

UMEÅ UNIVERSITY MEDICAL DISSERTATION

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**Epidemiological Studies on Mental Health
In Tehran – Iran**

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“To my wife Golnar and my daughters Dena and Maral for their patience”



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Abstract

Since 1979 Iranians have experienced a variety of events that reasonably will have lasting effects on their mental health. In 1979 the Islamic Revolution took place and in 1980 eight years of Iraq-Iran war started. In recent years there has developed conflicts between Iran and the International society because of the Iranian activities in developing nuclear energy. To these can be added the social and religious limitations on the behavior of people. These limitations are experienced especially strong in the life of adolescents and young people. This thesis covers four different aspects of the mental health of Iranians.

General health questionnaire (GHQ-12) was utilized to investigate the mental health of 4599 Iranian 3rd grade high school students (aged 17-18 years). The GHQ cut off was taken 7 or more. A considerable proportion of the students were at risk of suffering from mental health problems (29.5 %), girls more than boys. Periodic mental health surveys in high schools are proposed to identify students at risk and activities to improve their coping skills and problem-solving abilities.

To study the methods of poisoning used for deliberate self harm, 2039 medical records in Loghman Hospital in Tehran were reviewed (52.3 % were females). Loghman Hospital is a specialized hospital for intoxication cases. In both genders the greatest proportions of individuals were in the ages 20-29. Drugs, pesticides and other agricultural chemicals were the most commonly used methods in each age group regardless of gender. Females outnumbered males especially in the youngest age group of 10 to 19 years of age.

In a cross sectional study of 214 subjects from Tehran the Attitude Towards Suicide (ATTS) instrument was translated and validated in Farsi language. The coefficient alpha for all sections was more than 0.70 except for the Attitude section which was 0.68. Ten latent factors were extracted from the attitude section accounting for 61 % of the variance in the data. It is concluded that the instrument can be used to study

suicide ideation and attempts in Iranian populations, but new items with special attention to Iranian cultural characteristics should be added to the attitude section.

To make a cross cultural comparison of personality using the Temperament and Character Inventory (TCI) samples of 300 Germans, 300 Swedes and 316 Iranian subjects were studied. The factorial structural analysis using procrustes rotation method showed the structure of personality to be generally rather equivalent across cultures. It is apparent, however, that there are cultural differences between the Iranian and the European subjects mainly concerning character dimensions. These results support the theoretical assumptions that character development is mainly determined by socio-cultural factors during the socialization process.

Based on our studies on independent samples in Iran a significant number of people are at risk of various mental health problems. A considerable number of young and adults are at risk of attempting self harm and suicide. Because of many limitations on specific topics of research in Iran including self harm and suicide we cannot present a realistic picture of this phenomenon in our society. There are different sources of tension in adolescent's life in Iran including familial and social sources. They are ever increasing in nature and in number. Besides these domestic sources of inconvenience our people is living in a kind of cold war situation which increases tension over life of all people.

Key words: Iran, Mental health, Adolescents, Suicidal behavior, Personality

Original Papers

The thesis is based upon the following four papers. Reprints of original papers were made with approval from the publishers.

- I. Emami, H., Ghazinour, M., Rezaeishiraz, H., Richter, J. (2007) Mental Health of Adolescents in Tehran, Iran. *J Adolesc Health*. Dec; 41(6):571-6.
- II. Emami, H., Ghazinour, M., Richter, J., Pazumand, A., Abdollahi, M. (2008) Age and Gender Differences in the Use of Various Poisoning Methods in Parasuicide Cases Admitted to Loghman Hospital in Tehran (2000-2004). Accepted for publication in the *Suicide and Life-Threatening Behavior* April 2008.
- III. Emami, H., Richter, J., Salander-Renberg, E., Ghazinour, M. (2007) On the Feasibility of a Questionnaire on Attitudes Towards Suicide in an Iranian population. Manuscript.
- IV. Richter, J., Brändström, S., Emami, H., Ghazinour, M. (2007) An Iranian (Farsi) version of the Temperament and Character Inventory: a cross-cultural comparison. *Psychol Rep*. Jun:100:1218-28.

ABBREVIATION

ATTS	Attitude towards suicide
C	Cooperativeness
GHQ	General health questionnaire
HA	Harm avoidance
ICD	International classification of diseases
KMO	Kaiser-Meyer-Olkin
MANOVA	Multivariate analysis of variance
NPMH	National programme of mental health
NRITLD	National research institute of tuberculosis and lung disease
NS	Novelty seeking
RD	Reward dependence
ROC	Receiver operating characteristic
P	Persistence
SD	Self-directedness
SPSS	Statistical package for social sciences
ST	Self-transcendence
TCI	Temperament character inventory
WHO	World health organization

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Preface

I view mental health from an epidemiological point of view. Most of my research experiences are in the medical sciences other than mental health. Since 1979, however I have always been in close contact with and experienced the important social events that have had tremendous impact on people's life in Iran and reasonably also on their mental health. Twenty eight years ago in 1980 I finished my defense for getting a Msc- degree in Epidemiology and came back to my town to go to my work in southern Iran ,where Iran- Iraqi war started when I faced with a destroyed working place. This was the first day of the war. All my family was living in Abadan and Khorramshahr. None of them would leave the city because they thought the war wouldn't last more than one week. Nobody thought it could take 8 years. In the day 7 one of my brothers was badly injured. He was transferred to another city to be treated. He was treated and after 4 years again he was injured and died. In the second month of the war our smaller brother was injured and killed and one week later I myself was injured .I was working as medical technologist and when the war started I continued to work as a health worker to provide first aid in battle fronts.

When I became a permanent member of the Toxicological Research Center in Loghman hospital and the Tobacco control and prevention research center and also member of two committees on Suicide and HIV in that center it was a good opportunity to work on mental health projects.

I have been wondering for many years about Iran as a society in transition from the past to becoming an Islamic Republic and how this has influenced the mental health of the population. Another challenge is if it is really possible to measure mental health from a collective perspective. What would be the problems with epidemiological studies on mental health?

However my serious interest for studies on mental health with an epidemiological approach took form since I started a joint research project with mental health researchers from Umeå University. This gave me a unique opportunity to work on some aspects of mental health in Iran. I hope what I have done as my PhD- work can shed even a weak light on the mental health situation in Iran.

Introduction

The overall aim of this thesis is to contribute to the knowledge about mental health in Iran-Tehran and suicidal behavior. The thesis has an epidemiological approach and consists of four chapters. The first chapter gives a brief picture of Iran as a country and the history of the mental health field. Moreover psychiatric epidemiology in Iran will be presented and the main intention behind the thesis and the articles. In the second chapter the methodology of each investigation will be presented. In the third chapter the main findings of each paper will be reviewed and in chapter four comes a general discussion of the findings

Iran – Short presentation

Iran is located in the Middle East, between Turkey and Iraq on the west and Afghanistan and Pakistan on the east; it borders the Persian Gulf and the Gulf of Oman in the south and Armenia, Azerbaijan, the Caspian Sea, and Turkmenistan in the north. Its area is 1.65 million square kilometers, of which 1.64 million square Kilometers are land mass. It comprises 28 provinces, 282 districts, 724 cities and over 2260 villages. Urbanization has been on the rise; 60.4% of the population lives in urban areas and 39.6% in rural areas. Teheran, the capital, alone is home to over 11 million people. Iran's climate is mostly arid and semi-arid, with a humid rain-forest zone along the Caspian coast. About 40 percent of Iran's territory is considered cultivable if irrigation is available, but because of lack of water, less than 30 percent of that territory is cultivated. Iran has enormous reserves of oil and natural gas.

