health risk perception using non-parametric statistical methods.

The results from the study concluded that religious belief has effect on health risk outcomes but overall, risk behaviours based on ten risk issues studied do not seem to be associated with religious belief. It implied that religious belief may not have so much to do with an individual's perception of health risk.

It also came to light that an individual's assessment of risk has little to do with his/her encounter with risk: it may have rather more to do with the knowledge the individual have about the risk.

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INTRODUCTION

1.1 Background of Study

People take decisions each day of their lives. Majority of these decisions contain certain elements of risk. Paragliding, driving on a high way, investing in stocks, or spending resources in hopes of achieving specific goals all may contain levels of risk. The outcomes are unknown, hence the possibility of an injury or a loss due these actions or activities (Streufert and Taylor, 1971).

Risk aversion is an important factor worth considering in explaining many everyday decisions. Among these are decisions to go for regular medical check-up, avoiding drinking in excess and smoking and also a decision to handle work load such that it doesn't get stressful and its related effects (Weber, 2013).

Risk can be defined as the effect and impact of uncertainty on objectives. Uncertainties include events which may or may not happen. It also has both positive and negative effects and impacts on objectives. This definition was proposed by representations of over 30 countries and was based on the input of thousands of subject matter experts (Wikipedia, 2013).

A number of different measures that were designed to tap individual differences in risk taking propensity have been proposed. But it's worth knowing that people who are risky in one situation or on one measure may not be risky if tested in a different setting or on a different test. A possible solution to this problem will be preferably to ask people how risky they think they are, thus the way they perceive those risks. (Streufert and Taylor, 1971).

1.2 Global impact of a study in Risk Perception

Public risk perceptions can basically compel or constrain political, economic, and social action in relation to addressing a particular risk. The public have some form of power either to support or oppose policies (regulations, tax, and subsidies). Leiserowitz (2005) revealed that climate policies for instance, were greatly influenced by public perceptions in relation to the risks and dangers posed by it.

Attitudes of individuals towards risk are likely to affect the tendency to engage in behaviours that either increase or decrease mortality risk (Nielson et al. 2011).

Though, studies in tourism revealed some tourism environments may be unsecured, individuals waiver the benefits of it against the risk involved. In this sense, risk is seen to be normal in daily life and Shakya (2011) sees no sense in call being made to dismiss tourism.

1.3 Risk assessment methods

A number of different theories and methods have been used to measure risk perception such as cluster analysis, the psychometric paradigm, multi-dimensional scaling, self administered questionnaires, five-item self-report, risk involvement scales, risk perception questionnaires, comparative risk analysis and the fearful/not fearful measuring scale. Each of these methods or techniques has been used to measure risk either subjectively or objectively. Subjective measures are the most common methods used to measure risk perception. Risk is measured in different ways according to the environment and the person taking the risk. For example, when dealing with economic situations, a person is not going to make the same type of decisions or judgments, as would someone working in an industrial setting. Risk is defined differently when assessed within different contexts (LaTanya, 2003).

The psychometric paradigm approach is one of the widely used approaches in risk perception research. Since 1978 till date, it has been used in dozens of studies by several researchers and for many different purposes (AF-Wahlberg, 2001).

The approach utilises questionnaires and factor analytic procedures to extract primary and secondary dimensions of risk perception. The approach assumes that human risk perception is multidimensional and therefore can be measured by developing scales (AF-Wahlberg, 2001).

1.4 The Study Area

Risk perception research has gained more and more attention in the academic literature in recent decades as an essential part of risk management (Renn, 1998).

Research in risk perception has found significant differences in perception between groups of individuals based on gender, religion, age groups and cultural settings. A more pragmatic research into religious belief (as a factor in Risk Perception) needs to be made due to striking demographic characteristics from the 2010 Population and Housing Census of the Ghana Statistical Service. Out of 24,658,823 people enumerated, 23,356,746 representing 94.7%, have some form of religious affiliation.

Weber, in 2013, found out that Protestants and atheists tend to be less risk averse relative to people from other denominations. How true is the assertion? How significant is this difference relative to other factors such as gender?

The extents to which these religious beliefs influence daily decisions therefore need to be assessed and analysed.

1.5 The Research Population

The research population was the public sector workers in the Asikuma – Odoben – Brakwa district of the Central Region of Ghana. The choice of this population was to give a range of people with differing socio-demographic characteristics and religious beliefs. The data sampling was conducted by structured interviews using the questionnaires formulated for the study. A combination of purposive and disproportional stratified sampling was used to choose individuals.

The purpose of this sampling strategy was not to achieve a representative sample of the population but to gain a spread of individuals with heterogeneous, socio-demographic characteristics and religious beliefs so that between-group differences could be evaluated.

1.6 Problem Statement

Assessment of risk is a systematic approach used to estimate the magnitude of risk and adverse human health effects an exposure to a toxic chemical or other hazard may have on an individual or group of people. However, the reliability and accuracy of this process depends on the quantity and quality of the information.

Diseases influence the psychological bases of people's behaviours, and then may have an impact on their choices and preferences. Likewise, religious beliefs through many researchers have been seen to have impact considerably on the daily behaviours and decisions individuals take.

Slimak and Dietz (2006) found that religious beliefs account for 6% of the variance in ecological risk perception and do not show a consistent pattern in predicting ecological risk perception.

However, no research or relatively little research has been conducted on religious belief and its influence on how people perceive risk especially in Ghana.

Thus, the purpose of this study is to investigate whether religious belief significantly affects health risk aversion, by conducting an empirical study through data collected from the public sector workers in Asikuma-Odoben-Brakwa district.

The findings are expected to complement and add to existing knowledge on the argument on religious belief and risk perception.

In this study, we investigate or compare the means of a single factor, thus religious belief with six (6) different levels (religious groups).

The objective of this study is to find out if $E\left(y_{ij}\right)=\mu_i$, where

$$y_{ij}=\mu_i+E_{ij}\begin{Bmatrix} i=1,2,...,6 \\ j=1,2,...,n \end{Bmatrix},$$

y_{ij} is the jth (each) observation made for each religious faith group, μ_i is the means of the observations made under each religious faith group, and E_{ij} is the random error component that incorporates all sources of variability in the study.

1.7 Aims of the Study

This study will bring to light if religious belief is a factor worth considering when evaluating the perception of individuals in relation to risk. In summary, the aims of the study are to:

1. Identify the effect of religious belief on health risk perception.
2. Identify if an individual's experience with a health risk influences his/her perception of the risk.

1.8 Research Questions

Does the difference in religious belief imply a significant difference in health risk perception?

Will an individual who has had an encounter with a health risk, rate the risk associated with that health risk high?

1.9 Research Hypothesis

1. H_{o1}: There is no difference in an individual's perception of health risks based on his/her religious belief.

   H_{11}: There is difference in an individual's perception of health risks based on their religious belief.

2. H_{o2}: There is no association between an individual who had encountered a health risk and his/her risk perception of that health risk.

   H_{12}: There is an association between an individual who had encountered a health risk and his /her risk perception of that health risk.

1.10 Significance of the study

A successful research on health risk perception will help policy-makers in the area of improving communications between them (the experts) and the lay people (Slovic et al. 1982).

Variations in the responses on participants will be analysed to ascertain the progress made by health risk communicators.

1.11 Definition of Terms

1. Risk: the possibility that something bad or unpleasant (such as an injury or a loss of an asset) will happen.
2. Risk perception: *Risk perception* is the subjective judgment that people make about the characteristics and severity of a risk.
3. Religious belief: strong belief in a supernatural power or powers that control human destiny.
4. Riskiness: a state of danger involving risk.
5. Fatality: an accident or disaster resulting in death.

CHAPTER TWO

LITERATURE REVIEW

2.1 Religious Beliefs In Ghana

Religions in Ghana have various belief systems which in one way or the other make them unique. The Constitution provides for freedom of religion, and the Government generally respects this right in practice.

Christian denominations include Roman Catholic, Methodist, Anglican, Mennonite, Evangelical Presbyterian, Presbyterian, African Methodist Episcopal Zionist, Evangelical Lutheran, F'eden, numerous charismatic faiths, the Church of Jesus Christ of Latter-day Saints (Mormons), Seventh-day Adventist, Pentecostal, Baptist, and the Society of Friends. Christianity often includes an overlay of traditional beliefs (U.S. State Department, 2003).

Various Christian denominations are well represented in Ghana. The Volta Region has a high concentration of Evangelical Presbyterians. Many Akwapim are Presbyterians, and the Methodist denomination is strongly represented among the Fante. The Roman Catholic Church is fairly well represented in Central Region and Ashanti Region. Although no official figures exist to reflect regional distribution of the various denominations, it is generally agreed that the southern part of the nation is more Christian, while the north is more Islamic (The Library of Congress, 2010).

Three dominant Islamic orientations are represented in the country: the Wahhabi-oriented Ahlussuna, the Tijanis, and the Ahmadis. A small number of Shi'as are also present. The majority of the Muslim population is concentrated in the urban centers of Accra, Kumasi, Sekondi-Takoradi, Tamale, and Wa, and in northern areas of the country. The majority of the followers of more traditional religions mainly reside in the rural areas of the country. Christians live throughout the country (U.S State Department, 2003).

Religions which are considered to be "foreign" include the Baha'i Faith, Buddhism, Hinduism, Shintoism, Ninchiren Shoshu Soka Gakkai, Sri Sathya Sai Baba Sera, Sat Sang, Eckankar, the Divine Light Mission, Hare Krishna, and Rastafarianism (U.S State Department, 2003).

Traditional supernatural belief differs according to ethnic group. Akan religion acknowledges many spiritual beings, including the Supreme Being, the earth goddess, the higher gods (*abosom*), the ancestors, and a host of spirits and fetishes. Each family usually reveres its important deceased members both individually and collectively. They are believed to exist in the afterlife and protect or punish their descendants, who must pray and sacrifice to them and lead upright lives. Ancestral beliefs are also built into traditional rites, as the ancestors of the royal family especially deceased kings and chiefs serve as major central focus for general public observance like festivals (Berry, 1994).

Other ethnic groups also worship through the intercession of priests and chiefs. Ga observances focus on the *'wulomei',* the priests of the ocean, inlets, and lagoons. (Berry, 1994).

Ghana Statistical Service (GSS, 2013) in reporting the findings of the 2010 Population and Housing Census, revealed that about seventy-one percent of the population (71.2%) reported to be Christians (Catholic, Protestant, Pentecostal/Charismatic and other Christians) in 2010, followed by Islam (17.6%) and Traditionalists (5.2%) (Table 2.1). About five percent (5.3%) indicated that they had no affiliation to any religion. While the proportion of people with no religious affiliation, traditionalist and the orthodox churches (Catholics, Protestants) slightly declined between 2000 and 2010, the proportions of Pentecostals/Charismatic, Islam and other Christians increased over the period.

Religion	2000	2010
Total	18,912,079	24,658,823
No religion	6.1	5.3
Catholic	15.1	13.1
Protestant	18.6	18.4
Pentecostal/Charismatic	24.1	28.3
Other Christian	11.0	11.4
Islam	15.9	17.6
Traditionalist	8.5	5.2
Other	0.7	0.8

Table 2.1 Population by religious affiliation: 2000 and 2010, from GSS

The impact of these religious groups on various aspects of our social being and decision making process cannot be over emphasised. All these religious groups demonstrate varied teachings, origins and ideologies which could in a way influence their risk taking or avoidance ability.

2.2 Effects of belief on decision making

Though national cultural values have been a major factor in research study on cross-culture, beliefs are seen to be sometimes more useful in explaining cross-cultural differences in relation to certain specified attitudes or behaviours. People deciding a course of action to take consider their beliefs, the likely consequences of that course of action, resources that may be required to perform such an action and the possible impediments they are likely to face. These beliefs tend to influence their behavioural intentions and their actual behaviour. Beliefs are mostly a mediator between attitudes and cultural values (Fu et al. 2004).

Noussair et al. (2012), in their research, found out that Protestants are seen to hold stronger beliefs and are more active in terms of church attendance and frequency of prayer than Catholics. Though Catholics and protestants are almost equally risk averse (making safe decisions), protestants are more risk averse. Thus they make more safe decisions than Catholics.

2.3 Supernatural Powers: "Fear of Supernatural Punishment" Hypothesis (FSPH).

According to the FSPH which was defended by Bering et al. (2005), an individual who believes in the ability of a supernatural agent (understood as actually supernatural beings, as well as mere humans in possession of supernatural powers) are less likely to break established social norms or otherwise disrupt group stability.

