DEVELOPMENT AND EFFECTIVENESS OF MASS MEDIA EDUCATION CAMPAIGN ON THE KNOWLEDGE, BELIEFS, ATTITUDES AND BEHAVIOUR RELATING TO QAT CHEWING AND HEALTH RISK AMONG SECONDARY SCHOOL STUDENTS IN ADEN, YEMEN

by

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الَّذِينَ يَتَّبِعُونَ الرَّسُولَ النَّبِيَّ الْأُمِّيَّ الَّذِي يَجِدُونَهُ مَكْتُوبًا عِندَهُمْ فِي التَّوْرَاةِ وَالْإِنجِيلِ يَأْمُرُهُم بِالْمَعْرُوفِ وَيَنْهَاهُمْ عَنِ الْمُنكَرِ وَيُحِلُّ لَهُمُ الطَّيِّبَاتِ وَيُحَرِّمُ عَلَيْهِمُ الْخَبَائِثَ وَيَضَعُ عَنْهُمْ إِصْرَهُمْ وَالْأَغْلَالَ الَّتِي كَانَتْ عَلَيْهِمْ ۚ فَالَّذِينَ آمَنُوا بِهِ وَعَزَّرُوهُ وَنَصَرُوهُ وَاتَّبَعُوا النُّورَ الَّذِي أُنزِلَ مَعَهُ ۙ أُولَٰئِكَ هُمُ الْمُفْلِحُونَ

الاعراف (157)

DEDICATION

This work is dedicated firstly to my father who nurtured and supported me throughout his life, may Allah S.W rest his soul in peace, and to my beloved mother who I still owe her and view the world through her eyes. And my dear wife who lost her age taking care of my kids; my daughters Maryam and Aishah, sons Ahmed and Omar, and to my sister Dr.Nadia and her husband, Dr.Musa at Taiba University (Saudi Arabia), whom supported me financially. Also my thanks go to my sister and her husband in Aden (South Arabia) for their moral support.

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AMI	Acute Myocardial Infarction
ALT	Alanine Amino-Transferase (liver enzyme)
ALP	Alkaline Phosphatase (liver enzyme)
AST	Aspartate Trans-Aminase (liver enzyme)
BMI	Body Mass Index
CNS	Central Nervous System
DDT	Dichlorodiphenyltrichloroethane
ECG	Electro-Cardio-Gram
EMCDD	European Monitoring Centre for Drugs and Drug Addiction
GCC	Gulf Cooperation Council
ITC	International Tobacco Control
ICU	Intensive Care Unit
IBM	International Business Machines
MBP	Mean Blood Pressure
NGOs	Non-Governmental Organization
NIDA	National Institute on Drug Abuse
NPSAD	National Programme on Substance Abuse Deaths
PDRY	People's Democratic Republic of Yemen
SCL-90	Symptoms Check-List-90
SRS	Simple Random Sampling
USA	United States of America
UK	United Kingdom
UAE	United Arab Emirates

UNICEF	United Nations Children's Fund
UNNL	United Nations of Narcotics Laboratories
UNODC	United Nations Office on Drugs and Crime
USM	Universiti Sains Malaysia
WHO	World Health Organization
YAR	Yemen Arab Republic

PEMBANGUNAN DAN KEBERKESANAN KEMPEN PENDIDIKAN MELALUI MEDIA MASSA TERHADAP PENGETAHUAN, KEPERCAYAAN, SIKAP DAN TINGKAHLAKU BERKAITAN PENGUNYAHAN QAT DAN RISIKO KESIHATAN DALAM KALANGAN PELAJAR SEKOLAH MENENGAH DI ADEN, YAMAN.

ABSTRAK

Qat (*Catha edulis*) merupakan satu spesies tumbuhan yang digolongkan dalam famili *Celastraceae*. Pengunyahan qat adalah amalan biasa di rantau Afrika Timur dan Semenanjung Arab sejak 11 abad yang lalu. Daun segar dan tunas tumbuhan tersebut mengandungi katinon dan katin sebagai bahan aktif. Katinon adalah bahan perangsang menyerupai amfetamina yang bertanggungjawab terhadap kebanyakan tindakan farmakologi qat. Antara kesan qat adalah untuk meningkatkan tumpuan, dan ini telah digunakan sebagai alasan oleh para pelajar untuk mengunyah qat. Satu kajian keratan lintang telah dijalankan bertujuan untuk mengenalpasti prevalens pengunyahan qat dalam kalangan remaja diikuti oleh kajian rekabentuk kawalan eksperimen pra-dan pasca-ujian untuk menilai kesan kempen pendidikan melalui media masa terhadap pengetahuan, kepercayaan, sikap dan tingkahlaku pengunyahan qat dalam kalangan pelajar sekolah menengah awam di bandar Aden, Yaman. Dalam bahagian pertama kajian ini, prevalens pengunyahan qat dalam kalangan pelajar sekolah menengah di bandar Aden adalah 19.9%. Rakan sebaya, lelaki (jantina), tempat kelahiran, umur dan kepercayaan adalah peramal kepada pengunyahan qat. Dalam bahagian kedua kajian ini, kempen anti-kunyah qat yang terdiri daripada bahan audiovisual seperti papan iklan, poster, risalah, majalah