Apart from the multiethnic character of Iran, the country is surrounded by countries of different culture and traditions with Islam as the primary religion.

According to the national census in 2007 Iran's population is about 65.4 million with 50.4% under the age of 19 years and 4.4% over 65 years .The main ethnic groups in Iran are Persian(60%), Azeri (20%), Kurdish (7%), Lur (3%), Baloch (2%), Turkmen (2%), Turkish tribal groups, such as Qashqai (2%), and other groups such as Armenians, Assyrians, and Georgians (2 percent). Shi`a Islam is the official religion. At least 90 percent of Iranians are Shia Muslims, 9% are Sunni Muslim and the rest are Zorrostriian, Jewish, Christian or Baha`i. The official language is Persian (Farsi) which is spoken as the mother tongue by 58% of the population.

Iran was a monarchy until 1979. During 1979 an Islamic revolution against the Shah of Iran took place led by Ayatolah Khomeini, one of the great Muslim leaders in the

world. From 1979 Iran shifted from a monarchy to republic and today Iran is called “*The Islamic Republic of Iran*”. After the Islamic revolution, the government has met with several national and international challenges. For example Iran-Iraqi war which lasted for about eight years. The post war political climate in Iran has been characterized by development of the infra-structure of the country (e.g motorways, hospitals and improvement of education). The government reports that 95 percent of children receive primary and secondary education. Primary, secondary, and higher education is free, although private schools and universities charge tuition.

Mental Health

In the official web site of World Health Organization (WHO) mental health is defined as

“a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.”

Mental health is a complex phenomenon and during past decades many efforts have been done in high, middle and low countries to decrease mental health problems and improve the state of well being. Despite improved access to professional help, medical drugs and psychotherapeutic programs still mental disorders are common worldwide. One strategy dealing with mental health issues has been intensifying *research* on mental health in different ages, communities, countries and globally. Psychiatric epidemiology has been one strategy to increase our understanding about mental health in different communities and countries. Psychiatric epidemiology with focus on the prevalence of mental illness in a society, might force politicians and policy makers on health programs to pay attention to mental health as a major national and international public health concern. The World Health Organization has repeatedly stressed the necessity of recognizing mental health as a high priority issue also in low and middle income countries (WHO 2005).

The history of Mental Health services in Iran

Four periods could be identified in the history of mental health services in Iran (Yasamy et al, 2001; Ghobari & Bolhari, 2001) .

The history starts with the period of asylum care when psychiatric patients were kept

in poor conditions in lunatic asylums which were located out of town. The most familiar lunatic asylums were located in Tehran (the Capital), Hamadan (Western Iran), Shiraz (Southern Iran) and Isfahan (Central part of Iran). This period covers the early decades of the 20th century. The first government supported asylum in Tehran opened in the 1930s.

The second period began in the 1940s. This period is characterized by establishing medical schools where the field of psychiatry emerged as a scientific branch. More universities were established in the country and psychiatry departments were formed. Residency training in psychiatry was started in the 1960s, which improved the psychiatry care in the cities with university.

In the third period, which spans the 1970s, efforts were directed towards achieving comprehensive mental health care by developing community mental health care. This was directed by a first deputy of the Ministry of Health and Welfare. The Ministry initiated a series of epidemiological research projects, built a number of new psychiatric hospitals and centers in different regions of the country and started educational training in psychiatry and psychiatric nursing. These educational and research programmes were integrated to form the Teheran Psychiatric Institute after the Islamic revolution in 1979 and today also known as the Center of Excellence in psychiatry in Iran since 2001.

The fourth period started in October 1986, when the National Programme of Mental Health (NPMH) was drafted by a multidisciplinary team of professionals and adopted by the government.

There are many reasons why psychiatric care became an area of attention for politicians and health policy makers. Modernization of psychiatric care in Iran, reorganization of the scientific field in the medical schools and the increasing number of WHO collaborating universities are some important reasons.

There are also important socio-economical factors which Abootalebi (2004) mentions in his article

“Society in Iran in the meantime has gone through drastic socioeconomic and cultural changes, much of it because of the ideology and policies of the state itself. Iranian society today is dynamic and burgeoning with an energetic young generation more concerned with sociopolitical freedom and tangible material gains

than spiritual fulfillment through living an "Islamic" life. Iranians remain concerned with their future, and like people elsewhere, they mostly care about their families and their economic well-being. (page, 45)"

According to Abootalebi unemployment and inflation are other factors that Iranians deal with today.

Another reason is the Iran-Iraqi war from 1980 until 1988. The background of the war was disagreements about the border between both countries, since 1971. Iraq was also against to the Islamist propaganda that was transmitted from Iran to Iraq, and Iraq's government feared that there might be a revolution among the Iraqi Shi'is in the south. In 1980 Iraq estimated that Iran was weak after the Iranian Revolution. The war resulted in heavy losses on both sides with 600,000 Iranians and 400,000 Iraqis dead, and an estimated total economic loss of 1,2 billion US\$ (Web site, 2008; <http://i-cias.com/e.o/iranirqw.htm>). Post war consequences have been the topic of interest in different scientific communities in Iran. For example Ebrahimzadeh and collaguoges (2006) studied long-term follow-up of Iranian veteran upper extremity amputees from the Iran-Iraq war (1980-1988). They found that out of 200 war amputees there were 25 unilateral upper limb amputees; all others were lower limb amputees. The average age at the time of injury was 23 years, average age at follow-up was 41 years, and the average time between injury and follow-up was 17.5 years. The most common level of amputation was below elbow (40%), and the most common cause of war injury was artillery shells, mortar or rocket shells. The prevalence of clinical symptoms of phantom sensation, phantom pain, phantom movement and stump pain were; 64%, 32%, 20%, 24%, respectively. All patients were married and had children except one case. Sixty percent of patients were employed. Thirty-six percent had a documented psychiatric history ranging from minor depression to posttraumatic stress disorders.

Hashemian and colleagues (2006) reported about anxiety, depression, and posttraumatic stress in Iranian survivors of chemical warfare. In their investigation the respondents had a mean age of 45 years and were all of Kurdish ethnicity. Among individuals exposed to both high-intensity warfare and chemical weapons, prevalence rates for lifetime PTSD, current PTSD, major anxiety symptoms, and severe depressive symptoms were 59%, 33%, 65%, and 41%, respectively.

