Health Knowledge of Nigerian College Students

Chinyere Ogbonna-McGruder
Western Kentucky University

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HEALTH KNOWLEDGE OF NIGERIAN COLLEGE STUDENTS

A Thesis
Presented to
The Faculty of the Department of Public Health
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Master of Science

By
Chinyere Ogbonna-McGruder
December 1996
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sticking it through with me.
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Health Knowledge of Nigerian College Students

Abstract

Chinyere Ogbonna-McGruder December 1996

Directed by: Dr. Wayne Higgins, Chairperson, Dr. Tom Nicholson, and Dr. Patricia Minors

Department of Public Health
Western Kentucky University

The increase in preventable diseases in many parts of Africa is becoming quite a concern for the African community as well as for epidemiologists all over the world. There is a general consensus among African epidemiologists that a lack of health education and traditional cultures contribute to this trend. The purpose of this thesis is to report the results of a survey of health knowledge among college students in the southern region of Nigeria, specifically, in Enugu and its surrounding environ. First year students at the two universities in this region completed the health knowledge inventory (HKI). These students were enrolled in classes in general education—which covers topics ranging from history, geography, and government, to personal hygiene. The HKI was utilized in measuring the health knowledge of these students. The result of the survey indicates a need for improvement in the health knowledge of
Nigeria students. The Nigerian students scored lower than a large sample of American college students on human sexuality, chronic disease, communicable disease and mental health subscales. On the rest of the subscales the students' scores were above average. The results from this survey may be relevant in the development of health care programs for the area.
CHAPTER 1

INTRODUCTION

The increase in preventable diseases, especially AIDS, in many parts of Africa is becoming a source of concern for members of the African community and for epidemiologists. This state of affairs is believed to be partly attributable to the traditional cultures of Africans (which has an influence on health beliefs and attitudes) and the general population's lack of health education and knowledge (1). Another possible cause is the relative isolation of the African continent from the rest of the world. This isolation could help account for the lack of exposure to general knowledge about disease and possible preventive measures. Although Africa is the second largest continent in the world, encompassing an area five times that of Europe, its coastline is little more than a quarter as long as its size (2). Originally, very few of tropical Africa's rivers were navigable from the sea, while the Sahara desert impeded human contact from the north (2). Thus Africa had been relatively isolated from the rest of the world (2). The situation has changed today, though travel to African countries is still somewhat limited.
By the 1980s, most countries in Africa were experiencing declining per capita gross domestic product. Out of the forty-six countries in sub-Saharan Africa, twenty-eight of them had declining per capita gross domestic products. By 1994, tropical Africa's economy had declined by 2 percent relative to population growth (2). Sub-Saharan Africa's increasing population is mainly sustained by slash-and-burn agriculture (2) which results in poor economic growth for the area. Nigeria is an oil producing and exporting country, but mismanagement of the oil income coupled with increasing population has led to sluggish economic growth. The poor economic conditions in most African countries, especially in Nigeria where inflation is very high, contributes to poor health status. The high cost of medical care makes it difficult for the average citizen to afford even basic preventive and primary health care.

The Nigerian government has not sponsored extensive health education programs aimed at educating the citizens in basic preventive health care practices. With the rapidly growing population in most parts of Africa, the majority of the African governments have difficulty trying to improve the basic health infrastructure already in place in these countries. The ever growing African population makes it virtually impossible for the health infrastructure to keep
up with population growth. In many parts of West Africa, especially in Nigeria, expansion of the government health infrastructure has not been successfully implemented. Thus many of the health personnel in the field have not been given training manuals and other materials necessary to support the many village health workers trained all over the country (3). This situation makes it difficult for basic health care services and preventative health education to be provided in many rural areas as well as in some urban areas.

In developed countries such as United States, the foremost leading causes of death include heart disease, cancer, stroke, lung disease and accidents (4). Infectious diseases (with the exception of AIDS) do not constitute the leading causes of death in United States. But in most parts of Africa, the leading causes of death include preventable infectious diseases such as malaria, tuberculosis, AIDS, cholera, dysentery, and typhoid (5). In recent years, this situation has begun to change, as chronic disease rates have increased. The changing disease patterns include an increase in hypertension, stroke, and sudden deaths from heart attack (6). Nweze (6) suggests that this changing disease pattern might be due to stressful effects of social and cultural changes which "are far exceeding the coping and adjustment resources of average Nigerians." This is thought probably
to be related to Nigerians' changing behavioral patterns (6).

Due to the high cost of medical treatment by qualified health care professionals most of the Nigerian poor turn to traditional healers for their medical needs (7). Given the current economic hardships and health needs of Nigerians, the importance of preventative health care and health education cannot be overemphasized.

Need for the study

A 1994 report conducted by the United Nations rated 173 countries on the basis of literacy, schooling, population growth, per capita gross domestic product, and life expectancy. Out of the 173 countries rated, twenty-two of the bottom twenty-four countries were in sub-Saharan Africa (8). Nigeria was rated as 139th out of the total 173 countries. Such a poor rating by the majority of the African countries indicates a need for some form of action.

Given the alarming rate of infectious diseases in Nigeria as well as the rest of Africa the need to document the extent of health knowledge of Nigerians is important. Health knowledge is essential for effective decision-making and behavior change.

There have been no documented studies to determine the
health knowledge of Nigerians. Surveys that would provide more information about the health knowledge of Nigerians and their students are clearly needed.

PURPOSE OF THE STUDY

The purpose of this study is to evaluate the general health knowledge of Nigerian students who are currently enrolled at two universities in Enugu, using the Health Knowledge Inventory (HKI). Of the few documented studies that addressed health issues concerning Nigerians, only one (9) dealt specifically with youths or adolescents. Clearly more information regarding the health knowledge of Nigerian youth is necessary in order to provide direction for future health education planning in Nigeria. Recent studies that utilized the HKI indicate that college students are not well informed about health (10). This study is a follow-up to the work of Price et al (10). Its purpose is to determine the extent of health knowledge of Nigerian college students.

Basic Assumptions

The assumptions of this study are as follows:
1. All the respondents will honestly answer their questionnaires.
2. The options they choose will be the options that they
believe are the best options.

Limitations of the Study

There are some major limitations associated with the study, and these limitations are as follows:

1. The respondents for the study were freshman college students enrolled at two south central universities in Nigeria. The two universities were not randomly selected, but chosen for their convenient location. Thus the data collected could not be generalized to the population of all the college students or the adult population in Nigeria.

2. Since the results of the study were obtained from freshman college students, the results may not reflect the knowledge of all college students at the two universities.

3. It is also important to note that the study was conducted during the summer months of 1996, with available freshman college students enrolled at the University of Nigeria and Enugu State University of Technology. The Universities had just been reopened, after several months of closure. The closure was due to a political crisis in Nigeria, which included strikes by professors at the majority of Nigerian Universities.

4. Not all the freshmen students at the two universities were sampled. The sample included only the students that
were available for classes on the day the interviewer administered the questionnaires.

5. The original HKI questionnaire was slightly modified to reflect the Nigerian culture and experience. The modification was done by the author with input from an expert panel which included two of the test developers. However there was no analysis carried out to recheck the construct validity of the modified questionnaire.

**Definition of terms**

Several key terms used for the purpose of this thesis are defined as follows:

1. **Health behavior**: according to Gochman: “health behavior consists of those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behavior patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement” (12). Health behavior also refers to those actions (or inactions) that we take that directly or indirectly affect our health status or well being (13). Behavior as related to health, denotes something that people do or refrain from doing, although not always consciously or
voluntarily (13). Types of health related behavior includes preventive, utilization and compliance behaviors (13).

2. **Health knowledge**: The state of knowing, awareness or understanding of issues relating to health.

3. **Health education**: The World Health Organization defines health education as: “any combination of planned activities leading to a situation where people want to be healthy; know how to attain health; do what they can individually and collectively; and seek help when needed” (14).

4. **Attitudes**: A manner of acting, thinking or feeling that shows one’s opinion or disposition (15).

5. **Infectious diseases**: Diseases that can be contracted by exposure to infected individuals, objects or organisms. Generally, these diseases can be avoided if the infective organisms are avoided or if there is no exposure to an infected individual (15). Thus they are often times preventable.

6. **Preventable diseases**: These can be defined as diseases that can be avoided, stopped or kept from happening, usually by following preventive measures.