gantungan dindingsiaran radio sekolah, filem dokumentari, kad pelekat dan lakaran, serta kuliah dan seminar, telah diperkenalkan selama tiga bulan dan penilaian dibuat menggunakan eksperimen pra dan pasca-ujian melibatkan pelajar sekolah menengah awam gred kedua (ke-11) di bandar Aden, Yaman yang dibahagikan kepada kumpulan kawalan dan intervensi. Kajian mendapati bahawa pelajar sekolah menengah dalam kumpulan intervensi (89.9%) adalah lebih terdedah kepada mesej media massa anti-kunyah qat berbanding kumpulan kawalan (44.5%) selepas pendidikan semula dan ini meningkatkan tahap kesedaran berkaitan risiko kesihatan mengunyah qat serta menambahbaik tahap kepercayaan dan sikap. Pada keseluruhannya, pengetahuan, kepercayaan dan sikap pelajar sekolah menengah dalam kumpulan intervensi meningkat dengan signifikan. Walau bagaimanapun, perubahan tingkah laku dalam kalangan pelajar terhadap mengunyah qat masih tidak jelas. Sebilangan besar remaja yang telah terdedah kepada mesej media massa percaya bahawa kempen anti-kunyah qat berkait rapat dengan mereka. Mereka faham daripada kempen tersebut, bahaya mengunyah qat, dan mengurangkan kebarangkalian mereka untuk memulakan tabiat mengunyah qat pada masa hadapan. Kesan kempen adalah lebih ketara dalam kalangan bukan pengunyah qat berbanding pengunyah dan dalam kalangan pelajar perempuan berbanding lelaki. Secara keseluruhannya, kajian ini menunjukkan keberkesanan kempen pendidikan melalui media massa, khususnya kepentingan dan pengaruhnya terhadap pengetahuan, kepercayaan dan sikap remaja. Walau bagaimanapun, kesannya terhadap tingkah laku tidak diperhatikan, dan ini mungkin disebabkan oleh tempoh kajian yang pendek.

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ABSTRACT

Qat (*Catha edulis)* is a species belonging to the plant family *Celastraceae.* Qat is commonly chewed throughout East Africa and the Arabian Peninsula since the 11th century. The fresh leaves and buds of the plant contain cathinone and cathine as the active substances. Cathinone is an amphetamine like stimulant responsible for most of its pharmacological action. Among them, is enhancing concentration, and this has been used as a reason for the students to consume qat. A cross-sectional study was carried out aimed at determining the prevalence of qat chewing among adolescents followed by a pre-test post-test experimental control design study aimed at evaluating the outcome of mass media educational campaign on the knowledge, beliefs, attitudes and behavior of qat chewing health risk among public secondary school students in Aden city, Yemen. In the first part of the study, the prevalence of qat chewing among secondary school students in Aden city was found to be 19.9%. Friends, male (gender), place of origin, age and beliefs were the predictors of qat chewing. In the second part of the study an anti-qat chewing campaign consisted of audiovisual material such as billboards, posters, brochures, wall magazines, school radio, documentary movie, sticker cards and sketch, as well as lectures and seminars were introduced for three months and evaluated using a pre-test and post-test experiment consisting of control and intervention groups on second grade (11th)

public secondary school students in Aden city, Yemen. The study found that secondary school students in the intervention group (89.9%) were more exposed to the anti-qat chewing mass media messages than the control group (44.5%) after re-education resulting in greater level of awareness about health risk of qat chewing and improved beliefs and attitudes. The overall knowledge, beliefs and attitudes of the secondary school students in the intervention group were raised significantly. However, the behaviour change of students towards qat chewing was not evident. A significant number of adolescents who had been exposed to the mass media messages believed that the anti-qat chewing campaign relates closely to them. They understood from the campaign the dangers of chewing qat, and reduce their likelihood of acquiring or taking up the habit of chewing qat in the future. The effect of the campaign is more pronounced in non-qat chewers than qat chewers and female more than male students. Overall, this study demonstrated the efficacy of the mass media educational campaign, with respect to salience and its effects on adolescents' knowledge, beliefs and attitudes. However, its effect in behaviour was not observed, but this could be due to the short duration of the study.

CHAPTER I

BACKGROUND AND JUSTIFICATION

1.1 Introduction into qat chewing phenomena

1.1.1 The history and origin

The history of qat chewing can be traced back to as early as the fourteenth century in the horn of Africa especially in Ethiopia. A sources of ancient Arabs claim that qat originated from the highlands of Ethiopia and found its way to Yemen (Gebissa, 2010). In Yemen, the qat tree was named and described by the Swedish Botanist and Neutralist Peter Forsk (1732-1763), who had travelled to Yemen to collect some botanical and zoological specimens. Qat was one of the specimens that he found there. Forsk was died in Yemen by malaria disease. His companion Carsten Niebuhr (1736-1815) who was expedition had termed qat in his first botanical published under the generic name of *Catha edulis* Forsk in memory of his friend (Greenway, 1947).

Qat is chewed to enhance concentration, reduce hunger and fatigue, and as traditional remedies to cure venereal disease, asthma, cold, fever, cough and headaches (Elmi, 1983; Kalix, 1984). This phenomenon is fostered with religious ceremonies during worship, prayers and other religious affairs. By the sixteenth century, qat chewing had spread into the various strata of the Yemeni society raising legal and religious concern (Ward and Gatter, 2000).