Buorrat et al. (2011) made two basic predictions in their analysis of supernatural punishment and individual social compliance across cultures; positive correlation between pro-social behaviour of individuals and beliefs about supernatural punishment; positive connection between community size and the dominance of such beliefs. However, neither of the correlations was statistically significant after controlling potentially confounding variables. Buorrat et al. (2011) explained further that FSPH provides a good justification for the emergence or early evolution of religions but may not be suitable for explaining successive cross-cultural differences that may arise through cultural evolution, especially as community size increases.

Religious systems in Ghana have a form of belief in supernatural being which may be a force compelling individuals to take or avoid certain actions.

But how strong are these influences? Is there then a relationship between the concept of supernatural power and an individual's reaction to risk? Do individuals avoid risk or take certain risk based on a belief or trust in a certain supernatural force

2.4 Socio - Demographic Factors and Risk

A socio-demographic is a word used to describe an element of a group within a society or Socio-demographic factors refer to a set of variables such as a given population's age, ethnicity, or SES (socioeconomic status) whether they reside in an urban or rural area.

The 2010 Population and Housing Census by the Ghana Statistical Service (GSS) captured demographic characteristics such as literacy, age, level of education, attendance to school, etc. Kellens et al. (2011), asserts that an individual's socio-demographic characteristics can play an important role in shaping risk perception of natural hazards. For example, risk appears to be a gendered phenomenon: men are less risk averse than women. Women and men according to Booth and Nolen (2009) differ in their propensity to choose a risky outcome because of instinctive preferences or because their instinctive preferences are modified by pressure to conform to gender-stereotypes.

Marinaccio et al. (2013) suggest that the assessment and management of work-related stress risk should consider specific socio-demographic and occupational risk factors such as sex, age, educational status, job status, shift work, commuting time, job contracts, etc.

2.5 Risk perception theories and methods

An individual's assessment of a situation is the determining factor in labelling a situation as risky or not. If one person sees something one way and another sees it in a different way, then their perception of the situation is different and they may go about dealing with it in different ways.

It is essential to understand risk perception when dealing with individuals and things such as job placement and culture. Someone who is considered to be high-risk might be quick to do a task without thinking versus someone who is considered to be low risk. Attempting to

know the level of risk that someone is willing to take is what is called risk assessment (LaTanya, 2003).

Risk assessments are essential to control the level of risk and are in daily activities. Risk assessments are the things that come naturally with the preparation for any activity. This is something that cannot be measured on a scale but rather depends on the knowledge the person has on the risk related to such activity.

Boholm (1998) reviewed researches that have been made in risk perception within a period of twenty (20) years. Boholm revealed that most of the researches replicated the psychometric paradigm developed by Oregon research group in the 1970s. Boholm nevertheless highlighted the need for the refine of the methodology and theoretical framework guiding risk perception research.

Marris et al. (1998) replicated the psychometric paradigm by analysing the data with multiple regressions to compare its results with that of the cultural theory. In general, they concluded that the pattern observed were consistent with the predictions of the cultural theorists. They concluded that the methodology used was not the most appropriate way to analyse and interpret such data, which leaves room for the exploration of other methods to analyse risk perception data till a most appropriate method and road-map is concluded.

A current research in risk perception by Carlson (2015) explored a non-parametric method in assessing risk perception. Using a Mann-Whitney U test, Carlson suggested that gender, science education and overall level of education may be weak influencing factors to the resistance to changing one's risk perception following receiving education about how hazardous the risks are.

Exploring other non-parametric tests in addition to the Mann-Whitney U will help assess the results non-parametric tests can reveal in risk perception research.

2.6 The Psychometric Paradigm

The psychometric paradigm is used to describe the way the public judges risks. This is because the public and experts often define risks differently. Experts typically define risk strictly in terms of annual mortalities, while the public almost always include other factors in their definition of risk, such as disastrous potential, effects on future generations, etc. These conceptions often result in the public assigning relatively little credence to risk analysis made by experts. Experts usually include statistical data such as annual fatalities, but they also seem to be prone to the same biases as those of the public, particularly when experts are forced to go beyond the confines of available data and rely on their instincts and extrapolation (Schmidt, 2004).

In addition, psychometric studies include a variety of risks from different fields such as nuclear energy, smoking, tourism, pesticides, volcanoes, flooding and many others (Schmidt, 2004).

The psychometric paradigm is based on the assumption that some characteristics of risks are perceived similarly and they can be combined into two or more factors using multivariate factor analysis. Thus, each factor consists of several highly correlated items (Schmidt, 2004).

Nevertheless, other researchers equally criticize the psychometric paradigm for failing to distinguish between general risks and personal risks. Despite these weaknesses, Teye-Kwadjo (2011) asserts that it still remains the dominant approach to safety research in psychology in the absence of a more robust, flexible, and all-inclusive model.

2.7 Parametric Analysis and Likert Scale Data

Jamieson (2004) argued that any parametric analysis applied to likert scale is invalid. He argued that the intervals between them are not equal. But in contrast, Lubke and Muthen (2004) found that it is possible to find true parametric values in factor analysis if assumptions about skewness, number of categories, etc were met. Similarly, Glass et al. (1972) found that F-test in ANOVA could return accurate p-values on likert items under certain conditions.

Karen (2008) in the light of these arguments suggests a road-map in order to maintain researcher integrity:

i) At very least, items in the likert scale should be 5 points and indicate that intervals are approximately equal.
ii) Assumptions such as normality, equal variance of residuals, etc. be met.
iii) Alternative non-parametric test should be run. If same results, you can be confident about your conclusions.
iv) Also using a stringent alpha value like 0.01 or even 0.005.

2.8 Religion, Morality and Risk Perception

Briggs (2013) reported on the findings of two studies which both suggest that by creating a moral climate that fosters respect among neighbours and by helping to form individual consciences of young adults, violent crimes can be reduced.

Briggs (2013) further stated that communities with high levels of active participation in congregations may be particularly effective in minimising assaults, rapes, murders, etc in some poor areas that are most likely to suffer from violent crimes.

One study was by Baylor University which studied more than 15,000 people with ages between 18 and 28 and found that young adults who considered themselves religious were less likely than others to commit property or violent crimes. Those who averred to be spiritual but set themselves apart from organised religion were more likely to engage in both violent and property crimes. The other study which is independent of the first analysed crime and religion data from 182 counties in three states ; it was revealed that violent crime decreased as greater number of people got religiously active in their communities.

The link existing between religiosity and risk perception is argued on the grounds that people tend to adhere more to an absolute religious law and are less concerned with situation-based influences than people who have lower levels of religiosity. The link between religiosity and risk perception will more or less describe only what an individual's beliefs, concerning what he sees right or wrong but will not indicate whether they are going to act on these beliefs (Baazem et al. 2013).

Surveys conducted on youth and religion, have shown some form of consistency in youths belief in God. African-American youth are reported to have higher church or religious attendance rate than the white youth. Even though religion could be seen as a form of moderation and a promoter of pro-social behaviour, young people are hunted by other voices beckoning them to experiment including taking risks. Notwithstanding young people who perceived religion as important engaged less in risky behaviour (Sinha et al. 2007).

2.9 Religion and Health Risk Perception

Deaxton (2009) studied the effect of religiosity on a series of healthy measures and health-related behaviours. The research was conducted in 140 countries using more than 300,000 observations. The following results came to light though they do not all hold in all countries studied:

1. In most countries, religious people report better health, have more energy and experience less pain
2. Religious people have healthier social and personal behaviours.
3. Religious people have greater confidence in health care and medical system and are less likely to smoke.

2.10 Influence of disease on Risk Perception

Tison et al. (2012) conducted a research on eight diseases (cancer; diabetes; heart problem; stroke; arthritis or rheumatism; chronic bronchitis or emphysema; hypertension and emotional/nervous/psychiatric problems) on how people's risk aversion may change when they have to cope with these health shocks. Tison et al. (2012) concluded that people's reaction on risk perception would depend on the disease they face or encounter.

2.11 Effect of Information on Risk

When making complex decisions under conditions of uncertainty, where objective probabilities are unknown, and a policy maker is forced to rely on whatever information is accessible, he must decide whether he has the most favourable amount of knowledge to act upon. If he does not have the sufficient amount of information, he may not be able to accurately understand the situation and will be taking a certain amount of risk when arriving at a final choice (assuming the possibility of a negative outcome) (Streufert and Taylor, 1971).

Studies relating information to risk in decision making are typically ones in which a subject is required to make a decision about which there are a given number of bits of information available, usually in a form of lottery. The more information the subject has, the higher the probability of making a correct decision. When rewards are given for correct

decisions and each bit of information costs money, a measure of risk is involved to the extent that the subject makes a choice with less risk in order to maximize gain (Streufert and Taylor, 1971).

People seem to take more risk when information is costly in terms of money or time required to make the decision. Also, the amount of information available affects the degree of subjective uncertainty and confidence in a decision.

2.12 "Analytic deliberate" approach

Technical expertise is necessary but not a sufficient condition to make prudent decisions on risk. On the other hand, public perceptions are at least partially driven by some form of biases. Risk managers are therefore faced with a multitude of results pertaining to the mental processes of perception and analyses from experts and public groups alike.

Without consultation with public interest groups and those who are affected by the decision, a meaningful blend of expertise and public concerns cannot be achieved. Instead of having people respond to risk in anonymous questionnaires, as it is done in some risk perception studies, they should be made to engage themselves in a joint learning and deliberation process. This provides a common stage for members of the public, legislative body of stakeholder groups, experts and regulators.

A report by the National Academy of Sciences reviewed in Renn (1998), echoes a new understanding of risk communication and encourages risk experts to support public participation and involvement in risk management. The report emphasised the need for a combination of assessment and exchange of ideas which the authors have termed the 'analytic-deliberative' approach.

Several models have been proposed to ensure a sustainable integration between experts and the public views. One of these models proposed is by Webler and Renn, 1996 termed the "cooperative discourse" has undergone numerous modifications and has been applied to studies on energy policies and entails three consecutive steps;

i) Identification and selection of concerns and evaluative criteria

ii) The identification and measurement of impacts and consequences related to different policy options

iii) Conducting a rational dialogue with randomly selected citizens as representatives of interest groups as witnesses.

Another model worth considering and reviewed by Fiorino (1990) is the 'participatory mechanism' which deals with public hearings, initiatives, public surveys and citizen review panels. The 'fairness and competence theory' has also been proposed. It involves the fairness aspects (attending discourse, initiating discourse, participating in discourse and decision making) and the competence aspects (access to information and interpretation, use of best procedures for knowledge selection) (Webler and Tuler, 2000).

2.13 Measuring Risk perception using Questionnaires

Questionnaires are fundamental tools for acquiring information on public ideas on natural hazards.

To ensure responses are reliable, valid and sustainable when using questionnaires in conducting a research in risk perception, consideration must be given to questionnaire format, sequence and wording, the inclusion of classification, behavioural, knowledge and perception questions, and question length and output. Though closed questions are easy to administer, easy to code and analyse, allow comparison and quantification, and avoids irrelevant

responses, open questions allows respondents to share understanding, experiences, opinions and interpretations to situations, hence adapting a combination of closed and open questions makes the survey write-up have both quantifiable and in-depth results. The information obtained and results derived from questionnaires could produce robust results which are quantifiable and comprehensive, which adds an invaluable dimension in developing risk adaptation strategies (Bird, 2009).

CHAPTER THREE

METHODOLOGY AND DATA COLLECTION

3.1 Introduction

The study was conducted to determine if there were any distinct religious differences in the way individuals perceived risk of hazardous situations in order to justify reasons for further research. The choice of a research methodology is an important decision to make in the research process.

It is so because it is considered as the engine room on which the entire research is hinged. Thus, for the sake of the reader and future replication it is essential to be clear about the issues of methodology, ontology and epistemology. The researcher's beliefs about knowledge and the nature of reality being sought influence the choice of methodology. The research methodology chosen informs the techniques and tools to be used in the study. These tools and techniques provide the basis for the research design. The design embodies the linkages among theory, research questions, research aim, methods, and sampling techniques (Robson, 2002). Ensuring a good match between the research methodology and research questions has implications for the meaningfulness of the study and its findings. In the light of the foregoing, the methodological underpinnings of the present study are described below.