7. **Preventive health behavior**: This is defined as any activity taken by any individual that believes himself or herself to be healthy, for the purpose of preventing illness or detecting it in an asymptomatic state (16).
8. **Vesico-vaginal fistula**: A condition that is due to prolonged, obstructed labor in childbirth causing tearing of maternal tissues. The result is an abnormal passage (fistula) extending from the bladder to the vagina (17). Women who have this condition are incontinent, since their bladders continually leak urine.

9. **Validity**: A test possesses validity if it measures what it is supposed to measure. Validity can be determined in different ways, depending on the type of test and its intended use (11).

10. **Content validity**: This term is used to define the extent to which an instrument has sufficiently sampled the total possible meanings or substrata of a concept (11). Face validity which is a component of content validity is achieved when a group of experts in a field determine that the instrument measures the relevant construct (11).

11. **Logical validity**: This validity is achieved by the definition of the domain areas to be measured by a test and the design of items to cover these areas (11).

12. **Criterion related validity**: The degree of association of the instrument with another measure of the same phenomenon is defined as Criterion-related validity (11). This association is usually expressed as a correlation coefficient between the test score and the criterion score.
13. **Construct validity**: The degree to which a test measures the theoretical construct it was designed to measure, is known as the construct validity. It is usually assessed by making predictions about how the test scores would behave in various situations (11).

14. **Reliability**: The potential of a test instrument to generate similar answers when testing and retesting the same group of individuals. The common methods used for estimating reliability are internal consistency, parallel forms and test/retest (11).
Nigeria is one of the most heavily populated countries in Africa. The country has a rapidly growing young population and is characterized by numerous ethnic tribes and groups, with differing cultures. This cultural diversity impacts the educational achievement of Nigerians, as well as the training of the citizens in social and health issues.

**Relationship between behavior and disease**

The behavior modification approach can be utilized to explain the sequence of actions that take place when one wants to avoid a disease or an undesirable outcome. This approach emphasizes the roles played by habit and skill in attempting to modify undesirable personal or lifestyle behaviors and brings to bear a wide range of techniques (e.g., contingency contracting, self-monitoring, counterconditioning, covert sensitization, relaxation and environmental engineering) (18). The general plan that this approach usually follows is (18)

1. Identification of the problem (disease or undesirable outcome)
2. Description of the problem in behavioral terms
3. Selection of a target behavior that is measurable
4. Identification of the antecedents and consequences of the behavior

5. Setting of behavioral objectives

6. Devising and implementation of a behavior change program

7. Evaluation of the program

The above sequence can be utilized in determining what types of actions or behaviors predispose someone to a particular disease or unwanted situation.

Personal habits play important roles in the development of many serious chronic and infectious diseases as well as violence and accidents (19). Lifestyle is one of the most important modifiable factors affecting health behavior and diseases today. The majority of today's most pressing health problems in the more developed countries are related to unhealthy lifestyles and behaviors. Some of these behaviors include overindulgence in alcoholic beverages, tobacco abuse, unhealthy nutrition, indiscriminate use of medications, unsafe driving and relentless pressure to achieve which can lead to stress (19).

In the United States, of the ten leading causes of death (table 1), at least seven could be substantially reduced if people at risk modified just five behaviors: diet, smoking, lack of exercise, alcohol abuse, and use of antihypertensive medication (19).
<table>
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<tr>
<td></td>
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<td>6</td>
<td>2.5</td>
<td>2</td>
<td>25.5</td>
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<td>Stroke</td>
<td>8</td>
<td>0.6</td>
<td>9</td>
<td>1.2</td>
<td>8</td>
<td>6.1</td>
<td>3</td>
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<td>Arteriosclerosis</td>
<td>5</td>
<td>116.5</td>
<td>3</td>
<td>658.2</td>
<td>3</td>
<td>84.1</td>
<td>1</td>
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<td>Bronchitis, Emphysema, &amp; Asthma</td>
<td>1</td>
<td>407.7</td>
<td>2</td>
<td>294.4</td>
<td>3</td>
<td>253.1</td>
<td>4</td>
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<td>4.9</td>
<td>5</td>
<td>6.5</td>
<td>1</td>
<td>29.7</td>
<td>2</td>
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<td>10</td>
<td>0.4</td>
<td>10</td>
<td>2.4</td>
<td>8</td>
<td>17.8</td>
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<td>8.6</td>
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<td>39.2</td>
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<td>13.6</td>
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<td>4</td>
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<td>253.1</td>
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<td>142.8</td>
<td>4</td>
<td>5288.1</td>
<td>878.1</td>
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<td>Sudden infant deaths</td>
<td>4</td>
<td>142.8</td>
<td>4</td>
<td>142.8</td>
<td>4</td>
<td>5288.1</td>
<td>878.1</td>
</tr>
</tbody>
</table>

All causes 1412.1 43.1 117.1 182.5 1,000.0 5288.1 878.1

1 Rate per 100,000 live births
2 Rate per 100,000 population in specified group
Source: Based on data from the National Center for Health Statistics. Division of Vital Statistics
The leading causes of disease and death for Nigerian adults include malaria, typhoid, hepatitis B (which has ten times the incidence per capita in Africa compared to the United States), and tuberculosis (21). Other diseases that take their toll throughout Nigeria and Africa as a whole include, polio, spinal meningitis, schistosomiasis, river blindness, sleeping sickness (2), sickle cell anemia, cirrhosis of the liver, and diabetes (5). Sexually transmitted diseases are also becoming a source of concern. Though sickle cell anemia is hereditary, and diabetes is not always preventable, the majority of the other mentioned diseases can be prevented or at least controlled by the adoption of a more health conscious behavior. For example, typhoid could be controlled by the boiling and cautious use of water. The occurrence of malaria can be prevented or at least reduced by acquiring a habit of always sleeping under mosquito nets (21). Some behavior modifications already occur in most malaria endemic areas of Nigeria. These modifications include the limitation of evenings or night errands and the utilization of mosquito screens on windows.

The increasing number of sexually transmitted diseases could be reduced by behaviors such as abstinence or reduction in the number of sexual partners and the use of condoms. Nigerian habits such as non use of condoms and the
tendency not to boil drinking water contributes to the increase in some of the above mentioned diseases. Changing the behavior of driving under the influence of drugs or alcohol would also help reduce the rate of motor vehicle accidents in Nigeria.

Modification of "unhealthy" habits by the citizens of Nigeria could reduce the number of injuries and deaths that result from preventable causes. Studies of the behavior of Nigerian youths indicate that they practice behaviors which put them at increased risk for both unintentional and intentional injuries and diseases. Practices such as female genital circumcisions are commonplace (23), especially in rural villages. These practices are common in some villages even though such practices put females at increased risks for infection, complications during labor as well as transmission of the HIV virus and hepatitis B and A (23). Substance abuse is also on the increase in Nigeria (22). Though the problem of substance abuse is not entirely new in the country (22), a whole new dimension has been added by the diversity of substances now available to young people and urban elites (24). For instance, there is a wide variety of alcoholic beverages now available in Nigeria. This wide availability predisposes to an increase in alcohol consumption which contributes substantially to increase in
vehicle accidents, homicides, suicides, accidental falls and unprotected sex (22). Excessive alcohol consumption is also a direct cause of liver cirrhosis and psychotic conditions (22). There is growing evidence that alcohol consumption is on the increase in Nigeria (25, 26, 27). Partly for this reason, Nigeria also has the highest automobile accident rate in the world (22). In a study conducted in 1988 by International Council for Alcoholism and Addictions (ICAA) (28), it was noted that alcohol consumption accounted for the second largest group of patients admitted to three Nigerian hospitals.

The traditional culture of Nigeria stresses abstinence from sex before marriage, but there is now a growing number of young urban Nigerians who are indulging in both premarital and unsafe sexual practices with multiple partners (9). This sort of behavior contributes to an increase in the number of unwed mothers as well as an increase in the number of people with sexually transmitted diseases. Quinn and Mann (29) note that in Africa 75%-80% of HIV infection is acquired by sexual activity. They believe that there is a pressing need for research to be directed towards effective control measures. These should include studies of patterns of risk behaviors and the evaluation of health education interventions (29). The researchers suggest
that health education interventions will help bring about changes in individual behavior. The incidence of AIDS, gonorrhea, syphilis and hepatitis B is on the increase in Nigeria and this can be attributed to the "promiscuous" behavior of Nigerian youth.

