Decomposing disparity in adult individual's mental health in Tehran among lower and higher economic groups; an Oaxaca- Blinder analysis on urban HEART Survey- round 2

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Abstract:

Background: Mental health is one of the main aspects of social well-being. Tehran -capital of Iran- is metropolitan, where the mental health status of citizens is not prioritized effectively.

Objectives: The purpose of this study was identifying contributors of mental health inequality between lower and higher economic groups in Tehran through Oaxaca- Blinder method.

Methods: The study was conducted by the data of Tehran's Urban Heart Survey- Round 2 (2012). Through a three- stage stratified and clustered sampling method, 34,700 were selected as samples. The mental health status was measured by the General Health Questionnaire 28- items (GHQ- 28) and the quantity of the inequality in mental health was measured by corrected concentration index. The Fairlie's decomposition approach was performed in STATA 14.

Results: The corrected concentration index were: -0.0967 and -0.1004 by Erreyger's and Wagstaff's approaches. Being of the Iranian origin, disability conditions, employment status and smoking were identified as the main contributors of inequality in mental health among lower and higher economic groups.

Conclusion: Thus, re-organizing strategies and plans on promoting the socio- economic status of non-Iranian residents, improving employment opportunities, developing well-designed environment for disabled individuals and supporting plans to reduce smoking is recommended to the urban policy makers.

Keywords: Mental health, decomposing inequality, urban heart survey, Tehran.

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Introduction

Theoretical developments have revealed that mental health as one of the main aspects of human well-being is influenced by several social and demographical factors[1,2]. In the approach of social determinants of health (SDH), the mental health is known as a result of social, economic, and environmental factors' function[3]. A challenging

problem which arises in this domain is mental disorders as leading causes of epidemiological and economic burden of human illness and disabilities[4,5]. The severity of mental disorders may depend on the age groups, gender, ethnicity, economic class, and other demographical variables, which all imply on equality considerations[6,7]. Even in the condition of availability, accessibility and affordability of mental health procedures and services, the inequality is a challenging debate[8,9]. Previous research showed identifying roots of inequality, tackling them and reducing the gap between population groups are common actions in the countires[10]. The World Health Organization (WHO), encourages countries to promote individual's mental health and developed a plan, called:" WHO's Mental Health Action Plan 2013- 2020". This action plan was aimed to develop effective strategies in respect of population and health systems as well as community based interventions[11]. WHO defined mental health as per the following:" a state of well- being in which every individual realizes his/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/his community"[12]. A well mental health status could be known as a capability that enables individulas to act in accordance with their values[13]. The global statistics depicts a prevalent pattern of mental disorders over the past years[14]. In addition the depression, anxiety, schizophrenia and alcohol and substance abuse are the main current mental disorders challenges worldwide[5].

In developing countries like Iran, prevalence of mental disorders alongside, gender, regional, and socio-economic gaps has caused a double imposing challenge[15]. Traces of inequality especially in the socio- economic groups in the status of mental disorders were reported in literature[16,17]. A national survey by Noorbala et al. 2015, showed about 23.44% of participants were suspected of experiencing mental disorders, and this rate was about 19.28% in males and 27.55% in females[18]. Findings of this study showed that the rate of mental disorders was about 24.55% in urban regions and 20.89% in rural regions. Somatization, anxiety, and depression were recognized as the most common mental disorders in this survey[18]. In another national survey by the same researcher in 2004, about 20% of population including 25.9% of women and 14.9% of men, reported experiences of at least one type of mental

disorder[19]. In a newer survey the prevalence rate of mental disorders has been estimated at about 23.4% (27.6% for female and 19.3% for male in 2015)[20]. Decomposing inequality in mental health, may provide some insightful implications for realizing factors that are contributing to the gaps between poor and non-poor groups. This may lead to evidence-informed policy making in tackling the inequality. Over the past years, few studies have been conducted in the same area in Iran. Khedmati Morasae et al. investigated decomposing inequality on the first round of Tehran Urban Heart Survey[21]. However, the second round of Urban Heart was released in 2010 and an updated analysis of the inequality may be insightful in investigating the changes. In addition, we used another approach to decompose the inequality with some cutting-edge variables.

Another study in this filed was conducted by Veisani et al. in the Ilam province (West of Iran) in 2015[22]. The inequality in mental health may lead to widening the gap between socio- economic groups and this in turn is one of the main causes of social ignorance, feeling and lower level of belongingness. We aimed to conduct a decomposing inequality study with a newer version of Urban Heart (2010) which emphasized on the social determinants of mental health.