Qat tree which belongs to the *Celastraceae* family is cultivated and harvested in Ethiopia, Yemen, Somalia and Kenya (Halbach, 1972). It is perennial species and thriven in the wet highlands lasting more than 50 years. This characteristic makes qat a profitable crop (Kalix and Glennon, 1986). Qat is known by various names in the

western literature: Qat, khat, Chat, Qaad, Jaad, Miraa, Mairangi, Cat, Flower of Paradise, Tohai, African salad, and Catha and Tea of the Arabs (Kalix, 1990).

Advancement in transportation in the last two decades enabled qat to find its way into some Arab countries, Europe, North America, India and even Australia (Klein *et al.*, 2012). In recent years qat cultivation has expanded to new territories to Somalia, Djibouti, Tanzania, Uganda, Zimbabwe and Zambia, as well as Afghanistan and Turkistan (Halbach, 1972; Cox and Rampes, 2003). In Islamic countries like Yemen, Somalia, Ethiopian and Kenyan, qat chewing is prevalent among the local Muslims, considers legal unlike alcohol which is prohibited. Saudi Arabia, however bans qat chewing citing religious and economic reasons whereas in Yemen, even religious leaders practice this habit to induce milder antisocial behavior as oppose to narcotics that is unacceptable (Dhaifalah and Santavy, 2004).

The general pharmacological effects of qat chewing due to presence of cathinone and cathine include high blood pressure, enhance pulse rate, euphoria, depression and insomnia followed by constipation, anorexia, gastritis and lack of libido (Kalix, 1983). An updated report conducted in Yemen shown that long term of qat consumption may lead to psychosis disorders (El-Guneid, 1991). Because of its many repercussions on health, a number of European countries have banned qat import for negative social and economic reasons (Dhaifalah and Santavy, 2004).

In June 2014, because of drug misuse, the United Kingdom banned the import of qat, placing and scheduled it as class C an illegal drug. Likewise Netherlands and some other European countries followed the British example and prohibited qat chewing and its sale (Drugs and Addiction, 2014). Despite the negative consequences of qat chewing imposes on health and its social and economic implications, its consumption and usage remain a popular trend in Yemen, including

very remote areas. In the mid-1980s, the prevalence of qat usage was 85% for male and 60% for female in the north Yemen. After the unification, the chewing habit spread to the south of Yemen and evolved from occasional usage to everyday consumption (Ward and Gatter, 2000). Basunaid *et al.* (2008) reported the prevalence of qat chewing among Yemeni male and female to be about 80% and 60% respectively. According to the World Bank Report Qat Consumption Survey in Yemen 2006, the prevalence of qat chewing among male and female was 73% and 33% respectively (Milanovic, 2008). Astonishingly, 15 to 20% children less than 12 years were found to be daily qat chewers (Mugahed, 2008).

Qat consumption plays a major role in Yemen's economy and represents 10% of consumption and one-third of agriculture of gross domestic product (Ward and Gatter, 2000). It was also reported that qat consumers spent approximately half of their monthly income for purchase of the product and parents spend 4 to 5 hours a day joining other qat chewers away from their homes, thus neglecting their children's welfare and supervision of their education, leading to an illiterate generation (Al-abed *et al.,* 2014).

In Yemen, qat consumption particularly among children, have not yet been investigated although some studies have covered limited population groups (Bawazeer, 1993). This study aims to evaluate the efficacy of an anti-qat chewing mass media education campaign based on knowledge, beliefs, attitudes and beahviour of secondary school students in Aden city, Yemen.

It hopes that the outcome of this effort will be able to convince relevant authorities to institute policy change on the use of qat. It has the potential to provide schools, communities, cities, regions and countries with useful information to develop appropriate early measures to combat qat cultivation, production and

consumption and in doing so, protect the public and the environment from destruction and waste (Figure 1.1).

A) Qat Sellers

B) Qat cultivation

C) Stalks and leafs of qat

D) Yemeni youths chewing qat

Figure 1.1 Qat profile in Yemen (All pictures are reproduced from the internet: http://en.wikipedia.org/wiki/khat)

1.1.2 Chemical components

The United Nations of Narcotics Laboratories (UNNL) in 1975 isolated the main constituent called cathinone which analogue amphetamine a psycho-stimulant substance. Qat contains more than 40 alkaloids, glycosides, tannis, amino acids, vitamins and minerals (Elmi, 1983; Abdulwaheb and Abebe, 2007). The major active ingredients in a qat leaf was identified as the phenyl alkyl amine(-)-alpha amino-propiophenone named cathinone and cathine (nor-pseudo-ephedrine) (Kalix, 1984).

The fresh qat leaves after picking contain a higher proportion of cathinone. During the drying process cathionone is converted into cathine, which has milder effects than cathinone (Milanovic, 2008). To obtain better stimulation, chewers have to continually chew fresh leaves. Similarly to the amphetamine the cathinone exert its effects throughout neurochemical pathway: dopamine and noradrenalin as well as cathinone may release serotonin in the CNS (Numan, 2012).