Most of the previously mentioned diseases can be treated, managed or prevented, but basic knowledge about possible positive behavioral options is not available to the majority of Nigerians, especially the uneducated individuals.

On the positive side, Nigerians do not have a high proportion of obese people. Research suggests that this is probably due to their preference or habit for ethnic food which is generally low in both unsaturated and saturated fat (21).

Relationship Between Health Knowledge and Behavior

Information campaigns are based on the assumption that lack of knowledge is a barrier to improvement of health behaviors (30). But this assumption may not hold true in all cases. Health knowledge does not necessarily lead to positive change in health behavior. This relationship can be addressed with the knowledge-attitude-behavior (KAB) model (31). For knowledge to lead to behavior change, the
“knowledge” provided must be of a motivational kind (31). Research indicates that some types of knowledge are more motivating than others (31). For example, some types of knowledge enhance the motivation to take action. However, behavioral capabilities or instrumental knowledge is needed by people in order to act on their motivations (31). Therefore in order for people to apply health knowledge to their behavior, the knowledge should be both motivational and instrumental.

A review of nutritional studies spanning 70 years by Whitehead (32) suggests that in United States “nutrition education has been directed more toward disseminating information than toward improving dietary habits” (32). Such an approach was effective in increasing knowledge, but not in changing dietary behaviors or practices (32). Whitehead found that only studies that specifically set behavioral change as the goal of nutritional education and made use of educational strategies that were appropriate for that goal were able to achieve behavioral change (32).

Simmonds (33) acknowledged that health education has an emphasis on the determinants of human behavior, and on health behavior research. Green (18) indicated that effective models for health education require greater knowledge of the determinants of health behavior. These
determinants include individual cognitive factors such as interests, attitudes, perceptions, beliefs, values, and motives, as well as skills at the estimation of risks or vulnerabilities. Recognition of symptoms and social determinants such as peer pressure have an impact on health behavior (13). Therefore health knowledge has implications for the broad concepts of what health education and health promotion programs should be like, as well as for specific aspects of the content and targets of such programs (13).

The effectiveness of a health behavior intervention might be increased by the improvement of the theory on which the intervention is based. This approach can be utilized by more accurately describing and modeling the interacting determinants of a given health behavior and by more accurately describing the means by which those determinants can be influenced to modify the behavior (13).

It would be quite difficult to have one theory or model that can be used universally to explain or to develop interventions that might "(a) modify a great variety of health-related behaviors; (b) that are performed by populations that have very different socio-psychological characteristics (e.g., age, socioeconomic status); (c) that are performed in different contexts or situations; (d) that might be influenced by different types of interventions
(e.g., social regulations, economic incentives, education); and implemented by various organizational vehicles (e.g., medical facilities, schools, media, work sites)” (13). Rather, specific health-related behaviors might be modified and explained more effectively by the integration of components from a range of existing models. This integration will help generate the most parsimonious eclectic model of a specific behavior that is performed by a targeted population, in certain situations, with specific types of interventions and available organizational vehicles (13).

For example, the PRECEDE (34) model provides a generic framework within which more detailed theories can be integrated (13). The PRECEDE model suggests that three types of variables (predisposing, reinforcing and enabling) exert an influence on health behaviors (31). “Predisposing variables include relevant knowledge, beliefs, attitudes, values, and skills that might be influenced by direct communication with the target population. Reinforcing variables include relevant attitudes and behaviors of significant others (including parents, peers, teachers, celebrities, and so on) as they are perceived to be important by the target population. Indirect communication (i.e., messages provided by parents, peers and so on) can be used to augment direct communication. Enabling variables
include the availability, accessibility, and acceptability of resources required to perform the behavior. For many health-related behaviors, community organization is required to ensure such resources (e.g., ensuring that safety belts are installed in vehicles)." (13). The PRECEDE model can be integrated with other health models such as the health belief model (35).

Health education models such as the health belief model, the theory of reasoned action (30), and the theory of planned behavior (31) are also useful models in the explanation of the relationship between health knowledge and behavior. The Health Belief Model emphasizes the importance of behavior, beliefs and knowledge in health promotion and prevention of disease (35). This model indicates that for effective risk reduction behaviors to occur, the affected individuals must perceive the disease as serious and avoidable, and consider themselves as being at risk. They must also consider the benefits of the preventive action to outweigh the costs of the prevention (1). Therefore, the belief that a particular health practice will be effective in the reduction of threat is a major component of the health belief model (30). The model also assumes that if people can be persuaded or are aware that their current health habits are potentially harmful, they will be
motivated to change those health habits (30).

The Theory of Reasoned Action suggests that perceived norms (i.e., behavioral expectations of peers and family members) influence health behavior to some extent (30). The Theory of Planned Behavior suggests that behavioral intent and behavior are influenced by the amount of control people feel that they have in being able to perform the behavior (31). Thus, both the theory of reasoned action and the theory of planned behavior (31) indicate that personal beliefs about expectations or anticipated outcomes of a behavior, as well as the values placed on these outcomes, together constitute "attitudes" (31). These attitudes and social norms influence behavioral intention, which is thought to be the main predictor of behavior (31).

In more developed, industrialized countries such as the United States and Canada, there has been a marked reduction in the incidence of life-threatening infectious diseases in this century. Americans have also made impressive gains in health status in the past few decades. These gains include a significant reduction in infant mortality rates, increased life expectancy and decreased deaths due to heart disease (19). Some of the credit for these gains should go to earlier efforts at prevention, based on new knowledge that was obtained from ongoing health
related research (19). But a number of the recent gains are due to behaviors that people have adopted by themselves. These changes in lifestyle and behavior result from a growing awareness of the impact of certain habits and behaviors on health (19). Today many Americans are interested in health promotion and disease prevention. Thus, with the growing understanding of risk factors for chronic diseases, as well as AIDS, there will be new opportunities for major health status gains in America.

In Nigeria, the reverse seems to be the case. There is an increase in the incidence of preventable and life-threatening infectious diseases, such as malaria, typhoid and cholera. The incidence of AIDS is also on the rise. In both urban and rural areas, a changing disease pattern has been observed, and this trend seems to follow the changing behavior patterns of the “modern” Nigerian (5). Chronic diseases such as stroke, hypertension and heart attacks, are on the increase (36). It has been suggested by Nweze (36) that this trend might be a result of the stressful effects of cultural and social changes that are occurring at a pace that far out paces the coping and adjustment resources of the average Nigerian.

Oshuntokun (37) observed a disease pattern of increased incidence of noncommunicable diseases in developing African
countries. These diseases are usually associated with economic development, industrialization and psychosocial maladaptation (6). Oshuntokun (37) drew attention to the increasing incidence of diseases such as hypertension, coronary artery diseases, diabetes mellitus, obesity, cerebrovascular accidents, certain types of cancer, dental caries, traffic accidents, violence, multiple sclerosis, Alzheimer's disease, in both the rural and urban areas. The author also drew attention to the possibility of a link between changing lifestyles, lack of health awareness and behavior patterns that is related to the etiology of these diseases (37).

The Nigerian experience highlights the fact that the overall health status of the Nigerian today, as well as that of the general African citizen, depends to a great extent on social and economic variables as well as on behavioral factors (6). Thus, the establishment of a program to educate Nigerians on the advantages of a healthier lifestyle should have an effect on their behavior and health status as well.

**Previous Surveys**

There have been very few studies done to determine the extent of the general health knowledge of Nigerians and the effect of health knowledge on their behavior, lifestyles,
and overall health. But studies conducted in Nigeria as well as in America suggest that health knowledge and fear about the consequences of certain behavioral actions appear to have an effect on the behavior and lifestyles of individuals.

In the United States, McClaran and Sarris (38) conducted a study of college students and found that students have an understanding of behavior change concepts. In many cases these students reported making behavior changes such as a reduction in personal intake of salt, fats, oils, sugar and alcohol, and they increased the amount of time spent vigorously exercising at least 20 minutes (38). Another study that tested the health knowledge of college students across the United States, using the HKI, found that there were significant deficits in health knowledge pertaining to the content areas measured by the test (10). Students in the study missed about half of the items pertaining to communicable disease and human sexuality, suggesting the need for greater health education efforts in these areas (10).

A study conducted by Ojanuga (17) found that lack of health knowledge, lack of health education, and overall ignorance play a role in the incidence of vesico-vaginal fistula in Nigerian women. The results indicates that the
importance of community health education cannot be
overemphasized in the prevention of the occurrence of
vesico-vaginal fistula. The author also suggested that
education of women on the values of prenatal care and
hospital delivery should reduce the incidence of the ailment
(17).