Materials & methods
Data and settings

This study was conducted using the data gathered in the second round of Health Equity Assessment and Response Tool (Urban HEART) survey in Tehran (2011-2012). Data about mental health has been collected through the General Health Questionaire 28- item (GHQ-28 items). For more information about the validity of the contents, structure and scoring of the GHQ, one can refer to the studies of Willmot et al (2004) and Sterling (2011)[23,24]. The second round of Urban HEART included a lot of data about different social and demographical dimensions of households alongside their data about the expenditures, utilization from health services, children health, chronic diseases, disabilities, social capital, pain, lifestyle[25] The raw data through MS Excel files has been allowed to be used for research projects with permission of the funder and performers. The raw data was accessible after formal correspondings. Some of the previous studies, considered the score 24 in GHQ scoring mechanisms as

a cut-of-point. Those equal or exceeding 24 were suspected of having mental disorder and otherwise[29,30]. In the current study, we applied the above mentioned scoring method and divided the adult individuals into the healthy group without suspected mental disorders, and a healthy one.

Study population and samples
According to a general census in 2011, about 8.5 million people live in Tehran[26]. Samples of the present study, were selected in the Urban HEART by a three- stage stratified and clustered sampling method; and 34,700 individuals in each household were selected for mental health module[27].

Outcome variable: General Health Status
The outcome variable was measured by the 28-item General Health Questionnaire (GHQ-28). Scores of each subscale range from 0 to 21 and between 0-84 for the total scores. In each section, higher scores indicate poorer health status[23,25,28].

Independent variables
We included the following independent variables: educational level: The level of education of each member of a household based on national standard educational grading (illiterate, high school, academic undergraduate and academic postgraduate), family size: All of members of a household that were living in the same house (Total number of family members), employment status: This was collected through self- report of individuals about their current economic ativities (employed, housekeeper, unemployed and other), marital status (married, widowed, divorced and single), owning a house, age group (≥40, 41–59 and 60 years or above), smoking of family members: this was through a question about smoking during the last one month (yes or no), occurrence of domestic violence : the experience of any types of violence including physical or mental by other members of households over the last month (yes or no), presence of a disabled person in the family (yes or no), nationality (Iranian or non-Iranian), gender (female or male), body mass index: this was measured through dividing the weights (in Kilogram) by the height squared (in meters), coverage of basic health insurance: Have you any types of mandatory/public health insurance coverage: Social Security Insurance, Medical Services Insurance, Armed Forces Health Insurance, Imam Komeini Relief Foundation Insurance (yes or no), and coverage of complementary health insurance: Do you have any types of voluntary/private health insurance in addition to the basic health insurance (yes or no) (table x).

Statistical analysis
Data analysis was conducted in two phases as per the following: Firstly, household asset index was computed by combining three variables including: ownership status of house, having basic health insurance coverage and having a washing machine. This computation was done by polychoric principal components analysis (PCA). Then the asset scores was calculated and four quartiles assigned from the first (lowest) to forth (highest) quartile for each individual. Study samples were divided and enrolled into two groups: the lower economic group: equal or under quartile 1, and higher economic group: above quartile 1. Secondly, the contributing factors of the gap between the lower and higher economic groups for the mental health status were examined. A logistic based Oaxaca- Blinder decomposing through the Fairlie's command in STATA was applied[31]. The Oaxaca- Blinder decomposing model has been used by many researchers and it is an approved method in understanding the roots of inequality among economic groups. In addition, in the current study, our outcome variable is a binary one and among the different approaches for decomposition of inequality in mental health this approach showed better results.

In Oaxaca- Blinder decomposing method, the gap between the two supposed groups – lower and higher economic groups - were explained by some socio-economic determinants. In general the differences of means of an outcome variable between the two groups, could be formulated through O'Donnel et al. for the two supposed dependent variables (Y1, Y2) and explanatory variables (X1, X2)[32].

$$Y^{nonpoor} - Y^{poor} = \beta^{nonpoor} X^{nonpoor} - \beta^{poor} X^{poor} = \Delta x \beta^{poor} + \Delta \beta x^{poor} + \Delta x \Delta \beta$$
$$= E + C + CE$$

Where E, C and CE present, how much of the G1,2,3 is attributable to difference in endowments (explanatory variables), then coefficients and finally interaction between E and C. However the Firelie presents a extended logit and probit- based of model presented in the equation (1)[33]

Results

Our results have been organized in two parts, firstly the descriptive characteristics of the respondents by their demographics information are presented in table (1), and then, table (2) presented the results of decomposing analysis.