1.1.3 Mechanism of action

Cathinone or alpha-amino-propiophenon is considered as the most active ingredient of the qat plant, since its effect has been shown to be similar to amphetamine. Cathine nor-pseudoephedrine or phenylpropanolamine, isolated from the Ephedra plant has similar effects of qat components, cathine has milder psycho-stimulant action than cathinone. Fresh green leaves contain a higher proportion of the desirable cathinone. Cathinone, because of its instability, breaks down during drying into cathine which is less powerful than cathinone. It releases dopamine in the striatum and nucleus accumens shell of similar potency to amphetamine in low concentrations (Kalix, 1980; Kalix, 1983). Cathinone, in contrast, has more rapid

and intensive action that explains its high lipid solubility facilitating access into the CNS. Because it offers better stimulation, users prefer to chew fresh qat leaves continually (Cox and Rampes, 2003; Halbach, 1972; Brenneisen *et al.*, 1990; Al-Motarreb *et al.,* 2010; Kalix, 1987; Patel, 2000; Kalix, 1994).

1.1.4 Pharmacological of qat in human beings

Qat is a psychotropic drug having the amphetamine-like substance called cathinone. Both have the similar reaction on the brain. Cathinone has the ability to pass through the brain carrier and induced euphoria, increased alertness, hyperactivity, excitement, aggressiveness, anxiety and obsessive behaviour. A depression phase of malaise, lack of concentration, usually follows (Cox and Rampes, 2003; Al-Motarreb *et al.,* 2002; Hassan *et al.,* 2002). According to Luqman and Danowski (1976), the green leaves of qat with tiny tips contains cathinone and cathine, which is capable of inducing; stomatitis, oesophigitis, gastritis and constipation due to the presence of tannins in the gastrointestinal tract.

As for the genitourinary and reproductive system, cathinone reduces urine flow rate and is a cause for spermatorrhoea and erectile dysfunction. It is also reducing libido. Studies have shown the significant incidence of low birth-weight of full-term infants in the offspring of women who used qat during pregnancy (Kalix and Braenden, 1985; Kalix, 1990; Hassan *et al.,* 2007; Patel, 2000).

The consumption of large amounts of qat can lead to behavioural hypomania and psychosis syndromes, such as mania, schizophrenia, paranoid psychosis and symptoms of acute schizophrenia (Odenwald *et al.,* 2005). The World Health Organization (WHO) commission on Narcotics Drugs has reported qat consumption since 1946. Because of the qats biological and social effects, and vague scientific

literature of its chemical reactions, it was placed under the list of dangerous and banned drugs by the WHO in the 1980s (Kennedy *et al.*, 1980; Hassan *et al.*, 2003).

In recent years, even young children and secondary school students in Yemen have taken up qat chewing. Students appear to have the notion that chewing qat aids their ability to concentrate better, hence better performance in their studies. It is important, therefore, to evaluate this perception since qat usage has become a widespread habit in the Yemeni society. There is a need to understand what attracts people to this habit, the magnitude of this phenomenon, and how this seemingly harmless culture can be a bane to the nation's social and economic well-being.

1.1.5 Qat consumption and public health

According to the reports of United Nations Office on Drugs and Crime (UNODC), qat chewing has reached a proportion that warrants public and health concern, and recently there is an accepted view that qat chewing, like other substance abuse, could ultimately affect the users health (Drugs and Crime, 2010; Dependence, 2003; WHO, 2006) . The widespread prevalence of qat chewing reportedly ranges between 4.3% to 84% in countries where qat originate and elsewhere available (Elmi, 1983; Bhui *et al.*, 2003). Literature has suggested that qat chewing is detrimental not only to the health but socio-economically as well (Al-Motarreb *et al.*, 2005; Kassim and Croucher, 2006). Qat chewing may also lead to dependence, as recently suggested by (Griffiths, 1998; Odenwald, 2007; Kassim and Croucher, 2006).

In Yemen, there is an absence of vital indicators on the contributory factors of poverty, low participation in education particularly among girls, high rate of illiteracy and proper sanitation. Also lacking is the medical knowledge and initiatives

to tackle public health issues among which, is qat chewing.This inadequacy could possibly bring about greater damage to the national health and economy (Ward and Gatter, 2000). Qat chewing should be viewed as a potential threat to public health. It can, however, be curtailed through partnerships and collaborations among the strata of the general community that should ideally include policy makers, workers, educators, NGOs and health researchers and other related professionals (Douglas *et al.*, 2011).

One of the ways to counter qat usage may be in the form of health promotion activities in the form of campaigns to increase the public's knowledge and understanding on the dangers of qat chewing, particularly in communities where this activity is rampant. The campaign could also incorporate and promote harm-reduction strategies through educational programs (Douglas *et al.,* 2011).

1.1.6 Qat related morbidity and mortality

As for the physical, pharmacological and psychological effects of qat on humans, there are some issues in classifying the risk associated with drug morbidity. In Yemen and other qat producing countries, there is scant literature on the morbidity and mortality of qat use due to the lack of documented information and insufficient quantitative research (Gatter, 2006).

Morbidity relating to qat chewing was discussed in some recent literature encompassing cultivation to consumption (Corkery *et al.,* 2011). Death linked to qat chewing is traceable in every stage of the plant journey, from its cultivation, consumption and the effects in the human body. Date *et al.* (2004) reported that qat chewers who do not wash the qat leaves before consuming may ingest pesticides leading to cancer of the digestive system and kidney failure.