3.2 Methodological Considerations

Research philosophy is a belief about the way data about an event should be collected and analysed (Levin, 1988). The Psychometric approach is the almost classic research instrument in risk perception research. From its presentation (Fischhoff et al. 1978) up until date, it has been used in several studies by different researchers (AF-Wahlberg, 2001). This approach

makes use of questionnaires and factor-analytic procedures to extract a number of primary and secondary dimensions of risk perception. This approach has its basis on the assumptions that risk perception by humans is multidimensional and can be measured by developing scales (AF-Wahlberg, 2001). Dimensions in the form of scales and as well the risk factors are extracted. However, the dimensions extracted are not treated as universal as they do not seem to be expected to be the same from study to study. The risk factors are chosen based on its relevance to the research being conducted.

The questionnaire used in this procedure is designed to produce the relevant findings the researcher expects. Sarantakos (2005) argues that regardless of whether researchers adopt a qualitative or quantitative approach, some aspects of each will be incorporated into research design (Bazeley, 2006).

3.3 Description of study area

Asikuma-Odoben-Brakwa District is one of the districts of Ghana, located in the north-central portion of the Central Region of Ghana. The district was carved out of the former Breman-Ajumako-Enyan-Essiam District, in 1989. Its capital is Breman Asikuma. The District covers a geographical area of 884.84 square kilometres. It is sandwiched between 4 main districts, at a uniform radius of about 40 kilometres apiece from each of them, except Ajumako, which is 25 kilometres away. On the northern border is the Birim South District, on the Eastern border lies the Agona District and the Ajumako-Enyan-Essiam District is on the Southern border. The district has a population of 112 706 with diverse religious beliefs and sentiments as reported by the Ghana Statistical Service in the 2010 Population and Housing Census.

Figure 3.1 Map of the Central Region of Ghana showing the location of Asikuma-Odoben- Brakwa District (Source: GhanaDdistricts.com).

Table 3.1 Percentages of various religious groups

Religious Group	Percentages (%)
Catholics	11.0
Protestants	22.4
Pentecostals/Charismatic	29.0
Other Christians	20.7
Islam	9.1
Traditionalist	0.5
Other	1.0
No Religion	6.4

(Source: 2010 Population and Housing Census from GSS).

There are 46 683 economically active (15 years and older) people in the district of which 2 428 representing a percentage of 5.2 are public/Government workers (GSS, 2013).

3.4 Data Collection and Procedure

This study employed multi-methods, using both quantitative and qualitative techniques, in data collection with more emphasis on quantitative methods. It must be noted that the survey questionnaire was used as the main data collection instrument of this study because the

survey questionnaire enables a researcher to examine and explain relationships between constructs, in particular cause-and-effect relationships (Saunders et al. 2007).

Figure 3.2 represents the whole process of data generation in the study. It is in two major stages, thus the generation of the questionnaire and the pretesting of the questionnaire.

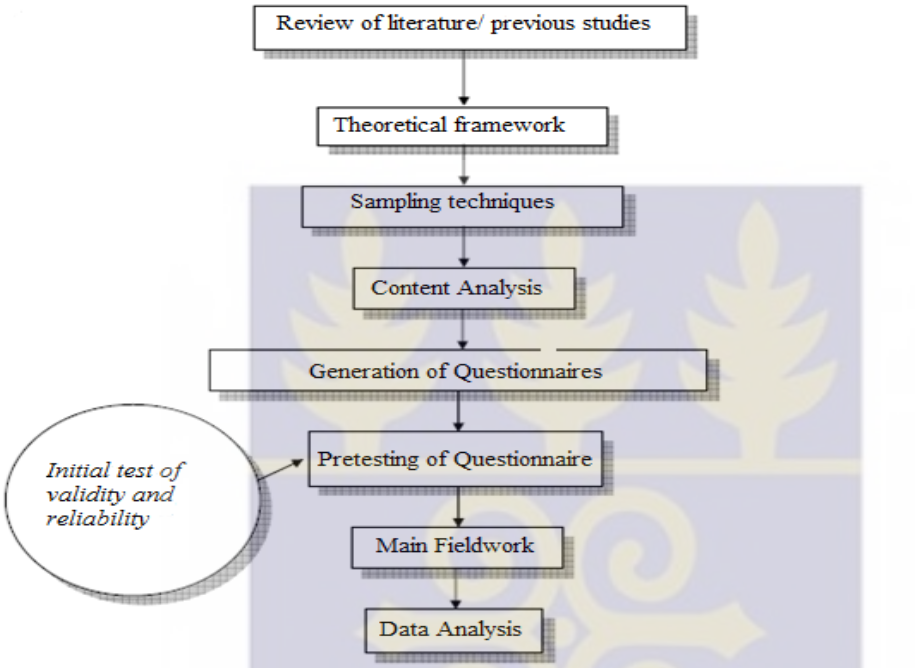


Figure 3.2 Data Generation Process

The data sampling was conducted by structured interviews using the questionnaires formulated for the study.

a. Instruments

The process of questionnaire development was based on the approach recommended by Churchill and Iacobucci (2002) which comprises of nine steps. Figure 3.3 illustrates a step-by step procedure which was used as a guideline for generating the questionnaire employed in this study.

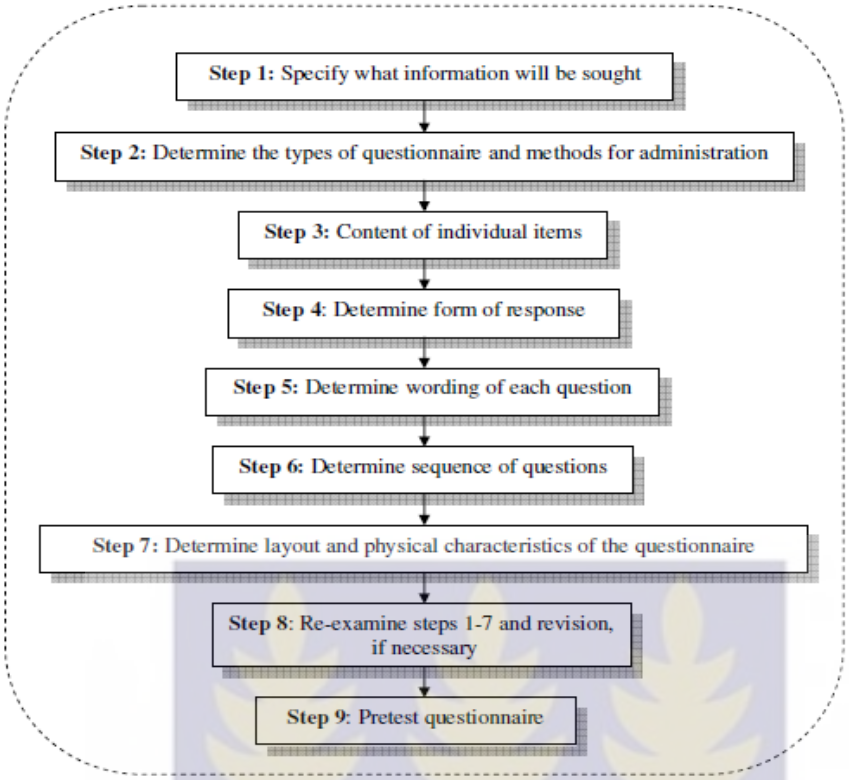


Figure 3.3 Questionnaire development process. Based on Churchill and Iacobucci (2002)

A questionnaire consisting of two parts was given to each participant to complete. The first part of the questionnaire (Appendix A) identified the participants' demographics. In the second part, participants were asked to rate the level of risk they felt was associated with 10 risk issues using a four-point likert-type scale (Appendix B).

b. Pre-testing of Questionnaire

The questionnaire pre-test is aimed at capturing potential wording ambiguities, timing, and other difficulties encountered by the respondents in completing the questionnaire. The issues of not having neither ambiguous nor confusing questions and verifying the initial validity and the likely reliability of the data that will be collected were also addressed. The initial descriptive analysis was run using statistical techniques (i.e. means, standard deviation). The results were satisfactory.

c. Participants

The participants selected to participate in this study were public sector workers of various religious faiths in the Asikuma-Odoben-Brakwa District in the Central Region of Ghana that were willing to share their perception that they had on risk in relation to their beliefs. The main reason for choosing Asikuma-Odoben-Brakwa District over other Districts was accessibility and financial constraints. A proportional stratified sampling was used to select participants from each stratum (religious faith group).

d. Sample Size

Determining sample size is a very important issue because samples that are large may waste time, resources and money, while samples that are too small may lead to inaccurate results.

i. Determination of sample size

The risk the researcher is willing to accept in the study, commonly called the margin of error coupled with the confidence level, is worth considering in the determination of sample size (Cochran, 1977). The alpha level used in most researches studies is either 0.05 or 0.01 (Ary et al. 1996). Cochran's 1977 formula incorporated alpha level using the z – value for the alpha level chosen (e.g Z –Value for alpha level of 0.05 is 1.96). An alpha level of 0.05 is generally accepted for most research (Bartlett et al. 2001).

The general rules for acceptable margin of error in social and educational research are that: for categorical data, 5% is acceptable while for continuous data, 3% is acceptable (Bartlett et al. 2001).

The confidence or risk level is based on ideas encompassed under the central limit theorem. The key idea encompassed in the central limit theorem is that when a population is repeatedly sampled, the average value of the attribute obtained by those samples is equal to the true population value. Furthermore, the values obtained by these samples are distributed normally

about the true value with some obtaining a lower score than the true population value (Bartlett et al. 2001).

ii. Sample size Formula

Cochran's sample size formula for categorical data and how the sample size of the study was obtained are presented below:

$$n_o = \frac{z^2 p(q)}{d^2},$$

where z = value for a selected alpha level, $p(q)$ = the estimate of variance $(q = 1 - p)$, and

d = the margin of error for the proportion estimated.

For the study an alpha level of 0.05 was used, which implies a $z-$value of 1.96. A conservative estimate of the sample size is made with a $p = 0.5$ and a 5% margin of error.

$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 384.16$$

Therefore, for a population of 2403, the required sample size is 384. However, since this sample size exceeds 5% of the population ($2403 \times 0.05 = 120$), Cochran's (1977) correction formula is used to calculate the final sample size. The calculations are as follows:

$$n_1 = \frac{n_o}{1 + \frac{n_o}{population\ size}} = \frac{384}{1 + \frac{384}{2403}} = 331.09,$$ where population size = 2403, n_o= required return sample size according to Cochran's formula =384 and n_1 = required return sample size because sample > 5% of population

These procedures result in a minimum returned sample size of 331. Assuming a response rate of 80%, a minimum drawn sample size of 414 should be used. These calculations were based

on the following: $n_2 = \frac{n_1}{a_o}$, where a_o = anticipated return rate = 80%, n_2 = sample size adjusted for response rate and minimum sample size (corrected) = 331.

Therefore, $n_2 = \frac{331}{0.80} = 414$.

A proportional stratified sampling was used to determine sample size to be allocated to each stratum (various religious faiths). The allocation was based on the number of people enumerated for the various religious groups in the Asikuma-Odoben-Brakwa District in the 2010 population and housing census. There were 111,128 people in the six strata enumerated. The number of people in each stratum and percentages is shown below in Table 3.2.

Religious group	Number of People	Percentage (%)
Catholics	12,398	11.2
Protestants	25,246	22.7
Pentecostals/ Charismatics	32,685	29.4
Other Christians	23,330	21.0
Islam	10,256	9.2
No religion	7,213	6.5

Table 3.2 Six Religious and computed percentages (Source: GSS, 2013)

The allocation was then made for each religious group based on Table 3.2 is shown in Table 3.3

Religious Group	Allocation made
Catholics	46
Protestants	94
Pentecostals/Charismatic	122
Other Christians	87
Islam	38
Not Religious	27
Total	414

Table 3.3 Stratum size allocation

3.5 Data Analysis

The raw data was sorted and coded in order to import the data into SPSS for statistical analysis. Evaluation of the data included descriptive statistics, frequencies and comparisons between and within groups. There was an explicit interest in the differences and similarities exhibited between various religious faith groups across the 10 risk issues.

Preliminary assessment of questionnaire revealed that the first road-map proposed by Ken (2008) as reviewed in chapter two (that at very least, items on the likert scale should be 5 points) was not met, therefore the need to analyse data using an alternative non-parametric test.

a. Kruskal – Wallis test

The non-parametric alternative to ANOVA: testing for differences between several independent groups. It is not necessarily a distribution-free test but just less restrictive than parametric tests. Analysis is based on ranked data. Though less powerful, it is used when the assumptions made in ANOVA (data should come from a normal distribution, variances should be fairly similar) are not met.

i. Kruskal-Wallis: Hypothesising

Ho: All religious groups have the same median risk perception

H_1: Not all religious groups have equal medians

Non-parametric tests hypothesises about the median instead of the mean (as parametric tests do).

ii. The Kruskal-Wallis test: theory

The response for all religious groups are taken and ranked; then the sum of the ranks of each group is obtained. One way ANOVA is applied to the ranks, not to the original observations. Repeated values (tied ranks) are ranked as the average of the potentials ranks for both scores (Mehotcheva, 2008).

