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Abstract

Background: The relationship between gender disparity and the risk of developing noncommunicable disease and other social health determinants has not been well researched in the Islamic Republic of Iran.

Aims: To assess how gender disparity contributes to the overall risk of noncommunicable disease in the Islamic Republic of Iran.

Methods: This was a secondary analysis of data on about 11 000 adults aged 15–69 years from the 2011 WHO STEPwise approach to NCD risk factor surveillance (STEPS) survey in the Islamic Republic of Iran. The outcome variable in our analysis was the noncommunicable disease risk factor index. We used an extension of the Blinder-Oaxaca decomposition model to decompose the predicted mean difference in this index. Sampling method, study design and sex were considered in the analysis. The predictor variables were age, household assets index, education, employment status, ethnicity, and residence.

Results: The overall mean (standard deviation) noncommunicable disease risk score was

39.26 (22.4). The risk score for women was significantly higher than for men (41.75 versus 36.84; P 140 mmHg, a diastolic blood pressure > 90 mm Hg, or current use of antihypertensive medication (24).

To account for the different contributions of each risk factor to the burden of NCDs, scoring for each risk factor was weighted proportionate to its contribution (25). That means the presence of each risk factor was scored relative to its contribution to the burden of NCDs, and absence of that the risk factor resulted in a contribution of 0 to the final index. The total risk score for each respondent was calculated from the sum of their weighted scores for all risk factors. These scores were then converted into a 0–100 scale.

Predictor variables

In addition to sex (male/female), the potential predictor variables examined were: age (in years); household assets index (see below); highest educational level (no education, 65% of the combined variance was considered the household assets index.

Statistical analysis

Stata, version 14 was used for all analyses. We used descriptive statistics, including central tendency and dispersion indices for quantitative variables and frequencies and percentages for qualitative variables. To decompose the gender disparity in the overall risk of NCDs, an updated package of the Blinder-Oaxaca decomposition model was used (27,28). The mean predicted gender difference in the NCD risk factor index from the model was considered an estimate of the related gender disparity. The model, which is based on a counterfactual regression approach, considers the frequency distribution and differential effect of contributing factors that vary across gender groups, i.e. it decomposes the gender disparity in the overall risk of NCDs into smaller components. Thus, the method explains how much of the disparity in mean predicted outcome (NCD risk factor index) is due to differences in the levels of the related factors among males and females (explained components) and how much is due to gender discrimination, but may also be due the differential effect (the magnitude of regression coefficients) of the factors and other unknown associated factors (unexplained components). In fact, the existence of inequality despite identical individual characteristics can be rooted in unknown factors that affect the outcomes (27,29).

Assuming that the NCD risk score (Y) is explained by n predictors (x1, ... xn), the gender mean difference in predicted Y(D) is as follows: (1)

Where β is the mean value of each predictor variable and β is the predicted regression coefficient.

If the male coefficients are used as the reference, then decomposition is formulated from the viewpoint of females. In other words, the counterfactual equation

( ) can be obtained by replacing the female coefficients with those of the male equation. By adding and subtracting the counterfactual equation in the right hand side of equation (1), the gender disparity in the mean predicted Y(D) can be decomposed into explained (E) and unexplained (U) components. It is straightforward to show that:

(2)

D E U

Ethical approval

Approval for the study was obtained from the ethics committee of the Shahid Beheshti University of Medical Sciences, Tehran, Islamic Republic of Iran (IR.SUMS.RETECH.REC.1399.765).

Results

Baseline characteristics

The baseline characteristics of all study participants is presented in Table 1 . Men comprised about 51.86% of the participants, and most (68.53%) were urban residents. The mean age [standard deviation (SD)] of the participants was 35.89 (SD 14.37) years. In terms of education, 16.71% were not educated, while 46.11% had graduated from high school or had a higher education. Less than half the participants (42.88%) were part of the labour force, while 28.45% of men and 86.68% of women were non-labour force. Almost half of the participants (47.94%) were of Persian ethnicity. Significant differences were found between males and females for: age (P= 0.001), household assets index (P= 0.001), educational attainment (P= 0.001), employment status (P

Low consumption of fruits and vegetables (73.58%) was the leading risk factor, followed by obesity and overweight (49.23%), insufficient physical activity (38.68%), high blood pressure (22.05%) and cigarette smoking (11.53%). Significant gender differences were found in cigarette smoking (men 21.76%; women 1.01%), insufficient physical activity (men 26.73%; women 50.99% and obesity and overweight (men 43.05%; women 55.59%); all P = 0.001.

Decomposition results

The decomposition of the gender disparity in predicted mean NCD risk is shown in Table 2 . The disparity was in favour of men (P

Discussion

We aimed to assess the contribution of related factors to gender disparity in the overall risk of acquiring NCDs among adults living in the Islamic Republic of Iran using data from a nationwide survey. Our findings suggest that men and women have different levels of exposure to NCD risk factors. The overall NCD risk for women was higher than for males. Decomposition of the risk showed that employment status, educational level and age substantially contributed to this gender difference.

Consistent with other studies (12,17,30,31), our study highlights the higher risk of NCDs among women. Evidence from a new WHO report shows that the different gender roles and cultural norms have a major effect on the NCD risks of men and women. These factors tend to change with age and according to social and cultural influences. Accordingly, this leads to different behaviours which affect exposure to NCD risk factors and health and help-seeking behaviour (32).