Another study conducted by Odujinrin and Akinkuaede (39)
focused mainly on the knowledge, attitudes, and beliefs of
Nigerian adolescents concerning preventive AIDS practices.
This study showed that Nigerian adolescents have a very
limited understanding of the causative agent, the route of
transmission, and the groups at high risk for AIDS (39). The
study also showed that adolescents have limited knowledge
and utilization of preventive measures. The youths believed
that while AIDS is a serious health problem for the rest of
the world it was not yet a health problem for Nigeria (39).
They practiced carefree, sexual behaviors with multiple
partners. Very few of them practiced preventive sexual
measures. Odujirin and F. Akinkuaede (39) also found that
64.1% of the students sampled believed that changes in
behavior or lifestyle can help prevent AIDS, though only
about one fifth of them were aware of and made all the
appropriate lifestyle changes. This change is similar to the
one reported in a college age youth study conducted in
Kansas city, where about 25% of the youths believed that AIDS was a concern and had made changes in their sexual behavior (40). The study by Odujinrin and Akinkuade indicates a need for coordinated health education programs coupled with communication and involvement of Nigerian youths (39).

Health Education Programmes and Attitudes in Nigeria

In most regions of Nigeria, the majority of the health care programs focus mainly on health problems that are caused by the environment and pathogenic organisms. Diseases that are not very well known are labeled as of unknown origin or idiopathic in nature (6). For example, diseases such as elephantiasis and lassa fever are not well understood in the country. This attitude has led to acceptance of these diseases as being inevitable, thus negating the need for practices which can help prevent them from occurring. The World Health Organization (WHO) reported that infectious diseases (which take their greatest toll in developing countries) such as malaria, tuberculosis, dengue fever and AIDS are on the increase (5). In view of the increase in the incidence of these diseases, it is important that mass media information and health education programs for the Nigerian general public should be an important
component of disease prevention efforts. In order to carry out this process, it is necessary to access the health knowledge of the community in question, and thus develop a program that will target the community needs.

Development of the HKI:

The Health Knowledge Inventory (HKI) was developed to determine college students' health related knowledge (11). The inventory was developed to address eleven health content areas, including accidents and safety, aging and death, chronic disease, communicable disease, consumer health, environmental health, human sexuality, mental health, nutrition, physical fitness, and substance abuse/use (11).

The HKI is comprised of 110 items that were selected from an initial item pool of 1,014 questions developed by the authors of the inventory. The selection of the 110 questions was done through a process of rating the questions in each content area. Prior to the selection process, between 70 and 100 items were developed for each content area ($x = 92.16; SD = 11.52$). A minimum of 8 and a maximum of 18 expert reviewers rated questions in each content area ($x = 13.90; SD = 3.20$) (11). Each item was rated on a Likert scale (1-poor, 2-below average; 3-average; 4-good; 5-superior). Measures of central tendency and variability were calculated for each item, based on the jurists' ratings.
Items were ranked, within each content area, from highest to lowest on the basis of median rating values (11). Then from each content area, the 20 highest rated items were selected, resulting in a second round pool of 220 items, with each item in this pool having an above average rating by the reviewers (11). The twenty items from each content area were then randomly assigned to two equal groups, and ten items from each group were combined to form two preliminary versions of the HKI (versions A and B)(11). Each of the two versions contained a total of 110 items (10 from each content area). These were then administered to 351 students enrolled in undergraduate personal health classes, (173 students initially completed version A, and 178 students initially completed version B (table 2)). An item analysis and initial test-retest reliability estimation was then calculated for the two versions (11).

Using only the scores from the initial administration of both versions (i.e., 220 items), item analysis was performed on the scores to select the best 110 items out of the second round pool of 220 items (11). The r-biserial correlation coefficient, d-item-discrimination index, p-item difficulty, and item characteristic curves-ICC, values were utilized in the selection of the ten best items to be included in the final draft of the HKI (11). All the items
Table 2. Descriptive Information on First Administration of HKI

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Sample Size</td>
<td>173</td>
</tr>
<tr>
<td>Mean Score</td>
<td>62.53</td>
</tr>
<tr>
<td>Variance</td>
<td>97.19</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>9.86</td>
</tr>
<tr>
<td>Std. Error of Measurement</td>
<td>5.13</td>
</tr>
<tr>
<td>Low Score</td>
<td>38</td>
</tr>
<tr>
<td>High Score</td>
<td>86</td>
</tr>
</tbody>
</table>
selected had positive r values ranging from +.13 to +.49, and positive d values ranging from +.12 to +.55 (11). P values for the selected items ranged from +.27 to +.95 (11). All the ICCs for the selected items had positive slopes, which indicates that higher scoring students were more likely to pass these items than lower scoring students (11).

The original HKI has reasonably good construct, content, logical, and criterion-related validity as well as good reliability for college students in the United States (11). Because the HKI was developed using American college students the instrument had to be slightly modified in order to reflect the culture and background of Nigerian students. This modification resulted in the rewording or substitution of 13 questions of the original HKI.
CHAPTER 3

METHODS AND PROCEDURES

This survey was designed to test the health knowledge of Nigerian students at two universities in Enugu, using the HKI. Results from the survey give an indication of the level of general health knowledge of these students.

Location of the Study

Enugu is the capital city of Enugu State. The State is located in the southern part of Nigeria. Nigeria is located in West Africa. The city of Enugu has an estimated population of one million people and is made up of different subdivisions. These subdivisions vary depending on economic standing. Thus, some divisions have a majority of affluent people and families, while other divisions have a majority of low income families. The two universities sampled are located centrally in the city.

The Study Participants

Students at two Nigerian universities were surveyed. The students were enrolled at either the University of Nigeria, Enugu campus, or Enugu State University of Science and Technology. The Universities were selected because they are the two main Universities located in Enugu. Students
enrolled at these institutions are drawn from all parts of Nigeria.

The students enrolled at the universities are graduates of various high schools and represent different levels of socioeconomic class and settings. All of the students that took the tests were Nigerians. Both of the Universities have a very small selection of international students; however, none of the students sampled were international in origin because none of the international freshmen students were available on the day the test was administered.

**Data Collection**

A total of 300 college students from the two universities were sampled in July of 1996. All of the currently enrolled and available (students attending school on the day the survey was conducted) first year students from the two Universities were surveyed. The HKI test was administered to the students in their classes by a medical student attending the University of Nigeria. The students eligible for taking the test had either taken or were enrolled in a general studies class. All the surveyed students had completed at least one semester of college classes. The general studies class includes content in basic
social science, natural and biological science. It is a three credit hour class that is designed to give freshmen students a basic understanding of the general sciences.

One hundred copies of the HKI test and a box of computer scoring sheets were mailed to the research interviewer, who also lives in the city of Enugu. The interviewer obtained permission from the students' Professors to administer the tests to the students after their class lecture periods were over. The tests were administered to the students in groups of 100.

The students were provided with written as well as oral directions. The written directions requested the students to follow carefully the instructions on the computer testing sheets and respond appropriately while taking the test. The oral directions requested the students to complete the 110 questions, choosing for each question the answer they felt was best from the four choices. They were told that completion of the test was voluntary and they would be given sufficient time to complete the test. They were also asked to indicate their age and gender on the computer scoring sheet. The students were assured of complete confidentiality. They were informed that only group results would be used for the survey report. The interviewer acted as the study contact for the survey. The interviewer took
the HKI copies and the computer scoring sheets to the two Universities and utilized uniform instructions and testing procedures for the administration of the test to the students. Upon completion of the tests, the interviewer collected the computer scoring sheets and mailed them back to the investigator. The grading and statistical analysis of the tests were carried out at Western Kentucky University, using appropriate data processing systems at the University.

Instrumentation

The survey instrument was the Modified Health Knowledge Inventory. The HKI inventory was developed for the testing of college students’ health knowledge. The inventory has good construct, criterion and content validity. The HKI (as developed in the United States) can be utilized as a reliable test for health knowledge and this reliability is indicated by its test/retest reliability.