In Kruskal-Wallis, one way ANOVA is applied to the ranks as said earlier, not the original scores. If there are N observations in all, the ranks are always the whole numbers from 1 to N. The total sum of squares of the ranks is therefore a fixed number no matter what the data are (Mehotcheva, 2008).

iii. The Kruskal -Wallis: Test Statistic

The test statistic H is calculated as:

$$H = \frac{1}{S^2}\left[\sum_{i=1}^{a}\frac{R_{i.}{}^2}{n_i} - \frac{N(N+1)^2}{4}\right],$$

where $R_{i.}$ is the sum of the ranks in the ith treatment, n_i is the number of observations in the ith treatment, N is the total number of observations, a is the levels of the factor (treatments) and S^2 is the variance of the ranks given by

$$S^2 = \frac{1}{N-1}\left[\sum_{i=1}^{a}\sum_{j-1}^{n_i} R^2{}_{ij} - \frac{N(N+1)^2}{4}\right]$$

If there are no ties, S^2 is given by $S^2 = \frac{N(N+1)}{12}$ and the test statistic simplifies to

$$H = \frac{12}{N(N+1)}\left[\sum_{i=1}^{a}\frac{R_{i.}^{2}}{n_i} - 3(N+1)\right]$$

b. Reliability Test

Cronbach's alpha is a reliability test particularly for questionnaires using a likert scale. With the variables $x_1, \ldots, x_k$ and $x_o = \sum_{j=1}^{k} X_j$, the Cronbach's alpha will be defined as

$$\frac{k}{k-1}\left(1 - \frac{\sum_{j=1}^{k}\text{var}(x_j)}{\text{var}(x_o)}\right),$$

where k= the number of independent variables or number of different items measured, $\text{var}(x_j)$= sample variance of each i variable or item and $\text{var}(x_o)$= sample variance of the total, k items measured.

Cronbach's alpha provides useful lower bound reliability. Cronbach's alpha will generally increase when the correlation between the items increase. For this reason the coefficient measures the internal consistency of the test. Its maximum value is 1 and usually its minimum value is 0 (Zaiontz, 2014).

c. Normality Test

Though the analysis is a non-parametric one, a parametric test may be performed to confirm the non-parametric analysis results, hence the need to test the normality of the data.

The normality test Hypotheses is given by:

H_O: the observed distribution fits the normal distribution.

H_1: the observed distribution does not fit the normal distribution.

If we accept H_o, we assume normality and vice versa. Some researchers recommend the Shapiro-Wilk test as the best choice for testing the normality of data (Ghasemi and Zahediasl, 2012).

The Shapiro-Wilk test gives a W statistic; small values indicate the sample is not normally distributed (you can reject the null hypothesis that your population is normally distributed if

your values are under a certain threshold). The formula for the W statistic is:

$$W = \frac{\left(\sum_{i=1}^{n} a_i x_{(i)}\right)^2}{\sum_{i=1}^{n}(x_i - \bar{x})^2},$$

where: a_i are constants generated from the covariances, variances and means of the sample (tabulated coefficients), $x_{(i)}$ is given by $x_{n+1-i} - x_i$, x_i are the samples values and n is the number of observations.

d. Chi-square test of independence

There are two basic types of chi-square analysis, the Goodness of Fit Test, used with a single nominal variable, and the test of Independence, used with two nominal variables. Both types of chi-square tests use the same formula.

The chi square test of independence is used to decide whether two variables in a population are independent. If there is no association between two variables, we say that they are independent. If two variables are not associated (that is, if they are independent), then knowing the value of one variable for some subject will not help us predict the value of the other variable for the same subject. On the other hand, if two variables are associated, the knowledge of one is helpful in predicting the value of the other (Kobina, 2012).

i. Hypothesis

The hypothesis to be tested will be the form:

H_0: The two criteria of classification are independent.

H_1: The two criteria of classification are not independent.

ii. Test Statistic

The test statistic for testing the hypothesis is defined by:

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{c} \frac{\left(n_{i,j} - \overline{n_{i,j}}\right)^2}{\overline{n_{i,j}}} \quad \text{in which} \quad \overline{n_{i,j}} = \frac{n_{i,\bullet} \times n_{\bullet,j}}{n_{\bullet,\bullet}}$$

where $n_{i,j}$ are the observed frequencies and $\overline{n_{i,j}}$ are the expected frequencies if the null hypothesis is true.

In the limit of large sample sizes, the asymptotic distribution of the test statistic is χ^2 with (r - 1) (c - 1) degrees of freedom. The null hypothesis is rejected for large values of the test statistic.

According to Cochran's rule, the χ^2 test can be used provided that all expected frequencies are greater than one, and fewer than a fifth of them are less than five. If these criteria are not met, the use of the Fisher exact test is recommended (Slezàk et al. 2014).

e. Dunn's Test

A significant result in the risk perception data require a pairwise comparison be made to ascertain which of the treatment pairs accounted for the significant results.

Dunn (1964) procedure is an effective way of doing pairwise simultaneous inference.

Comparing say Group A to Group B, the Dunn's test statistic is given by $z_i = \frac{y_i}{\sigma_i}$,

where i is one of the 1 to m multiple comparisons, $y_i = \overline{W_A} - \overline{W_B}$, where, $\overline{W_A} = \frac{W_A}{n_A}$, and W_A is the sum of ranks of observations in Group A and n_A is the sample size for the group A,

$$\sigma_i = \sqrt{\left\{\frac{N(N+1)}{12} - \frac{\sum_{s=1}^{r} \tau_s^3 - \tau_s}{12(N-1)}\right\}\left(\frac{1}{n_A} + \frac{1}{n_B}\right)}$$

σ_i is the standard deviation of y_i. N is the total number of observations across all groups, r is the number of tied ranks, and τ_s is the number of observations tied at the sth specific tied value. When there are no ties, the term with the summation in the denominator equals zero and the calculation of σ_i simplifies considerably to $\sigma_i = \sqrt{\left\{\frac{N(N+1)}{12}\right\}\left(\frac{1}{n_A} + \frac{1}{n_B}\right)}$

The pairwise comparison is said to be significant if $z_i \geq z_{\alpha/k(k-1)}$.

$z_{\alpha/k(k-1)}$ is the z-value of the comparisons after a Bonferonni adjustment is made. The Bonferroni correction is an adjustment made to *P* values when several dependent or independent statistical tests are being performed simultaneously on a single data set. The Bonferroni correction is used to reduce the chances of obtaining false-positive results (type I errors) when multiple pair wise tests are performed on a single set of data.

3.6 Ethical Considerations

Prior to filling each questionnaire, participants were taken through a consent statement indicating that confidentiality, anonymity and respect for human rights would be observed throughout the study (Appendix C). The details of the consent statement were thoroughly explained in simple, understandable language and participants were allowed time to ask questions.

CHAPTER FOUR

RESULTS

4.1 Introduction

In this chapter, we present the findings of the study arising from processes of analysis as described in Chapter 3. The structure of the chapter corresponds to the order of the research questions.

4.2 Demographic Results

The first question of the survey identified the age of the respondent. The possible responses were: 1 – [below 18] years old, 2 – [18 – 25] years old, 3 – [26 – 35] years old, 4 – [36 – 45] years old, 5 – [Above 45] years old.

62.7% of the participants were between the ages of 18 and 35, majority of which were between the ages of 26 and 35. Few of the participants (12.1%) were above 45. The results are summarised in Table 4.1.

Age	Frequency	Percentage
18-25	97	28.3
26-35	118	34.4
36-45	86	25.1
above 45	42	12.2
Total	343	100.0

Table 4.1 Age Distribution of Respondents

The second question identified the gender of the respondent. The respondent was either 1 – Male or 2 – Female.

More males (59.5%) participated in the study than females (40.5%).

The third question provided the marital status of each respondent. The possible responses were: 1 – Married, 2 – Single, 3 – Separated, 4 – Divorced, 5 – Widowed.

About half of the participants were married, a few more (33.5%) were single whereas less than 1% of them were divorced. The results are summarised in Table 4.2.

	Frequency	Percentage
Married	173	50.6
Single	116	33.9
Separated	38	11.1
Divorced	3	0.9
Widowed	12	3.5
Total	342	100.0

Table 4.2 Marital Status of Respondents

The fourth question identified the religious faith of the respondent. The possible responses were as follows: 1 – Catholics, 2 – Protestants (other orthodox churches other than catholics), 3 – Pentecostal/Charismatic, 4 – other Christians, 5 – Islam, 6 – No Religion.

28.9% of the participants were Pentecostals/ charismatics and a little less than 5% had no form of religion, an indication that about 95% of the participants who part in the study had some form of religious belief. The results are summarised in Table 4.3.

Religious Faith Groups	Frequency	Percentage
Catholics	35	10.2
Protestants	85	24.8
Pentecostal/Charismatic	100	29.2
Other Christian	78	22.7
Islam	30	8.7
No Religion	15	4.4
Total	343	100.0

Table 4.3 Religious Faith of respondents

The Fifth question identified the educational background of the respondent. The possible responses were as follows: 1 – senior high/ A- level, 2 – college diploma, 3 – undergraduate degree, 4 – postgraduate degree.

Most of the respondents (80.2%) had some form post senior high/ A-level education. The results are summarised in Table 4.4.

Educational Qualifications	Frequency	Percentage
Senior High/A-Level	68	19.8
College Diploma	157	45.8
Undergraduate Degree	106	30.9
Postgraduate	12	3.5
Total	343	100.0

Table 4.4 Educational Background of respondents

The sixth question identified if the belief of the respondent influences his actions. The possible responses were as follows: 1 – yes, 2 – No.

All the participants interviewed averred that they are guided by their own belief rather than the belief of others.

The seventh question identified how often the respondent went for a routine check-up. The possible responses were as follows: 1 – monthly, 2 – quarterly, 3 – semi –annually, 4 – yearly, 5 – when necessary.

About 86.5% of the participants went for routine check-up and health screening 'when necessary' while a very few (1.4%) submitted themselves to routine medical check-up monthly. The results are summarised in Table 4.5.

	Frequency	**Percentage**
Monthly	5	1.5
Quarterly	10	2.9
Semi-Annually	11	3.2
Yearly	20	5.9
When Necessary	295	86.5
Total	341	100.0

Table 4.5 Routine Medical Check-up.

The eighth question identified how often the respondent engaged in moderate physical activities outside work. The possible responses were as follows: 1 – daily, 2 – weekly, 3 – monthly, 4 – when necessary.

68.1% of the participants engage in moderate physical activities outside work 'when necessary' whereas 21.5% engage in them daily. The results are summarised in Table 4.6

	Frequency	Percentage
Daily	73	21.5
Weekly	20	5.9
Monthly	15	4.4
When Necessary	231	68.1
Total	339	100.0

Table 4.6 Engaging in moderate Physical activities outside work.

The ninth question identified if the respondent was satisfied with the balance between his/her work and leisure. The possible responses were as follows: 1 – not satisfied, 2 – satisfied, 3 – very satisfied.

78.5% of the participants were satisfied with the balance between their work and leisure whereas 12.1% were not satisfied. The results are summarised in Table 4.7.

	Frequency	Percentage
Not Satisfied	41	12.1
Satisfied	266	78.5
Very Satisfied	32	9.4
Total	339	100.0

Table 4.7 Balance between work and leisure

The tenth question identified the advice the respondent seeks for when ill. The possible responses were as follows: 1 – medical doctor, 2 – herbalist, 3 – self-medication.

41.6% of participants preferred medical advice from a professional medical doctor whereas about 31.3% preferred self-medication. The results of question ten are summarised in Table 4.8.

	Frequency	Percentage
Medical Doctor	141	41.6
Herbalist	92	27.1
Self-medication	106	31.3
Total	339	100.0

Table 4.8 Medical Advice preference

4.3 Reliability Statistic

A questionnaire was employed to measure different, underlining constructs. One of the constructs, "Risk Perception", consisted of ten (10) questions. The scale had a high level of internal consistency as determined by a Cronbach's alpha of 0.743.