According to World Health Organization mental health atlas (2005) three percent of

the total budget in the country aims to finance mental health issues in Iran. According to the same source access to the specialized psychiatric care and professional help from psychiatry is as follows:

- 1 Total psychiatric beds per 10 000 population 1.6
- 2 Psychiatric beds in mental hospitals per 10 000 population 1.4
- 3 Number of psychiatrists per 100 000 population 1.9
- 4 Number of psychiatric nurses per 100 000 population 0.5
- 5 Number of psychologists per 100 000 population 2
- 6 Number of social workers per 100 000 population 0.6

One strategy from mental health workers and policy makers since 1980 has been to integrate mental health within the primary care system. This means that in addition to the psychiatric staff, primary health care staff have been educated and trained in the mental health field. This strategy in itself means that the Iranian mental health policy and program is based on a community based care system. The community care system is supposed to take a more active and direct responsibility to provide mentally ill patients with basic mental health service.

According to the regional advisor of World Health Organization on mental health in Eastern Mediterranean Region Dr Mohit (2001) there have been many innovations in the area of delivering mental health services during the past few decades, which can provide national mental health administrators with better models for success. Beside a community mental health program some of these innovations are:

- 1 *Integration of mental health within Primary Health Care System.*
In this approach, general health facilities are utilized to provide mental health services and mental health - as an integral part- contributes to the better functioning of general health. This system is based on careful Leveling of services, problems and resources and the existence of an efficient Referral System. Experiences with this type of approach are done in countries like India, Iran and Pakistan.
- 2 *School Mental Health in which the whole school system is utilized not only to receive but also to provide services. Schools are particularly useful institutions for Promotion of Mental Health.*
- 3 *Innovative approaches in the area of Urban Mental Health of which, we can point to Integration of Mental Health within Healthy City projects.*
- 4 *In the past few decades there has been an increasing appreciation of teamwork in psychiatry and mental health. Utilization of teams and reliance on the spirit of cooperation between different professionals would decrease chronicity and the duration of hospital stay and provides more opportunities to support the patients.*

Mental Health studies with an epidemiological approach in Iran

There are a number of epidemiological studies on mental health issues in Iran.

Noorbala and colleagues (2004) conducted a national investigation on the prevalence of mental disorders in Iran. The aim of their study was to determine the mental health status of a population sample aged 15 years and over. Their method was based on cluster random sampling, 35 014 individuals were selected and evaluated using the 28-item version of the General Health Questionnaire. A complementary semi-structured clinical interview was also used to detect learning disability ('mental retardation'), epilepsy and psychosis. Their results indicate that about a fifth of the people in the study (25.9% of the women and 14.9% of the men) were detected as likely cases. The prevalence of mental disorders was 21.3% in rural areas and 20.9% in urban areas. Depression and anxiety symptoms were more prevalent than somatisation and social dysfunction. The interview of families by general practitioners revealed that the rates of learning disability, epilepsy and psychosis were 1.4%, 1.2% and 0.6%, respectively. The prevalence increased with age and was higher in the married, widowed, divorced, unemployed and retired people. Noorbala and his colleagues concluded that prevalence rates are comparable with international studies. There are regional differences in the country, and women are at greater risk.

Modabernia and colleagues (2008) conducted another epidemiological study in the northern part of Iran, in Gilan province about prevalence of depressive disorders. In a sample of 4020 subjects they found that 9.5% of the samples (63% female and 37% male) were diagnosed with depressive disorders. The prevalence of minor depressive disorder, dysthymia and major depressive disorder was 5%, 2.5%, and 1% respectively. Socio-economic class was significantly associated with both depressive symptoms based on Becks Depression Inventory (BDI) score ($p < 0.001$) and depressive disorders based on clinical interview ($p < 0.001$).

The author of this thesis together with Motaghipour and colleagues (2006) conducted another epidemiological investigation to evaluate the general mental health status of inhabitants in an area of Tehran as part of the Tehran Lipid and Glucos Study (TLGS). A sample of 927 participants (20 years and older) living in the eastern part of Tehran was selected. Subjects completed the demographic data forms along with the General Health Questionnaires (GHQ), validated for the Iranian population. The results show that 489 (52.8%) were suspected of having psychiatric disorders. The mean score of total GHQ was 7.0 ± 5.4 and regarding the subscales of the questionnaire including physical symptoms, anxiety and sleep disorders, social dysfunction and depression, mean scores were 1.2 ± 1.7 , 1.7 ± 2.0 , 3.4 ± 2.0 , 0.75 ± 1.4 respectively and the median of mentioned subscales were 0, 1, 3 and 0 respectively.

The frequency of women suspected of suffering from mental disorders was significantly higher than that of men (59.7% vs. 43.6%, $p < 0.001$). The research group concluded that taking into consideration the sample group and the method of gathering data, the frequency of those suspected of having psychiatric disorders in our study was higher as compared to other studies in Iran. The research group recommended the implementation of policies and programs for prevention since mental health plays an important role in community development, because of the financial and psychological burden of mental illness.

Mental Health in children and adolescents in Iran

In the last two decades the interest in doing scientific investigations on children and adolescents has increased dramatically. One reason is because of scientific findings in both developmental neuroscience and genetics and the possibilities for early identification and preventive programs (Kimberly & Serene, 2002; Nejatisafa et al, 2006). The second reason was the identification of high rates of mental disorders among children and adolescents, and thus, an increasing awareness and insight by clinicians and policy makers that mental disorders are frequent and handicapping in this age group also (Rey & Walter, 2001; Nejatisafa et al, 2006). World Health Organization predicts that by the year 2020, childhood neuropsychiatric disorders will rise proportionately, to become one of the five most common causes of mortality, morbidity, and disability among children (Report of the Surgeon General's conference on children's Mental Health, USA & Nejatisafa et al, 2006).

The post war society of Iran is characterized by a rapid shift in the age distribution of the population towards younger ages. Mental health planning needs to adapt accordingly. Many mental health investigations on child and adolescents have thus been initiated in this respect.

In Damavand, for example, school mental health programs have been initiated. Damavand is a city of 250 000 inhabitants about 100 km north of Teheran. A pilot project was started in 1997 which covered both students and parents. According to Yasami and colleagues (2001) the intervention significantly improved students' and parents' knowledge and attitude towards mental health, increased students' self-esteem, relieved their problems with parents and teachers, reduced fear of examinations, ended physical punishment of the students and truancy from school, and reduced sexual assaults and smoking. The authors of the article stress how such investigations can be examples of how interventions at school might help. The mental

health office has initiated a program based on prevention of child abuse and violence against women in collaboration with the United Nations Children's Fund and the World Health Organization. Educational training has been prepared for general practitioners and health workers on prevention of child abuse and several workshops have been organized.

A review on child and adolescent psychiatric research publications from 1973 to 2002 in Iran by Nejatisafa and collagouges (2006) shows that from 1993 research on child and adolescent psychiatry has been accentuated rapidly.

According to the same research group, out of 3113 Iranian mental health articles published in the 30-year period, the topic of child and adolescent mental health constituted 883 (28%) articles. Among these articles 81 (9%) appeared in international journals and the remaining were published in domestic journals (no international indexing). Among the first authors, 65% were male and 50% had a doctoral degree. Despite improvement of child and adolescents psychiatry in terms of mental health programs much still has to be done in the area of child abuse and its diverse aspects.