The GHQ 28 items were measured for 23,327 selected adult individuals in Tehran's households. Women created about 53% of respondents and about 99% of samples were of the Iranian nationality, with a 3.56 mean for households' size. About 40.38% of participants have been suspected to have at least one type of the common mental disorders. Table (1) presents the descriptive results completely.

As table (1) demonstrates, the major part of samples were young (under 40 years old), and owned houses (66% owner), were married (72%), and were of up to high school education (66%).

The concentration index has been calculated through the corrected concentration index. Table (2) depicts the results based on two common approaches including the Erreygers and Wagstaff's methods for concentration index. The corrected concentration index shows the poor were bearing the burden of inequality of mental health.

The main contributors in explaining the gap between poor and non- poor individuals' mental health status, have been shown in table (3)

Table (1): Some characteristic of the samples in the Urban HEART- Round 2

Variable	Frequency (%)	Mean (SD)
Suspected to Mental Disorders	8,697 (40.38)	
Nationality	24.353 (98.62)	
Family Size		3.56 (1.31)
Gender	12.961 (52.58)	
Educational Level:		
Illiterate	1742 (7.05)	
High School	16316 (66.02)	
Academic Undergraduate	5671(22.95)	
Academic Postgraduate	986 (3.99)	
Employment Status:		
Employed	7077 (28.93)	
Householder	13235 (54.10)	
Unemployed	3835 (15.67)	
Other	319 (1.30)	
Marital Status:		
Married	17484 (72.07)	
Widow	1603 (6.61)	
Divorced	454 (1.87)	
Single	4720 (19.46)	
Owning of House:		
Owner	16319 (66)	
Tenant	7235 (29.26)	
Other	1170 (4.73)	
Smoker	6012 (24.48)	
Experiencing Violence	1871 (7.75)	
Having Disability	3573 (14.54)	
Age Groups:		
Young (≤40)	11210 (45.77)	
Middle Age (40-59)	8417 (34.36)	
Elder (≥60)	4866 (19.87)	

Table (2): Inequality in distribution of the mental health status in Tehran's Citizens 2102

Concentration Index	Value	Standard Error	P- value
Erreyger's Normalized	-0.097	0.0074	0.000
Wagstaff's Normalized	-0.100	0.008	0.000

Table (3): The main contributor of inequality in individuals' mental health in Tehran (2012)

Mental Health	Coefficient	Standard Error	Z	P>|Z|	95% Confidence Interval	
Iranian Nationality	-0.003	0.001	-2.56	0.01	-0.005	-0.001
Gender(Men)	0.001	0.001	1.56	0.10	-0.000	-0.003
Household Size	-0.002	0.001	-1.29	0.20	-0.004	0.001
Age Category	0.003	0.005	0.60	0.55	-0.007	0.013
Coverage of Basic Health Insurance	-0.002	0.002	-0.87	0.61	-0.005	0.001
Coverage of Complementary Health Insurance	-0.004	0.003	-1.24	0.22	-0.009	0.002
Educational Level	0.0112	0.021	0.54	0.60	-0.030	0.536
Employment Status	0.004	0.002	1.92	0.05	-0.000	0.008
Marital status	0.006	0.004	1.53	0.13	-0.002	0.014
Having Disability	0.004	0.0009	3.84	0.000	0.002	0.005
Smoker	0.001	0.0004	2.75	0.006	0.000	0.002
Experiencing Violence	0.002	0.0011	1.65	0.09	-0.0033	0.004
Body Mass Index Category	-0.0004	0.0012	-0.31	0.756	-0.003	0.002
Owning of House	-0.0011	0.0013	-0.83	0.408	-0.000	0.002

No. of Observation= 15716   No. of Observation G=0=poor=3686   No. of Observation G=1=Non- poor=12030

Difference: 0.123   Total Explained: 0.230

Notes: age categories: agesdummies1 agesdummies2 agesdummies3

Body Mass Index Category: dummiesBMI1 dummiesBMI2 dummiesBMI3 dummiesBMI4

Educational Level: educationdummies1 educationdummies2 educationdummies3 educationdummies4

Employment Status: employmentsdummies1 employmentsdummies2

employmentsdummies3 employmentsdummies4

Owning of House: Owningdummies1 Owningdummies2 Owningdummies3

Marital status: martialdummies1 martialdummies2 martialdummies3

martialdummies4

The gap between lower and higher economics groups in mental health status was about 0.12, and the model explained about 23% of this difference. The main significant contributors of the difference between lower and higher economic groups in mental health status were: employment status, having a disability, being of Iranian nationality, experiencing violence, being male, and smoking daily.

