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# FACTOR ANALYSIS OF TOBACO USE AMONG UNIVERSITY STUDENT

***The thesis has submitted as a partial fulfillment of the requirement for the M. Sc. Degree***

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# Chapter One
# (Introduction)

## 1.1 Background

In 1962, the British Royal College of Physicians established a link between smoking and bad health, in 1970, a senior medical consultant in the United States of America gave strong health warnings that smoking is harmful to health and in 1978, World Health Organization experts announced that "smoking is a major cause of ill-health and premature death; but this is avoidable by giving up smoking or not smoking at all. Since that time, scientific evidence has accumulated to the point that more than 25 diseases, most of which are life – threatening, are known or strongly suspected to be casually related to smoking.

Health and education are the basis of economic productivity; healthy populations are critical for poverty reduction, economic growth and long-term development.

Tobacco is responsible for one death every 10 seconds worldwide and killing 3.5 million people every year around the world, by the year 2015 the tobacco use is expected to kill 10 million annually. Tobacco use causes deaths every year more than fires, automobile crashes, alcohol, cocaine, heroin and AIDS, it leads to serious illnesses. Society pays the Price, with more suffering, lost lives lost productivity, and higher health care spending.[1]

Tobacco consumption was reported to be among the ten leading risk factors globally which account for more than one third of all deaths worldwide. Tobacco proved to be the second major cause of death in the world, however in high mortality rate developing countries it was ranked

[1] http://www.wpro.who.int/health_topics/tobacco/

number six and in low mortality developing countries tobacco was the second most important cause of deaths.

In June 1995, representatives of 22 international organizations met to examine the implication of current global trend in tobacco production and consumption for sustainable development, especially in developing countries. The meeting participants concluded that tobacco posed a major challenge not just to health but also to social and economic development.[2]

Tobacco is a silent epidemic and remains a major killer, particularly in developing countries. And it targets children and youth. If current pattern continue, tobacco use will results in the deaths of an estimated 250 million children and young people alive today.[3]

The premature loss of a human life to tobacco has an impact not only on the family but also on the country's economy. Enormous costs are associated with tobacco use, including medical care for treatment of tobacco-related diseases, absenteeism from work, reduced productivity, losses due to fire, and foregone income due to early mortality. A 1993 World Bank study estimated that tobacco use results in a global net loss of US$200 billion per year, half of which occurs in developing countries. The losses accrued from tobacco on the world economy exceed the total current health expenditures in all developing countries combined.[4]

The tobacco industry is often viewed as economically advantageous for tobacco company workers and for small farmers in developing countries. However, only a small portion of the enormous profits actually goes to the tobacco industry workers in developing countries. Most of the profit goes to

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2 World Health Organization. Guidelines for controlling And monitoring the tobacco epidemic. 1998

[3] International consultation on tobacco and youth, Singapore, 28-30 September, 1999

[4] World Bank. “The Economic Costs and Benefits of Investing in Tobacco”. March 1993.

the transnational corporations that have taken control of the tobacco industry, often from former government monopolies. In contrast to many national governments, these companies are committed to achieving market expansion rather than to enhancing the local economy. Although some new factories may recruit local employees, the successful companies are increasingly replacing human labor with automated cigarette production machines, closing down the less efficient factories. In the majority of developing countries, tobacco production results in a net loss in the balance of trade. In 1992 five African countries reported negative annual tobacco trade balances of over US$100 million. The modernization of cigarette production forces low-income countries to use scarce foreign exchange reserves to purchase tobacco machinery and other tobacco manufacturing inputs. Reduced demand for tobacco products in North America, the European Union, and Nordic countries diminishes the amount of foreign currency developing countries earn from tobacco exports. Increased imports of foreign cigarettes into developing countries, as a result of aggressive marketing and free trade agreements, imposes further burdens on the economies of poor countries already struggling with severe balance of payment problems.[5]

**1.2 Definitions**:

1. A Smoker is someone who at the time of the survey smokes any tobacco product either daily or occasionally.

A smoker can be divided further into two categories.

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[5] World Health Organization. "Tobacco Epidemic Much More than a Health Issue". Fact Sheet No. 155, May 1997.)

a-Daily smoker is someone who smokes any tobacco product at least once a day ( with the exception that people who smoke everyday, but not on days of religious fasting, are still classified as daily smokers).

b- Occasional smoker is someone who smokes, but not every day.

2- Non-smoker is someone who, at the time of the survey, does not smoke at all

**1.3 Statement of the problem**

Many young people smoke, and therefore they are at risk of developing tobacco use related diseases. Those who do not smoke have colleagues, friends or relatives who do. Hence nonsmoker suffers from involuntary exposure to tobacco smoke and also risk developing tobacco caused diseases.

**1.4 Targeted population**

This study targeted the university student from age 16 - 24 year old who are using tobacco, in Khartoum state.

**1.5 Sample Size**

Factor analysis depends mainly on correlation coefficient between variables which fluctuate from sample to sample. Much has been written about the necessary sample size fore factor analysis resulting in many rules of thumb. The common rule is to suggest that a researcher has at least 10 to fifteen subjects per variable. Although Nunnally, 1978 did recommended having 10 times as many subject as variables. Kass and Tinsely 1979 recommended having between 5 and 10 subjects per variable up to a total of 300 ,beyond which test parameters tend to be stable regardless of the subject to variable ratio [6]. From the above rules 10 subjects per variable will be used

[6] Andy Field, Discovering statistics Using SPSS for Windows, sage publications (2003), London, Thousand oaks

in this study, since the questionnaire includes 25 variables therefore the sample size will be calculated as

25×10=250

**1.6 Sample selection**

Universities in Khartoum state are classified into two main groups according to the income level, public and private universities.

One university was selected according to the Probability Proportion Sample (PPS) from each group. From the first group Juba University was selected and The Academy of Medical Sciences and Technology was selected from the second group.

According to probability proportion sample faculty of Engineering was selected from Juba University, then the questionnaire was distributed randomly to smoker's student. 25 students were selected from each batch regardless to which department they belong.

The small numbers of students in The Academy of Medical Sciences and Technology, and the low student's response requires repeating the above procedure four times, so four faculties were selected randomly from the 10 faculties, there are, Biomedical, Pharmacy, Business Administration and Computer Sciences.

**1.7 Variables of the study**

The questionnaire includes 35 questions they are divided to six dimensions as follows

1- **Personal questions**: -

Age, days of smoking during last month, duration of smoking, type of cigarette smoked, number of cigarette smoked per day, the uses of other

narcotics, types of narcotics, smokers among family, favourite time for smoking and the places of smoking.

2- General questions, which include six dimensions with 25 questions as follows: -

1/ Psychological dimension

2/ Economical dimension

3/ Social dimension

4/ Advertisement dimension

5/ Health dimension

6/ quitting dimension

**1.8- Objectives of the study:**

The main objectives of the study are:

1-To determine the main factors behind tobacco use

2-To shed light on the Pattern of tobacco use among university students

**1.9-Hypothesis of the study**

1-H0: One of the main factors behind tobacco use comes from direct contact with friends and relatives who smoke.

H1: Direct contact with friends and relative who smoke is not one of reasons behind smoking and does not increases the number of smokers.

2-H0: Tobacco advertising affects young population and increases the number of smokers.

H1: Tobacco advertising does not affect young population and does not increases the number of smokers.

3-H0: Social and cultural attitude play a big role in encouraging the tobacco use.

H1: Social and cultural attitude does not encourage the tobacco use.

4-H0: The unawareness of young people at early age about tobacco health hazard encourages them to be user.

H1: The unawareness of young people at early age about tobacco health hazard has no effect on the number of users.

5-H0: There are psychological reasons behind smoking habit among university students.

H1: There are no psychological reasons behind smoking among university students.

## 1.10 Material and Methods: -

Both primary and secondary data will be used in this study, the secondary data will be collected from file, books, magazines, papers and internet web sides. A questionnaire will be distributed to smokers to collect primary data. The data will be analyzed using the Statistical Package for Social Sciences

## 1.11 Organization of the study

The study consist five chapters, which are as follows:

Chapter one: Introduction

Chapter two: Literature review

Chapter three: Factor Analysis Techniques

# Chapter two

# Literature Review

## 2.1 History of Tobacco use

Historians believe Native Americans began using tobacco before the European conquest. The Arawak people of the Caribbean, observed by Christopher Columbus in 1492, smoked tobacco through a tube they called a Tobago, from which the name was originated. Brought to Spain from Santo Domingo in 1556.Tobacco was introduced to France in the same year by the French diplomat Jean Nicot, from whom the plant derived its generic name. In 1585 the English navigator Sir Francis Drake took it to England, and the practice of pipe smoking was introduced among the Elizabethan courtiers by the English explorer Sir Walter Raleigh. Tobacco use quickly spread throughout Europe and Russia, and by the 17th century it had reached China, Japan, and the west coast of Africa[7].

## 2.2 Health impact of Tobacco

Tobacco use has been described as "public health disaster" it is the single greatest cause of preventable illness in the world.

WHO reported that smoking related diseases kill one in ten adults globally, or cause four million deaths. By the years 2030 if the current trend continues, smoking will kill one in six people.[8]

7 http://www.ash.org.uk/html/schools/keydates.html

8 World Health Organization, smoking statistics,2002

Nicotine, a major ingredient in tobacco products, is a psychoactive, addictive drug. Evidence indicates that dependence on nicotine is as strong as or stronger than dependence on heroin or cocaine.[9]

Tobacco products also contain developmental and reproductive toxicants and over 60 carcinogenic compounds. Tobacco products remain the only harmful and addictive substances (when used as intended by its manufacturers) that are still legal and in widespread use. Smoking causes heart, lung, respiratory, and vascular diseases; stroke; and many types of cancer[10].

The long delay between the onset of smoking and the development of disease reduces the seriousness with which tobacco issues are addressed. Although smokers may experience a reduced capability for physical exercise and other short-term health effects. Those who take up the habit today will not bear the full burden of disease for some 30 years. Half of the world's lifelong smokers will die from tobacco; and half of these will die in middle age, losing on average 22 years of non-smoker life expectancy[11].

The health risk to individual smokers depend on a number of factors including at which age tobacco use began, quantity of tobacco used per day, type of tobacco, and tobacco use behavior (for example the degree of inhalation).

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9 World Health Organization, Tobacco Use: A Public Health Disaster, 1997

10 World Health Organization, Guidelines for controlling And monitoring the tobacco epidemic. 1998

11 Peto, R.; Lopez, A. D.; Boreham, J.; Thun, M.; Heath, C. Mortality from Smoking in Developed Countries 1950-2000. Oxford University Press, 1994.

Nicotine is a major ingredient in tobacco products; evidence indicates that dependence on nicotine is as strong as or stronger than dependence in heroin or cocaine[12].

Tobacco smoke contains more than 4,000 chemicals some of which have irritant properties and some 60 are suspected carcinogens.

Tobacco smoke includes:

1- Acetone as found in paint striper
2- Ammonia as found in floor cleaner
3- Arsenic as found in ant poison
4- Butane as found in light fuel
5- Cadmium as found in car batteries
6- Carbon as found in exhaust fuel
7- DDT as found in insecticide
8- Hydrogen Cyanide as found in gas chamber
9- Methanol as found in rocket fuel
10-Napthalen
11-Toluene as found in industrial solvent
12-Vinyl chloride[13]

**2.3 Diseases caused by Tobacco**

Scientific evidence has shown that all forms of the tobacco cause health problems throughout life, frequently resulting in death or disability.