The HKI is a 110-item multiple choice test (appendix A), which measures the general health knowledge of the college student population. The test contains ten items each from the following eleven areas: accidents and safety, aging and death, chronic disease, communicable disease, consumer health, human sexuality, mental health, nutrition, physical fitness and drug use. For each of the above eleven
categories, test-retest reliability ranges from .60 to .77 while internal consistency reliability ranges from .43 to .57 (11). Indicators of content validity, construct validity and criterion based validity were found to be consistently high (11). The original HKI was slightly modified to better reflect Nigerian culture and experience. This slight modification of the original HKI inventory could possibly have an effect on the overall content, construct, and criterion based validity of the modified HKI.

Oral informed consent was obtained from the students before they were allowed to take the test. All the students that took the tests did so voluntarily.
CHAPTER 4

Results

Description of Study Sample

A total of 300 students were administered the questionnaires, but out of that number, only 176 of the participants returned their completed data forms. Thus the sample for data analysis included just the 176 subjects who had turned in their completed questionnaires. The rest were eliminated from the sample because they did not return their answer sheets.

The respondents were a mixture of students from both Enugu State university of technology and from University of Nigeria Enugu campus. Out of the 176 sample students, 162 of them reported their ages. The age of these students ranged from 18 to 52 years with a mean of 25.6 years. All the students sampled were freshmen, who had taken or were enrolled in a general studies class. In regard to ethnic status, all of the 176 students sampled were Nigerians. The gender of the sample was 63% female (n=111) and 37% male (n=65).

Data Analysis Discussion

The mean of the total HKI scores for both males and females combined was 57.5 (53%), with a standard deviation
of 9.64 (table 3). Subscale scores ranged from 23 to 64 (table 4). The minimum scores for each subscale ranged from zero (chronic disease and consumer health) to 3 (physical fitness). The maximum scores for each subscale ranged from 6 for chronic disease to 10 for drug use, nutrition, environmental health, aging and death, and accidents and safety (table 5).

The lowest subscale score was in chronic disease with 23% answered correctly, while the highest were in physical fitness and accidents and safety with 64% correct (table 4). Females generally scored higher than males in all subscales apart from the subscales that dealt with aging and death and drug use (table 4). The total score on all the subscales combined was 59.07 (54% correct) for the females and 55.86 (51% correct) for the males (table 4).

General linear ANOVA revealed no significant differences between the males and the females (alpha level .05). The F-values ranged from .001 to for human sexuality to 3.361 (table 6). The fact that there was no significant difference between the males and females might be due in part to the small sample size (n=176)

The students exhibited a level of health knowledge only slightly lower than that found in the larger Price et al sample of American college students (10). The Nigerian
students had a percentage correct score of 53, while the students in the Price et al study (1991), scored 58%. When compared with results from other HKI studies displayed in table 7, the Nigerian students scored somewhat lower on the average than students at two other schools. The difference is more noticeable when compared with the College de Sherbrooke(Canada) study (41).
Table 3. Total HKI Scores for the Nigerian College Students

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Sample</td>
<td>57.47</td>
<td>1.33</td>
<td>176</td>
</tr>
<tr>
<td>Females</td>
<td>59.07</td>
<td>1.36</td>
<td>111</td>
</tr>
<tr>
<td>Males</td>
<td>55.86</td>
<td>1.34</td>
<td>65</td>
</tr>
</tbody>
</table>
Table 4. Percentage of Correct Responses for HKI Subscales by Gender

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Total Sample (Percent Correct)</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Sexuality</td>
<td>34%</td>
<td>34%</td>
<td>33%</td>
</tr>
<tr>
<td>Physical Fitness</td>
<td>64%</td>
<td>64%</td>
<td>62%</td>
</tr>
<tr>
<td>Accidents and Safety</td>
<td>64%</td>
<td>66%</td>
<td>61%</td>
</tr>
<tr>
<td>Aging and Death</td>
<td>57%</td>
<td>56%</td>
<td>57%</td>
</tr>
<tr>
<td>Chronic Disease</td>
<td>23%</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>Communicable Disease</td>
<td>49%</td>
<td>51%</td>
<td>47%</td>
</tr>
<tr>
<td>Consumer Health</td>
<td>62%</td>
<td>65%</td>
<td>57%</td>
</tr>
<tr>
<td>Environmental Health</td>
<td>63%</td>
<td>65%</td>
<td>60%</td>
</tr>
<tr>
<td>Mental Health</td>
<td>49%</td>
<td>51%</td>
<td>47%</td>
</tr>
<tr>
<td>Nutrition</td>
<td>63%</td>
<td>64%</td>
<td>60%</td>
</tr>
<tr>
<td>Drug Use</td>
<td>51%</td>
<td>50%</td>
<td>54%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>53%</strong></td>
<td><strong>54%</strong></td>
<td><strong>51%</strong></td>
</tr>
</tbody>
</table>
Table 5. Total Mean and Standard Deviation for each Subscale for Nigerian College Students

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Minimum Score</th>
<th>Maximum Score</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Sexuality</td>
<td>3.38</td>
<td>1.34</td>
<td>1</td>
<td>8</td>
<td>176</td>
</tr>
<tr>
<td>Physical Fitness</td>
<td>6.35</td>
<td>1.33</td>
<td>3</td>
<td>9</td>
<td>176</td>
</tr>
<tr>
<td>Accidents and Safety</td>
<td>6.43</td>
<td>1.6</td>
<td>1</td>
<td>10</td>
<td>176</td>
</tr>
<tr>
<td>Aging and Death</td>
<td>5.65</td>
<td>1.55</td>
<td>1</td>
<td>10</td>
<td>176</td>
</tr>
<tr>
<td>Chronic Disease</td>
<td>2.32</td>
<td>1.71</td>
<td>0</td>
<td>6</td>
<td>176</td>
</tr>
<tr>
<td>Communicable Disease</td>
<td>4.93</td>
<td>1.35</td>
<td>1</td>
<td>9</td>
<td>176</td>
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<tr>
<td>Consumer Health</td>
<td>6.17</td>
<td>1.51</td>
<td>0</td>
<td>9</td>
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<tr>
<td>Environmental Health</td>
<td>6.32</td>
<td>1.71</td>
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<td>10</td>
<td>176</td>
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<tr>
<td>Mental Health</td>
<td>4.94</td>
<td>1.34</td>
<td>1</td>
<td>8</td>
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<tr>
<td>Nutrition</td>
<td>6.28</td>
<td>1.53</td>
<td>2</td>
<td>10</td>
<td>176</td>
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<tr>
<td>Drug Use</td>
<td>5.12</td>
<td>1.52</td>
<td>2</td>
<td>10</td>
<td>176</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>57.9</td>
<td>9.64</td>
<td>35</td>
<td>83</td>
<td>176</td>
</tr>
<tr>
<td>Subscale</td>
<td>Male</td>
<td>Female</td>
<td>F value</td>
<td>Significance</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>------</td>
<td>--------</td>
<td>---------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Human Sexuality</td>
<td>3.32</td>
<td>1.34</td>
<td>3.41</td>
<td>1.35</td>
<td>0.001</td>
</tr>
<tr>
<td>Physical Fitness</td>
<td>6.23</td>
<td>1.41</td>
<td>6.41</td>
<td>1.29</td>
<td>0.351</td>
</tr>
<tr>
<td>Accidents and Safety</td>
<td>6.11</td>
<td>1.59</td>
<td>6.61</td>
<td>1.59</td>
<td>0.009</td>
</tr>
<tr>
<td>Aging and Death</td>
<td>5.74</td>
<td>1.45</td>
<td>5.60</td>
<td>1.61</td>
<td>0.735</td>
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<tr>
<td>Chronic Disease</td>
<td>1.98</td>
<td>1.67</td>
<td>2.51</td>
<td>1.71</td>
<td>0.378</td>
</tr>
<tr>
<td>Communicable Disease</td>
<td>4.71</td>
<td>1.43</td>
<td>5.05</td>
<td>1.29</td>
<td>0.193</td>
</tr>
<tr>
<td>Consumer Health</td>
<td>5.69</td>
<td>1.57</td>
<td>6.45</td>
<td>1.41</td>
<td>0.168</td>
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<tr>
<td>Environmental Health</td>
<td>6.00</td>
<td>1.84</td>
<td>6.51</td>
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<td>0.032</td>
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<tr>
<td>Mental Health</td>
<td>4.68</td>
<td>1.34</td>
<td>5.10</td>
<td>1.32</td>
<td>0.437</td>
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<tr>
<td>Nutrition</td>
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<td>1.49</td>
<td>6.41</td>
<td>1.53</td>
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<td>Drug Use</td>
<td>5.35</td>
<td>1.65</td>
<td>4.98</td>
<td>1.42</td>
<td>3.261</td>
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</table>

*NS - not significant
Table 7. American, Canadian and Nigerian Student Subscale Performance on the Health Knowledge Inventory

<table>
<thead>
<tr>
<th>Subscale</th>
<th>14 U.S. Colleges &amp; Universities (Price, et al. sample) (n=1,841)</th>
<th>College de Sherbrooke (n=43)</th>
<th>Western KY University (n=35)</th>
<th>Enugu State &amp; University of Nigeria (n=176)</th>
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<td>66%</td>
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<td>63%</td>
<td>60%</td>
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CHAPTER 5

Discussion

The author of the study evaluated the health knowledge of Nigerian college students. The Nigerian students’ overall level of health knowledge was found to be similar to that of both American and Canadian students, with the Nigerian students scoring slightly lower than American and Canadian students previously studied. No statistically significant difference was found on both total and subscale scores by gender.