Cronbach's alpha mathematically is given by $\frac{k}{k-1}\left(1-\frac{\sum_{j=1}^{k}\text{var}(x_j)}{\text{var}(x_o)}\right)=\frac{10}{9}\left(1-\frac{8.8185}{24.679}\right)=0.743$

What constitute a good level of internal consistency differs depending on what source you refer to, although all recommended values are 0.7 or higher (Devillis, 2003: Kline, 2005).

Table 4.9 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.743	.748	10

4.4 Risk Perception Results

Respondents on the average perceived the risk associated with Heart disease as “very risk”. The other risk issues (Asthsma, Cancer, Smokers Cough, Sickle cell, Diabetes, Hepatitis, Stroke, and Hypertension) were perceived on the average to be “risky”. The means and standard deviations are listed in Table 4.10.

	N	Mean	Std. Deviation
Asthma	343	3.01	.933
Cancer	343	3.35	.849
Smokers Cough	343	2.83	.982
Heart Disease	343	3.63	.672
Stroke	343	3.42	.787
Sickle Cell	343	2.93	1.056
Diabetes	343	2.86	.941
Hepatitis	343	2.85	.993
Kidney Disease	343	3.54	.782
Hypertension	343	3.19	.980

Table 4.10 Risk Perception Mean and Standard Deviation

4.4.1 Risk Perception and Religious Faith Results

A Kruskal-Wallis H test was conducted to determine if there were differences in the risk perception of the ten risk issues (asthma, cancer, smokers cough, Heart disease, stroke, sickle

cell, diabetes, hepatitis, kidney disease and Hypertension) scores between groups that differed in their religious faith: "Catholics"($n = 35$), "Protestants" ($n = 85$), "Pentecostal/charismatic" ($n = 100$), "Other Christians" ($n = 78$), "Islam" ($n = 30$), "No religion" ($n = 15$). Values are mean ranks unless otherwise stated. Distributions of the risk perception of all the ten risk issues were not similar for all groups, as assessed by virtual inspection of a boxplot (Figures 4.1).

Risk Perception scores for diabetes, $\chi^2(3) = 21.915$, $p = 0.001$ (Table 4.11) and hepatitis, $\chi^2(3) = 11.451$, $p = 0.043$ (Table 4.13) were statistically significantly different between the different religious faith groups.

Subsequently, pairwise comparisons were performed using Dunn (1964) procedure with a Bonferonni correction for multiple comparisons. This post hoc analysis revealed statistically significant differences in Risk perception of diabetes scores between "protestants" (147.94) and "Islam" (234.90) ($p = 0.000$), "other Christians" (160.16) and "Islam" (234.90) ($p = 0.003$) but not between any other group combination (Figure 4.2).

The post hoc analysis was not able to reveal which of the religious group combination contributed to the significant difference in the risk perception score of hepatitis (Figure 4.3).

Islam had the highest mean rank for both the perception of Diabetes and Hepatitis risk, which projects them as more Diabetes and Hepatitis risk conscious than other religious groups. Protestants on the other hand had the lowest mean rank for both the perception of diabetes and Hepatitis, which describes them as less Diabetes and Hepatitis risk conscious (Table 4.12 and 4.13).

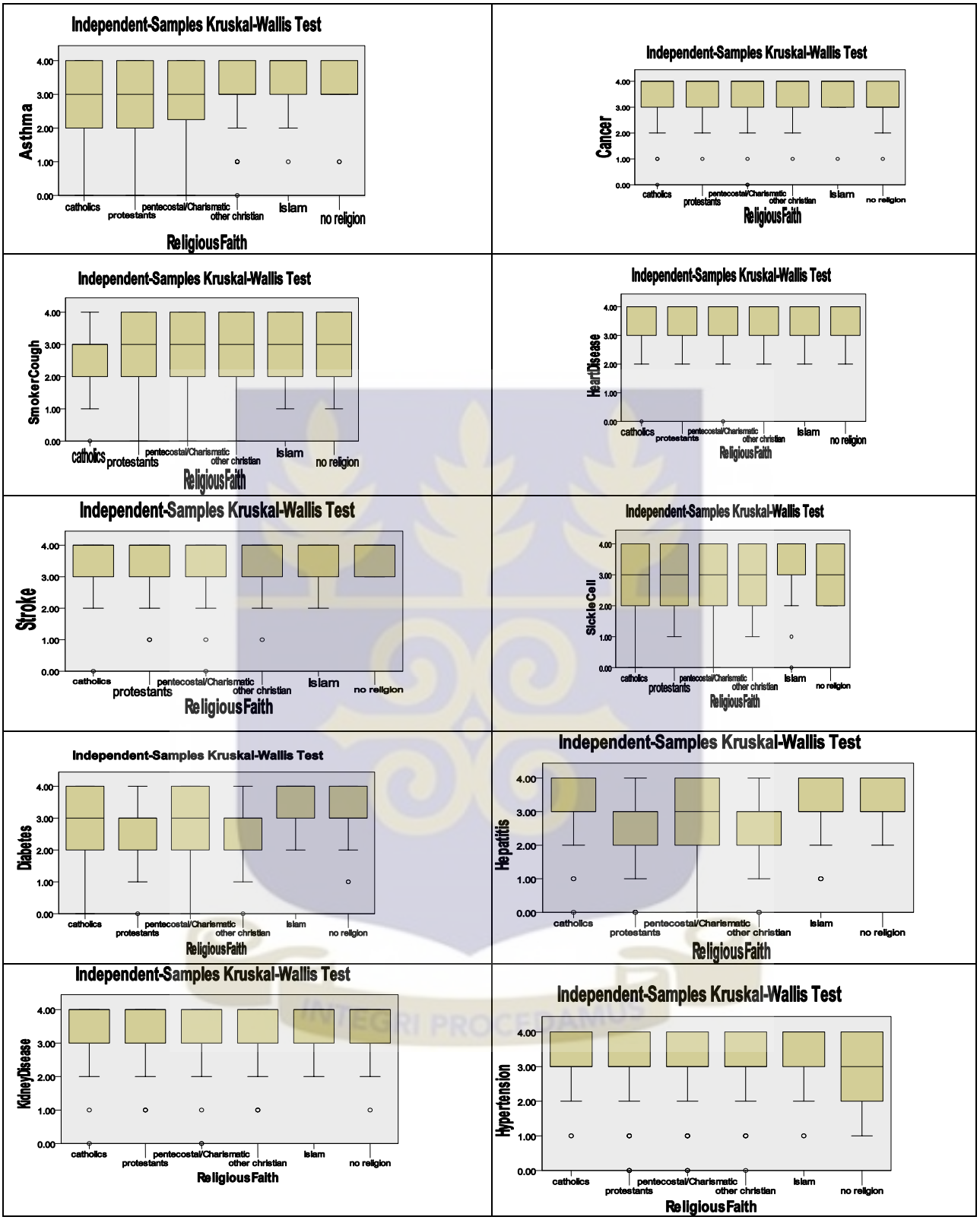
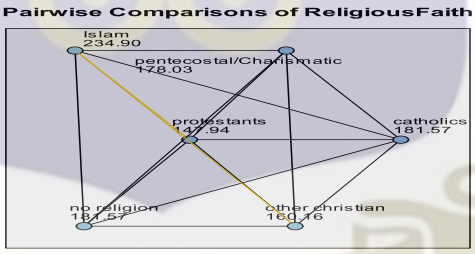


Figure 4.1

Table 4.11

RISK ISSUES	TEST STATISTIC (χ^2)	DEGREES OF FREEDOM	SIGNIFICANCE
Asthma	5.890	5	0.317
Cancer	5.699	5	0.337
Smokers cough	3.451	5	0.631
Heart disease	2.077	5	0.838
Stroke	2.942	5	0.709
Sickle cell	6.473	5	0.263
Diabetes	21.195	5	0.001
Hepatitis	11.451	5	0.043
Kidney disease	1.123	5	0.952
Hypertension	7.612	5	0.179

Figure 4.2

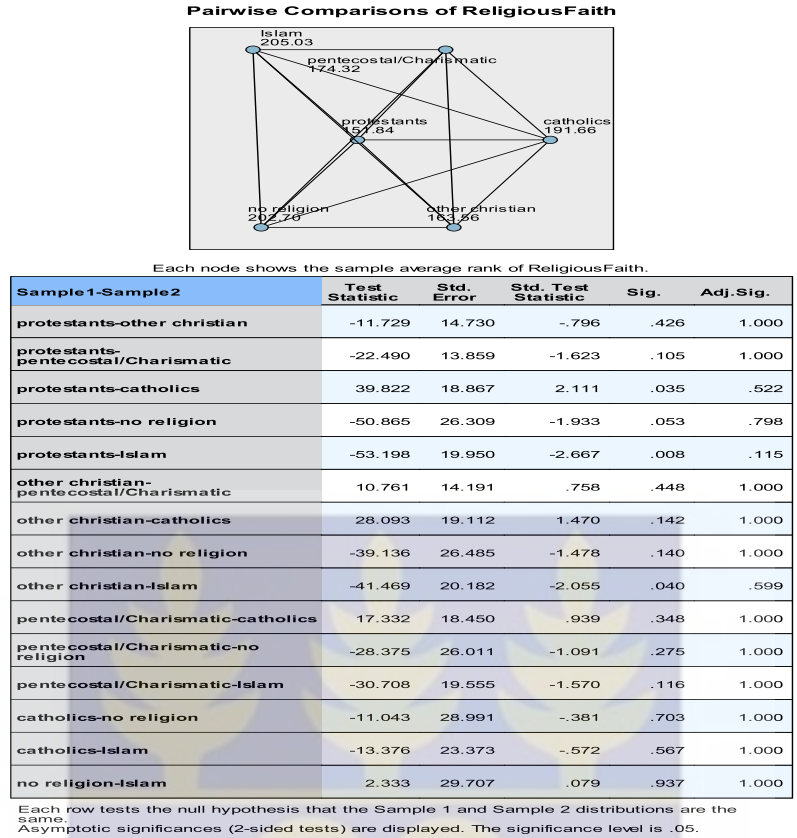


Each node shows the sample average rank of ReligiousFaith.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
protestants-other christian	-12.219	14.730	-.830	.407	1.000
protestants-pentecostal/Charismatic	-30.089	13.859	-2.171	.030	.449
protestants-no religion	-33.625	26.309	-1.278	.201	1.000
protestants-catholics	33.630	18.867	1.783	.075	1.000
protestants-Islam	-86.959	19.949	-4.359	.000	.000
other christian-pentecostal/Charismatic	17.870	14.191	1.259	.208	1.000
other christian-no religion	-21.406	26.485	-.808	.419	1.000
other christian-catholics	21.411	19.112	1.120	.263	1.000
other christian-Islam	-74.740	20.182	-3.703	.000	.003
pentecostal/Charismatic-no religion	-3.537	26.011	-.136	.892	1.000
pentecostal/Charismatic-catholics	3.541	18.450	.192	.848	1.000
pentecostal/Charismatic-Islam	-56.870	19.555	-2.908	.004	.055
no religion-catholics	.005	28.991	.000	1.000	1.000
no religion-Islam	53.333	29.707	1.795	.073	1.000
catholics-Islam	-53.329	23.373	-2.282	.023	.338

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 4.3



Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
protestants-other christian	-11.729	14.730	-.796	.426	1.000
protestants-pentecostal/Charismatic	-22.490	13.859	-1.623	.105	1.000
protestants-catholics	39.822	18.867	2.111	.035	.522
protestants-no religion	-50.865	26.309	-1.933	.053	.798
protestants-Islam	-53.198	19.950	-2.667	.008	.115
other christian-pentecostal/Charismatic	10.761	14.191	.758	.448	1.000
other christian-catholics	28.093	19.112	1.470	.142	1.000
other christian-no religion	-39.136	26.485	-1.478	.140	1.000
other christian-Islam	-41.469	20.182	-2.055	.040	.599
pentecostal/Charismatic-catholics	17.332	18.450	.939	.348	1.000
pentecostal/Charismatic-no religion	-28.375	26.011	-1.091	.275	1.000
pentecostal/Charismatic-Islam	-30.708	19.555	-1.570	.116	1.000
catholics-no religion	-11.043	28.991	-.381	.703	1.000
catholics-Islam	-13.376	23.373	-.572	.567	1.000
no religion-Islam	2.333	29.707	.079	.937	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Table 4.12 Diabetes Mean Ranks

	Religious Faith	N	Mean Rank
Diabetes	Catholics	35	181.57
	Protestants	85	147.94
	Pentecostal/Charismatic	100	178.03
	Other Christians	78	160.16
	Islam	30	234.90
	No Religion	15	181.57
	Total	343	

Table 4.13 Hepatitis Mean Ranks			
	Religious Faith	N	Mean Rank
Hepatitis	Catholics	35	191.66
	Protestants	85	151.84
	Pentecostal/Charismatic	100	174.33
	Other Christians	78	163.56
	Islam	30	205.03
	No Religion	15	202.70
	Total	343	

4.4.2 Risk Perception and Gender Results

A Mann-Whitney U test was run to determine if there were differences in risk perception of the ten risk issues (asthma, cancer, smokers cough, Heart disease, stroke, sickle cell, diabetes, hepatitis, kidney disease and Hypertension) scores between males ($n = 204$) and females ($n = 139$). Distribution of the risk perception scores of all risk issues for males and females were not similar, as assessed by visual inspection (Figure 4.4).