The parts of the body that are especially affected by tobacco use are as follows:

1. Brain and Mental

A- Strokes

12 http:www.sparks.org/pma/tobacco.com

13 World Health Organization, "The tobacco atlas" ,2005

B- Addiction

C- Withdrawal

D- Altered Brain chemistry

E- Anxiety about harm caused by tobacco

2. Hair -Altered smell and staining of hair

3. Nose-less sense of smell

4. Teeth

    A- Discoloration and stains of teeth

    B- Plague

    C- Loose teeth

    D- Gum diseases

5. Mouth and Throat

    A-Cancer of lip

    B-Cancer of mouth

    C-Cancer of throat (Smoking causes about 80% of throat cancer.)[14]

    B- Sore throat

    C- Reduce sense of taste

    D- Breath smells of smoke

6. Respiration and Lungs

    A- Lung cancer

    B- Cough and sputum

    C- Shortness of breath

    D- Colds and flu, pneumonia and asthma

    E- Emphysema (About 85% of all deaths from Emphysema are causes by tobacco use.)[14]

    F- Complicates tuberculosis

[14] http://www.spars.org/pma/tobacco.htm april,2005

7. Liver – Cancer of Liver

8. Reproduction

a- Males

A- Sperm deformity, loss of motility, and reduced number.

B- Infertility

C- Impotence

b- Females

A- Period pains

B- Earlier menopause

C- Cancer of cervix (Women who smoking are 4 times more to develop cancer of cervix than non- smoking women.)[15]

D-Infertility and delay of conception

Couples who are smoking or at least one of them smoking, are more than 3 times more likely to have trouble getting pregnant than non- smoking couples

9. Eyes

Eyes sting

A- Blindness

B- Cataracts

10. Skin - Wrinkles and Premature ageing

11. Hand - Poor circulation and Tar stained fingers

12. Heart- Heart attack, (Smokers are 4 times more likely to develop heart diseases than non- smokers).[15]

13. Chest-Chest cancer

14. Abdomen -Stomach cancer and Colon cancer, (Tobacco use doubles the risk of cancer of stomach).[15]

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[15] http://www.spars.org/pma/tobacco.htm april,2005

16. Blood- Blood cancer, Smoking causes 40% of all cases of blood cancer[15]

17. Burns

18. Wounds and Surgery-Wounds and operation wounds take longer time to heal among the smoker

19. Diabetes

20. Legs and Feet-Increased leg pain

21. Back pain

22. Drug interaction

23. Chest-Breast cancer (Women smokers are 75% more likely to develop Breast cancer than non- smokers). [16]

24. Low Birth Weight (Women who smoke as few as 5 cigarettes per day during pregnancy have a significant greater risk of giving birth to an unnaturally small). [16]

25. Nutrition (Smokers tend to have poorer Nutrition than non- smoker) [16].

**2.4 Knowledge and attitudes about smoking**

Despite the growing body of information about the health effects of smoking the results of 1990, 1992 and 1996 California in USA Tobacco Survey (CTS) indicate that smoker were less inclined to believe that smoking is harming their health. This may have some connection with the fact that increasing numbers of smokers are occasional, rather than daily smokers, occasional smokers are often feel that they are not harming their own health as they would be if they smoke daily. In 1986 the Surgeon General Report's focus exclusively on danger of environmental tobacco smoke (ETS) or secondhand tobacco smoke, this was among the first wildly published public health documents that clearly identifies the health risk of (ETS) to nonsmoker[17].

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[16] http://www.spars.org/pma/tobacco.htm april,2005

17 http://www.cdc.gov/tobacco/sgr/sgr_1998/index.htm

A cross-sectional study of 772 British women showed that smokers did not know of increased cervical cancer risk, and were less positive about screening. However, they were just as likely to intend having a smear, and the report notes the potential of screening for raising awareness and offering quit support [18]

**2.5 Tobacco advertising and its dangerous effects on young population**

Children are the most valuable commodity we are given in life, we need to educate them while they are young to be independent thinkers and not to be swayed by the tobacco companies who are trying to take advantage of their mind and body

Advertising is defined as the activity of attracting public attention to products or services, as by paid announcements in print or on the air. With millions of their customers either dying from tobacco-related illnesses or quitting each year, it is crucial for the financial health of the tobacco industry to keep recruiting new smokers. Since studies showed that the majority of smokers begin before the age of 18, the logic of the industry dictates that it must somehow reach young people. Each year, the tobacco industry spends billions of dollars around the world on advertising, marketing and promotion. In the United States alone, with less than 5% of the world's smokers, tobacco companies spent over $5.6 billion on advertising and promotional expenditures in 1997.[19]

Despite industry denials, the overwhelming majority of independent, peer-reviewed studies showed that tobacco advertising leads to an increase in consumption.[20] Tobacco advertising also has a powerful effect among young people. Studies have shown that tobacco promotional activities are

[18] http://www.inwat.org/pdf/CABS/dec01-mar02-e.pdf
[19] Federal Trade Commission Press Release, 28 July 1999.
[20] London, Economics and Operational Research Division, Department of Health, October 1992

causally related to the onset of smoking in adolescents and that exposure to cigarette advertising is predictive of smoking among adolescents. Research has also shown that following the introduction of brand advertisements that appeal to young people, the prevalence of use of those brands, and even the prevalence of smoking altogether, increases.[21]

In April a Journal of Marketing study in USA concluded that children are three times more sensitive than adults to cigarette advertising. The study reports that when cigarette marketers increase the amount of advertising for particular brands, the corresponding sales of these cigarettes go up.

Everyday 3,000 children start smoking most of them between age of 10 and 18, those accounts for 90 percent of all smokers. In fact 90 percent of all adult in USA said that they start smoking before 18 years old. These statistics clearly show that the young people are the prime target in tobacco wars, the cigarette manufactures may deny it but advertising and promotion play a vital role in making this reality.[22]

Television program depicting tobacco usage may encourage tobacco use among childhood and adolescent and indicated that a widespread portrayal of smoking on television in prime-time programming, movies, music video and sport event increasing the number of smokers.

In recent review of 81 films, 35 films (43%) showed tobacco use with mean exposure 2.1 minutes per films.

Study was done in 1992 by Gadwani and et al (USA) (Television and initiation of smoking among youth), examined the relationship between television viewing and initiation of smoking. They found strong relationship,

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[21] Nicola Evans, Arthur Farkas, et al., "Influence of Tobacco Marketing and Exposure to Smokers on Adolescent Susceptibility to Smoking," Journal of the National Cancer Institute, Vol. 87 No. 20, October 1995

22 http://www.termpapers4u.com/social/tobacco.htm, April, 2005

youth who watched TV more than 5 hours per day were 5.99 times more likely to initiate smoking behavior than youth who watched 0-2 hours per day.

Similarly youth who watched 4-5 hours per day were 5.24 times more likely to initiate smoking than youth who watched 0-2 hours. Teen-magazines, which represent tobacco use as rebellion, independence, acceptance, and happiness is another type of advertising. This type of advertising is one of the top reasons behind the rise in adolescent tobacco use.

In four countries where advertising bans have been introduced as part of a comprehensive tobacco control policy (Finland, France, New Zealand and Norway), a recent study showed that per capita consumption of cigarettes dropped by between 14% and 37% after the implementation of the ban. Smoking prevalence among young people declined in three of the four countries and remained stable in the fourth[23].

**2.6 The impact of tobacco on our environment**

Tobacco use is not just a health issue, it is also an environmental issue. Tobacco cultivation is a process that rapidly depletes soil nutrients and requires extensive use of herbicides, pesticides and other chemicals. Tobacco use also contributes to air pollution since the second hand smoke (SHS) contains over 4,000 chemicals, at least 60 of which can cause cancer. SHS may also contain pesticides, herbicides and other toxic additives used to manufacture tobacco products. SHS is one of major public health hazards because no level of exposure is considered safe[24].

Tobacco growing requires the heavy use of dangerous chemicals which contaminate our environment and put tobacco farmers at risk. This is particularly true in developing countries, where much of the equipment used

23 www. tobaccofreekids.org/campaign/ global/docs/advertising.pdf

24 http://www.mpshu.on.ca/tobacco/enviro.htm,april,2005

for spraying chemicals is of low quality and where there is no safety regulations requiring protective clothing and few restrictions on the chemicals used[25].

Environmental tobacco smoke (ETS) is a mixture of particles that are emitted from the burning end of a cigarette, pipe, or cigar, and smoke exhaled by the smoker. Exposure to secondhand smoke also causes eye, nose, and throat irritation. (ETS) is an even greater health threat to people who already have heart and lung illnesses.

Infants and young children whose parents smoke in their presence are at increased risk of lower respiratory tract infections (pneumonia and bronchitis) and are more likely to have symptoms of respiratory irritation like coughing. In children under 18 months of age, passive smoking causes between 150,000 and 300,000 lower respiratory infections. Children with asthma are especially at risk from (ETS), the exposure to (ETS) increases the number of asthma.[26]

**2.7 Tobacco cessation**

Tobacco cessation programs are designed to help users recognize and cope with problems that come up during quitting and to provide support and encouragement in staying quitting. While many programs focus primarily on smokers, most are open to tobacco users as well.

The World Health Organization emphasizes the importance of governments, communities, organizations, schools, families and individuals to help current smokers stop their addictive and damaging habit:

"Smoking cessation is a critical step toward substantially reducing the health risks run by current smokers, thereby improving world health. Tobacco has

25 Yach, D. Tobacco in Africa, World Health Forum, Vol. 17, 1996

26 http://www.123helpme.com/view.asp?id=10848

been shown to cause about 25 life-threatening diseases, or groups of diseases, many of which can be prevented, delayed, or mitigated by smoking cessation. As life expectancy increases in developing countries, the morbidity and mortality burden of chronic diseases will increase still further. This projected concentration of tobacco-related disease burden can be lightened by intensive efforts at smoking cessation. Studies have shown that 75 to 80 percent of smokers want to quit, while one-third have made at least three serious cessation attempts. Cessation efforts cannot be ignored in favor of primary prevention; rather, both efforts must be made in conjunction with one another. If only small portions of today's 1.1 billion smokers were able to stop, the long-term health and economic benefits would be immense. Governments, communities, organizations, schools, families and individuals are called upon to help current smokers stop their addictive and damaging habit."[27]

**2.8 The influences of the parental tobacco use**

The studies had shown that one parents who use Tobacco have strongly influenced their children to use tobacco. Approximately half of teen smoker have one parent who smoke. Also other family members influence teen and youth with older brothers who use tobacco, are more likely to be smoker.

The effects of prenatal tobacco exposure on older children's growth are not as clear as the effects on infants, Rantakallio (1983) found that exposed children were shorter than nonexposed children at age 14 [28], and Fogelman and Manor (1988) reported decreased height at ages 7, 11, and 23.

Lindley. 2000 study shows that prenatal tobacco exposure may not only be related to size deficits at birth, but may also be associated with disproportionate weight for height among both infants and young children.

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27 http://www.WHO/tobacco cessation april,2005

28 http://www.findarticles.com/p/articles/mi_m0CXH/is_4_24/ai_78395686/pg_2

For example, a recent study of more than 200,000 births in Sweden found that prenatal tobacco exposure was significantly associated with reduced birth length and birth weight

Sexton et al. 1990 Study have also reported effects of prenatal tobacco exposure on cognitive and behavioral development in older children. In one study, cognitive functioning at age 3 was higher among the children of mothers who quit smoking during pregnancy than among children whose mothers smoked throughout pregnancy.