Corkery *et al.* (2011) documents reported deaths caused by poisoning from ingestion of pesticides and fertilisers used in the cultivation of qat. In Ethiopia, Daba *et al.* (2011) found excessive levels of pesticide residues such as, Diazinon and DDT in qat leaves which are linked to oral and oesophageal cancers in various qat producing areas. Sudden death was linked due to the use of other pesticides such as Dimethoate. However this was attributed to the accumulation of acetylcholine in the heart and brain muscles that may lead to bradycardia and cardiac arrest, as several of qat chewing fatalities (Daba *et al.*, 2011; Corkery *et al.*, 2011).

Despite increasing qat consumption-related deaths in Yemen, no documented literature or research has looked into this matter. There exist only isolated reports in Yemen on deaths of individuals due to choking on qat. Yemen reported the death of an 11-years old boy when a chewed qat was lodged in his trachea and could not be ejected despite repeated coughing (Mugahed, 2008). The UK National Programme on Substance Abuse Deaths (NPSAD) also reported a number of deaths due to medical complication related to qat consumption.

Ghodse *et al.* (2013) identified and described causes of qat-related deaths. They suggest that no deaths associated with qat toxicity and overdose have been reported,but cases due to its toxic effects are now known and confirmed (George's, 2010). According to the National Programme on Substance Abuse Deaths Report, Corkery *et al.* (2011) revealed that there were fifteen qat related deaths (14 male and 1 female) in various hospitals in the UK. The roles of qat in death are the prolonged use with other substnance of abuse such as alcohol or tobacco, traumatic suicide, psychosis and hepatic necrosis. Most of the victims were from Somalian and Eretrian immigrants residing in the UK.

1.2 Socio-Economic aspects of qat chewing

1.2.1 Social norms

According to Borelli (2005), essentials factors such as social and economic generally influence the level an individual consuming qat. Notwithstanding this, qat is sometimes consumed in significant amount due to "social pressure", e.g. at a qat chewing party where the pressure or the temptation to use the substance may be unusually high. Qat chewing is a factor to socio-economic problems due to loss of work hours, reduced economic production, malnutrition and diversion of money to buy excessive quantities of qat (Kassim *et al.*, 2010).

Traditionally, qat chewing is common in the Horn of Africa and the Arab Peninsula. The chewing process involves the picking of the soft leaves of qat that are then placed inside the cheek. After chewing, the leaves remain in the mouth. The leaves extract mixed with saliva is then swallowed. The consumption produces a sense of euphoria and excitement due to the cathinone effects. In a traditional social setting, qat chewers are likely to conduct this activity in one of the homes of a fellow chewer, usually in the afternoon. Each chewer comes with his own supply of qat. They laze on cushions while indulging in this pastime that might also include smoking water pipes, cigarettes, sweet beverages and coffee. A gathering of this nature may have as many as twenty chewers at one time such sessions are perceived by qat users as promoting social interactions (Luqman and Danowski, 1976; Ward and Gatter, 2000; Ageely, 2008; Milanovic, 2008; Baasher and Sadoun, 1983).

Students, workers and especially long distance drivers chew qat to obtain the stimulant effect, purportedly to keep them alert and enhance work capacity (Halbach, 1972; Kalix and Braenden, 1985; Toennes *et al.*, 2003). An informal report from qat producing countries even suggests that qat chewing is a remedy for treating asthma,

depression and abating hunger and fatigue (Luqman and Danowski, 1976; Al- Motarreb *et al.*, 2002; Dhaifalah and Santavy, 2004). In Ethiopia and Yemen, qat chewing is common among the communities. One of the factors that contribute to the widespread chewing is an absence of policy on the cultivation and production of qat (Ward and Gatter, 2000). A World Bank Report has mentioned that qat chewing has even become prevalent among women of different backgrounds in qat-producing countries (Griffiths, 1998; Patel *et al.*, 2005).

1.2.2 Economic aspects

In the 17th and 18th century, Yemen's coffee was a highly sought after commodity, but its popularity gradually declined against competition from Indonesia, South America, and East Africa (Ageely, 2008). Currently, farmers are switching to qat cultivation as the financial returns are more lucrative. Large farmlands are now dedicated to qat cultivation in place of sorghum and coffee (Ward and Gatter, 2000).

In Ethiopia, thousands of hectares of farmlands are devoted to qat cultivation because of its investment value despite being a "non-nutritious and unproductive" crop (Ageely, 2008). Qat chewing affects human productivity hence contributes little to boost the factor. This is due to time explicitly wasted when qat chewers indulge in their chewing sessions instead of being productive otherwise. It was suggested in 1973, that an estimated 4 billion hours or more, of work a year was lost due to qat-chewing habit. The move to completely ban qat consumption was heavily resisted despite heavy tax levied. The levying of high taxes on other substances such as nicotine was able to reduce its consumption but was not effective on qat. According to latest statistics, Ethiopians, Yemenis, and Djibouti families spent about one-third of their income on qat consumption (Ageely, 2008).

1.3 Qat control in Yemen

Qat chewing habit has been rooted for hundreds of years in Yemen, both as a social and culture-based activity. Qat is consumed to broaden social interaction and is prominent at ceremonies such as, wedding, birth and for solace (Numan, 2012). However, despite the scientific evidence that qat chewing has negative impact affecting health, social and the economy, the Yemeni government has not made serious efforts to curb qat consumption to reduce its undesirable effects (Ward and Gatter, 2000). Prior to the unification between the south and north Yemen in 1990, there was no law to either control qat chewing or reduce its cultivation that had risen in popularity, particularly in the northern Yemen (Ward and Gatter, 2000).