Suicide and suicidal behavior in Iran

In the psychiatric literature suicide has been attached to the state of depression but also to other psychiatric disorder (e.g schizophrenia or bipolar disorders).

Investigations on suicide and suicide attempts show that suicide and attempted suicide are currently considered as an epidemic disease. According to WHO, one million of individuals worldwide commit suicide each year. Every 40 seconds, one person commits suicide and every 3 seconds, one person makes a suicide attempt. Over recent years, the risk of suicide and suicide attempt has considerably increased. Several risk factors have been identified as psycho-social, psychopathological, genetic or biological (Pitchot et al, 2008).

In recent years epidemiological studies have been focused on suicide thoughts and suicidal behaviors. Shooshtary et al (2008) investigated the lifetime prevalence of suicidal behaviors in a community sample of Iranian adults. They found that lifetime prevalence rates for suicidal ideation, planning and attempts were 14%, 6.6%, and 4.1% respectively. Tobacco use and long-term mental and physical disabilities were significantly higher among subjects with a history of suicidal attempts. Younger ages, tobacco abuse, and long-term mental or physical disabilities could be considered risk factors for attempting suicide.

Lari and colleagues (2007) conducted another epidemiological study to determine

features and factors associated with suicidal behaviors by burns requiring hospitalization in the province of Isfahan, Iran. Their investigation was a prospective population-based study of all suicidal behaviors by burns requiring hospitalization. Data were obtained from patients, family members, and/or friends through interviews during the course of hospitalization. A total of 89 patients aged 13 to 62 years with suicidal behaviors by burns were identified during the study period, representing an overall incidence rate of 2.9 per 100,000 persons-year (P-Y; 95% confidence interval 2.3-3.5 per 100,000 P-Y). Females (4.7 per 100,000 P-Y) had a higher rate of suicidal behavior by burns than males (1.2 per 100,000 P-Y; $P < .001$). The age-specific rate of suicidal behavior by burns peaked at age group 20 to 29 years (6.3 per 100,000 P-Y). Among the population aged 15 to 29 years, married women had a higher rate of suicidal behavior by burns (9.3 per 100,000 P-Y) than single women (6.6 per 100,000 P-Y). The highest rate of suicidal behavior by burns was found among the unemployed population (17.7 per 100,000 P-Y). The most frequent precipitating factor for suicidal behavior was a quarrel with a family member, relative, and/or friend (61.8%). Depression and anxiety disorders were the most frequent psychiatric comorbidities associated with suicidal behaviors. Mortality rate caused by suicidal behavior by burns was 1.4 per 100,000 P-Y. A high rate of suicidal behavior among young and mostly married women in the province of Isfahan is a tragedy and great concern. Social, cultural, and economical factors may contribute to suicidal behavior in Isfahan, and they need to be addressed through education, support, and commitment. Findings of this study can be used for implementation of a preventive program(s) to reduce the incidence of suicide among high risk groups.

Several other studies have been done by research groups in general population of Iran based on suicide behavior (e.g Groohi et al, 2006; Mohammadi et al, 2005; Saadat, 2005).

Aims of the thesis

Despite several investigations on suicide and other important topics in the field of mental health, there is still a lack of comprehensive knowledge about mental health in non western settings. The principal aims of this thesis are twofold: Firstly to contribute to the knowledge concerning mental health in a muslim culture with special regards to (a) adolescent mental health (b) suicidal behavior and personality development. Secondly to validate two investigation instruments, that might be suitable in future epidemiological psychiatric investigations.

Specific aims

1. To investigate the general mental health status of adolescents in Tehran-Iran, using a short version of the General Health Questionnaire (GHQ-12).
2. To investigate the different methods of poisoning used by individuals with the diagnosis of Para suicide admitted to the Loghman Hospital in Tehran from 2000 to 2004 with particular focus on gender and age differences.
3. To investigate the feasibility of a Farsi version of the Attitude towards Suicide questionnaire developed in Sweden.
4. To make a cross-cultural comparison using an Iranian (Farsi) version of the Temperament and Character Inventory.

Subjects and methods

This thesis is based on 4 separate samples focused on populations living in Tehran. The designs of all the studies are cross-sectional except in paper II where the data has been taken directly from the hospital records. Table 1 summarizes the investigation designs for each study, the data collection, ethical review and table 2 socio-demographic characteristics of the population in each paper.

Paper I deals with mental health in adolescents in Tehran. The first step for this investigation was taken by the first author when working in the Tobacco research center in Tehran. The initial idea was to conduct an investigation about quality of life and tobacco smoking among adolescents. During the design and discussion about the procedures of this investigation the mental health of the subjects became an important issue. Using a short version of General Health Questionnaire (12 items) was a way of screening of the mental health among the subjects. The participants were 17 and 18 years old students at high-schools. This investigation was presented to the Ministry of education to get permission to carry out the research project. The Ministry of education did not agree with the project and their reason was that asking questions about smoking might stimulate them to smoke. Having a meeting with the Tehran educational organization which is a lower local authority the research team received a permission to conduct an investigation in the Tehran area. A stratified cluster random sampling procedure was used to obtain a sample of third-year high school students in Tehran. In order to select a representative sample, we divided Tehran into five arbitrary geographical areas of north, south, east, west, and central Tehran. In total, 12 high schools were randomly selected from each educational region, six for boys and six for girls. All third-year students from the chosen high schools were invited to participate in the investigation, with a total of 2092 boys and 2499 girls being selected to take part in the study.

Paper II is about suicidal attempt cases treated at the Loghman Hospital. The Hospital is located in the very center of Tehran and specialized in treating intoxication cases. Every year around 20 000 cases are admitted to the hospital. Looking at the records of the patients, the first author tried to understand the prevalence and patterns of parasuicide behavior with special regards to poisoning. The idea of this investigation comes from the high number of suicide attempt cases admitted to this hospital. The

main question for the research group was to find out the accessibility of the drugs by which cases attempted suicide. Because of the sensibility of the research question from an ethical and cultural point of view we decided to start this investigation by looking to the records. Permission from the ethical committee of the Shahid Beheshti University of Medical Sciences was received. The data of this investigation was obtained from Loghman Hospital's Department of Disease Coding where the medical diagnoses are classified and coded according to the International Classification of Diseases (ICD-10).

Computerised medical records of 2039 patients were examined (973 male and 1066 female). The data analysis included data of all patients who presented at Loghman Hospital on the 1st and 15th of each month from 2000 to 2004 with a final diagnosis of parasuicide by means of intentional self-poisoning. Data of patients with completed suicides was not used. The patient's gender, age, parasuicide method used, history of attempted suicide, drug addiction and history of psychiatric disease were recorded.

Paper III and IV were performed to standardize and evaluate the feasibility of two instruments ATTS and TCI respectively. One important aspect of this part of the investigation on mental health was about producing professional instruments in Farsi language. Having Farsi versions of psychiatric instruments will enhance the capacity of professionals in meeting with clients. Paper III is based on an easy sampling method. It means that a number of volunteer subjects of different age and sex participated in the investigation, living in different parts of the Tehran city. Translation of the instrument was done from a Swedish version to Farsi Language. One of the authors was in good command of the Swedish and Farsi languages. The first author checked the Farsi version of the instrument and revised some items.