Looking at the Nigerian students’ performance on the inventory by subscale, it is apparent that they had poor knowledge of factors that predispose to chronic disease (they scored only 23% correct on the chronic disease subscale) as well as poor knowledge of human sexuality issues (34% correct).

Studies have shown that disease patterns are changing in Nigeria, as manifested in an increased incidence of hypertension, stroke, and hearth attacks (6). The increasing incidence of these diseases can be related to chronic disease factors and a lack of knowledge pertaining to them.

Another possible explanation for the low score on the chronic disease subscale might be due to the fact that the incidence of infectious diseases is high in Nigeria. Health
education programs tend to focus on infectious disease prevention. Chronic disease issues often receive less emphasis in government funded health educational programs, since they are considered to be of secondary importance. However, student performance on the communicable disease subscale suggests considerable room for improvement in health education directed at infectious disease as well.

Cultural factors might explain why the Nigerian students performed slightly below the Price et al average on the mental health subscale. Mental problems in the Nigerian society and culture are regarded as a malady that is principally inflicted on people by witch doctors. As such, there is not a great deal of effort directed by the government towards addressing mental health issues, and funding for government programmes directed towards mental health is minimal. Thus, information pertaining to mental health is not widely available.

The students' low score on the human sexuality subscale is of concern especially in this era of the AIDS pandemic. The low score may be attributable to Nigerian views about sexuality. This manifests itself in a reticence to talk freely about sexual issues, problems and behaviors. Overall, the Nigerian culture does not lend itself to the dissemination of human sexuality
The Nigerian students performed relatively well on the rest of the subscales. This result could be attributed to the fact that the students are a select group, by virtue of their being admitted to a university. A much smaller percentage of the Nigerian populations is able to gain admission to attend college relative to USA.

The Nigerian students scored higher than the American students in the Price et al (1991) study on accidents and safety, aging and death, communicable disease, and consumer health subscales, and they tied with the American students on the environmental health subscale. Such outcomes are surprising considering that students in Nigeria do not get as much exposure to classes or media communication pertaining to health as does American students. On the rest of the subscales the Nigerian students scored lower than the American students. This probably reflects the relatively low level of health information available to Nigerian students.

Comparing the Nigerian students performance with that of students from a small private college in Canada and students from a regional university in the USA indicates that the Nigerian students scored lower on the inventory than other students at the other two schools (table 7). They scored better than the Canadian students and tied with the
Americans on the accidents and safety subscale. In the aging and death subscale, they scored better than the American students but lower than the Canadian students. On communicable disease subscale they tied with the American students but scored lower than the Canadian students. In consumer health they scored higher than the American students but lower than the Canadian students (table 7).

Conclusion

A study was conducted to determine the level of health knowledge of Nigerian students. Nigerian college students scored somewhat lower than students in a large sample from 14 American colleges and universities and lower than smaller samples from a small private Canadian college and a regional American university. The low scores on the chronic disease and the communicable disease subscales are particularly troubling, given the high incidence of infectious disease and increasing incidence of chronic disease in Nigeria. Overall, results suggest that these students could benefit from improved health education programs.
Appendix A

THE HEALTH KNOWLEDGE INVENTORY

1. According to health professionals which of the following weight reducing techniques is the most highly recommended?
   a. Hypnosis
   b. Fasting and/or fad diets
   c. Sweat belts and spot reducing techniques
   d. Regular exercise combined with reduced calorie intake

2. The risk of heart disease is most serious for women who smoke and
   a. Have arthritis  c. Use oral contraceptives
   b. Are pregnant  d. Have osteoporosis

3. Hashish is a derivative of:
   a. Mescaline  c. Psilocybin
   b. LSD  d. Marijuana

4. All of the following statements are true about shock except:
   a. It is easier to prevent shock than to treat it
   b. The victim's temperature is usually high
   c. Vomiting is common
   d. Breathing is shallow and irregular

5. Of the following, which statement is inaccurate?
a. The dying patient should be separated from other patients during the terminal phase.
b. Terminally ill patients should be told they are dying
c. Most patients prefer to die at home rather than in a hospital.
d. Health providers usually do not communicate easily with each other on issues relating to the needs of the dying patient.

6. Osteoporosis (brittleness of the bones) is associated with a deficiency of:
   a. Vitamin A
   b. Calcium
   c. Potassium
   d. Vitamin B12

7. A positive HIV antibody test means:
   a. The person has full blown AIDS.
   b. The person is infected with the AIDS virus, and most certainly will develop AIDS.
   c. The person was exposed to the virus that causes AIDS, but has developed antibodies to the virus and is immune.
   d. The person has AIDS and will probably die within a year.

8. Pushing painful thoughts or feelings from the conscious mind is indicative of:
   a. Sublimation
   b. Regression
   c. Reaction formation
   d. Repression
9. Carbon monoxide is dangerous because it:
   a. Destroys cilia in the lung's air sacs
   b. Impairs the red blood cells' oxygen-carrying function
   c. Helps to create fluorocarbons in the air
   d. Causes sterility once the accumulation reaches toxic levels

10. Immediately following a strenuous workout a person should:
    a. Drink a large quantity of water to replace lost body fluids
    b. Eat a hearty meal to replace needed energy
    c. Walk or jog slowly in place
    d. Lie down and relax

11. A heart attack is known as:
    a. Congestive heart failure  c. Endocarditis
    b. Cardiac ischemia  d. Myocardial infarction

12. Fat consumption should not exceed ___% of daily caloric intake.
    a. 50%  c. 30%
    b. 40%  d. 20%

13. When a person is in very good physical condition his or her heart:
    a. Pumps faster
    b. Produces fewer abnormal heart sounds
    c. Pumps more slowly
d. Produces more arrhythmias

14. Individuals who derive sexual excitement from dressing in the clothes of the opposite sex are called:
   a. Transvestites (cross dressers)  c. Transsexuals
   b. Homosexuals                        d. Bisexuals

15. If you suspect internal bleeding:
   a. Apply hot compresses to the area
   b. Give fluids such as water
   c. Apply cold compresses to the area
   d. Give a depressant such as alcohol

16. In Nigeria, it is presently uncommon to:
   a. Medically prolong life against a person's will
   b. Practice active euthanasia (actively help a person painlessly end his/her life)
   c. Practice passive euthanasia
   d. Let your family members decide what treatment to be given if you are too sick or unconscious to make the decision

17. Rheumatic fever is best prevented by:
   a. Periodic physical examination
   b. Controlling high blood pressure
   c. Prompt treatment of streptococcal infections
   d. Eliminating foods high in cholesterol from the diet

18. Microorganisms that can harm or injure humans in some way are called:
a. Microbes    c. Hosts
b. Pathogens     d. Bacteria

19. What type of vitamin supplement does a person eating a well balanced diet need?
   a. Only Vitamin C
   b. A multiple vitamin tablet
   c. A multiple vitamin tablet with iron
   d. No supplements are needed

20. Exercises that pit one muscle, or part of the body against another or against an immovable object in a strong but motionless pressing or contracting are called:
   a. Isometric
   b. Static
   c. Isotonic
   d. Ballistic

21. The type of chest pains usually felt by someone experiencing a heart attack:
   a. Pain in the left chest, centering on the nipple
   b. Squeezing, aching, or pressing pain
   c. Sharp or jabbing pains
   d. Pain will increase with movement