**2.9-Islam and tobacco use**

Muslims are forbidden to harm themselves or others. Yet millions of Muslims all over the world are doing just that - harming, even killing themselves and their families. Islamic scholars have historically had mixed views about tobacco, and until recently, cigarette smoking has not been unanimously forbidden or even discouraged.

The mixed views on the subject came about because cigarettes are a more recent invention and did not exist at the time of the revelation of the Qur'an in the 7th century A.D. Therefore, one cannot find a verse of Qur'an or words of the Prophet Muhammad (peace be upon him) saying clearly that "Cigarette smoking is forbidden." However, there are many instances where the Qur'an gives us general guidelines, and calls upon us to use our reason and intelligence, and seek guidance from Allah about what is right and what is wrong. In the Qur'an, Allah says, "...he [the Prophet] commands them what is just, and forbids them what is evil; he allows them as lawful what is good, and prohibits them from what is bad..." (Surah al-Ar'af 7:157). So the evils of tobacco use, for your health and for your deen (religion) are

1. Danger to your health

Allah says, "...make not your own hands contribute to your destruction..." (Surah al-Baqarah 2:195); "...nor kill yourselves..." (Surah al-Nisaa 4:29). It is universally understood that cigarette smoking causes a number of health problems that often ultimately result in death. Men who smoke contract lung cancer at 22 times the rate of non-smokers. Smokers are also highly at risk for heart disease, emphysema, oral cancer, stroke, etc. There are hundreds of poisonous and toxic ingredients in the cigarette itself that the smoker inhales straight into the lungs. In an authentic hadith, the Prophet Muhammad (peace be upon him) said that "Whomsoever drinks poison, thereby killing himself, will sip this poison forever and ever in the fire of Jahannum (Hell)." Over 3 million people worldwide die from smoking-related causes each year.

2. Danger to your family's health

The Prophet (peace be upon him) said that "there should be neither harming, nor reciprocating harm." In another hadith, the Prophet (peace be upon him) said: "Anyone who believes in Allah and the Last Day should not hurt his neighbor." Those around the smoker inhale what is known as "second-hand smoke" - the unfiltered, poisonous waste that goes in the air around the smoker. There are over 4,000 chemicals in cigarette smoke, over 60 of which are known to cause cancer. Second-hand smoke causes or aggravates asthma, bronchitis, and other respiratory problems, especially in children.

3. Addictive

The addiction to tobacco is a physical response that often interferes with one's life and worship. For example, smoking is clearly forbidden during the daytime fast of Ramadan. Many addicted smokers spend their

fasting days sleeping and short-tempered, just counting the hours until they can have their fix at sunset.

4. Noxious Smell

Muslims are advised to refrain from eating raw onions and garlic - simply as a courtesy to those around them because of the awful smell. The same goes even more for the reek of cigarettes, which permeates everything around the smoker - hair, clothing, home, car, etc. The Prophet (peace be upon him) said: "Whoever has eaten from such greens as garlic, onions or leek should keep away from our mosque." Many smokers try to hide the smell by using breath mints or perfume. This does not get rid of the smell, it only masks it. Often the combination of smells is even more nauseating.

5. Waste of Money

Allah says, "...But spend not wastefully (your wealth) in the manner of a spendthrift. Verily spendthrifts are brothers of the devils..." {Surah al-Israa' 17:26-27} And in an authentic hadith the Prophet (peace be upon him) said that: "Allah hates for you three things: gossiping, begging, and wasting money." In the U.S. and other countries, cigarettes are taxed heavily in order to discourage this habit and reimburse the government for the overwhelming health care costs to care for those afflicted with diseases caused by smoking. [29]

**2.10 Giving up smoking**

Nicotine is a drug found naturally in tobacco. It is highly addictive[30] - as addictive as heroin or cocaine. The body becomes physically and psychologically dependent on nicotine.

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29 http://www.islam.about/libarary/weekly/aa090600.htm

30 WHO. Neuroscience of psychoactive substance use and dependence. Geneva, World Health Organization, 2004

The scientific studies showed that the Nicotine affects many parts of the body, including heart, blood vessels, hormonal system, and brain, also it produces pleasurable feelings that make the tobacco user want to use more. As the nervous system adapts to nicotine, tobacco users tend to increase the amount of tobacco they use.

Eventually, the tobacco user reaches a certain nicotine level and then keeps up the usage to maintain this level of nicotine. Smokeless tobacco delivers a high dose of nicotine. An average dose for snuff is 3.6 mg and for chewing tobacco is 4.6 mg - compared to 1.8 mg for cigarettes.

Stopping tobacco use causes a decrease in Nicotine level, which has physically (the body is reacting to the absence of nicotine) and psychologically (the user is faced with giving up a habit, which is a major change in behavior) symptoms.

These symptoms can be classified as

1- Depression

2- Feeling anger

3- Irritability

4- Trouble sleeping

5- Difficulty in concentrating

6- Restlessness

7- Headache

8-Tiredness

These uncomfortable feelings may lead user to start using tobacco again to increase the levels of nicotine to stop symptoms, user may suffer from these symptoms for a few days to several weeks, and all these symptoms are contributing to the difficulties of quitting tobacco use.

**The nicotine replacement therapy:-**

Nicotine replacements (nicotine substitutes) provide nicotine without the other harmful components of tobacco. For cigarette smokers, nicotine replacement therapy (NRT) has been proven to help reduce withdrawal symptoms. Together with counseling or other support, it doubles the chances that a smoker will quit. (NRT) products include:

1- Nicotine gum
2- Nicotine patch
3- Nicotine lozenges
4- Nicotine inhaler
5- Nicotine nasal spray

Nicotine replacement therapy may be useful in helping tobacco user to quit; it only deals with the physical aspects of addiction. These products are best used in combination with other quitting aids such as group sessions or counseling. They may reduce withdrawal symptoms, allowing user to concentrate on dealing with the psychological aspects of addiction.[31]

**2.11 Statistics on tobacco use among youth in different countries**

Tobacco use among adolescents is a critical indicator not only of the initiation of tobacco use but also of the future trends in prevalence of tobacco dependence and tobacco related disease in adults.

Fourteen percent of people aged 13-15 throughout the world smoke cigarettes and 25% of them started this habit before the age of 10, around 30% of 15-18 year-old in Europe are smokers. Since 1990 smoking among young people in the eastern European countries has slightly risen, while rates among young people in Western Europe have remained stable over the same period. Smoking among young people in Europe is increasing, even when at the same time tobacco use among adults in fact is decreasing in

31 http://www.nidcr.nih.gov/HealthInformation/OralHealthInformationIndex/SpitTobacco/QuittingGuide/.

many European Union countries. The increase is noticeable among young girls. While there is a clear evidence of decreasing in smoking rates by adults in some European countries. No country has shown a significant decrease in smoking by young people during recent years. Geographical differences in rates of smoking by young people in Europe are significantly smaller than those for adults. Twenty-nine percent of young people (15-16 year-old) in Eastern European countries smoke compared to 26% in western European countries. The difference is only 3% among young people, whereas the difference for adults is as big as 10% between smoking prevalence in eastern (34%) and western (24%) Europeans countries.

In the period 1994-1998 the rate of smoking among girls was less than or almost as much as for adult women. Currently, 15-16-year-old girls smoke more (26%) than adult women (22%), according to comparable data from 13 countries in Europe. For 16-17-year-old girls the smoking prevalence rate rises to 28%. For males, the pattern for the same period is more stable, with an average of 30% for boys and 36% for men.

In 1995, 18% of girls in Eastern Europe were smokers, while the figure in 1999 was 21%. In 13 European countries, teenage girls already smoke more than or approximately as much as boys. The highest smoking prevalence rates among 15-year-olds in the Europe countries can be found in Austria (32%), Finland (30%) and Germany (33%). The lowest prevalence rates are found in Greece (14%) and Sweden (15%). Among the countries in accession to Europe the highest smoking prevalence rate is in Czech Republic (32%) and the lowest in Malta (17%). In Africa smoking prevalence is increasing dramatically in most countries both among the adult population and among young people. The current youth smoking rate in e.g. Burkina Faso is 37%, in Ghana and Nigeria 17%, in South Africa 24% and

in Zimbabwe 58%. The tobacco marketing in Africa is massive and many children start smoking when as young as eight or nine years old. In the Americas smoking prevalence among young people varies very much. The highest prevalence rate can be found in Santiago, Chile, 39%, whereas the lowest current smoking rate is in Antigua and Barbuda, 14%. The exposure to environmental tobacco smoke in the Americas follows the same pattern. Data from China reveals that 39% of the school children who are currently using tobacco smoked their first cigarette before the age of 10. [32]

**2.12 The Millennium Development Goals (MDGs) and Tobacco use**

Tobacco control is relevant to the achievement of following MDGs coals

1. Achieve universal primary education

The tobacco industry employs children in cultivation and production in the developing world. Very poor families spend money on tobacco rather than education for their children. Poverty and child labour are key reasons why children are not sent to school. An increase in education correlates with economic progress and better health.

2. Promote gender equality and empower women

Advertising encourages women in developing countries to smoke as a sign of independence and success. The number of women smoking is set to increase from 218 million in 2000 to 259 million in 2025.

3. Reduce child mortality

4. Improve maternal health

Poor maternal nutrition and health are major causes of infant mortality. Money spent on tobacco deprives mothers and babies of food, and possibly medical attention. Women who use tobacco have smaller babies, who are weaker and more likely to die. Passive smoke disproportionately

32 http://www.ktl.fi/enypat/statistic_page.htm

affects women and children and increases respiratory and other diseases in children.

5. Combat HIV/AIDS, malaria and other diseases

Smoking causes further illness in those with HIV/AIDS, including bacterial pneumonia and AIDS-related dementia. Smoking causes sub clinical tuberculosis to advance to clinical tuberculosis and increased death rates. Up to one billion people are estimated to have sub clinical tuberculosis. Already, smoking is implicated in 50% of deaths from tuberculosis in India.

6. Ensure environmental sustainability.

Globally, land is cleared for tobacco farming and wood-fired curing at the rate of 200 000 hectares per year. This accounts for 5% of deforestation in developing countries, especially among major tobacco producers such as China, Malawi and Zimbabwe. Pesticides used during tobacco cultivation lead to environmental degradation, and tobacco manufacturing produces more than 2.5 billion kilograms of waste each year.

Tobacco control can do much to assist in achieving some of (MDGs) gales such as the above six goals. Health damage can be reduced if smokers are assisted to stop, and if young people are discouraged from taking up tobacco. A smoker who quits reduces his or her risk of stroke and heart attack by 50% within two years. Tobacco advice and cessation services can be incorporated into existing primary health care services at marginal addiction cost.

# Chapter three

## Factor Analysis Techniques

### 3.1 Factor analysis

Factor analysis is widely used to analyse data, and no doubt, will continue to be widely used in future, the reason for this is that the technique does seem to be useful for gaining insight into structure of multivariate data.[33]

The essential purpose of factor analysis is to describe, if possible the covariance relationship among many variables in terms of a few underlying, but unobservable random quantities called factors (or latent variables). Variables can be grouped according to their correlations, that is, all variables within a particular group are highly correlated among them selves but have relative small correlation with variable in different groups. It is conceivable that each group of variables has a single underlying construct, or factor that is responsible for observed correlation. Factor analysis can be considered as an extension of principal component analysis both can be viewed as an attempt to approximate the covariance matrix ($\sum$). However the approximation based on factor analysis model is more elaborate.

### 3.2 Data Requirements:

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33 Bryan F.J. Manly, Multivariate Statistical Methods A primer. London. New York. Chapman and Hall.