Only Risk perception of cancer scores for males (mean rank = 179.40) and females (mean rank = 160.49) were statistically significantly different, U= 15778, z = 1.976, p = 0.048 (Table 4.14). Males (mean rank 179.40) perceived the risk associated with cancer higher than females (mean rank = 160.49).

Figure 4.4

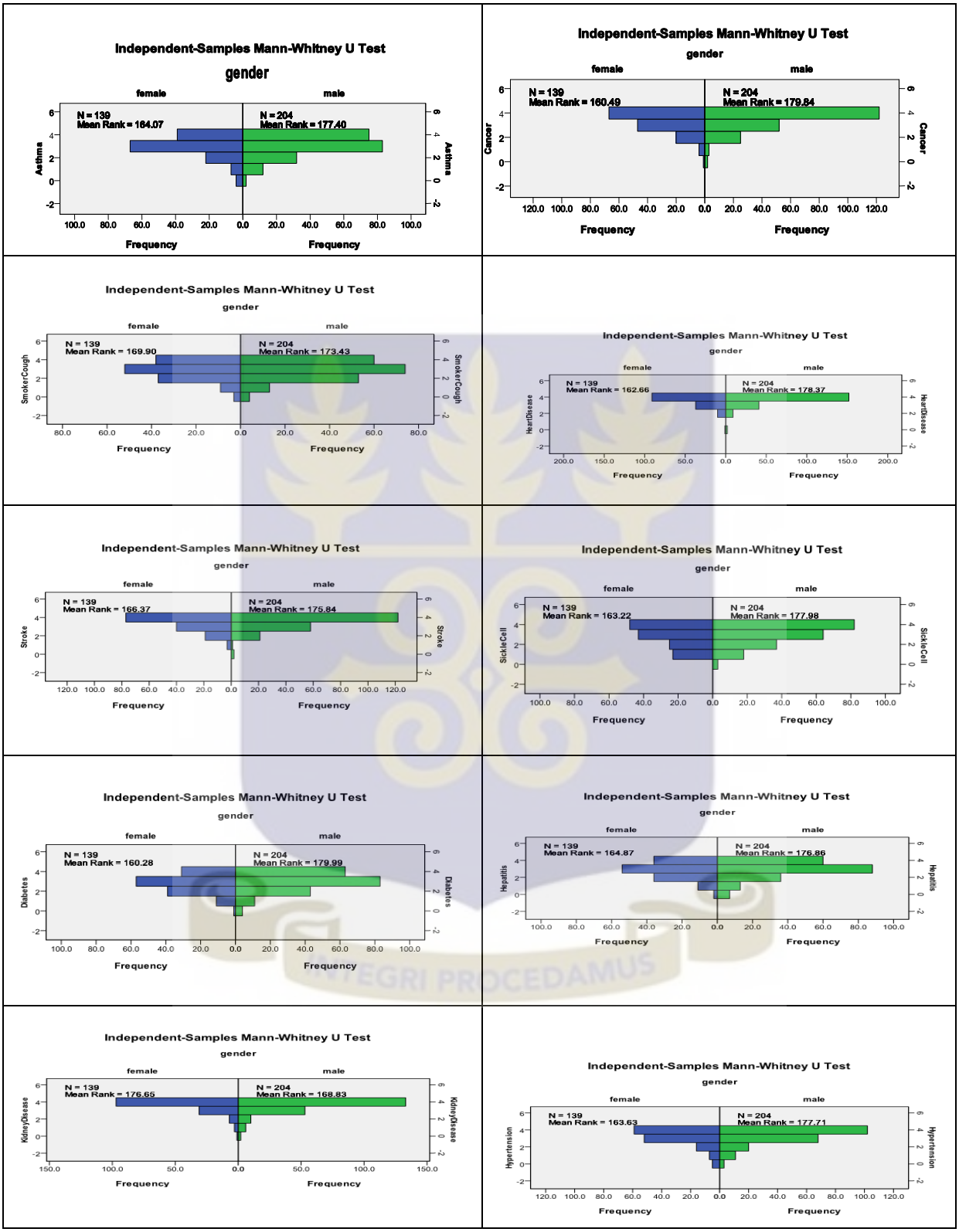


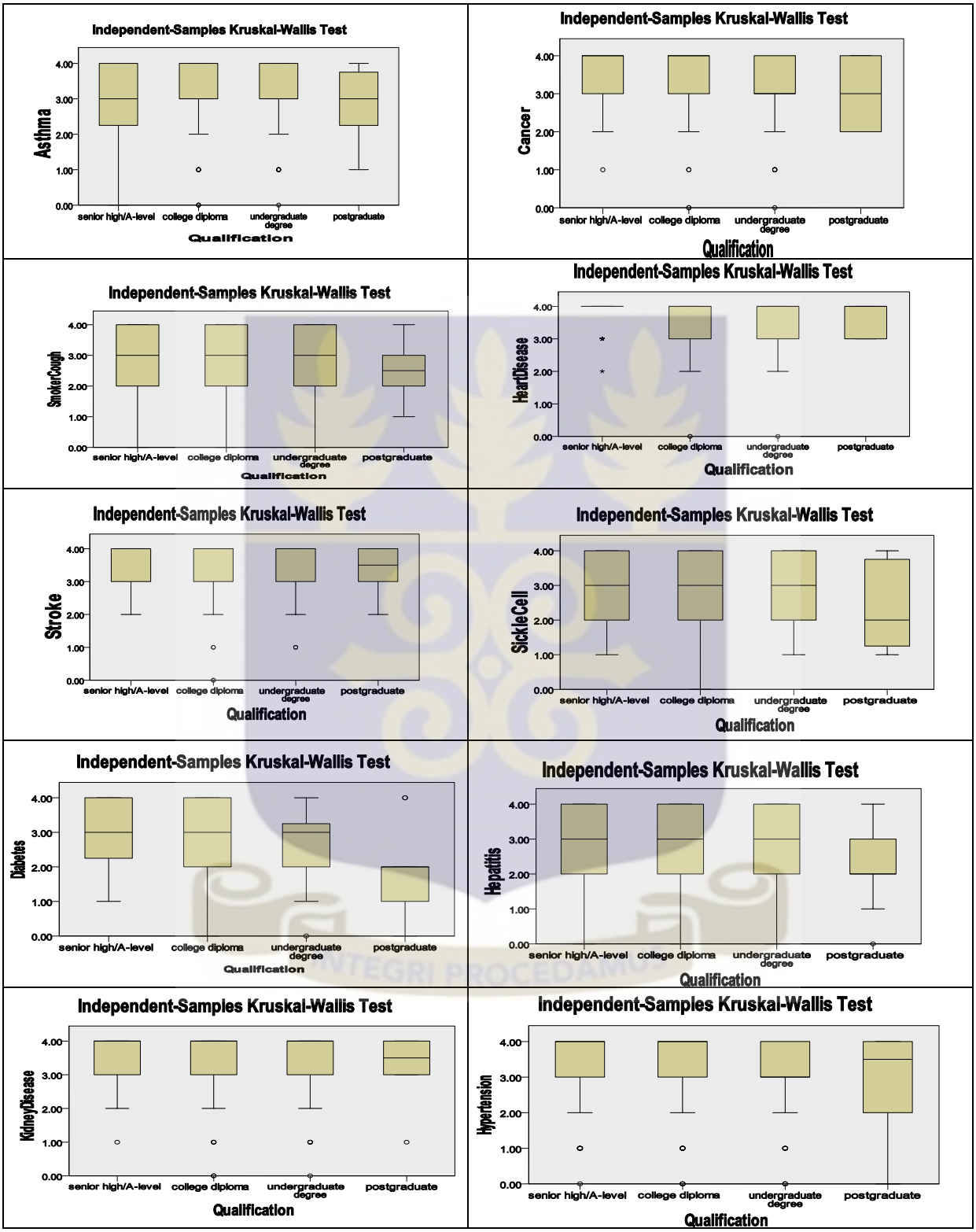
Table 4.14

RISK ISSUES	TEST STATISTIC (U)	STANDARDIZED TEST STATISTIC (Z)	SIGNIFICANCE
Asthma	15280.000	1.306	0.191
Cancer	15778.000	1.976	0.048
Smokers cough	14470.000	0.340	0.734
Heart disease	15476.000	1.811	0.070
Stroke	14961.000	0.983	0.325
Sickle cell	15398.500	1.421	0.155
Diabetes	15807.000	1.907	0.056
Hepatitis	15168.500	0.160	0.246
Kidney disease	13532.000	- 0.867	0.386
Hypertension	15342.000	1.398	0.162

4.4.3 Risk Perception and Educational Background Results

A Kruskal-Wallis H test was conducted to determine if there were differences in the risk perception of the ten risk issues (asthma, cancer, smokers cough, Heart disease, stroke, sickle cell, diabetes, hepatitis, kidney disease and Hypertension) scores among groups that differed in their level of education: "senior high/A-level " ($n = 68$), "college diploma" ($n = 157$), "undergraduate degree" ($n = 106$), "postgraduate" ($n = 12$). Values are mean ranks unless otherwise stated. Distributions of the risk perception of all the ten risk issues were not similar for all groups, as assessed by virtual inspection of a boxplot (Figure 4.5).

Figure 4.5



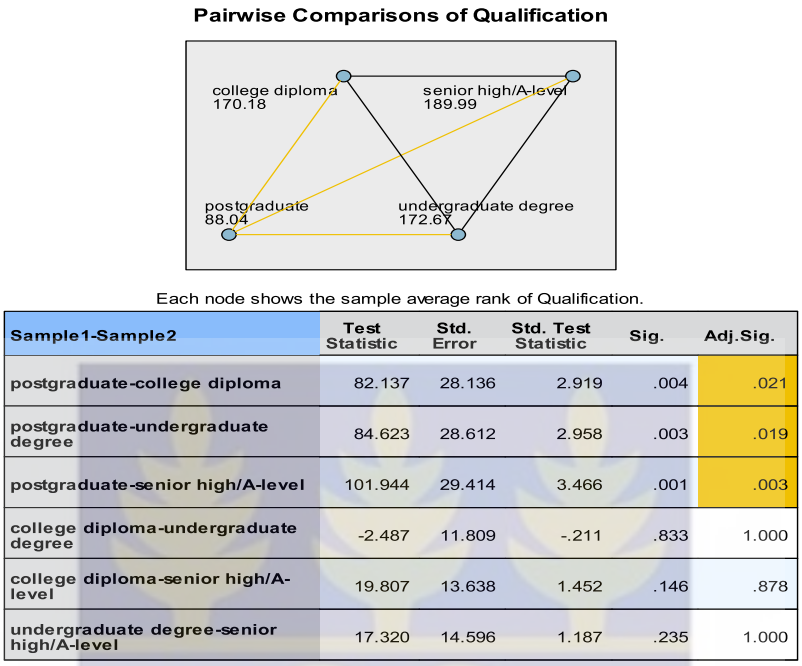
Only Risk Perception scores for diabetes were statistically significantly different among the different levels of education, $\chi^2(3) = 12.142$, $p = 0.007$ (Table 4.15).

Table 4.15

RISK ISSUES	TEST STATISTIC (χ^2)	DEGREES OF FREEDOM	SIGNIFICANCE
Asthma	0.613	3	0.893
Cancer	7.483	3	0.058
Smokers cough	2.212	3	0.530
Heart disease	2.629	3	0.452
Stroke	6.506	3	0.089
Sickle cell	4.415	3	0.220
Diabetes	12.142	3	0.007
Hepatitis	4.746	3	0.191
Kidney disease	2.041	3	0.564
Hypertension	5.875	3	0.118

Subsequently, pairwise comparisons were performed using the Dunn (1964) procedure with a Bonferonni correction for multiple comparisons. This post hoc analysis revealed statistically significant differences in Risk perception of diabetes scores between postgraduate (88.04) and college diploma (170.18) ($p = 0.021$), postgraduate (88.04) and undergraduate (172.67) ($p = 0.019$), and postgraduate (88.04) and senior high/ A-level (189.99) ($p = 0.003$) (Figure 4.6).