Discussion

Mental health has been realized as one of the main aspects of human's welfare[1].Over the last decades, the importance of mental health was not considered as equal to physical health. The importance of this aspect of human's well-being was not prioritized sufficiently.Of course in recent decade the leading influential global authorities such as World Health Organization, developed some policies and plans to promote mental health and tackle the inequality in this regard through the social determinants of health approach[34]. Quantities of concentration index imply an unfavorable condition which imposes the major burden of inequality on the poor. In fact, it could be concluded that individuals of lower economic levels were more likely to experience the mental disorders. This may also explain why people from the lower economic groups in a metropolitan such as Tehran, are experiencing more challenging social difficulties.

Living in a megacity with rising daily expenditure and low level of financial capacity may influence the mental health negatively. In fact, limited financial capacity of the poor may not be adequate to afford their daily needs for food, cloth, transportation, and payments for other essential goods and services. This finding was in line with study that was conducted on the first round of Urban HEART survey. The concentration index was estimated at -0.0673. However, our results imply, worse conditions in inequality of mental health in the second round of the survey[21].

Another study, conducted in Ilam (2014)[19] on some representative samples docmented that concentration index was -0.04922.

Conversely, a study in Shiraz showed that the concentration index was about 0.023.[28] This implies that the impact of contextual factors such as the environmental determinants of mental health and its inequality. Although Shiraz is a metropolitan, however it is smaller than Tehran and the financial capacity and other factors have less effect on the mental health.

Results of the decomposing section reflected that, employment status, having disabilities, being Iranian (non-foreign immigrant such as Afghan), experiencing violence, being male, and daily smoking, had a statistically significant association with the inequality between the poor and non-poor in terms of the mental health status. Employment status was the main contributor in explaining this difference and it showed a direct significant contribution in mental health inequality among citizens of Tehran. Over the past years, unemployment rate dramatically raised in Tehran, and the lower economic households were more likely to experience job insecurity. On this basis, it could be expedited that the increasing rate of subsistence expenditures in a metropolitan city such as Tehran along with unemployment status may lead to degenerative outcomes for mental health, and this may be more obvious in lower economic groups[35,36].

Literature review illustrated a positive impact of employment of individuals on mental health as the general consensus[37,38]. Broadly translated, our findings indicate that suffering from physical or mental disabilities are some of the contributors of inequality of mental health among the poor and non- poor. It seems that, coping behaviors with disabilities may not be effective among the poor. In addition, they may not be able to afford the expenditures of long-term care for their special condition. Some of the prior studies claimed that people who suffer from disabilities stated higher rate of obesity, smoking, and lack in physical activity. These may intensify the probability of suffering from a chronic diseases, so they are more suspected to have mental disorders[39,40]. Nationality of the samples was another significant determinant of mental health. The Iranian nationality had a negative statistical significance on inequality in mental health among the two groups of study. This may relate to lack of well- designed and defined facilities and utilities for other nationalities in Iran. According to statistics, the Afghans were major part of foreigners in Tehran and most of them did not enjoy good socio- economic situation in Iran. Although they could benefit from free education, their chances are very low to get well-reputed and achieve high level occupations. Many of them are occupied by employers with low salary and in many cases -especially for illegal and informal migrants- the accessibility to health care and social services were not developed effectively[41-44]. On the other hand, smoking showed a positive significant contribution in explaining inequality in mental health among the poor

and non- poor. Smoking, may be related with some problems in mental or psychological conditions in individuals. In case of considering smoking as an addictive behavior, it may cause some mental outcomes for smokers. However, results of the present study implied more that smoking may lead to more gaps in mental health of the poor and non-poor. As a result, smoking expenditure may be an important factor in this situation. In fact higher financial burden of smoking among poor individuals may be more obvious and lead to more inequality in mental health.

Conclusion

The main conclusion that can be drawn is that generally the inequality in distribution of mental health is relatively considerable and in comparison to previous studies looks greater. It could be recommended to the urban policy makers to develop social interventions for promoting socio-economic status of non-Iranian immigrant residents of Tehran, securing the employment condition, promoting the life conditions for disabled people and finally reducing the smoking rate among citizens. This requires a comprehensive action plan with focus on social, cultural and economic factors. Here we need a social determinants of health approach to tackle the inequality in a mega city such as Tehran.

Conflict of interest

The authors declare that they have no competing interests.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Was obtained for all participants.

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Authors contributions

Study design: HGH and GHGH. data synthesis: BA, MN and SN. Drafting the manuscript: HGH,BA , EA, and MVM. Critical revision of the manuscript: BA, and AAF.

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