Factor analysis is conducted on the correlations or covariance between items. The variables should be quantitative at the interval or ratio level. Categorical data (such as religion or country of origin) are not suitable for factor analysis. Data for which Pearson correlation coefficients can sensibly be calculated should be suitable for factor analysis.

### 3.3 Assumptions

The data should have a bivariate normal distribution for each pair of variables, and observations should be independent. The factor analysis model specifies that variables are determined by common factors (the factors estimated by the model) and unique factors (which do not overlap between observed variables); the computed estimates are based on the assumption that all unique factors are uncorrelated with each other and with the common factors.[34]

### 3.4 The Orthogonal Factor Model

The observed random vector X with P components, has mean $\mu$ and covariance matrix $\Sigma$, the factors model postulates that X is linearly dependent upon a few unobservable random variable $F_1$, $F_2$…Fm called common factors and P additional sources of variation
$\varepsilon 1$, $\varepsilon 2$… $\varepsilon p$ called errors in particular the factor analysis model

$$X1 - \mu 1 = l_{11}\ F_1 + l_{12}\ F_2 + \ldots + l_{1m}\ F_m + \varepsilon_1 \qquad (3.1)$$

$$X2 - \mu 2 = l_{21}\ F_2 + l_{22}\ F_2 + \ldots + l_{2m}\ F_m + \varepsilon_2$$

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.
.

[34] SPSS 11 manual

$Xp - \mu_p = l_{p1}\ F_p + l_{p2}\ F_2 + \ldots + l_{pm}\ F_m + \varepsilon_p$

Or on matrix form that can be written as follows:-

$$\underset{(P*1)}{x} - \underset{}{\mu} = \underset{(p*m)}{\mathbb{L}} \quad \underset{(m*1)}{\mathbb{F}} + \underset{(p*1)}{\varepsilon} \qquad (3.2)$$

μi = mean of variable i

εi = ith specific factor

Fj = jth common factor

Lij = loading of the ith variables on jth factor

P = number of variables

m = number of factors

If m = p there is no factor analysis

Because factor analysis used to reduce the data, if the number of factor is equal to the number of variable then there is no need to use Factor analysis.

The coefficient lij called the loading of the ith variable on the jth factor, so the matrix L is the matrix of factor loadings. The ith specific factor εi associated with the ith response Xi**.** The p deviation

X1 - $\mu$1, X2 - $\mu$2,…,. Xp - $\mu$p are expressed in term of p+m random variable *F1*, *F2*, …, *Fm* , ε1, ε2… εp which are unobservable. This distinguishes the above model from the multivariate regression model in which the dependant variable can be observed.

With some additional assumptions about random vector F and ε, the above model implies certain covariance relationships:

The unobservable random vector F and **ε** satisfy the following properties: -

F and **ε** are independent

**E(F) = 0** **(3.3)**

**Cov(F) =E(FF$^{/}$)=** $\underset{(m*m)}{\mathbf{I}}$ **(3.4)**

**E(ε) = 0** **(3.5)**

**Cov(ε) = E(ε ε$^{/}$)=** $\underset{(p*p)}{\Psi}$ **(3.6 )**

Where Ψ is diagonal matrix

$$\begin{bmatrix} \Psi 1 & 0 & \ldots\ldots & 0 \\ 0 & \Psi 2 & \ldots\ldots & 0 \\ . & . & . & . \\ . & . & . & . \\ . & . & . & . \\ 0 & 0 & \ldots\ldots & \Psi p \end{bmatrix}$$

The orthogonal factor model implies a covariance structure for X, from the following model

$$\underset{(P*1)}{\mathbf{X}} - \underset{}{\mu} = \underset{(p*m)}{\mathbb{L}} \quad \underset{(m*1)}{\mathbb{F}} + \underset{(p*1)}{\varepsilon}$$

$$(\mathbf{X} - \mu)(\mathbf{X} - \mu)' = (LF+\varepsilon)(LF+\varepsilon)'$$

$$= (LF+\varepsilon)((LF)' + \varepsilon')$$

$$= LF(LF)' + \varepsilon(LF)' + LF\,\varepsilon' + \varepsilon\,\varepsilon'$$

$$\Sigma = \text{cov}(x) = E(X - \mu)(X - \mu)'$$

$$= LE(F\,F')L' + E(\varepsilon\,F')\,L' + L\,E\,(F\,\varepsilon') + E\,(\varepsilon\,\varepsilon')$$

Since

***E*(FF$^{/}$)= I and F& ε** are independent So ***E*(ε F)=0** **(3.7)**

There fore

$$\Sigma = L L' + \Psi \qquad (3.8)$$

Or

$$Var(X_i) = l^2_{i1} + l^2_{i2} + \ldots + l^2_{im} + \psi_i \qquad (3.10)$$

$$cov(X_i X_k) = l_{i1} l_{k1} + l_{i2} l_{k2} + \ldots + l_{im} l_{km} \qquad (3.11)$$

Also from the same model

$$\underset{(P*1)}{x} - \underset{(P*1)}{\mu} = \underset{(p*m)}{\mathbb{L}} \quad \underset{(m*1)}{\mathbb{F}} + \underset{(p*1)}{\varepsilon}$$

$$(X - \mu) F' = (LF + \varepsilon) F'$$

$$(X - \mu) F' = LF F' + \varepsilon F'$$

So

$$cov(X,F) = LE(F F') + E(\varepsilon F') = L \qquad (3.12)$$

$$cov(X_i,F_j) = l_{ij} \qquad (3.13)$$

### 3.5 Communality

That portion of variance of the $i^{th}$ variable contributed by the m common factors is called the $i^{th}$ communality. It is important to understanding some basic thing about the variance within an R matrix, the total variance for particular variable will have two components some of it will be shared with other variables or measure (common variance) and some of it will be specific to that measure (unique variance). We tend to use unique to refer to a variable that can be reliably attribute to only one measure, however there is also variance that is specific to one measure but not reliably to one measure so this variance is called error or random variance, the proportion of common variance present in a variable is known as the communality. As such, a variable that has no specific variance (or random variance) would have communality of one; a variable that shares

none of its variance with any other variable would have a communality of zero. In factor analysis we are interest in finding common underlying dimensions within the data and so we are primary interested only in the common variance. Therefore, when we run factor analysis its fundamental that we know how much of the variance present in our data is common variance. This presents us with a logical problem, to do the factor analysis we need to know the proportion of common variance present, yet the only way to find the out extent of the common variance is by carrying out a factor analysis, there are two ways to solve this problem.

First approach: -

We assume that the communality of every variable is equal one by making this assumption we merely transpose our original data in to constituent linear component known as principle component analysis

Second Approach: -

In the second approach is to estimates the amount of common variance by estimating the communality value fore each variable. There are various methods of estimating communalities but the most wildly use (including SPSS) is to used the squared multiple correlation (SMC) of each variable with all others variable, in this case we use multiple regression using one measure (variable) as outcome (dependant variable) and the other variables as predictors (independent variables), the resulting multiple $R^2$ would be used as an estimate of the communality of the dependent variable, we should note that R is correlation between the observed value of the dependant variable and predicted value of the dependant variable estimated by multiple regression model, mention that large value of the multiple R represent a large correlation between predicted and observed value of the dependant variable. A multiple R of one represents a situation in which the model

perfectly predicted the observed data. This second approach is what is done in factor analysis. These estimates allow the factor analysis to be done. Once the underlying factors have been extracted, new communalities can be calculated that represent the multiple correlation between each variable and the factor extracted. Therefore, the communalities measure the proportion of variance explained by the extracted factors.

From the above we can rewrite equation (3.10) as follows

var(Xii) = communalities + specific variance

Or

$h^2_i = l^2_{i1} + l^2_{i2} + \ldots + l^2_{im}$

And

$\sigma_{ii} = h^2_i + \psi i \quad where \ i = 1,2 \ldots p \quad (3.14)$[35]

**3.6 Methods of estimation**

We shall consider two of the most popular methods of parameter estimation. The principal component (and the related principal factor) method and the maximum likelihood method. The solution from either method can be rotated in order to simplify the interpretation of factor.

**3.7 The principal component (and principal factor) method**

The principal component factor analysis of the sample covariance matrix S is specified in term of its eigenvalue-eigenvector pairs $(\lambda_1, \hat{e}_1)$, $(\lambda_2, \hat{e}_2)$, $(\lambda_3, \hat{e}_3) \ldots (\lambda_p, \hat{e}_p)$

where $\lambda_1 \geq \lambda_2 > \geq \geq \ldots \geq \lambda_p$. let the number of common factors be m which is less the number of variable (p) the matrix of estimated factors loading ($\boldsymbol{l_{ij}}$) is given by

[35] Andy Field, Discovering statistics Using SPSS for Windows, sage publications (2003), London, Thousand oaks

$\mathbf{L} = \{(\sqrt{\lambda_1})\,\hat{\mathbf{e}}_1 \quad (\sqrt{\lambda_2})\,\hat{\mathbf{e}}_2 \quad \ldots \quad (\sqrt{\lambda_m})\,\hat{\mathbf{e}}_m\}$

The estimated specific variances are provided by the diagonal elements of the matrix

$S - L L'$

So

$$\Psi = \begin{bmatrix} \psi_1 & 0 & \ldots\ldots\ldots & 0 \\ 0 & \psi_2 & \ldots\ldots\ldots & 0 \\ . & . & . & . \\ . & . & . & . \\ 0 & 0 & \ldots\ldots\ldots & \psi_p \end{bmatrix} \quad \text{with } \psi_i = S_{ii} - \Sigma\, \boldsymbol{lij} \quad \boldsymbol{i=1,2\ldots m}$$

Communality are estimated as

$$\boldsymbol{h^2_i = l^2_{i1} + l^2_{i2} + \ldots + l^2_{im}}$$

Noted that the principal component factor analysis of the sample correlation matrix is obtained by stating with R in place of S.

We should note that the principal component factor analysis is appropriate for first pass through the data and it is not required that R or S be non-singular.[36]

### 3.8 The maximum likelihood Method

If the common factor F and specific ε can be assumed to be normally distributed, then the maximum likelihood estimates of the factor loadings

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36 K.V.M ardia, J.T.Kent and J.M.Bibby, multivariate analysis, third printing 1982 London or Landsan Diego New York

and specific variance may be obtained. When $F_i$ and $\varepsilon_i$ are jointly normal, the observation

$X_j - \mu = QF_j + \varepsilon_j$ and then normal, the likelihood is

Where $Q$ is loading of the ith variables on jth factor

$$\begin{aligned}\ell(\mathcal{X};\mu,\Sigma) &= -\frac{n}{2}\log \mid 2\pi\Sigma \mid -\frac{1}{2}\sum_{i=1}^{n}(x_i-\mu)\Sigma^{-1}(x_i-\mu)^{\top} \\ &= -\frac{n}{2}\log \mid 2\pi\Sigma \mid -\frac{n}{2}\operatorname{tr}(\Sigma^{-1}\mathcal{S}) - \frac{n}{2}(\overline{x}-\mu)\Sigma^{-1}(\overline{x}-\mu)^{\top}.\end{aligned}$$

This can be rewritten as

$$\ell(\mathcal{X};\widehat{\mu},\Sigma) = -\frac{n}{2}\left\{\log \mid 2\pi\Sigma \mid + \operatorname{tr}(\Sigma^{-1}\mathcal{S})\right\}.$$

Replacing $\mu$ by $\widehat{\mu} = \overline{x}$ and substituting $\Sigma = \mathcal{Q}\mathcal{Q}^{\top} + \Psi$ this becomes

$$\ell(\mathcal{X};\widehat{\mu},\mathcal{Q},\Psi) = -\frac{n}{2}\left[\log\{\mid 2\pi(\mathcal{Q}\mathcal{Q}^{\top}+\Psi)\mid\} + \operatorname{tr}\{(\mathcal{Q}\mathcal{Q}^{\top}+\Psi)^{-1}\mathcal{S}\}\right].$$

### 3.9 Kaiser- Meyer-Olkin (KMO) Measure of sampling Adequacy

The (KMO) statistic can be calculated for individual and multiple variables and represent the ratio of square correlation between variables and the square partial correlation between variables, the (KMO) varies between 0 and 1, a value of 0 indicate that the sum partial correlation is large relative to the sum of correlation indicating that the factor analysis is likely to be inappropriate. A value close to 1 indicates the patterns of correlation are relatively compact and so factor analysis should yield distinct and reliable factors. Kaiser (1974) recommends accepting value greater than .5 as acceptable value, value below this value should to either to collect more data or rethink which variables to include.