Paper IV is a comparative investigation between three sets of samples from Germany, Sweden and Iran. The procedures and subjects of the investigation are based on easy sampling taken in five geographical parts of Tehran.

The instrument was translated to Farsi language from the English version of the instrument. A short assessment in 20 Iranians was performed to find out the quality of the translation in whole and the items specifically. Some items needed to be revised.

Table 1. Design and ethical review

Paper	Design of the study	Procedure/data collection	Ethical review
I	Cross-sectional-Representative sample	Stratified cluster random sampling from the Grade 3 High school students in Tehran	The study was approved by Ethical Committee of Tobacco prevention and control research center . Shaheed Beheshti University of Medical Sciences in Tehran
II	Cross Sectional study	Chart Review study.At Loghman Hospital on the 1 st and 15 th of each month from 2000 to 2004	The study was approved by the Toxicological Research Council and by the Research Ethics Committee of the Shaheed Beheshti University of Medical Sciences in Tehran.
III	Cross-sectional Nonprobability sampling	convenience sample	The study was approved by the Research Ethics Committee of the Shaheed Beheshti University of Medical Sciences in Tehran.
IV	cross-sectional	The sampling started in one household in each of these geographical areas: from north, south, east, west and central areas of Tehran, capital of Iran.	The study was approved by the Research Ethics Committee of the Rehabilitation and Welfare University in Tehran

Table 2. Socio-demographic characteristic of the participants in papers I- V

Paper	Sample N	M/F	Age Range
I	4310	1923/2387	17-18
II	2039	973/1066	13-90 M 12-75 F
III	215	132/83	18-59
IV	316	101/215	>18

Instruments and protocols

Three questionnaires have been used in the thesis. Using questionnaires is not always easy especially when the investigation will be done in another country with a different cultural context. In paper I a short version of the instrument (GHQ-12) has been used. GHQ has been validated in Iran by other researchers. In paper II data was collected from hospital records (age, gender, parasuicide method used, earlier suicide attempts, history of drug addiction and mental disorders). In Paper III Attitude Towards Suicide (ATTS) has been used and in paper IV the Temperament and Character Inventory (TCI), both not used before in Iran.

General Health Questionnaire (GHQ-12)

The General Health Questionnaire (GHQ) has been used in more than 30 languages all over the world as a case finder in screening large populations (Goldberg & Williams 1988; Kihc & Rezaki, 1997). The questionnaire was originally developed as a 60-item instrument but at present a range of shortened versions of the questionnaire including the GHQ-30, the GHQ-28, the GHQ-20, and the GHQ-12 are available. Several investigations on the factorial structure of the GHQ28 have shown the original four-factor solution (Lobo et al. 1986; Medina-Mora et al. 1983; Romans-Clarkson et al. 1989; Weyerer et al. 1986), which suggests a cross-cultural applicability (Kihc & Rezaki, 1997). There are few studies (Graetz 1991; Worsley & Gribbin, 1977; Burvill & Knuiman, 1983; Politi et al. 1994; Gureje 1991) that attempt at factor analyzing the 12-item version (GHQ12).

An Iranian research group from Iranian Institute for Health Sciences and Research in Tehran- Iran, Montazari and his colleagues (2003) conducted an investigation on the

12-item General Health Questionnaire (GHQ-12). They translated the instrument and made a validation study of the Iranian version. They found that the Iranian version of the GHQ-12 has good structural characteristics and is a reliable and valid instrument that can be used for measuring psychological well being in Iran (Montazari et al, 2003). Each item in GHQ-12 is rated on a four-point scale (less than usual, no more than usual, rather more than usual, or much more than usual); and for example when using the GHQ-12 it gives a total score of 36 or 12 based on the selected scoring methods. The most common scoring methods are bi-modal (0-0-1-1) and Likert scoring styles (0-1-2-3) (Montazari et al, 2003).

Attitude Towards Suicide (ATTS)

This instrument aims at studying attitudes towards suicide in population-based surveys and was developed in two waves by Salander-Renberg and Jacobsson (2003) in Sweden and used in several countries and even in countries with very different culture compared to Sweden (for example, Nicaragua by Rodríguez, et al, 2006; Kurdish people in Iran by Mofidi et al, 2008). The questionnaire contains 3 sections – one is related to experiences with suicide and expressions of suicidal behavior in the social neighborhood, the second section consists of items concerning attitudes towards suicide and the third is focused on the individual's own suicidal expressions. In this study we refer to the first and second parts of the ATTS. In its 1996 version, the attitude-related section of the measurement consists of 34 items that are answered on a five-point Likert-type scale (agree completely, agree to a large extent, doubtful, do not agree, agree not at all) (Mofidi et al, 2008, p.291).

Temperament Character Inventory (TCI)

The TCI is a 238-item self-administered true-false test evaluating four temperament and three character dimensions. The TCI has been extensively studied in clinical and non-clinical samples, across different cultures and ethnic groups (Gutierrez et al, 2001; Cloninger, et al, 1994). It includes four basic dimensions of temperament: 1) Novelty Seeking (NS) is thought to be related to the behavioral activation system, 2) Harm Avoidance (HA) to the behavioral inhibition system 3) Reward Dependence (RD) to the behavioral maintenance system 4) Persistence (P) to perseverance in behavior despite frustration and fatigue. Three dimensions of character are measured: 1) Self-directedness (SD) 2) Cooperativeness (C) tendency towards social tolerance, empathy,

helpfulness and compassion, 3) Self-Transcendence (ST) identification with nature and the ability to accept ambiguity and uncertainty (Jylhä & Isometsä, 2006).

Statistics

The statistics methods used in paper I were based on the X^2 test to compare groups of subjects with high and low scores on the GHQ-12. Because of the big sample size, t -tests were calculated to test for group differences.

Odds ratios or w-coefficients are provided as effect size measures. An explorative factor analysis, principle axis factoring, was applied to explore the structure within the GHQ-12 items. Cronbach's alpha score and corrected total correlations were calculated as reliability indicators.

In paper II computerized medical record was used. In paper III internal consistency of the Attitude towards suicide questionnaire was assessed by Cronbach's alpha coefficient. A factor analysis with varimax rotation was performed on the attitude items. Kaiser-Meyer Olkin (KMO) measurement and Barlett's test of Sphericity were used.

In Paper IV means and standard deviations for the higher-order dimensions and for the subscales of the Temperament and Character Inventory were calculated. Gender differences within the subsamples were analysed by means of T tests for independent samples. MANOVAs were calculated to analyse effects of gender, age, and culture and their interactions on TCI subscale scores. Factor analyses with direct oblimin rotation were calculated based on the subscale scores. The results of these factor analyses were used for the calculation of factor congruence coefficients by means of orthogonal Procrustes rotation.

All analyses in paper I and III were performed by Statistical Package for Social Sciences (SPSS) program, version 11.0, and all analyses in paper IV were conducted with SPSS, Version 12.1.