Figure 4.6



Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
postgraduate-college diploma	82.137	28.136	2.919	.004	.021
postgraduate-undergraduate degree	84.623	28.612	2.958	.003	.019
postgraduate-senior high/A-level	101.944	29.414	3.466	.001	.003
college diploma-undergraduate degree	-2.487	11.809	-.211	.833	1.000
college diploma-senior high/A-level	19.807	13.638	1.452	.146	.878
undergraduate degree-senior high/A-level	17.320	14.596	1.187	.235	1.000

Senior High/ A-level respondents had the highest mean rank for the perception of Diabetes, which projects them as more Diabetes risk conscious. On the other hand, postgraduates had the least mean rank, projecting them as less diabetes risk conscious (Table 4.16),

Table 4.16 Diabetes Mean Ranks

	Qualification	N	Mean Rank
Diabetes	Senior High/A-Level	68	189.99
	College Diploma	157	170.18
	Undergraduate Degree	106	172.67
	Postgraduate	12	88.04
	Total	343	

4.4.4 Risk Perception and Age Results

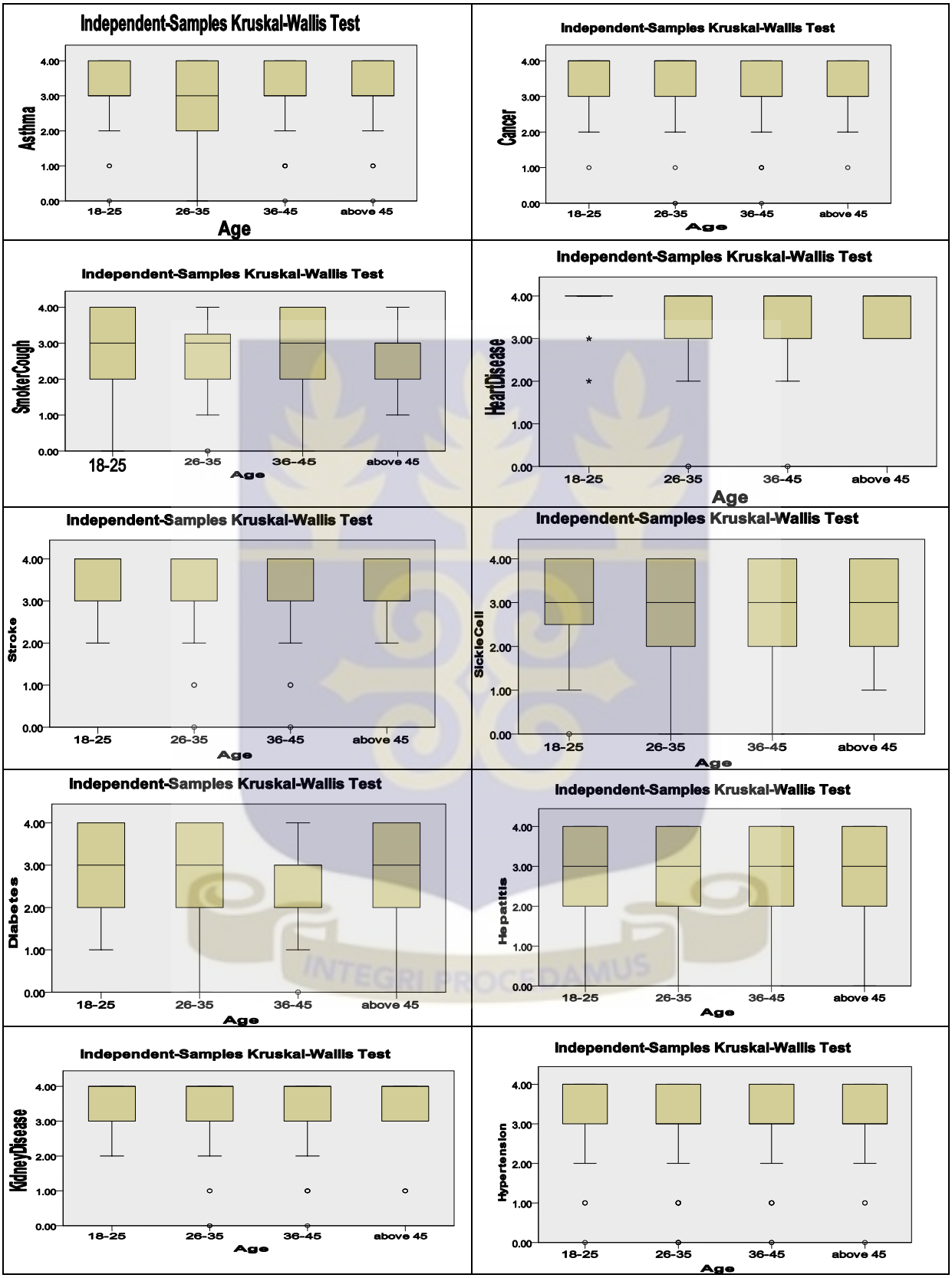
A Kruskal-Wallis H test was conducted to determine if there were differences in the risk perception of the ten risk issues (asthma, cancer, smokers cough, Heart disease, stroke, sickle cell, diabetes, hepatitis, kidney disease and Hypertension) scores between groups that differed in their ages: " 18-25 " ($n = 97$), " 26-35 " ($n = 118$), " 36-45 " ($n = 86$), " above 45 " ($n = 42$). Values are mean ranks unless otherwise stated. Distributions of the risk perception of all the risk issues were not similar for all groups except for Hepatitis, as assessed by virtual inspection of a boxplot (Figure 4.7).

None of the Risk Perception scores for the ten (10) risk issues were statistically significantly different between the different ages (Table 4.17).

Table 4.17

RISK ISSUES	TEST STATISTIC (χ^2)	DEGREES OF FREEDOM	SIGNIFICANCE
Asthma	6.300	3	0.098
Cancer	4.518	3	0.211
Smokers cough	2.947	3	0.400
Heart disease	2.262	3	0.520
Stroke	7.139	3	0.068
Sickle cell	4.445	3	0.217
Diabetes	1.663	3	0.645
Hepatitis	1.657	3	0.647
Kidney disease	0.948	3	0.814
Hypertension	4.067	4	0.254

Figure 4.7



4.4.5 Normality Test

A normality test was conducted to check the need for a parametric analysis to confirm the results of the non-parametric analysis. The Shapiro-Wilk test was used to check the normality of the data. Assessing the results of the Shapiro-Wilk test (Appendix D), we conclude that each of the levels of the independent variables (Religious faith groups) is not normally distributed. Therefore, the assumption of normality has not been met for this sample; hence no need to conduct a parametric analysis.

4.4.6 Risk perception and those ever diagnosed of any of the Risk issues

Preliminary results shows the need to perform a Fishers Exact test instead of the Chi square test since more than 80% of the cells on nine (9) of the risk issues had expected frequencies less than 5 (Appendix E). None of the respondents reported ever being diagnosed of stroke.

Primary outcome results using the Fisher's exact test indicated a non-significant difference in all nine (9) risk issues perceived among those ever diagnosed of any of risk issues as against those who have never been (Table 4.18).

Table 4.18

RISK ISSUES	P-VALUES (2 SIDED)
Asthma	0.636
Cancer	0.332
Smokers cough	0.301
Heart disease	0.819
Sickle cell	0.166
Diabetes	0.870
Hepatitis	0.627
Kidney disease	0.847
Hypertension	0.417

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the summary of the results of this study is presented. A brief overview of the study and answers to the hypotheses which drove the study and the connection between them and the relevant literatures and theories will also be presented. Also, a comprehensive conclusion is made on the whole research, implications of the research and recommendations are suggested based on the findings.

5.2 Summary of Results

The objectives of the study were:

1. Identify the effect of religious belief on health risk perception
2. Identify if an individual's experience with a health risk influences his/her perception of the risk.

The hypotheses tested were:

1. H_{o1}: There is no difference in an individual's perception of health risks based on his/her religious belief.

   H_{11}: There is difference in an individual's perception of health risks based on their religious belief.
2. H_{o2}: There is no association between an individual who had encountered a health risk and his/her risk perception of that health risk.

   H_{12}: There is an association between an individual who had encountered a health risk and his /her risk perception of that health risk.

After conducting a detailed empirical analysis on the data, the following findings were made:

1. All public sector workers' (Asikuma-Odoben-Brakwa district) beliefs influence their actions and behaviours.
2. 86.5% of public sector workers (Asikuma-Odoben-Brakwa district) go for routine medical check – up when necessary.
3. 68.1% of public sector workers (Asikuma-Odoben-Brakwa district) engage in physical activities outside work when necessary.
4. 78.5% of public sector workers (Asikuma-Odoben-Brakwa district) were satisfied with the balance between their work and leisure.
5. 41.6% of public sector workers (Asikuma-Odoben-Brakwa district) sought for a medical professional's advice when ill but also about 31.3% preferred self-medication rather.
6. There were statistically significant differences in the risk perception of diabetes ($\chi^2(5) = 21.915, P = 0.001$) based on religious faith among public sector workers (Asikuma-Odoben-Brakwa district). The differences were significant among :
    a. Protestants (mean rank =147.94) and Islam (mean rank =234.90), ($p = 0.000$)
    b. Other Christians (mean rank =160.16) and Islam (mean rank =234.90), ($p = 0.003$).
7. There were significant differences in the risk perception of Hepatitis ($\chi^2(5) = 11.451, P = 0.043$) based on religious faith among public sector workers (Asikuma-Odoben- Brakwa district) but the post-hoc analysis did not reveal which of the religious faith groups accounted for the difference.

8. Islamic respondents were for both the perception of Diabetes and Hepatitis risk, more risk conscious than other religious groups. Protestants on the other hand, for both the perception of diabetes and Hepatitis, were the least risk conscious.
9. Risk perception of cancer scores for males (mean rank = 179.40) was statistically higher than for females (mean rank = 160.49), (U= 15778, z = 1.976, p = 0.048).
10. There were statistically significant differences in the risk perception of Diabetes ($\chi^2(3) = 12.142, p = 0.007$) based on their levels of education among public sector workers (Asikuma-Odoben-Brakwa district). The differences were significant among:
    a. Postgraduates (mean rank = 88.04) and college diploma holders (mean rank = 170.18), ($p = 0.021$).
    b. Postgraduates (mean rank = 88.04) and undergraduates (mean rank = 172.67), ($p = 0.019$).
    c. Postgraduate (mean rank = 88.04) and Senior High School/A-level holders (mean rank = 189.99), ($p = 0.003$).
11. Senior High/ A-level respondents were more Diabetes risk conscious than respondents with other education background. Postgraduates (mean rank = 88.04) were the least diabetes risk conscious.
12. Differences in risk perception of all risk issues based on age were statistically non-significant among public sector workers (Asikuma-Odoben-Brakwa district).
13. Differences in risk perception of all risk issues among those participants ever diagnosed of any of the health risk issues as against those who had never been diagnosed among public sector workers (Asikuma-Odoben-Brakwa district) were also statistically non-significant.

5.3 Discussions

This research resulted in a few significant outcomes as well as support for all hypothesis tested. The results from the research revealed differences among religious faith groups and their risk perception of ten risk issues but only few of these differences were significant. There were limitations to this research but they will be discussed later in this chapter.

Hypothesis 1: Discussion on Health Risk Perception and Religious Belief

The total risk perception scores indicated that participants from the Islamic faith have an overall higher perception, indicating that they may be more cautious regarding their health.

The risk perception results as well as the results from other parts of this research not only suggest that there is a difference between religious faith group's perception of risk and different hazards, but may also suggest that there is a difference in the way individuals view the overall consequences and take control of outcomes of a hazardous situation or event, though only few were statistically significantly different.

Generally, risk issues were scored high among various religious faith groups, which confirms the relationship between religious belief and risk cautiousness (Deaxton, 2009; Aimie, 2012; Noussair et al. 2012).