### 3.10 Anti-image correlation Matrix

The diagonal of the anti-image correlation represents the (KMO) for individual variables, as well as checking the over all (KMO) statistic it is important to examine the diagonal elements of the ant-image correlation

matrix, the value of should be above .5 for all variables, variables with value below .5 should exclude from the analysis. The off-diagonal elements of the anti-image correlation represent the partial correlation between variable.

### 3.11 Bartlett's Test of Sphericity

Bartlett's test the null hypothesis that the original correlation matrix is an identical matrix. Factor analysis needs some relationships between variables and if the R-Matrix was an identical matrix then all correlation coefficients would be zero therefore to do factor analysis this test should be significant value less than .05. A significant test tell us that the R-matrix is not an identical matrix therefore there are some relationships between the variables.

### 3.12 Kaiser Criterion

In factor analysis not all factors are retained in an analysis, Kaiser recommended retaining all factors with eigenvalues greater than one, this criterion is based on the idea that the eigenvalue represent the amount of variation explained by a factor and that an eigenvalue of one represent substantial amount of variation, this criterion is accurate when the average communalities is grater than .6 and the sample not less than 250.

### 3.13 Factor rotation

Generally in factor analysis most variables have high loadings in the most important factor, and small lading in all other factors. This characteristic makes interpretation very difficult, and so a technique called factor rotation is used to discriminate between factors.

There are two types of rotation that can be done, the first is orthogonal rotation it mans that the factor analysis rotated factors while keeping them independent, before rotation, all factors are independent and the orthogonal rotation ensures that the factors remain uncorrelated. The other form of rotation is oblique rotation, the differences with oblique rotation is that factors are allowed to correlate. One approach used in factor analysis is to run the analysis using both types of rotation. Pedhazur and Schemlkin (1991) suggest that if the oblique rotation demonstrates a negligible correlation between the extracted factors then it is reasonable to use the orthogonally rotated solution, if the oblique rotation reveals a correlated factor structure, then the orthogonally rotated solution should be discarded. In any case, the oblique rotation should be used only if there are good reasons to suppose that the underlying factor could be related in theoretical term.[37]

[37] Andy Field, Discovering statistics Using SPSS for Windows, sage publications (2003), London, Thousand oaks

## Chapter four

## Data Analysis

### 3.1 Personal Data:-

The sample size of the data is 250 of university students aged (16-24 years), all of them are smokers. The frequency and percentage of each age group are recorded in table (4.1) the majority are concentrated in the age group (18-20 years) which account for more than 33%.

**Table (4.1) distribution of respondent classified According to age group**

| | Frequency | Percent |
|---|---|---|
| 16 - 18 years | 47 | 18.8 |
| 18 - 20 years | 83 | 33.2 |
| 20 - 22 years | 54 | 21.6 |
| 22 - 24 years | 66 | 26.4 |
| Total | 250 | 100.0 |

**Table (4.2): Distribution of respondent classified according to the favorite times of smoking.**

Most smokers like to smoke in the morning and evening with 35.6% and 21.6% respectively, because it is easy to be away from their families.

**What is your favorite time for smoking**

| | | Frequency | Percent |
|---|---|---|---|
| Valid | Morning | 89 | 35.6 |
| | Afternoon | 17 | 6.8 |
| | Evening | 54 | 21.6 |
| | Morning + Afternoon | 4 | 1.6 |
| | Morning + Evening | 44 | 17.6 |
| | Afternon + Evening | 10 | 4.0 |
| | Whole a day | 32 | 12.8 |
| | Total | 250 | 100.0 |

Table (4.3) shows the number of days of smoking during last month. More than 84 % of the total number of cases concentrated on last interval (25-30 days), all cases in this interval might be considered as regular smokers while the rest as irregular smokers.

**Table (4.3): Distribution of respondent classified according to the number of days of smoking during last month**

| | Frequency | Percent |
|---|---|---|
| < 5 days | 6 | 2.4 |
| 5 - 10 days | 5 | 2.0 |
| 10 - 15 days | 5 | 2.0 |
| 15 - 20 days | 6 | 2.4 |
| 25 - 25 days | 17 | 6.8 |
| 25 - 30 days | 211 | 84.4 |
| Total | 250 | 100.0 |

Table (4.4) gives the results of the type of cigarettes smoked, as it can be seen more than 55% of smokers smoked local cigarettes, 20.8% of smokers smoked imported cigarettes, this might be due to the high cost of legal imported cigarettes, while the illegal types always related with high risk of developing diseases.

**Table (4.4): Distribution of respondent by type of cigarettes smoked.**

| | Frequency | Percent |
|---|---|---|
| Local | 139 | 55.6 |
| Imported | 52 | 20.8 |
| Local + Imported | 59 | 23.6 |
| Total | 250 | 100.0 |

Table (4.5) shows the number of cigarettes smoked per day

More than 74% of smokers smoked less than ten cigarettes per day, which might be due economical factors.

**Table (4.5): Distribution of respondent by number of cigarettes smoked per day**

| | Frequency | Percent |
|---|---|---|
| < 5 cigarettes | 93 | 37.2 |
| 5 - 10 cigarettes | 94 | 37.6 |
| 10 - 15 cigarettes | 45 | 18.0 |
| 15 - 20 cigarettes | 12 | 4.8 |
| >20 | 6 | 2.4 |
| Total | 250 | 100.0 |

Table (4.6) shows the duration of smoking, more than 57% of all cases used smoking for less than three years, because the study targeted young population.

**Table (4.6): Distribution of respondent by duration of smoke**

| | Frequency | Percent |
|---|---|---|
| < 1 year | 38 | 15.2 |
| 1 - 3 years | 105 | 42.0 |
| 3 - 5 years | 51 | 20.4 |
| 5 - 7 years | 39 | 15.6 |
| > 7 years | 17 | 6.8 |
| Total | 250 | 100.0 |

Table (4.7) shows the other narcotics used, the majority of smokers 140(56%) used other narcotics, that might be due to low cost and availability of these narcotics as snuff, or because the smokers have difficulties to smoke at home or in the lecture room.

**Table (4.7): Distribution of respondent classified according to the use of others narcotic**

| | Frequency | Percent |
|---|---|---|
| Yes | 140 | 56.0 |
| No | 110 | 44.0 |
| Total | 250 | 100.0 |

Table (4.8) shows the types of others narcotics used besides smoking. Most smokers use Water Pipe 37.9%, that might be due to the direct contact with friends, on the other hand 29.3% of smokers use Snuff, due the low cost and availability of this type.

**Table (4.8): Distribution of respondent by the types of narcotics used**

**If the answer is yes what type**

| | Frequency | Percent |
|---|---|---|
| Snuff | 41 | 29.3 |
| Water Pipe | 53 | 37.9 |
| Alcohol | 4 | 2.9 |
| Snuff + Water pipe | 27 | 19.3 |
| Snuff + Alchol | 1 | .7 |
| Snuff + Drugs | 1 | .7 |
| Water pipe + Alcohol | 2 | 1.4 |
| Water pipe + Drugs | 1 | .7 |
| Alchol + Drugs | 1 | .7 |
| Snuff + Water pipe + Alchol | 1 | .7 |
| Snuff + Water pipe + Drugs | 2 | 1.4 |
| Water pipe + Alchol + Drugs | 2 | 1.4 |
| Snuff + Water pipe + Alcohol + Drugs | 4 | 2.9 |
| Total | 140 | 100.0 |

Table (4.9) shows that most of smokers 56% start smoking at age group (15-20 yeas), 27.2% at age group (10-15), 14% at age group (20-24 years) and 2.4% at age less than 10 years old.

**Table (4.9): Distribution of respondent by starting age of smoking**

| | Frequency | Percent |
|---|---|---|
| less than 10 years | 6 | 2.4 |
| 10 - 15 years | 68 | 27.2 |
| 15 - 20 years | 141 | 56.4 |
| 20 - 24 years | 35 | 14.0 |
| Total | 250 | 100.0 |

Table (4.10) show that most of smokers (70.4%) have one ore more smokers in their families, that may be consider as the most important reason which is encouraging young people to smoke.

**Table (4.10): Distribution of respondent by smokers among family members**

| | Frequency | Percent |
|---|---|---|
| yes | 176 | 70.4 |
| NO | 74 | 29.6 |
| Total | 250 | 100.0 |

**4.2 Factor analysis**

This section utilized two of the most popular methods of the parameters estimation, the principal component and the maximum likelihood methods. The solution from either method can be rotated in order to simplify the interpretation of factors and the results obtained from both method were compared.

Table (4.14) in Appendix (I) shows the R-matrix (or correlation matrix), half of this table contains Pearson correlation coefficient between all pairs of questions, while the bottom half contains the one-tailed significance of these coefficients. Therefore we can use this correlation matrix to check the pattern of the relationships between the questions.

Factor analysis needs variables that are correlated fairly well, but not perfectly, all questions in table (4.14) in Appendix (I) are correlated fairly well (there is no value greater than .9) that implies there is no need to eliminating any variable at this stage.

The determinant is listed at the bottom of the matrix in table (4.14) in Appendix (I), for this data it is value is 0.000352 which is greater than the minimum necessary value of .00001, therefore the multicollinearity is not a problem for this data.

Table (4.15) shows Kaiser-Meyar-Olkin (KMO) measure of sampling adequacy, Bartlett's test of sphericity. The (KMO) value is .689 reveal that factor analysis is appropriate and reliable for this data.

The Bartlett's tests measure the original correlation matrix if it is an identity matrix or not, when applied to our data the result obtained as shown in table (4.15) tell us that our original correlation matrix is not an identical matrix (p=.000). Hence the factor analysis I appropriate.