22. The best way(s) to prevent getting a sexually transmitted disease is:
   a. To use a condom.
   b. For partners to communicate honestly.
   c. To wash before and after intercourse.
   d. All of the above
23. When helping someone who is suffering from depression (extreme sadness), a friend or family member should:
   a. Take them to the hospital immediately
   b. Be an attentive, non judgmental listener
   c. Try to cheer the person up
   d. Tell the person to get hold of themselves and "pull themselves up by their bootstraps"

24. A woman who smokes during her pregnancy increases the chances that she will have a baby that:
   a. Is born addicted to nicotine
   b. Has Down's Syndrome
   c. Suffers neurological damage
   d. Has low birth weight

25. Which of the following statements is not true?
   a. Lifestyle can have a significant effect on one's health
   b. Aerobic exercises generally require a high expenditure of calories
   c. A cardiac patient who exercises is less likely to have another heart attack
   d. If you need recovery time after performing a strenuous activity, it's a signal that you've exercised too hard

26. The most effective method of birth control, excluding sterilization, is:
   a. Birth control pills c. The diaphragm
b. Norplant  

d. Spermicide

27. A type of cancer for which a genetic link has been identified in some cases:

a. Skin  

c. Breast

b. Bladder  

d. Lung

28. During the wet season, it is most important for _____ to be protected from extended exposure to drenching during rainfall:

a. Elderly & chronically ill  

c. Young adults

b. Young children  

d. General population

29. A generic drug name indicates:

a. The chemical content of a drug

b. The name of the individual who discovered the drug

c. The name of the company that manufactures the drug

d. The drug contains a narcotic derivative of some kind

30. Which vitamin is found in fortified milk and produced by the body in response to ultraviolet light?

a. Vitamin E  

c. Vitamin C

b. Vitamin K  

d. Vitamin D

31. Depletion of the ozone layer causes:

a. Plants to grow slower.

b. An increase in sunburns

c. Suppression of the immune system

d. All of the above
32. Which of the following is not a physiological factor in depression (mental sadness)?
   a. Low blood sugar
   b. Elevated cholesterol level
   c. Nutritional deficiency
   d. Imbalance in the brain levels of certain neurotransmitters

33. The most common attitude toward death in Nigerian society has been described by scholars as one of:
   a. Death denying
   b. Death defying
   c. Death desiring
   d. Death accepting

34. Individuals believed to be suffering from acute alcohol intoxication:
   a. Should be forced to vomit
   b. Should be placed in a cold shower immediately
   c. Should be left alone to sleep
   d. Should receive emergency medical help immediately

35. Identify the cause of more than half of all fatal residential fires.
   a. Cigarette smoking
   b. Children playing with matches
   c. Malfunction of electrical appliances
   d. Cooking

36. Exercise that makes the cardiovascular and respiratory system strong is:
   a. Aerobic exercise
   c. Calisthenic exercise
b. Isometric exercise  d. Isotonic exercise

37. ___________ occurs when a person's vital body signs (heartbeat, respiration) cease functioning.
   a. Clinical death   c. Brain death
   b. Cellular death   d. Spiritual death

38. The most common and most curable of all cancer is:
   a. Colon   c. Skin
   b. Breast   d. Lung

39. Which of the following is a weakness of a strict vegetarian diet?
   a. Too much bulk and fiber content
   b. Tends to aggravate high blood pressure
   c. It could lack essential amino acids
   d. Tends to cause diarrhea

40. _________________ is the capacity of a muscle to exert a force against a resistance.
   a. Strength   c. Endurance
   b. Flexibility   d. Coordination

41. Which of the following statements is true?
   a. Most old people are basically alike
   b. Most old people live at or below the poverty level
   c. Most old people will be a victim of crime
   d. Most old people retain their interest in sex

42. Which of the following is a recognized method for controlling bleeding?
   a. Elevating the wound   c. Apply pressure
b. Apply direct pressure  
d. All of these methods

43. Analgesic drugs are used to:
   a. Reduce pain  
   c. Reduce fever
   b. Reduce swelling  
   d. Reduce nausea & vomiting

44. A lack of dietary or supplemental iron will cause:
   a. Anemia  
   c. Hypoglycemia
   b. Diabetes Mellitus  
   d. Herpes Type I

45. LSD, mescaline, and psilocybin are classified as:
   a. Opiates  
   c. Stimulants
   b. Depressants  
   d. Hallucinogens

46. The most prevalent form of rape in Nigeria is:
   a. Acquaintance Rape  
   b. Child molestation
   c. Marital rape  
   d. Rape of a person from a different race or ethnic group

47. _________is a diagnostic test for breast cancer.
   a. Pap smear  
   c. Mammogram
   b. Arteriogram  
   d. Electromyogram

48. Of the following, which is a characteristic of kwashiorkor?
   a. Stunted growth, edema, and a protuberant belly
   b. Primarily affects adolescent females
   c. A conscious relentless attempt to diet
d. Eating binges followed by induced vomiting

49. The major threat to the quality of Nigerian water supply is:
   a. Sewage
   b. Organisms that cause cholera and thyroid fever
   c. Industrial and agricultural chemicals
   d. Garbage disposal

50. Exercising the body at levels greater than to which it is accustomed is:
   a. Overload
   b. Cardiorespiratory endurance
   c. Training effect
   d. Principle of reversibility

51. Breast and testicular self-exams should be done:
   a. Monthly
   b. Every 3 months
   c. Twice a year
   d. Once a year

52. Although only one area of the body may be injured, the body as a whole may react by depressing vital processes. This condition is:
   a. Shock
   b. Anoxia
   c. Asphyxia
   d. Vital depression

53. Which of the following statements about Alzheimer's disease is inaccurate?
   a. Alzheimer's is an organic brain syndrome that primarily affects the elderly
   b. Alzheimer's is incurable
   c. Alzheimer's is primarily caused by atherosclerosis
d. Most Alzheimer's patients are cared for at home rather than being institutionalized

54. The primary psychoactive ingredient in marijuana is:
   a. Peyote           c. DMT
   b. THC              d. Methedrine

55. Fertilization usually occurs in the:
   a. Fallopian tubes  c. Ovaries
   b. Vagina           d. Uterus

56. The primary role of the Food and Drug Administration (FDA) is to:
   a. Protect the public from quackery
   b. Enhance buyer awareness
   c. Regulate the effectiveness, safety and labeling of drugs and food products
   d. Develop and enforce uniform safety standards

57. Grass is a slang name for:
   a. Mescaline         c. Opium
   b. Cocaine           d. Marijuana

58. If a child has swallowed a bottle of medicine, what do you do?
   a. Go to a day care center
   b. Go to Nigerian Red Cross
   c. Take the medicine bottle with you and go immediately to the nearest clinic
   d. Take the child to a pharmacy

59. Which of the following statements about the effectiveness
of aerobic exercises is true?

a. Aerobic exercises should be done daily for 1 to 2 hours per session.
b. Aerobic exercises should be done 3-4 times weekly for approximately 20-30 minutes per session.
c. Aerobic exercises should be done once per week for 30-45 minutes per session.
d. Aerobic exercises should be done once per month for 1 hour per session.

60. Antibiotics are effective in treating diseases caused by which of the following category of organisms?

a. Viruses  
   c. Bacteria and fungi
b. Animals  
   d. Parasitic worms

61. The major danger associated with quack treatments is:

a. They tend to create false hopes of cure
b. They may have a placebo effect
c. Effective treatment may be delayed
d. Money is needlessly wasted

62. Foods served at Mama put joints typically tend to be:

a. High in palm oil, fat, calories and salt content
b. High in calories, low in protein and salt
c. Low in calcium and fats, high in sugar
d. Low in protein, sugar and salt

63. Menopausal symptoms are primarily attributable to:

a. The "empty nest" syndrome  
   c. Cultural expectations
b. Estrogen deficiency   d. Environmental influences

64. Which of the following procedures should be used as a last resort to stop severe bleeding?
   a. Apply a tourniquet
   b. Elevate the injured part
   c. Apply direct pressure to the wound
   d. Apply pressure to the supplying artery (pressure point)

65. Which statement regarding tuberculosis (TB) is not accurate?
   a. Symptoms include chronic coughing, weight loss and even death
   b. All TB infections are easily cured
   c. TB is spread through coughing
   d. The disease thrives in places such as hospitals, college residence halls, and prisons

66. A health care provider who believes that all diseases are related to spinal dislocations is called:
   a. An Osteopath   c. An Internist
   b. An Orthopedist   d. A Chiropractor