Ethical considerations

The ethical issues considered in these studies were;

Paper I:

- 1: To get permission for the study from the Ethical committee of National Research Institute of Tuberculosis and Lung Disease (NRITLD).
- 2: To get official written agreement from Tehran Educational Organization to do the study.
- 3: To get permission from the high school principals where the data should be collected.
- 4: All the questionnaires were anonymous and the participation voluntary.
- 5: We promised to give back information about the results of the study to those who gave us the permission to do the study.

Paper II:

- 1: To get permission from Shaheed Beheshti University of Medical Sciences.
- 2: All the data retrieved from the record are kept confidential and anonymous.

Paper III:

- 1: The study was reviewed and supported by University of Rehabilitation and Welfare in Tehran.
- 2: The questionnaire was answered in anonymity.
- 3: Participation was voluntary.

Paper IV:

- 1: The project was accepted by the Shaheed Beheshti University of Medical Sciences.
- 2: All the questionnaires were filled in anonymously.

Results:

Paper I: General mental health status of adolescents in Tehran – Iran.

The study sample comprised originally 4591 subjects who were students in high-school at the time of the data collection. The cases decreased to 4310 because 36 students decided not to participate and another 245 students were excluded because of age 19 and above. All the students were 17 and 18 years old. An exploratory factor analysis suggested a unidimensionality of the GHQ-12 items. A conservative cut-off score of 7 or more was chosen and still 29.5 % got scores above this threshold. Girls reported more mental health problems than boys (34.1 % vs. 23.7 %). The results also showed that 18 years old cases had a slightly higher tendency for mental health problems than 17 years old cases. A highly significant relationship between GHQ-12 scores and self-evaluated quality of life was found, the more mental health problems were reported the worse the evaluated quality of life and health. Students who evaluated themselves as “more physical active” than their friends reported lower GHQ-12 scores.

Paper II: The different methods of poisoning used by parasuicide cases admitted in Loghman Hospital.

We aimed at studying the prevalence of different methods of poisoning used by parasuicide cases admitted in Loghman Hospital from 2000 to 2004 according to gender and age. The sample consisted of 1066 females (52.3 %) and 973 males . Females were three years younger than the males. The proportion of adolescent females (> 19) was much higher than that of males. The most frequently used methods were drugs (women 90 % and men 83 %), followed by pesticides and agricultural chemicals (women 2.7 % and men 9 %). Males used drugs as they became older whilst use of pesticides decreased with age. In females drugs were most often used in the youngest age group; whereas the use of pesticides was lowest in this age category. There was no gender difference in the past history of attempted suicide (men: n = 71 (7.3 %); women: n = 101 (9.5 %)). Men used opiates 6 times more than the women. According to the records only 90 men and 154 of the women had a past history of mental disorder.

Paper III: Farsi version of the Attitude Towards Suicide questionnaire developed in Sweden.

Factor analysis resulted in rejection of five of 37 attitude items and the analysis was repeated using the remaining 32 items. The coefficient alpha for all sections was more than 0.70 except for the attitude section which was 0.68. Ten latent factors were extracted from the attitude section accounting for 61% of the variance in the data. The factors extracted were mostly different from those of the Swedish version. Most of the factors (8 out of 10) had alpha coefficients less than 0.70. Based on the high internal consistency of the Farsi version of the ATTS it is suitable to be used in Iranian population. The reliability of the instrument is limited by the instability of most of the factors. To extract stable factors more items with respect to the Iranian cultural background should be added to the attitude section and more studies on other larger samples should be performed in Iranian populations.

Paper IV: Iranian (Farsi) version of the Temperament and Character Inventory: a cross-cultural comparison.

In a sample of 300 Germans, 300 Swedes, and 316 Iranian subjects, the factorial structure analysis using Procrustes rotation method showed the structure of personality to be generally equivalent across cultures. Moreover, noteworthy cultural differences between the overall Asian and European subjects reflected by data were observed in various Temperament and Character dimensions. Apparently, there are cultural differences in the expression of the various personality facets that require a replacement of several items in the Iranian TCI version. There was a cross-culturally consistent gender difference exclusively on the temperament dimension Harm Avoidance with females scoring higher than males. The TCI is sensitive to age, gender and cultural differences in personality. The results generally support the factorial similarity of all three versions. However, it appears that the Iranian version is somewhat complex possibly due to culture-specific variations of the meaning of many items.

Discussion

I: Mental health of adolescents in Tehran-Iran.

Our aims in this article were to find out the proportion of adolescents with possible mental health problems, comparing high GHQ score between the two sexes and to show the correlation of perceived quality of life, physical activity and having chronic disease with GHQ score in a representative adolescent sample in Tehran. Although we chose a high conservative cut off for GHQ-12 score a high proportion of the adolescents had rather high score. Other studies in Iran and in other countries show similar results. Girls were more probable to have high GHQ score which is also in accordance with other studies worldwide. GHQ score was significantly correlated with perceived quality of life, physical activity and positive history of chronic disease. The possible sources of mental distress among the young population in Iran are limitations which are exerted by the families and society over the behaviors of young generations and especially over girls. Periodic mental health surveys in high schools to find high risk adolescents and programmes aiming at improvement of their coping skills and problem solving abilities are our suggestion to health administrators and decision makers. Such programs could help to enhance adolescents' coping strategies with their mental health problems, to improve their general coping and problem-solving skills, and even to prevent the onset of mental health problems in this vulnerable population.

II: Different methods of poisoning used by parasuicide cases admitted in Loghman Hospital in Tehran

Our objectives were to study prevalent ways of poisoning and the difference between sexes and different age groups in using different poisoning methods. Our setting was Loghman hospital which is a referral center for poisoning and suicide attempts in Iran. Deliberate self harm is a major problem in Iran. In the age group of 10-19 females were twice as many as the males. This gender difference was not seen in other age groups. Female to male ration reversed after age 40. Life-time prevalence of psychiatric disorders was significantly higher among the women. However the reported prevalence is very low probably because of underreporting. Drugs and pesticides were the most common methods used by the parasuicide cases both in men and women of all age groups. The female –to-male ration of 1.1:1 is very low compared to other

Islamic countries. The sex ratio of 4:1 in the age group of 10-14 could be related to earlier puberty in girls and its relation to psychological problems. Men use pesticides more than the women - more seriousness among men could be the possible cause. Psychotropic and convulsants were the most frequent drugs used by the two sexes which is in accordance with similar studies in Iran. Men used opiates 6 times more than the women. The reason may be related to the seriousness of men in DSH. Opiates traditionally also have been used as a recreational substance and it is more accessible by men than women. Public education and awareness regarding the toxicity of and fatality of drugs seems to be a promising action.

III: Farsi version of the Attitude Towards Suicide questionnaire developed in Sweden.