Table (4.15)

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .694 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1837.1 |
| | df | 300 |
| | Sig. | .000 |

Table (4.16) list the eigenvalues associated with each linear component before extraction, after extraction and after rotation, extracted from the principal component method. In the same table the eigenvalues associated with each factor represent the variance explained by that particular linear component. The first seven factors explain relatively large

amounts of total variance. Factors with eigenvalues greater than one is only extracted in the columns labeled Extraction sums of squared loading, there are seven factors with eigenvalues greater than one, and in the final part of the table labeled Rotation sums of square loading the eigenvalues of factor after rotation are displayed. Before rotation factor one and two accounted for more variance than the remaining factors , 15.932 and 11.138 compared to 9.098, 7.334, 6.561,5.627 and 4.675 however after rotation it account for 10.432 and 9.678 compared to 9.498, 9.033, 8.322, 6.809 and 6.593 respectively**.**

Table (4.16)

**Total Variance Explained**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3.983 | 15.932 | 15.932 | 3.983 | 15.932 | 15.932 | 2.608 | 10.432 | 10.432 |
| 2 | 2.785 | 11.138 | 27.071 | 2.785 | 11.138 | 27.071 | 2.419 | 9.678 | 20.110 |
| 3 | 2.274 | 9.098 | 36.168 | 2.274 | 9.098 | 36.168 | 2.374 | 9.498 | 29.608 |
| 4 | 1.833 | 7.334 | 43.502 | 1.833 | 7.334 | 43.502 | 2.258 | 9.033 | 38.641 |
| 5 | 1.640 | 6.561 | 50.063 | 1.640 | 6.561 | 50.063 | 2.081 | 8.322 | 46.963 |
| 6 | 1.407 | 5.627 | 55.690 | 1.407 | 5.627 | 55.690 | 1.702 | 6.809 | 53.772 |
| 7 | 1.169 | 4.675 | 60.365 | 1.169 | 4.675 | 60.365 | 1.648 | 6.593 | 60.365 |
| 8 | .978 | 3.911 | 64.276 | | | | | | |
| 9 | .894 | 3.577 | 67.853 | | | | | | |
| 10 | .813 | 3.251 | 71.105 | | | | | | |
| 11 | .752 | 3.007 | 74.111 | | | | | | |
| 12 | .721 | 2.885 | 76.997 | | | | | | |
| 13 | .685 | 2.741 | 79.738 | | | | | | |
| 14 | .622 | 2.487 | 82.225 | | | | | | |
| 15 | .605 | 2.420 | 84.645 | | | | | | |
| 16 | .557 | 2.227 | 86.872 | | | | | | |
| 17 | .512 | 2.048 | 88.920 | | | | | | |
| 18 | .479 | 1.918 | 90.838 | | | | | | |
| 19 | .454 | 1.818 | 92.655 | | | | | | |
| 20 | .431 | 1.723 | 94.379 | | | | | | |
| 21 | .412 | 1.646 | 96.025 | | | | | | |
| 22 | .308 | 1.232 | 97.257 | | | | | | |
| 23 | .291 | 1.164 | 98.421 | | | | | | |
| 24 | .251 | 1.002 | 99.423 | | | | | | |
| 25 | .144 | .577 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis.

Table (4.17) and Table (4.18) shows the communality before and after extraction, the communality indicate that the amount of variance in each variable that is accounted for, Table (4.17) extracted according to Principal component method, since before extraction there are as many factors as there are variables, so all variance is explained by the factors and communalities are one, but after extraction there are only seven factors which can not explain all of the variance present in the data but they can explain some of it because there are some information lost. Small values indicate variables that do not fit well with the factor solution and should possibly be drooped from the analysis.

Table (4.17)

**Communalities**

| | Initial | Extraction |
|---|---|---|
| 1-Smoking makes me feel happy | 1.000 | .612 |
| 2-Smoking helps in concenteration and innovation | 1.000 | .695 |
| 3-Somoking helps in reduction problems | 1.000 | .578 |
| 4-When you smoke at work place you feel you are gentlman | 1.000 | .594 |
| 5-When I see my colleagues smoking, they look mature and independant | 1.000 | .512 |
| 6-Smoking makes boys more atractives | 1.000 | .598 |
| 7-My friends are smokers, so I imitated them | 1.000 | .665 |
| 8-Relative at home smoke , I imitated them | 1.000 | .695 |
| 9-My father is smoker, so I imitated him | 1.000 | .607 |
| 10-Advertisement and poster of cigarettes speard in public in public places | 1.000 | .620 |
| 11-Advertisement and poster of cigarettes speard in sport occasions | 1.000 | .852 |
| 12-When I watch TV progrems I see some actors smoking | 1.000 | .863 |
| 13-Smoking is majuare cause of cancer | 1.000 | .531 |
| 14-Smoking decreases the ability of sensing ( testing,smelling,.....) | 1.000 | .566 |
| 15-When under medication smoking delays healing prosses | 1.000 | .599 |
| 16-Smoking is majore cause of heart diseases | 1.000 | .672 |
| 17-I tried to quit smoking | 1.000 | .415 |
| 18-I want to stop smoking because my family hates smoking | 1.000 | .665 |
| 19-I want to stop smoking because my relative advised me to do so | 1.000 | .586 |
| 20-I want to stop smoking for finacial reasons | 1.000 | .623 |
| 21-I want to stop smoking for heath reasons | 1.000 | .458 |
| 22-I agree with law that prohibited smoking in the public place | 1.000 | .365 |
| 23-I have to find money to buy cigarettes anyway | 1.000 | .417 |
| 24-Dially allowance and ( Pocket money) given to children help them to smoke | 1.000 | .693 |
| 25-Smoking has negative effect in family income | 1.000 | .611 |

Extraction Method: Principal Component Analysis.

Table (4.18)

**Communalities** [a]

| | Initial | Extraction |
|---|---|---|
| Smoking makes me feel happy | .330 | .376 |
| Smoking helps in concenteration and innovation | .330 | .497 |
| Somoking helps in reduction problems | .301 | .358 |
| When you smoke at work place you feel you are gentlman | .372 | .496 |
| When I see my colleagues smoking, they look mature and independant | .344 | .341 |
| Smoking makes boys more atractives | .350 | .467 |
| Dially allowance and ( Pocket money) given to children help them to smoke | .358 | .839 |
| Smoking has negative effect in family income | .295 | .268 |
| My friends are smokers, so I imitated them | .452 | .479 |
| Relative at home smoke , I imitated them | .540 | .798 |
| My father is smoker, so I imitated him | .434 | .441 |
| I agree with law that prohibited smoking in the public place | .197 | .166 |
| Advertisement and poster of cigarettes speard in public in public places | .396 | .387 |
| Advertisement and poster of cigarettes speard in sport occasions | .735 | .817 |
| When I watch TV progrems I see some actors smoking | .747 | .884 |
| Smoking is majuare cause of cancer | .423 | .455 |
| Smoking decreases the ability of sensing ( testing,smelling,.....) | .435 | .373 |
| When under medication smoking delays healing prosses | .398 | .389 |
| Smoking is majore cause of heart diseases | .533 | .674 |
| I tried to quit smoking | .333 | .324 |
| I want to stop smoking for heath reasons | .301 | .332 |
| I want to stop smoking for finacial reasons | .380 | .472 |
| I want to stop smoking because my family hates smoking | .423 | .543 |
| I want to stop smoking because my relative advised me to do so | .365 | .405 |
| I have to find money to buy cigarettes anyway | .273 | .158 |

Extraction Method: Maximum Likelihood.

a. One or more communalitiy estimates greater than 1 were encountered during iterations. The resulting solution should be interpreted with caution.

According to Kaiser's criterion (only factors with eigenvalues greater than one should be extracted), this criterion is accurate when the average communalities is grater than .6 and the sample size is not less than 250. From table (4.17) the average communalities according to Principal component method can be calculated as following: -

(.612+.695+….+.611)/25

15.09124/25 = .603649

Since the sample size is 250 and average communalities is (.6063649) so Kaiser's will be use and seven factors will be extracted.

Table (4.19) and table (4.20) represent the correlation matrix between the seven factors. This matrix contain the correlation coefficients between factors as predicted from the rotated component matrix and the rotated factor matrix (see table (4.21) and table (4.22) in Appendix (I)), according to principal component and Maximum Likelihood as Extraction Method, if the orthogonal rotation (Varimax) were completely appropriate then we expect a symmetric matrix, since both matrixes are very unsymmetrical then we must convert to oblique rotation (Oblimin).

Table (4.19)

**Component Transformation Matrix**

| Component | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | .560 | .543 | -.376 | .377 | .107 | .310 | -.022 |
| 2 | .329 | .228 | .130 | -.415 | -.691 | -.064 | .411 |
| 3 | .231 | -.140 | .786 | .459 | .043 | .224 | .214 |
| 4 | .684 | -.587 | -.142 | -.220 | .276 | -.206 | .034 |
| 5 | .159 | .276 | .392 | -.559 | .217 | .269 | -.560 |
| 6 | .052 | .455 | .214 | .012 | .372 | -.763 | .155 |
| 7 | -.171 | .077 | -.058 | -.339 | .497 | .391 | .668 |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table (4.20)

**Factor Transformation Matrix**

| Factor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | -.933 | .170 | .228 | .116 | .127 | .136 | -.010 |
| 2 | .303 | .287 | .321 | .566 | .079 | .629 | .034 |
| 3 | .063 | .522 | .300 | -.640 | -.377 | .189 | .215 |
| 4 | .052 | .479 | .164 | .431 | -.185 | -.701 | .172 |
| 5 | .094 | .563 | -.287 | -.186 | .649 | -.050 | -.365 |
| 6 | .130 | -.228 | .779 | -.150 | .208 | -.223 | -.456 |
| 7 | .068 | -.133 | .196 | -.119 | .581 | -.079 | .763 |

Extraction Method: Maximum Likelihood.
Rotation Method: Varimax with Kaiser Normalization.

1- Principal component results:

Table (4.23) shows the component matrix from which the rotated Structure matrix in table (4.24) was obtained according to principal component as a method of extraction and direct oblimin as a method of rotation.

Table (4.24) show that the questions that load highly in factor 1 includes, I want to stop smoking because my family heat smoking, I want to stop smoking for financial reason, I want to stop smoking because my relatives advised me to do so, I want to stop smoking for health reason and to some extent I tried to quit smoking, all questions related to quitting the smoking so this factor might be labeled as quit smoking, which explains 10.432 % from the total variance as shown in table (4.16).

Similarly three questions load highly in factor 2, the first question is when you smoking in public places you feel you are a gentleman, the second question Smoking make boys more attractive, while the last question is, When I see my colleagues smoking they look mature and independent all these questions are related to having good looking therefore, this factor might be labeled as good looking, which explains 9.678% from total variance.

On the other hand the question that loaded highly on the third factor includes When I watch TV programs I see some actors smoking, advertisement and poster are speared in public places the last question is Advertisement and poster of cigarettes speared in sport occasions all these questions are related to advertisement therefore this factor can be called Advertisement, which explains 9.498% from the total variance.

Four question are load highly in factor 4 the first questions is smoking is major cause of heart diseases, the second question is when under

medication smoking delays healing process, the third question is smoking is major cause of cancer, the last question is smoking decreases the ability of sensing (testing, smelling,…) all these questions are related to health condition therefore this factor might be labeled as Health., which explains 9.033% from the total variance.

Because most of smokers started smoking earlier when they are very young and start to know the hazard of smoking after a long time of smoking so it was very difficult for them if not impossible to abandon smoking, because smoking becomes a habit and rather addiction.

Three question that load high in factor 5, the first question is my friend are smokers so I imitated them, the second my relatives are smokers so I imitated them and the last question is my father is smoker so I imitated him, this factor might be labeled imitation, which explains 8.322% from the total variance.

Two questions load high in factor 6, the first one is daily allowance and pocket money given to children help them to smoke, and the second one is smoking has negative effect to the family income, therefore this factor might be labeled income statues, which explains 6.809% from the total variance.

Finally three question load highly in the last factor, the first question is smoking helps in concentration and innovation , the second question smoking makes me feel happy and – again to some extent –smoking helps in reduction of problems this factor might be labeled feeling, which explain 6.593% from the total variance.