67. Ascribing an undesirable thought or action of one's own to another person is called:
   a. Displacement   c. Projection
   b. Reaction formula   d. Compensation

68. Side effects commonly associated with alcohol do not
include:

a. Irritates the gastrointestinal tract
b. Enhances the effects of other depressant drugs
c. Enhances sexual performance
d. Acts as a diuretic

69. The source of water pollution most likely to be contaminated with disease organisms is:

a. Synthetic organic chemicals
b. Inorganic chemicals and minerals
c. Radioactive substances
d. Human sewage

70. A rule to prevent infection is to never touch a wound with anything that is not sterile, the most important exception to this is:

a. If there is severe bleeding
b. If the wound is a burn
c. If there is clothing sticking to the wound
d. If the wound is a puncture and not bleeding

71. A document that indicates the signer's preferences for medical treatment in the event a person is diagnosed terminally ill and is unable to express his/her choice or wishes regarding their medical treatment.

a. Last Will and Testament
b. Durable Power of Attorney for Health Care
c. Living Will
d. Informed consent form
72. A biopsy is:
   a. A radioactive substance which tends to destroy a cancerous tumor
   b. Removal of tissue for examination
   c. Sputum sample examined for cancerous cells
   d. A scanning procedure to check for cancer

73. A sexually transmitted disease that can also be picked up from infected towels, linens, or clothing is:
   a. Syphilis
   b. Genital Herpes
   c. Pubic lice
   d. Gonorrhea

74. Two diseases that quacks frequently claim to be able to cure are:
   a. Arthritis and cancer
   b. Diabetes and baldness
   c. Heart disease and asthma
   d. Obesity and epilepsy

75. Disorders which originate in the mind and manifest themselves in bodily symptoms are known as:
   a. Panic attacks
   b. Psychosomatic complaints
   c. Affective disorders
   d. Neurotic reactions

76. Air pollutants which affect the respiratory system cause:
   a. The cilia to slow down thereby allowing a greater absorption of the pollutant into the body
   b. The cilia to speed up thus becoming more effective
   c. More cilia to be generated so as to increase cleansing efficiency
d. Cilia to grow longer - thereby increasing their resistance

77. Teenage mothers are more likely to have all the following with the exception of:
   a. Premature babies
   b. Stillbirths
   c. Shorter labor
   d. Higher maternal mortality

78. When treating a suspected fracture you should:
   a. Move the victim to a more convenient location
   b. Treat for shock, and immobilize the injured area
   c. Set or reduce the fracture
   d. Strengthen a joint that is out of alignment

79. When dealing with bereaved children it is advisable to do all the following except:
   a. Allow the child to attend the funeral or memorial service if he/she wants to
   b. Grieve openly in the presence of the child
   c. Tell the child the truth about how, when, where a significant other died
   d. Tell the child that death is like "going to sleep", "going on a trip," etc.

80. Which of the following has been associated with cancer?
   a. Chemicals presently used in food for coloring
   b. Diets low in vitamins
   c. Diets low in fats and high in sugar
d. Diets high in fats and low in fiber

81. Preparations of weakened or killed pathogens that stimulate antibody formation without causing observable signs and symptoms of the disease are called:
   a. Vaccines
   b. Antibiotics
   c. Toxoid
   d. Pheromones

82. Panadol is of no value in the treatment of:
   a. Fever
   b. Pain
   c. Inflammation
   d. Headaches

83. The best way to get the different nutrients we need is to:
   a. Eat a wide variety of foods
   b. Take a vitamin and mineral supplement daily
   c. Eat only "organically" grown foods
   d. Eat a good breakfast daily

84. The term "dementia" means:
   a. To be deprived of the mind
   b. To be dying
   c. To be psychotic
   d. To be elderly

85. The term "snuffing" is associated with:
   a. PCP
   b. Tobacco
   c. Heroin
   d. LSD

86. A term that means "without oxygen" or not requiring oxygen is:
   a. Anaerobic
   b. Metabolism
   c. Aerobic
   d. Aneurysm

87. What is the first thing that should be done when attempting to aid an unconscious person?
a. Check for a pulse  
b. Attempt the Heimlich Maneuver  
c. Start artificial respiration immediately  
d. Open the airway and check for breathing

88. Cancer specialists are referred to as:  
a. Oncologists  
b. Nephrologists  
c. Pathologists  
d. Obstetricians

89. The main function of carbohydrates in the diet is to:  
a. Build and repair the body  
b. Regulate body temperature  
c. Supply the body with energy  
d. Manufacture hormones and enzymes

90. Healing that results from a person's belief in treatments that have no medical value is called:  
a. Quackery  
b. Mysticism  
c. Voodooism  
d. Placebo effect

91. What is the major source of human-made radiation to which the majority of the Nigerian population is exposed to each year?  
a. Fallout from nuclear weapons testing  
b. Faulty color television sets  
c. Medical and dental X-rays  
d. Nuclear power generators

92. What should you do if you are unable to blow air into the victim's lungs when trying to give artificial respiration?  
a. Keep trying
b. Attempt the Heimlich Maneuver
c. Let someone else try
d. Retilt head, try again

93. Biological changes commonly associated with aging include all the following except:
   a. Diminished immune system response
   b. Diminished blood sugar levels
   c. Diminished breathing capacity
   d. Diminished hearing acuity

94. To reproduce, which of the following must take over the reproductive machinery of a body cell?
   a. Protozoa
   b. Bacteria
   c. Viruses
   d. Fungi

95. Which drug is the most potentially lethal when combined with alcohol?
   a. Barbiturates
   b. Marijuana
   c. Cocaine
   d. Decongestants

96. Which of the following is most likely to lead to hearing loss?
   a. Loud music during a party
   b. Illness and ear disease from drinking too much liquor
   c. Continually listening to loud music through headphones
   d. Sound waves emitted from the TV

97. Individuals who manifest both masculine and feminine psychological traits are termed:
98. Diabetes mellitus involves a malfunctioning of which gland?
   a. Adrenal         c. Thyroid
   b. Pancreas        d. Pituitary

99. Which of the following is a well-balanced dietary program?
   a. Slim Fast diet   c. Weight Watchers
   b. Macrobiotic      d. Liquid protein diet

100. In which of the following stages of bodily reaction to stress is psychosomatic illness most likely to occur?
    a. Alarm stage      c. Exhaustion stage
    b. Resistance stage d. Holistic stage

101. The condition known as "runners' high" has been associated with the release of brain chemicals known as:
    a. Endorphins      c. Steroids
    b. Prostaglandins  d. Platelets

102. Research on the incidence of child rape/molestation indicates that most child rapings/molestation is done by individuals who are _________ in their sexual orientation.
    a. Bisexual        c. Heterosexual
    b. Homosexual      d. Asexual

103. Physical exercise is beneficial to the elderly because it provides all the following results except:
    a. Lowers cholesterol levels
b. Prevents the loss of brain cells

c. Increases respiratory efficiency

d. Reduces mental anxiety and tension

104. Which group is at the greatest risk of developing diabetes mellitus?

   a. Adult males   c. The obese
   b. People under 20 d. People whose diet is high in simple carbohydrates

105. Which of the following diseases may deform a fetus if an expectant mother contracts it during the first 3 months of pregnancy?

   a. Smallpox   c. Rubella (German measles)
   b. Measles d. Varicella (Chicken pox)

106. Which of the following is not an example of a Nigerian public health system?

   a. Government Primary health services for child health and immunizations
   b. A hospital owned by a Doctor
   c. City hospitals run by the state
   d. University teaching hospitals

107. Attempts to understand another's emotional thoughts and feelings is called:

   a. Compassion   c. Tolerance
   b. Empathy   d. Sympathy
108. What gas is responsible for about 50% of global warming:
   a. Oxygen               c. Chlorofluorocarbons
   b. Carbon dioxide       d. Sulphur dioxides
109. Contemporary research indicates that a primary explanation
     for homosexuality is:
     a. A hormonal dysfunction
     b. Heredity
     c. Poor relationship with parents
     d. There is no agreement regarding an explanation
110. If you burn yourself on the hand with a hot iron, you
     should:
     a. Cover the wound with butter or other grease
     b. Cover the wound with a cotton ball dipped in oil
     c. Cover the wound with sterile gauze that has been dipped
         in warm water
     d. Cool the area and cover loosely with a sterile dressing
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