In the southern Yemen, known as the People's Democratic Republic of Yemen, a law prohibited people from chewing except at the end of the week (Thursday and Friday). Qat users to be more disciplined because of this law (Ward and Gatter, 2000). In 1972, North Yemen prime minister banned public servants from chewing qat during work hours including restricting its cultivation. He also initiated a campaign using the mass media (radio, newspaper, poems, skits and journals) to encourage the population to quit qat chewing saying it was bad for their health. Unfortunately, the commendable efforts of the Prime Minister met with opposition and he lost his position just after three months and the campaign he initiated was abandoned (Ward and Gatter, 2000; Gatter, 2007).

The World Bank Report in 2007 estimated that one-third of Yemenis, especially the rural population, depended on qat crop for their domestic income. Restrained by this condition, the country will require a significant and balanced policy change if qat cultivation and its usage is to be effectively controlled. At the Yemeni International Convention in 2002, many suggestions and recommendations

were put forth by researchers to assist the government to fight the negative impacts of qat (Ward and Gatter, 2000). The Yemeni government adopts a cautious policy on its stand on qat. While imports are banned, production is legal and sales are taxed (Ward and Gatter, 2000). Although some politicians have opposing views on qat, there is however no concerted effort to implement anti-qat campaigns. Since 1999, the government has adopted a number of specific policies to control, regulate and taxes on qat. However, these policies have not successfully curbed the production or consumption of qat. It did, however, succeed in fostering public debates on qat and policy makers continue to seek ways to reverse the alarming spread of its usage (Ward and Gatter, 2000).

1.3.1 Qat control in Aden (before unification)

Qat chewing was not noted among the Adeni community until the 19th century after it was brought in from Ethiopia and Somalia. The chewing habit in the Adeni society started in a small area around Taiz (Dhalla and Yaffa), where qat was grown in small quantities. The governing party in Aden attempted to control qat use among the Adenis in the 1950s. Despite this effort, there were reports of illegal use especially among foreign Arab workers. By 1958, measures to stem out qat use had all failed.

Following the British occupation in Aden, the People's Democratic Republic of South Yemen was established in 1967. The authority outlawed the chewing of qat in Aden except on Thursday and Friday. This law was very effective in controlling qat use among the people of Aden and in the People's Democratic Republic of South Yemen. In 1990, South and North Yemen unified as one country, known as it is now, the Republic of Yemen. The new Republic replaced the old constitution and

abolished the previous law on qat use, though it remained valid in Southern Yemen (Ward and Gatter, 2000). As a result, qat chewing became rampant and uncontrolled in Aden and in many southern provinces. The government was powerless to deal with the situation, as there was no law prohibiting the public from using qat. However, the lack of control by the Yemeni government has enabled qat traders to expand their business to new markets, particularly to the main cities such as Aden and Hadramout where qat cultivation did not exists. In a World Bank 2007 report, 'Yemen Towards Qat Demand Reduction' the rate of qat chewing in non-cultivated areas had reached 83% and 61% in the coastal areas and 23% in the areas around the Wadi of Hadramout. This phenomenon gave rise to new problems in the communities previously known to be peaceful areas (Ward and Gatter, 2000). In fact, in some areas, qat cultivation and trading became a new source of income for the economy.

1.3.2 Qat chewing in different cultures

In Yemen and southern Saudi Arabia, qat chewing is one of the traditional habits within communities. Qat chewing is very common as some people believe that it can overcome fatigue and depression and confer a euphoric effect for a more active lifestyle. In Ethiopia, people have used this plant to treat ailments such as depression or as part of their dietary requirements. long-distance drivers who are known to chew qat to keep them awake and more energised and for better concentration (Al-Motarreb *et al.,* 2002; Baynesagne *et al.,* 2009).

Qat chewing is endemic among Yemenis, Somalis, and other minorities in Ethiopia and Kenya. It is not prohibited in Islam unlike alcohol where its use is clearly stated in the Holy Quran (Verse 219 in Surah 2 and Verses 90 and 91 in

Surah 5, and the Hadith). However, there are disagreements on the permissibility of qat chewing in Islam; some scholars deem it as impermissible while others (primarily Yemenis) do not see it as such. Qat is also used by some Yemeni community and farmers for crafts (Kennedy *et al.,* 1983; Kalix, 1984; Krikorian, 1984; Mekasha, 1984; Weir, 1985; Hassan *et al.,* 2007).

1.4 Qat chewing and mass media educationan campaigns in Yemen

The media play an essential role in any society. It is an undisputable fact that media campaigns do have strong impact on the audience of different social classes (McQuail, 1977; Straubhaar *et al.,* 2013). Media is considered as the most important source to publicize information and create awareness among the society. Media campaigns are used around the world for targeted individuals and the society. Such campaigns may focus on various issues e.g. health, agriculture and education. A successful campaign can yield the desired results and significantly improve a prevailing unhealthy situation. One of the most widely used media campaign is on stamping out smoking and the use of substance of abuse (Levy and Friend, 2000).

This study on qat usage will focus on Yemeni secondary school students. This section of the Yemeni population was chosen for two reasons: First, Yemen is a country where student numbers is very low (Gatter, 2002). Second, students are generally considered as the backbone of the society. Healthy students can deliver a wealthy society and result-oriented nation. The Yemeni government does not control or limit qat growing, production and sale. Farmers and landowners are not encouraged to grow alternative cash crops (Ward and Gatter, 2000). There is also no policy to control or reduce the number of chewers, especially the younger population. Perhaps it is also the unwillingness of the people themselves to change.