Table (4.**23**)

**Component Matrix** [a]

| | Component | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Smoking is majore cause of heart diseases | .584 | .355 | .123 | .411 | .075 | .031 | -.121 |
| I tried to quit smoking | .573 | .253 | -.02 | -.031 | .144 | .020 | .005 |
| I want to stop smoking for finacial reasons | .529 | .032 | -.04 | -.384 | .026 | .383 | .213 |
| I want to stop smoking for heath reasons | .523 | .178 | -.226 | -.178 | .121 | .232 | -.031 |
| Smoking is majuare cause of cancer | .523 | .320 | .110 | .354 | .090 | .030 | -.089 |
| Smoking decreases the ability of sensing ( testing,smelling,.....) | .499 | .216 | .153 | .435 | .193 | .107 | .093 |
| I want to stop smoking because my relative advised me to do so | .483 | .210 | -.04 | -.404 | .106 | .241 | -.272 |
| My father is smoker, so I imitated him | .448 | -.404 | .159 | -.022 | -.402 | .199 | -.126 |
| When I see my colleagues smoking, they look mature and independant | .155 | -.607 | .124 | .101 | .065 | .047 | .295 |
| When you smoke at work place you feel you are gentlman | .075 | -.606 | .003 | .241 | .253 | .201 | .241 |
| Smoking makes boys more atractives | .179 | -.571 | .128 | .307 | .040 | .263 | .244 |
| Somoking helps in reduction problems | .005 | .491 | .216 | .099 | -.427 | -.307 | .061 |
| I have to find money to buy cigarettes anyway | -.337 | .371 | -.09 | .102 | .127 | -.038 | .361 |
| Advertisement and poster of cigarettes speard in sport occasions | -.402 | .167 | .715 | -.165 | .325 | .092 | -.103 |
| When I watch TV progrems I see some actors smoking | -.453 | .133 | .698 | -.109 | .337 | .108 | -.130 |
| Advertisement and poster of cigarettes speard in public in public places | -.407 | .062 | .563 | -.007 | .163 | .298 | .134 |
| My friends are smokers, so I imitated them | .311 | -.327 | .527 | -.172 | -.368 | -.114 | -.070 |
| Relative at home smoke , I imitated them | .381 | -.329 | .433 | -.295 | -.389 | -.008 | -.125 |
| When under medication smoking delays healing prosses | .425 | .105 | .257 | .561 | .084 | .055 | -.131 |
| I want to stop smoking because my family hates smoking | .473 | .273 | -.02 | -.486 | .305 | .135 | .137 |
| Smoking makes me feel happy | -.065 | .402 | .220 | .186 | -.514 | .176 | .262 |
| Smoking has negative effect in family income | .365 | -.122 | .135 | -.120 | .251 | -.548 | .259 |
| Dially allowance and ( Pocket money) given to children help them to smoke | .437 | -.085 | .193 | -.206 | .196 | -.505 | .349 |
| I agree with law that prohibited smoking in the public place | .348 | .018 | .296 | .033 | .061 | -.353 | -.164 |
| Smoking helps in concenteration and innovation | .027 | .480 | .144 | -.154 | -.332 | .182 | .525 |

Extraction Method: Principal Component Analysis.

a. 7 components extracted.

# Table (4.24)

**Structure Matrix**

| | Component | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| I want to stop smoking because my family hates smoking | **.767** | .128 | -.034 | .137 | .005 | -.308 | .022 |
| I want to stop smoking for finacial reasons | **.727** | -.151 | -.178 | .113 | -.216 | -.089 | .143 |
| I want to stop smoking because my relative advised me to do so | **.686** | .235 | -.108 | .202 | -.219 | -.022 | -.140 |
| I want to stop smoking for heath reasons | **.623** | .052 | -.308 | .278 | -.046 | -.039 | -.050 |
| I tried to quit smoking | **.480** | .115 | -.211 | .460 | -.082 | -.252 | .011 |
| When you smoke at work place you feel you are gentlman | -.059 | **-.754** | -.041 | -.002 | -.060 | -.020 | -.238 |
| Smoking makes boys more atractives | -.072 | **-.738** | -.061 | .122 | -.246 | .019 | -.068 |
| When I see my colleagues smoking, they look mature and independant | -.062 | **-.661** | -.057 | -.042 | -.261 | -.193 | -.111 |
| When I watch TV progrems I see some actors smoking | -.177 | .099 | **.923** | -.098 | .057 | .018 | -.003 |
| Advertisement and poster of cigarettes speard in sport occasions | -.118 | .131 | **.915** | -.088 | .031 | -.035 | .033 |
| Advertisement and poster of cigarettes speard in public in public places | -.152 | -.127 | **.737** | -.113 | .075 | .145 | .224 |
| Smoking is majore cause of heart diseases | .223 | .137 | -.161 | **.808** | -.098 | -.132 | .071 |
| When under medication smoking delays healing prosses | -.022 | -.088 | -.026 | **.742** | -.164 | -.066 | -.010 |
| Smoking is majuare cause of cancer | .216 | .115 | -.136 | **.717** | -.073 | -.132 | .065 |
| Smoking decreases the ability of sensing ( testing,smelling,.....) | .196 | -.110 | -.075 | **.715** | -.008 | -.158 | .100 |
| Relative at home smoke , I imitated them | .142 | -.088 | .012 | .035 | **-.813** | -.208 | .040 |
| My friends are smokers, so I imitated them | -.017 | -.105 | .092 | .075 | **-.774** | -.281 | .077 |
| My father is smoker, so I imitated him | .143 | -.283 | -.249 | .161 | **-.703** | .042 | -.011 |
| I have to find money to buy cigarettes anyway | -.131 | .122 | .162 | -.095 | .547 | .016 | .331 |
| Dially allowance and ( Pocket money) given to children help them to smoke | .198 | -.064 | -.075 | .142 | -.178 | **-.817** | .000 |
| Smoking has negative effect in family income | .099 | -.064 | -.085 | .138 | -.114 | **-.770** | -.116 |
| I agree with law that prohibited smoking in the public place | .017 | .149 | .027 | .343 | -.306 | -.431 | -.135 |
| Smoking helps in concenteration and innovation | .201 | .176 | .083 | .011 | .083 | -.019 | **.794** |
| Smoking makes me feel happy | -.136 | .185 | .081 | .158 | -.044 | .199 | **.726** |
| Somoking helps in reduction problems | -.210 | .508 | .029 | .202 | -.068 | -.144 | **.509** |

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

2-Maximum likelihood result

Table (4.25) shows the factor matrix from which the rotated Structure matrix in table (4.26) was obtained according to Maximum likelihood as a method of extraction and direct oblimin as a method of rotation.

Three questions that have a high load in the first factor which are when I see TV I see some actors smoking, advertisement and poster of cigarettes speared in sport place and divertissement and poster of cigarettes speared in public place, this factor might called Advertisement.

Two questions load high in the second factor the first one is Daily allowance and the pocket money given to children helps them to smoke and- to some extent smoking has negative effect in family income, this factor can be labeled Income Status.

Smoking is major cause of heart diseases, smoking is major cause of cancer, smoking decrease the ability of sensing and when under medication smoking delay the healing process load highly in the fourth factor, this factor can be Health.

Three factors load high in factor four , relative at home smoke so I imitated them, my friend are smokers so I imitated them and my father is smoker so I imitated him, this factor can be labeled Imitation.

Three questions load highly in factor five the first question is when you smoke in public place you feel you are gentleman, the second question is smoking make boys more attractive, the last question is when I see my colleagues smoking they look mature and independent, this factor can be labeled Good Look.

Four questions load highly in factor six I want to stop smoking because my family hates smoking, I want to stop smoking for financial

reasons, I want to stop smoking because my relatives advised me, and I want to stop smoking for health reasons, load highly in factor six , this factor can be labeled Quit Smoking.

Three questions load high in last factor, Smoking helps in concentration and innovation, smoking makes me feel happy and to some extent smoking helps in reduction problems, this factor can be Feeling.

Table (4.25)

**Factor Matrix[a]**

| | Factor | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| When I watch TV progrems I see some actors smoking | -.915 | .196 | .038 | .026 | .064 | .045 | -.019 |
| Advertisement and poster of cigarettes spear in sport occasions | -.864 | .252 | .068 | .008 | -.004 | .041 | .006 |
| Advertisement and poster of cigarettes spear in public in public places | -.574 | .045 | -.043 | .029 | .043 | -.040 | .221 |
| Dially allowance and ( Pocket money) given t children help them to smoke | .226 | .667 | .160 | -.548 | -.030 | -.120 | .019 |
| Relative at home smoke , I imitated them | .111 | .603 | -.514 | .327 | -.203 | -.056 | -.079 |
| My friends are smokers, so I imitated them | .044 | .519 | -.385 | .182 | -.049 | -.154 | .008 |
| Smoking has negative effect in family income | .164 | .407 | .062 | -.219 | .076 | -.019 | -.133 |
| I agree with law that prohibited smoking in the public place | .050 | .357 | .090 | .032 | .081 | -.081 | -.120 |
| I have to find money to buy cigarettes anyway | -.169 | -.246 | .197 | -.034 | -.125 | -.101 | .054 |
| Smoking is majore cause of heart diseases | .236 | .282 | .486 | .437 | .306 | -.109 | -.088 |
| Smoking is majuare cause of cancer | .227 | .247 | .432 | .296 | .243 | -.089 | -.030 |
| My father is smoker, so I imitated him | .310 | .325 | -.375 | .295 | .091 | .004 | .062 |
| When I see my colleagues smoking, they look mature and independant | .124 | .209 | -.364 | -.149 | .303 | .041 | .184 |
| I tried to quit smoking | .288 | .323 | .343 | .086 | .016 | .107 | -.018 |
| Smoking decreases the ability of sensing ( testing,smelling,.....) | .186 | .276 | .324 | .247 | .305 | -.057 | .019 |
| When you smoke at work place you feel you are gentlman | .080 | .034 | -.296 | -.176 | .535 | .186 | .224 |
| Smoking makes boys more atractives | .118 | .129 | -.338 | -.009 | .482 | .057 | .294 |
| When under medication smoking delays healing prosses | .129 | .258 | .211 | .273 | .394 | -.177 | -.017 |
| I want to stop smoking because my family hates smoking | .164 | .352 | .341 | .017 | -.221 | .473 | .060 |
| Somoking helps in reduction problems | -.050 | .064 | .279 | .123 | -.251 | -.438 | .054 |
| I want to stop smoking because my relative advised me to do so | .187 | .282 | .204 | .207 | -.178 | .408 | -.084 |
| I want to stop smoking for finacial reasons | .287 | .322 | .076 | .159 | -.152 | .404 | .262 |
| I want to stop smoking for heath reasons | .329 | .159 | .238 | .156 | -.051 | .337 | .036 |
| Smoking helps in concenteration and innovation | -.039 | .062 | .275 | .178 | -.378 | -.159 | .465 |
| Smoking makes me feel happy | -.100 | -.040 | .165 | .258 | -.172 | -.343 | .351 |

Extraction Method: Maximum Likelihood.

a. 7 factors extracted. 14 iterations required.