In this study which was the first study in Iran about attitudes towards suicide we aimed at translating and standardizing the Swedish version of Attitude Towards Suicide and to see if it is feasible to be used in populations in Iran. Ten factors were extracted which were not in congruency with the original version. Internal consistency for the attitude section was lowest (0.68) comparing to the two other parts of the questionnaire but still is regarded as a good reliability. The low alpha of attitude section might be due to the existence of items with reverse phrasing and another reason could be the effect of different attitude domains. To achieve stable factors, a series of studies is needed. They should be conducted on larger samples and probably, some particular items should be added (Tucker et al, 1997) that are more relevant to Iranian culture. The main limitation of our study was the sample selection. Our sample was a convenience sample and is probably not representative of Iranian Urban population.

IV: Iranian (Farsi) version of the Temperament and Character Inventory: a cross-cultural comparison

Our aims in this study were the cross cultural comparison of the psychometric properties of Iranian version with that of German and Swedish one and to verify the reliability and the validity of the TCI measurement and its underlying theory. The results support the factorial similarity of the three versions. The Psychometric properties of the Iranian version were different from the other two which were similar maybe because of differences in cultural background, problems in translating the questionnaire into Farsi or may be because contents of many items probably did not

fit with the Iranian culture. This can partly be explained by the collectivistic thinking of Iranians in contrast with individualistic orientation of European countries. Factor congruency between three versions was similar. Our conclusion is however that TCI inventory is a useful method for assessment of personality in cross cultural studies.

On the use of research instruments developed in another socio-cultural setting

In our study to translate and validate the Attitude Toward Suicide instrument into Farsi following points are worth discussing. In our pilot study we noticed that respondents do not like to answer the questions which are directly about committing suicide. This was why we dropped two items from the study “*Even though you would prefer another way to die, painful circumstances in life might lead to suicidal ideation. How do you estimate the probability that you sooner or later will commit suicide?*” And “*Every person will sooner or later die. Please indicate which manner of death you would prefer by ranking the alternatives from 1 to 5*”. The translation into Farsi of these two questions were correct and the respondents understood the meaning. One possible reason may be due to the people’s belief in Islam but I cannot simply say that it was only related to the Islamic rules about suicide. In western countries people believe in Christianity or other religions but they do not have problem with answering these questions.

I am now piloting another project on mental health conditions of patients suffering from tuberculosis at the time of diagnosis and after two weeks of treatment in a referral hospital in Iran. I am using SCL-90. According to interviewer’s report, many patients have difficulty with the questions about suicide or taking their lives in the SCL-90.

Nearly all of the instruments in different domains are results of years of study by western scientists with different socio-cultural-religious background. The instruments are first standardized in their countries and then they are translated and standardized in other countries among people with different nationality and cultures. Most of the translation studies end with suggestions that the study should be repeated with inclusion of new items which fit more with the cultural background of the respondents. In our study comparing the psychometric properties of German, Swedish and Iranian version of TCI we see the culture-specific variation of the meaning of many items which complicated the Iranian version. Items such as disorderliness, fear of certainty, shyness, fatigability, sentimentality, congruent second nature, compassion

and pure heartedness and self forgetfulness were among the complicated items. Our study showed a great similarity between German and Swedish versions .The difference between Iranian and the other two countries might be because of translation or cultural difference as Iranian society is characterized by collectivistic thinking in contrast with the individualistic orientation of western societies.

Ethical reflections

Giving feed back after finishing research projects to the people who participate in studies is an important ethical issue. I remember in 1990's in one of the remote villages in south of Iran where Malaria is a major health concern, when technicians from a rural health center were collecting blood samples for annual Malaria screening, one adolescent girl refused to cooperate .She said," I remember that every year you come here and pierce my finger's tip and take my blood and go back until the next year and no one yet has told me what they have found in my blood."

In addition to the people who participated in our study this is also the others right to receive the results. They are decision makers and health providers. The gap between epidemiological research and the implications of the findings into health policies and actions is a big ethical concern in my country and many developing countries. Often the findings of the research projects are reported as articles and published in prestigious journals (domestic or international) which brings academic degree for the authors but still nothing for the people who helped the researcher to do his job.

When I was collecting data in high schools to study mental health and tobacco smoking among adolescent one of the principals wanted me to send him the results especially for comparison with students of other schools. He wanted to evaluate his activities in controlling for smoking by students. None of the authorities in Educational organization of Tehran who gave me the permission to study are now requesting the findings. There is a very tense competition between universities, research centers and other scientific institutions in increasing the number of published articles in high impact journals. The priority is by international journals. This is regarded as knowledge production. The first question that is asked from the researcher is about the name and the impact factor of the journal and not about the findings. The health policy makers will receive the findings from articles published in journals. Increasingly number of published articles is a criterion for evaluation of scientific

centers. Every year centers are compared and ranked based on their published articles. The articles which however may never be read by health providers and never by the people.

Conclusion

Mental health in Iran is an essential health issue. It needs to be systematically and continuously studied. Mental health consultation centers should be established to actively offer services for adolescents and adults. Mental health has been established in Primary Health Care system in Iran but it doesn't work as was expected. We also lack efficient consultation service in schools to provide the students who are in their critical ages, necessary support. Some studies are needed to assess the efficacy of these consultation services in high schools and also in society at large. Some of the potential and important sources of mental disorders are out of control. The people are getting poorer. The economic inequity problems put force on people in every age group. The gap between rich and poor is getting deeper and deeper. We cannot recommend any solution for providing effective ways of coping with mental disorders in society while neglecting economic gap between people. Mental health of the adolescents should be monitored systematically. The essential tensions on young people should be studied and the way to prevent them should be proposed to the authorities and be implemented. Nearly all of the research activities in Iran do not end with applicable interventions.

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References

- Abootalebi, A., (2004) Iran's struggle for democracy continues: an evaluation of twenty-five years after the revolution. *Middle East Review of International Affairs*, Vol. 8, No. 2.
- Burvill, PW., Knuiman, MW. (1983) Which version of the General Health Questionnaire should be used in community studies? *Aust N Z J Psychiatry* 17:237-242.
- Cloninger, CR., Przybeck, TR., Svrakic, DM., Wetzel, R. (1994) *The Temperament and Character Inventory (TCI): a guide to its development and use*. St. Louis: Washington University School of Medicine, Department of Psychiatry.
- Ebrahimzadeh, MH., Fattahi, AS., Nejad, AB. (2006) Long-term follow-up of Iranian veteran upper extremity amputees from the Iran-Iraq war (1980-1988). *J Trauma*. Oct; 61(4):886-8.
- Goldberg, DP., Williams, P. (1988) *A user's guide to the General Health Questionnaire*. NFER/Nelson, Windsor.
- Ghobari, B., Bolhari, J. (2001) The current state of medical psychology in Islamic Republic of Iran. *Journal of clinical psychology in medical settings*, 8(1):39-43.
- Graetz, B. (1991) Multidimensional properties of the General Health Questionnaire. *Soc Psychiatry Psychiatr Epidemiol* 26:132-138.
- Groohi, B., Rossignol, AM., Barrero, SP., Alaghebandan, R. (2006) Suicidal behavior by burns among adolescents in Kurdistan, Iran: a social tragedy. *Crisis*; 27(1):16-21.
- Gureje, O. (1991) Reliability and the factor structure of the Yoruba version of the 12-item General Health Questionnaire. *Acta Psychiatr Scand* 84:125-129.
- Gutierrez, F., Torrens, M., Boget, R. et al. (2001) Psychometric properties of TCI questionnaire in Spanish psychiatric populations. *Acta Psychiatrica Scand* 103:143-147.