In fact, most if not all people do not recognize that this habit has negative effects on health, social and economic aspects of life (Ward and Gatter, 2000; Numan, 2012).

To educate people on the health risks associated with qat chewing, it is important to design an awareness campaign that can effectively highlight the negative and harmful effects of qat on health including its social and economic implications. The influence of the media on society can be quite profound, be it the good or less desirable aspect. Nevertheless, its effect on children and youth can be quite intense (Gatter, 2002; Sacks, 2003; Gatter, 2006).

There are several ways to use the mass media to curb qat chewing. A mass media campaign proposed in a 2002 convention to counter the negative effects of qat use in Yemen included dissemination through radio and television, lectures, newspapers, internet and printed materials (Abdul-Malik, 2002). However, this process did not take place as planned (Ward and Gatter, 2000). Generally, in Yemen, there is poor utilization of mass media channels specially to target health issues and social matter. Instead, they are more used for other purposes such as marketing and trading propagandas (Gatter, 2006).

Anti-qat chewing campaigns activities in Yemen are rarely publicized and it can be said it was practically not done until the writing of this chapter. This could be due to the lack of, or, poor planning by the government to control the cultivation, production, sale and use of qat. Furthermore, the negative attitude of the general population is clearly reflected by the way they live their life and the activities they indulge in, especially among the youths (Ward and Gatter, 2000). It is therefore vital and urgent for NGOs and other civil society in Yemen to put concerted effort to counter the qat chewing habit and reduce the negative consequences of qat practices on population life (Ward and Gatter, 2000). Recently, some anti-qat NGOs in Yemen

under the auspices of the United Nations Children's Emergency Fund (UNICEF) have taken on this initiative but they had little political backing to fight against qat consumption. As pointed out by Ward and Gatter (2000) such initiative requires full governmental as well as public support for the outcome to be noticed.

This study focuses on an important section of the Yemeni population, that is, the secondary schools students. It is the first study of its kind to examine qat chewing among Yemeni secondary school students using the mass media as a study tool. This section is aimed to development the mass media tool and the use of educational program to improve the secondary school students' knowledge, beliefs, attitudes and behaviour on qat chewing habit in the Aden city, Yemen.

1.5 The history of educational system in Aden city

The educational system in Aden, considered as the oldest in the area, started in 1930s, before World War II. At that time, there were about 1,000 students enrolled in the public schools and around other 2,000 studied in private education. Majority of the teachers in Aden then were English and Indian. In 1943, the British Council introduced English classes for both men and women in Aden. In addition, young people from elite backgrounds had the opportunity to attend primary and higher education system in UK elite schools and universities.

Immediately after the independence of PDRY (South Yemen) in 1967 from British occupation, the PDRY's education system was expanded, nationalized, and Arabized. In 1975, the structure of educational schooling system changed to two-eight-four: two years of kindergarten, eight years of basic schooling (effectively covering primary and preparatory or lower secondary), and four years of secondary schools. The education system was completely free at all levels with students

(Anaam *et al.*, 2009). Pupils were given free textbooks and transportation. In rural areas where small villages distributed around within the same area of a governorate, but further apart, pupils were also given free board. At the universities levels, students were also given a monthly stipend equivalent to about half of the average salary at that time.

The education system that was adopted in the Republic of Yemen after unification in 1990 was essentially a blend and merger of both systems of the Yemen Arab Republic (YAR), (North Yemen) and PDRY People's Democratic Republic of Yemen (South Yemen) with few changes. The current education system consists of nine years of primary education, followed by three years at secondary level. At recent count, public secondary schools numbers in Aden city were 35 and 14 were private secondary schools. The student numbers stood at 181,087 in both public and private basic education and 23,686 in the secondary school systems in the Aden city (Ministry of Education, 2009).

1.6 Purpose of the study

1. The purpose of the study is to evaluate the current level of knowledge, beliefs, attitudes and behaviors among public secondary school students on qat chewing in Aden city, Yemen.
2. To develop the practical and effective intervention tools to improve students' knowledge, beliefs, attitudes, and behaviors.
3. To evaluate the impact of intervention (using tools) on students knowledge, beliefs, attitudes and behaviors.
4. To develop a model to improve students' knowledge, beliefs, attitudes and behaviors throughout Yemenis education system.

1.7 Rationale of the study

1. The lack of information and knowledge on qat consumption and increased the level of qat chewing habit among Yemeni people, particularly children and students.
2. The results of this study will be utilised to provide information to the knowledge, beliefs, attitudes and behaviour which could be used as a basis for the preparation of a remedial action by the relevant authorities.
3. The outcome of this study will be useful to both Ministry of Education and Ministry of Public Health in drafting effective guidelines to reduce problems associated with qat chewing habit among Yemenis.
4. The results will enable policy makers to create and formulate new policies to control the cultivation and production as well the consumption of qat in Yemen.
5. The study findings may be utilised as references to counter other possible drug problems in Yemen.