# Table (4.26)

**Structure Matrix**

| | Factor | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| When I watch TV progrems I see some actors smoking | **-.935** | -.046 | -.111 | -.060 | -.098 | -.202 | .037 |
| Advertisement and poster of cigarettes speard in sport occasions | **-.898** | .021 | -.101 | -.033 | -.131 | -.140 | .082 |
| Advertisement and poster of cigarettes speard in public in public places | **-.583** | -.124 | -.137 | -.050 | .059 | -.195 | .195 |
| Dially allowance and ( Pocket money) given to children help them to smoke | .079 | **.903** | .169 | .210 | .071 | .205 | -.040 |
| Smoking has negative effect in family income | .080 | **.493** | .192 | .192 | .052 | .140 | -.168 |
| I agree with law that prohibited smoking in the public place | -.024 | .310 | .285 | .218 | -.027 | .092 | -.048 |
| Smoking is majore cause of heart diseases | .150 | .150 | **.810** | .102 | -.117 | .257 | .099 |
| Smoking is majuare cause of cancer | .149 | .177 | **.661** | .055 | -.082 | .236 | .103 |
| Smoking decreases the ability of sensing ( testing,smelling,.....) | .102 | .185 | **.601** | .104 | .048 | .203 | .054 |
| When under medication smoking delays healing prosses | .053 | .146 | **.599** | .167 | .108 | .031 | .031 |
| I tried to quit smoking | .201 | .312 | .418 | .087 | -.091 | .418 | .023 |
| Relative at home smoke , I imitated them | .006 | .219 | .075 | **.879** | .098 | .160 | -.021 |
| My friends are smokers, so I imitated them | -.054 | .252 | .108 | **.675** | .161 | .024 | .027 |
| My father is smoker, so I imitated him | .235 | .065 | .190 | **.598** | .307 | .150 | -.059 |
| I have to find money to buy cigarettes anyway | -.116 | -.153 | -.102 | -.311 | -.220 | -.128 | .201 |
| When you smoke at work place you feel you are gentlman | .045 | .020 | -.002 | .081 | **.686** | -.056 | -.296 |
| Smoking makes boys more atractives | .062 | .013 | .094 | .252 | **.667** | -.061 | -.139 |
| When I see my colleagues smoking, they look mature and independant | .065 | .162 | -.022 | .291 | **.539** | -.044 | -.177 |
| I want to stop smoking because my family hates smoking | .072 | .280 | .175 | .031 | -.142 | **.708** | -.009 |
| I want to stop smoking for finacial reasons | .191 | .139 | .150 | .236 | .109 | **.639** | .080 |
| I want to stop smoking because my relative advised me to do so | .121 | .127 | .214 | .152 | -.158 | **.602** | -.085 |
| I want to stop smoking for heath reasons | .274 | .093 | .260 | .049 | -.033 | **.538** | -.037 |
| Smoking helps in concenteration and innovation | -.076 | -.027 | .050 | -.045 | -.235 | .174 | **.670** |
| Smoking makes me feel happy | -.108 | -.141 | .115 | -.018 | -.165 | -.106 | **.593** |
| Somoking helps in reduction problems | -.061 | .094 | .175 | -.024 | -.391 | -.127 | **.464** |

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.

Table (4.27) and table (4.28) represent the correlation matrix between the factors. This matrix contain the correlation coefficients between factors as predicted from the structure matrix in table (4.24) and table(4.26) , From table (4.27) factor 2 and factor 7 have little or no relation with other factors, while factor 1, factor 3, factor 4,factor 5 and factor 6 interrelated to some degree. From table (4.28) all factors interrelated to some degree.

If the factors are independent then component correlation matrix should be identical matrix (all factors should have correlation coefficient of zero), and the results which obtained from the oblique rotation should be identical with that one obtained from the orthogonal rotation, since this is not the case therefore independent can not be assumed . The orthogonal results should not be trusted and the oblique rotation solution is more meaningful.

## Table (4.27)

**Component Correlation Matrix**

| Component | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | 1.000 | 4.433E-02 | -.182 | .167 | -7.7E-02 | -.108 | -2.9E-02 |
| 2 | 4.433E-02 | 1.000 | 5.099E-02 | 5.889E-02 | .119 | -2.4E-02 | .136 |
| 3 | -.182 | 5.099E-02 | 1.000 | -.128 | 6.522E-02 | 1.088E-02 | 8.796E-02 |
| 4 | .167 | 5.889E-02 | -.128 | 1.000 | -.140 | -.163 | 5.061E-02 |
| 5 | -7.7E-02 | .119 | 6.522E-02 | -.140 | 1.000 | .152 | 4.224E-02 |
| 6 | -.108 | -2.4E-02 | 1.088E-02 | -.163 | .152 | 1.000 | 4.079E-02 |
| 7 | -2.9E-02 | .136 | 8.796E-02 | 5.061E-02 | 4.224E-02 | 4.079E-02 | 1.000 |

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

## Table (4.28)

**Factor Correlation Matrix**

| Factor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | 1.000 | 4.086E-02 | .150 | 5.991E-02 | 8.534E-02 | .227 | -.119 |
| 2 | 4.086E-02 | 1.000 | .258 | .256 | 1.776E-04 | .194 | -.104 |
| 3 | .150 | .258 | 1.000 | .172 | -2.95E-02 | .234 | 8.002E-02 |
| 4 | 5.991E-02 | .256 | .172 | 1.000 | .241 | .125 | -5.30E-02 |
| 5 | 8.534E-02 | 1.776E-04 | -2.95E-02 | .241 | 1.000 | -6.53E-02 | -.259 |
| 6 | .227 | .194 | .234 | .125 | -6.53E-02 | 1.000 | -4.41E-02 |
| 7 | -.119 | -.104 | 8.002E-02 | -5.30E-02 | -.259 | -4.41E-02 | 1.000 |

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.

Table (4.29) shows the estimated communalities and specific variance according to maximum likelihood and Principal component methods. The seven-factor in the Maximum Likelihood solution account for a large specific variance in many cases but as the residual matrix in appendix (II) indicate the Maximum Likelihood estimates Ĺ and Ψ do a better job in producing R there are only 12% nonredundant residuals with absolute value greater than .05 while in the principle component there are 32% nonredundant residuals with absolute value greater than .05. On this basis we prefer the maximum likelihood approach.

The factors obtained from the two methods were found to be identical. Accordingly, the facts obtained from the two methods are quite reliable the only difference found in the application of the two methods was in ranking of their out comes.

## Table (4.29) Estimated Communities and Specific Variance

| | Maximum Likelihood Method | | Principle Component Method | |
|---|---|---|---|---|
| | $h^2$ | Ψ | $h^2$ | Ψ |
| 1-I want to stop smoking because my family hates smoking | 0.944364 | 0.055636 | 0.663825 | 0.336175 |
| 2-I want to stop smoking for financial reasons | 0.862278 | 0.137722 | 0.629417 | 0.370583 |
| 3-I want to stop smoking because my relative advised me to do so | 0.456421 | 0.543579 | 0.577961 | 0.422039 |
| 4-I want to stop smoking for heath reasons | 0.943595 | 0.056405 | 0.389265 | 0.610735 |
| 5-I tried to quit smoking | 0.37348 | 0.62652 | 0.313554 | 0.686446 |
| 6-When you smoke at work place you feel you are gentleman | 0.236736 | 0.763264 | 0.579847 | 0.420153 |
| 7-Smoking makes boys more attractive | 0.800729 | 0.199271 | 0.586188 | 0.413812 |
| 8-When I see my colleagues smoking, they look mature and independent | 0.566974 | 0.433026 | 0.481474 | 0.518526 |
| 9-Somoking helps in reduction problems | 0.463286 | 0.536714 | 0.550365 | 0.449635 |
| 10-When I watch TV programs I see some actors smoking | 0.424638 | 0.575362 | 0.876278 | 0.123722 |
| 11-Advertisement and poster of cigarettes speared in sport occasions | 0.503364 | 0.496636 | 0.872587 | 0.127413 |
| 12-Advertisement and poster of cigarettes speared in public in public places | 0.861466 | 0.138534 | 0.616116 | 0.383884 |
| 13-Smoking is major cause of heart diseases | 0.560793 | 0.439207 | 0.631051 | 0.368949 |
| 14-When under medication smoking delays healing process | 0.573458 | 0.426542 | 0.656138 | 0.343862 |
| 15-Smoking decreases the ability of sensing (testing, smelling,) | 0.248528 | 0.751472 | 0.585062 | 0.414938 |
| 16-Smoking is major cause of cancer | 0.570243 | 0.429757 | 0.496398 | 0.503602 |
| 17-Relative at home smoke , I imitated them | 0.544427 | 0.455573 | 0.700893 | 0.299107 |
| 18-My friends are smokers, so I imitated them | 0.440231 | 0.559769 | 0.651882 | 0.348118 |
| 19-My father is smoker, so I imitated him | 0.63595 | 0.36405 | 0.57179 | 0.42821 |
| 20-I have to find money to buy cigarettes anyway | 0.55992 | 0.44008 | 0.394736 | 0.605264 |
| 21-Dially allowance and ( Pocket money) given to children help them to smoke | 0.49444 | 0.50556 | 0.675407 | 0.324593 |
| 22-Smoking has negative effect in family income | 0.445839 | 0.554161 | 0.60659 | 0.39341 |
| 23-I agree with law that prohibited smoking in the public place | 0.544916 | 0.455084 | 0.321384 | 0.678616 |
| 24-Smoking helps in concentration and innovation | 0.434467 | 0.565533 | 0.699992 | 0.300008 |
| 25-Smoking makes me feel happy | 0.427966 | 0.572034 | 0.587487 | 0.412513 |

# Chapter Five

# Conclusion and Recommendations

## 5.1 Conclusion

The aim of This study is to find out the factors influencing tobacco use among university students, the study covered 250 males university students who are smokers aging between (16-24years) many questions were asked regarding the causes behind their beginning to smoke.

Many facts were obtained which are summarized in the following:

1- 56% of all smokers use other narcotics in addition to cigarettes 16% of them use Snuff, 21% use Water Pipe while 10% use both of them.

2- The majority of smokers started smoking in early years of their life with mean age 15 year old, however only 2.4% starting smoking in the age less than 10 years old, 27.2% of them starting in the age between (10 – 15 years), 56% starting in the age between (15 – 20 years) and 14% starting in the age between (20 – 24 years)

3-The majority (74.8%) of students smoke less than 10 cigarettes per day

4-Around 70% of the student said that they have smokers in their families

5-the study showed that advertisement play a very important role in entering the world of smoking

6-The study resulted that most of smokers knew that the smoking has bad effect of their health.

7-The study showed that the imitation is one of the main factor behind smoking

8-The study also showed that most of smokers entering the world of smoking because they want to have a good looking.

9-The study notes that the feeling of problems reduction is one of factors behind smoking.

10- Finally the study showed that smokers are uncomfortable about their smoking and thinking about quitting.

## 5.2 Recommendations

The researcher recommends the following

1-Young people should be targeted in health education in basic education to explain the hazard of smoking for health.

2-Public education can raise awareness of health effect of tobacco use and motivate smokers to quit

3-Direct support for smokers who want to quit by providing pharmaceutical treatments for tobacco addiction

4-Development of health system that facilitates access to trained health professionals who provide the necessary therapy.

5- Increasing the price of cigarettes through taxation could reduce cigarette consumption through three mechanisms: some smokers would quit smoking; some would reduce the amount that they smoke, and some would not start smoking, these are more affective in low income group and youth who have less disposable income.

6/ Control of tobacco smuggling, because the availability of cheap types of cigarettes, encourages young people to smoke.

7-Restrictions of smoking in public and work places will reduce the frequency of smoking and even the number of smokers, it will also change people's attitudes to smoking.

8-Medical staff, doctors in particular, as well as all hospital workers should set a good example to others and refrain from smoking

9-Provision of a free telephone which links smokers with trained counselors who provide guidance to quitters that can help them to avoid common mistakes that may stop their attempt.