Hypothesis 2: Discussions on Health Risk Experience and Health Risk Perception

Differences in risk perception of all risk issues among those participants ever diagnosed of any of the health risk issues as against those who had never been diagnosed among public sector workers (Asikuma-Odoben-Brakwa district) not being statistically significant suggests that individuals assessment of risk has little to do with their experience having such risk. These findings bring another dimension into risk communication and contradict Tison et al. (2012) research which suggests that; People reaction on risk perception would depend on the

disease they face. This suggests that innovative educational strategies are needed to increase risk factor knowledge and awareness among at-risk individuals and not only those who had ever encountered such risks (Homko et al. 2008; Walters et al. 2015).

General Discussion

Results from risk perception based on educational levels, suggest that the level of education of an individual can influence his/her perception of risk. The statistically significant different results in risk perception of diabetes showed that the differences were between postgraduates and other levels (undergraduates, Senior High/A-level, college degree) of education. This suggests and confirms that the education level of an individual has influence on his/her risk perception. Though research suggests a negative correlation between risk of developing diabetes and education (Essien et al. 2007), mean ranks of the various educational levels studied regarding their perception of diabetes suggests otherwise. Senior High/ A-level holders were rather more risk conscious than those with postgraduate degrees. This brings some complexity in risk communication. Does this suggest people become more complacent regarding the risk associated with health risk as they grow in knowledge?

The perception of the risk associated with diabetes based on religious belief and educational level were statistically. This suggests variations in the perception of individuals regarding how risky diabetes is, a situation which needs to be addressed through effective communication. Pádua et al. (2013) suggested that when individuals perceive that they are at risk consistently, they adopt more modified risk behaviours.

The sample studied (public sector workers in Asikuma-Odoben-Brakwa district) could have accounted for the few variations in risk perception since almost all individuals in the sample studied had some form of education. This education in whatever form it may be, could also have contributed to the outcome.

5.4 Implications from the Findings

Religious belief influences health risk perception outcomes but Risk behaviours based on the ten health risk issues studied do not seem to be associated with religious belief. This implies that religious belief may not have so much to do with individuals' perception of health risk. Educational levels of the participants come out much stronger as a factor worth considering in health risk perception than religious belief.

Also, an individual's assessment of health risk has little to do with his/her encounter with the health risk; it may have rather more to do with the knowledge the individual has about the health risk.

5.5 Limitation of Research

Although it produced a number of significant outcomes, this research had its limitations. The limitations that were associated with this research could have had a possible effect on the overall outcome of the study.

The first limitation was the uneven balance of participants in regard to gender. The balance of male and female participants per religious faith group was significantly different and could have strongly affected the risk perception results. If there was an equal number of male and female participants per religious group, the study might have produced different results overall.

The second limitation was that all public sector workers sampled had a form of education. Having some who had not had any form of education could have affected the outcome of the results.

Thirdly, as discussed earlier in the literature review, the link between religiosity and risk perception will more or less describe only what an individual's believes, concerning what he sees right or wrong but will not indicate whether they are going to act on these beliefs (Baazem et al. 2013).

5.6 Recommendations

Based on the findings of this research, the following recommendations are made:

1. Education concerning health risk should be intensified as it could help individuals adopt more modified risk behaviours
2. Community-based surveys should be conducted before and after education campaigns on risk issues to ascertain to what extent the education had had impart on the risk taking behaviours of the individuals.
3. Though the effect the media has made with regards to risk perception was not explored in this research, the impact of the media in the education and information delivery process among individuals cannot be overemphasised. The media needs to be involved in this education.
4. Health experts should review and devise more innovative ways of communicating risk issues to individuals to eliminate the variations in risk perception on some risk issues especially that of diabetes.
5. Individuals with high educational background should be cautioned against complacency in handling health risk issues.
6. Since religion produces more risk-cautious individuals, increasing and encouraging participation in religious activities will result in safer and healthier communities.

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APPENDICES

A. DEMOGRAPHIC QUESTIONNAIRE

Please answer each question accurately as possible.

DD1. What is your age?

[ ] Below 18 [ ] 18 – 25

[ ] 26 – 35 [ ] 36 – 45

[ ] Above 45

DD2. What is your gender?

[ ] Male [ ] Female

DD3. What is your marital status?

[ ] Married [ ] Single [ ] Separated

[ ] Divorced [ ] Widowed

DD4. Please indicate your religious faith.

[ ] Catholic [ ] Protestants (Anglican, Presbyterian, Methodist)

[ ] Pentecostal/Charismatic [ ] Other Christian

[ ] Islam [ ] No Religion

DD5. What is your highest qualification?

[ ] Senior High School/A'Level [ ] College Diploma

[ ] Undergraduate Degree [ ] Graduate Post- Diploma

[ ] Masters Degree [ ] other (please specify) ……

DD6. My actions are guided by my own beliefs rather than the beliefs of others.

[ ] Yes [ ] No

DD7. How often do you see your Physician for routine check-up, health screenings and disease control?

[ ] Monthly [ ] Quarterly [ ] semi-annually

[ ] Yearly [ ] When Necessary

DD8. How often do you engage in moderate physical activity outside of work?

[ ] Daily [ ] Weekly [ ] Monthly [ ] When Necessary

DD9. Are you satisfied with the balance between your work time and leisure time?

[ ] Not at all Satisfied [ ] Satisfied [ ] very Satisfied

DD10. Which of these do you mostly oft for when sick?

[ ] Medical advice from a professional

[ ] Medical advice from a Herbalist/traditional medicine

[ ] Self medication

DD11. Have the doctor ever told you that you have any of the following conditions?

I. Asthma [ ] Yes [ ] No

II. Cancer [ ] Yes [ ] No

III.	Smoker's cough	[ ] Yes	[ ] No
IV.	Heart Disease	[ ] Yes	[ ] No
V.	Stroke	[ ] Yes	[ ] No
VI.	Sickle cell	[ ] Yes	[ ] No
VII.	Diabetes	[ ] Yes	[ ] No
VIII.	Hepatitis	[ ] Yes	[ ] No
IX.	Kidney disease	[ ] Yes	[ ] No
X.	Hypertension (High Blood Pressure)	[ ] Yes	[ ] No

B. RISK PERCEPTION SCALE

On a scale of **0 – 4**, how many people do you think die each year as a consequence of …….?

1. Asthma

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

2. Cancer

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

3. Smoker's cough

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

4. Heart attack

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

5. Stroke

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

6. Sickle cell

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

7. Diabetes

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

8. Hepatitis

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

9. Kidney disease

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

10. Hypertension (High Blood Pressure)

Not at all risky	Slightly risky	Risky	Very risky	Extremely risky
0	1	2	3	4

C. CONSENT STATEMENT

METHODIST UNIVERSITY COLLEGE GHANA

FACULTY OF SOCIAL STUDIES

DEPARTMENT OF MATHEMATICS AND STATISTICS

Title of Project: Non-Parametric Analysis of the Effects of Religious Belief on Health Risk Perception

Principal Investigator: SELASI KWAKU OCLOO, Graduate Student

Supervisor: PROF. J.B. OFOSU

Co-supervisor: PROF. O.A.Y. JACKSON

I. THE PURPOSE OF THIS RESEARCH

The purpose of this research is to determine if there are any distinct religious differences in the way people perceive health risk.

II. PROCEDURES

First, you will complete a short questionnaire used to obtain general information about yourself.

The second, you will observe ten (10) different health risk situations and rate them using a 4-point likert-type scale.

III. RISKS

There are no factors related to this research experiment that should pose more than minimal risk to you.

IV. BENEFITS OF THIS RESEARCH

Your participation in this research will be used to better understand the extent to which religious differences can influence health risk perception.

V. EXTENT OF CONFIDENTIALITY/ANONYMITY

The results of this study will be kept strictly confidential. At no time will the researchers release the results of the study to anyone other than the individuals working on the project without your consent. The information you provide will not have your name, only a number will identify your responses during analyses and any written reports of the research.

D. Normality Tests

Table D.1 Test of Normality for Asthma Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance
Catholics	.831	35	.000
Protestants	.840	85	.000
Pentecostal/Charismatic	.835	100	.000
Other Christian	.807	78	.000
Islam	.766	30	.000
No Religion	.730	15	.001

Table D.2 Test of Normality for Cancer Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance.
Catholics	.733	35	.000
Protestants	.745	85	.000
Pentecostal/Charismatic	.731	100	.000
Other Christian	.760	78	.000
Islam	.549	30	.000
No Religion	.805	15	.004

Table D.3 Test of Normality for Smokers Cough Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance.
Catholics	.899	35	.004
Protestants	.868	85	.000
Pentecostal/Charismatic	.870	100	.000
Other Christian	.850	78	.000
Islam	.846	30	.001
No Religion	.881	15	.050

Table D.4 Test of Normality for Heart Disease Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance.
Catholics	.647	35	.000
Protestants	.592	85	.000
Pentecostal/Charismatic	.595	100	.000
Other Christian	.579	78	.000
Islam	.623	30	.000
No Religion	.596	15	.000

Table D.5 Test of Normality for Stroke Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance.
Catholics	.637	35	.000
Protestants	.741	85	.000
Pentecostal/Charismatic	.733	100	.000
Other Christian	.683	78	.000
Islam	.744	30	.000
No Religion	.603	15	.000

Table D.6 Test of Normality for Sickle Cell Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance.
Catholics	.829	35	.000
Protestants	.847	85	.000
Pentecostal/Charismatic	.825	100	.000
Other Christian	.848	78	.000
Islam	.735	30	.000
No Religion	.782	15	.002

Table D.7 Test of Normality for Diabetes Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance
Catholics	.848	35	.000
Protestants	.878	85	.000
Pentecostal/Charismatic	.854	100	.000
Other Christian	.868	78	.000
Islam	.705	30	.000
No Religion	.803	15	.004

Table D.8 Test of Normality for Hepatitis Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance
Catholics	.821	35	.000
Protestants	.880	85	.000
Pentecostal/Charismatic	.854	100	.000
Other Christian	.867	78	.000
Islam	.755	30	.000
No Religion	.806	15	.004

Table D.9 Test of Normality for Kidney Disease Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance
Catholics	.611	35	.000
Protestants	.609	85	.000
Pentecostal/Charismatic	.638	100	.000
Other Christian	.610	78	.000
Islam	.656	30	.000
No Religion	.658	15	.000

Table D.10 Test of Normality for Hypertension Risk Perception

Religious Faith	Shapiro-Wilk		
	Statistic	df	Significance
Catholics	.786	35	.000
Protestants	.783	85	.000
Pentecostal/Charismatic	.755	100	.000
Other Christian	.788	78	.000
Islam	.601	30	.000
No Religion	.816	15	.006

E. CROSS-TABULATIONS

Table E.1

		Asthma Risk Perception					
		Not At All Risky	Slightly Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Asthma	Yes	1	2	15	35	24	77
	No	5	17	39	115	90	266
Total		6	19	54	150	114	343

Table E.2

		Cancer Risk Perception					
		Not At All Risky	Slightly Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Cancer	Yes	0	1	3	13	13	30
	No	3	6	42	86	176	313
Total		3	7	45	99	189	343

Table E.3

		Smoker Cough Risk Perception					
		Not At All Risky	Slightly Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Smoker Cough	Yes	2	1	10	9	9	31
	No	5	21	80	117	89	312
Total		7	22	90	126	98	343

Table E.4

		Heart Disease Risk Perception				
		Not At All Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Heart Disease	Yes	0	0	5	16	21
	No	3	19	73	227	322
Total		3	19	78	243	343

Table E.5

		Sickle Cell Risk Perception					
		Not At All Risky	Slightly Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Sickle Cell	Yes	1	3	1	5	7	17
	No	2	38	61	102	123	326
Total		3	41	62	107	130	343

Table E.6

		Diabetes Risk Perception					
		Not At All Risky	Slightly Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Diabetes	Yes	0	2	8	16	7	33
	No	5	20	74	124	87	310
Total		5	22	82	140	94	343

Table E.7

		Hepatitis Risk Perception					
		Not At All Risky	Slightly Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Hepatitis	Yes	1	1	4	5	5	16
	No	8	23	68	137	91	327
Total		9	24	72	142	96	343

Table E.8

		Kidney Disease Risk Perception					
		Not At All Risky	Slightly Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Kidney Disease	Yes	0	0	0	1	7	8
	No	3	9	17	83	223	335
Total		3	9	17	84	230	343

Table E.9

		Hypertension Risk Perception					
		Not At All Risky	Slightly Risky	Risky	Very Risky	Extremely Risky	Total
Ever Had Hypertension	Yes	0	1	1	8	4	14
	No	8	17	35	112	157	329
Total		8	18	36	120	161	343