Hashemian, F., Khoshnood, K., Desai, MM., Falahati, F., Kasl, S., Southwick, S. (2006) Anxiety, depression, and posttraumatic stress in Iranian survivors of chemical warfare. *JAMA*, Aug 2;296(5):560-6.

Jylhä, P., Isometsä, E., (2006) Temperament, character and symptoms of anxiety and depression in the general population. *European Psychiatry* 21: 389–395.

Kimberly, H., Serene, OS. (2002) The NIMH Blueprint for change Report: Research priorities in child and Adolescent mental health *Journal of the American Academy of Child and Adolescent Psychiatry*; 41(7): 760-762.

Kihc, C., Rezaki, M., Rezaki, B., Kaplan. I., Ozgen, G., Saduyu, A., Oztürk, M. (1997). General Health Questionnaire (GHQ12 & GHQ28): psychometric properties and factor structure of the scales in a Turkish primary care sample. *Soc Psychiatry Psychiatr Epidemiol* 32:327-331.

Lari, AR., Joghataei, MT., Adli, YR., Zadeh, YA., Alaghebandan, R. (2007) Epidemiology of suicide by burns in the province of Isfahan, Iran. *J Burn Care Res*. Mar-Apr; 28(2):307-11.

Lobo, A., Perez-Echeverria, MR., Artal, J. (1986) Validity of the scaled version of the General Health Questionnaire (GHQ-28) in a Spanish population. *Psychot Med* 16:135 140.

Medina Mora, ME., Padilla, GP., Campillo-Serrano, C., Mas, CC., Ezban, M., Caraveo, J., Corona, J. (1983) The factor structure of the GHQ: a scaled version for a hospital's general practice service in Mexico. *Psychol Med* 13:355-362.

Modabernia, MJ., Shodjai Tehrani, H., Fallahi, M., Shirazi, M., Modabbernia , AM., (2008) Prevalence of depressive disorders in Rasht, Iran: A community based study. *Clin Pract Epidemiol Ment Health*. 4: 20.

Mohit, A., (2001) Psychiatry and Mental Health for Developing Countries, Challenges for the 21st Century. Regional Adviser, Mental Health. Eastern Mediterranean Region. World Health Organization. 13th Congress of Pakistan Psychiatric Society. Islamabad, Pakistan, January 25-28 2001.

Mofidi, N., Ghazinour, M., Salander-Renberg, E., Richter, J. (2008). Attitudes towards suicide among Kurdish people in Iran. *Soc Psychiatry Psychiatr Epidemiol* (2008) 43:291–298

Mohammadi, MR., Ghanizadeh, A., Rahgozart, M., Noorbala, AA., Malekafzali, H., Davidian, H., Naghavi, H., Soori, H., Yazdi, SA. (2005) Suicidal attempt and psychiatric disorders in Iran. *Suicide Life Threat Behav.* Jun;35(3):309-16.

Montazeri, A., Mahmood Harirchi, A., Shariati, M., Garmaroudi, G., Ebadi, M and Fateh, A. (2003) The 12-item General Health Questionnaire (GHQ-12): translation and validation study of the Iranian version. *Health and Quality of Life Outcomes*, 1:66.

Motaghipour ,Y., Valaei F, Amiri P, Emami H, Mohammadbeigi F, Hajipour R, Ainy E, GHanbarian A, Sarbazi N, ZahediAsl S, Azizi F. (2006) Study of the general mental health status in an area of Tehran: Tehran Lipid and Glucose Study (TLGS). *Iranian Journal of Endocrinology & Metabolism*, Vol 7 No.4 (Iranian language).

Nejatisafa, AA., Mohammadi, MR., Sharifi, V., et al (2006) Iran's contribution to child and adolescents mental health research (1973-2003): A scientometric analysis. *Iran J of Psychiatry* 1: 93-97.

Noorbala, AA., Bagheri Yazdi, SA., Yasamy, MT., Mohammad, K. (2004) Mental health survey of the adult population in Iran. *Br J Psychiatry.* Jan; 184:70-3.

Politi, PL., Piccinelli, M., Wilkinson, G. (1994) Reliability, validity and factor structure of the 12-item General Health Questionnaire among young males in Italy. *Acta Psychiatr Scand* 90:432-437.

Pitchot, W., Paquay, C., Ansseau, M. (2008) Suicidal behavior: psycho-social and psycho-pathological risk factor. *Rev Med Liege.* May-Jun; 63(5-6):396-403

Rey, JM., Walter, G,. (2001) Child and adolescent psychiatry research comes of age. *Australian and New Zealand Journal of Psychiatry*; 35: 261-262.

Renberg, ES., Jacobsson, L.(2003) Development of a questionnaire on attitudes towards suicide (ATTS) and its application in a Swedish population. *Suicide Life Threat Behav* 33:52-64.

Romans-Clarkson, SE., Walton, VA., Herbison, GP ve ark. (1989) Validity of the GHQ-12 in New Zealand women. *Aust N Z J Psychiatry* 23:187-196.

Rodríguez, AH., Caldera, T., Kullgren, G., Renberg, ES. (2006) Suicidal expressions

among young people in Nicaragua: a community-based study *Soc Psychiatry Psychiatr Epidemiol.* Sep; 41(9):692-7.

Saadat, M. (2005) Epidemiology and mortality of hospitalized burn patients in Kohkiluyeh va Boyer-Ahmad province (Iran): 2002-2004. *Burns.* May; 31(3):306-9.

Shooshtary, MH., Malakouti, SK., Bolhari, J., Nojomi, M., Poshtmashhadi, M., Amin, SA., Bertolote, JM., Fleischmann, A. (2008). Community study of suicidal behaviors and risk factors among Iranian adults. *Arch Suicide Res.*; 12(2):141-7.

Tucker, LR., MacCallum, RC. (1997) *Exploratory Factor Analysis*; pp 131-143 Ch.6

US public Health Service. Report of the Surgeon General's conference on children's Mental Health, A National Action Agenda. Washington: US public Health Service, 2000.

Web site, 2008; <http://i-cias.com/e.o/iranirqw.htm>

Weyerer, S., Elton, M., Fichter, MM. (1986) The factor structure of the General Health Questionnaire among Greek and Turkish adolescents. *Eur Arch Psychiatry Neurol Sci* 236:75-82.

World Health Organization. (2005) *Mental Health Atlas*. Department of Mental Health and Substance Abuse. World Health Organization, Geneva.

Worsley, A., Gribbin, CC. (1977) A factor analytic study of the twelve item General Health Questionnaire. *Aust J Psychiatry* 11:269-272.

Yasamy, MT., Shahmohammadi, D., Bagheri Yazdi, SA., Layeghi, H., Bolhari, J., Razzaghi, EM., Bina, M., Mohit, A. (2001) Mental health in the Islamic Republic of Iran: achievements and areas of need. *Eastern Mediterranean Health Journal* Volume 7, No. 3, May 381-391