1.8 Study hypothesis

- The second grade secondary school students in Aden have less knowledge on the harmful effects of qat chewing;
- There is no relation between students' knowledge and socio-demographic factors (pre-and post-intervention);
- There is no relation between student's beliefs and attitudes and socio-demographic factors (pre-and post-intervention);
- There is no relation between students beliefs and perception with socio-demographic factors (pre-and post-intervention);

- There is no relation between student's behaviour and socio-demographic factors (pre-and post-intervention);

1.9 Study questions

1. What is the impact of the mass media educational campaign in the knowledge, beliefs, attitudes and behaviour of secondary school students about qat chewing habit?
2. What is the level of secondary school students' knowledge before and after the intervention particularly for those who were exposed to the campaign?

1.10 Study objectives

1.10.1 General objective

To evaluate the effectiveness of mass media education campaign on knowledge, beliefs, attitudes and behavior related to the health, social and economic impacts of qat chewing among public secondary school students (second grade student's) in Aden city, Yemen.

1.10.2 Specific objectives

(A) Prevalence study

1. To determine the prevalence and patterns of qat chewing among the public secondary school students in Aden city, Yemen.

(B) Mass media education campaign study

1. To develop and validate the campaign tools on knowledge, beliefs, attitudes and behavior on qat chewing effects among public secondary school students in Aden city, Yemen

2. To assess and determine the level of students' knowledge, beliefs, attitudes and behavior related to qat chewing effects among public secondary school students after the final intervention in Aden city, Yemen.
3. To assess the impact of the mass media tools after the program among public secondary school students in Aden city, Yemen

CHAPTER II

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Qat chewing prevalence

A study conducted by the National World Bank (2007) revealed the prevalence of qat chewing in seven cities on Yemen, with age groups of 12 years and above accounting for 54.4% of the overall figure (Gatter, 2007). Al-Khader and Darwish (2009) reported the prevalence of qat chewing among male medical Yemeni students in Aden showing an increase in frequency from their first to the final year of study (35% to 90%). Qat history has played a major role in Yemeni Society culturally and traditionally, which may explain the conflicting beliefs among Yemeni students. In the past two decades, qat chewing habit has spread rapidly and extensively among the general population.

There is evidence of a growing number of school children who are attaching themselves to the usage of qat and indulging in qat chewing (Arrabyee, 2002). The lack of knowledge on the adverse health effects of chewing qat does little to reduce the usage (Corkery *et al.*, 2011). Traditionally, qat chewing is only initiated when a person turns 20 years old. These days, however, chewers start even as early as 8 to 10-years-old. This is noted in qat cultivating countries, e.g. Yemen, Ethiopia and Kenya, (Griffiths, 1998; Alem *et al.*, 1999; Nabuzoka and Badhadhe, 2000; Carrier, 2005). In fact, qat consumption in these countries has become a youth culture.

Similar to tobacco smoking, several factors may accelerate this habit, such as, less or non-existence of anti-smoking campaigns, higher exposure to pro-tobacco messages, normalisation of smoking (community acceptance), parents and friends using tobacco, and, the affordability of the product. All the above-mentioned factors

may make teenagers more inclined to smoke (Seo *et al.,* 2008). The popularity of qat chewing varies between population in the cultivating and producing countries such as Yemen, Ethiopia and Kenya. Most studies are carried out in the local communities. Some clinical studies and homogenous samples include all age groups such as university and school students. Ageely (2009) found that the prevalence of qat chewing among junior and high secondary school male students in southern Saudi Arabia was 63.90% in the Jizan Province, a qat cultivating area. In Ethiopia, (Kebede, 2002) reported that prevalence of qat chewing among students was 26.6%, and, 10.9% indulged in smoking as well as chewing qat. Baynesagne *et al*. (2009) has record that the prevalence of qat chewing among university students in Ethiopia is 31.2%. Almost half of the qat chewers in the study used the product for relaxation and to boost their performance.

Hannani (2004) was conducted astudy among Yemeni university students. He has found that 81.1% male and 25.9% female students have chewed qat. Statistics show qat chewing among this group to be approximately 2.3% (female students) and 38.2% (male students) who use the substance on a daily basis. Interestingly, the study also found that about 19.8% of female and 35.1% of male students were not willing to stop using qat. In another study, to measure the prevalence of qat chewing among medical students in Aden University also involved both genders. Bawazeer (1993) reported the number of medical students' qat chewers as 17.2%.

In Somalia, Elmi (1983) reported that the prevalence of qat chewing among the Somalia's was 59%. A similar study in Kenya reveals that qat chewing prevalence among Kenya's Northeast population is as high as 88 % (Aden *et al.,* 2006). According to Litman *et al.* (1986) the prevalence of qat chewing in diasporas was about 39% among Jewish immigrants, Yemenis male in Israel.

On Europe, there were a few published studies conducted among Yemenis, Somalis and Ethiopians refugees. However a study among Somalis in the United Kingdom found that the prevalence of qat chewing was 24% to 67%, male and female, respectively (Ahmed and Salib, 1998; Nabuzoka and Badhadhe, 2000; Griffiths *et al.*, 1997; Griffiths, 1998; Bhui *et al*., 2003). Gebreslassie *et al.* (2013) conducted a study in Ethiopia on undergraduate students and found that the prevalence of qat chewing, alcohol drinking and smoking was 7.9%, 32.8% and 9.3% respectively. Comparison on the prevalence of qat chewing from several studies conducted in Ethiopia, Kenya, Tanzania, Saudi Arabia and Yemen on school and university students are as shown (Table 2.1).