Despite this higher risk, the focus on women’s health is often limited to reproductive ages and NCDs are considered primarily men’s diseases (12,33). This gender bias could lead to inadequate screening of NCD risk factors among women, making it difficult to control these diseases among them (12). While women tend to live longer than men, older women experience poorer health and more and NCD multimorbidity than older men, with higher associated cost (12,33). This highlights a challenge in health care provision for older women in the Islamic Republic of Iran.

Our findings suggest that the mean age difference between males and females contributed the most to the disparity in NCD risk factor index. Our study indicates that a significant part of the observed disparity was attributed to the different gender effects of age. That means the women experienced greater NCD risk with increasing age than men. This finding is consistent with other studies suggesting that multimorbidity is more prevalent among elderly women than elderly men (16,17,34,35). Of course greater longevity is associated with increased morbidity and women tend to live longer than men. At the same time, elderly women often encounter multiple challenges including financial insecurity, illiteracy, discrimination, domestic violence, physical dependency and a greater possibility of living alone. As well as these difficulties, their health needs and specific requirements are often neglected (33). Therefore, more attention should be given to elderly women in this regard.

Employment status also contributed to the observed disparity in our study. This may be due to the differences in jobs and working conditions between men and women in the labour market, which in turn has resulted in different prevalence rates and patterns of health outcomes among men and women (15). According to the Framingham Study, the combination of occupation and family responsibility roles exerted considerable pressure on women. Interpersonal relationships, coping styles and occupations of some working women, along with family responsibilities, have been reported to influence the development of some NCDs in women, such as coronary heart disease (36). This finding is plausible given that the activities generally expected of women in Iranian society involve less physical activity than those associated with men, which is in line with other studies in the Islamic Republic of Iran (29,37). In a gender-biased society, women often have less access to education and social and health services, and fewer employment opportunities than men. Moreover, in Iranian society, education and work settings are highly gendered which could cause gender inequalities in health. In spite of the substantial increase in women’s enrolment in higher education in the Islamic Republic of Iran, significant development in the women’s labour force has not taken place and they continue to face discrimination in the job opportunities (38).

Different gender effects on educational status also contributed to the disparity. Thus, equalizing the educational levels of men and women could potentially reduce the total difference. This finding, together with female educational levels below those of men, suggests that the overall risk of NCDs for women tends to be lower among more highly educated women. This corresponds with a study in the Republic of Korea that showed a higher burden of NCDs in less educated groups, especially among women (39); however, it was not the case in an earlier study among Asians (40).

Data for our study were taken from the sixth round of the national STEPS survey in Islamic Republic of Iran, a population-based survey that used the STEPwise approach proposed by WHO (20) and adapted to local conditions. Given the study design, our findings could be

generalized to the entire population. However, despite adopting a suitable approach in measuring and explaining gender disparity in NCD risk factors and taking into account the roles of the related social determinants of health, our study had some limitations. First, we used data from a national survey and could not therefore ascertain the reliability of the data. Second, as with other cross-sectional studies, causal relationships between the variables cannot be determined. Therefore, our findings should be used with caution if considering policymaking and intervention design. Future research should focus on determining whether or not the identified correlations are causal in nature, thereby providing the knowledge required for effective control and prevention of NCD risks, especially among women.

Conclusions

Our findings highlight the importance of gender-based population level interventions aimed at preventing NCDs. NCD risk-reduction policies need to consider not only gender groups but also how gender interacts with social determinants to make some gender subgroups more vulnerable than others. Elderly women should be a focus of interventions aimed at reducing gender disparity in the risk of common NCDs. Targeted education about healthy lifestyles among these women and improving their knowledge of NCD risk factors can reduce the risk of these diseases. Women's occupation is also a fundamental factor in NCD risk. Therefore a women's information registration system and the use of appropriate key indicators to periodically monitor and evaluate their health is recommended. Further cooperation between government agencies, research institutes and academia related to women's health issues is necessary.

Acknowledgement

The authors thank the centre for NCD control of the Iranian Ministry of Health and Medical Education for providing the data for this study.

Funding: None.

Competing interests: None declared.

Disparité entre les genres et risque de maladie non transmissible chez les adultes en République islamique d'Iran

Résumé

Contexte : La relation entre la disparité entre les genres et le risque de contracter une

maladie non transmissible et d'autres déterminants sociaux de la santé n'a pas fait l'objet de recherches approfondies en République islamique d'Iran.

Objectif : Évaluer dans quelle mesure la disparité entre les genres contribue au risque global de maladies non transmissibles en République islamique d'Iran.

Méthodes : Il s'agissait d'une analyse secondaire de données concernant environ 11 000 adultes âgés de 15 à 69 ans, issues de l'approche STEPwise de l'OMS 2011 sur la surveillance des facteurs de risque des maladies non transmissibles (STEPS) en République islamique d'Iran. La variable de résultat dans notre analyse était l'indice des facteurs de risque de maladies non transmissibles. Nous avons utilisé une extension du modèle de décomposition de Blinder-Oaxaca pour décomposer la différence moyenne prévue dans cet indice. La méthode d'échantillonnage, le plan de l'étude et le sexe ont été pris en compte dans l'analyse. Les variables prédictives étaient l'âge, l'indice de richesse des ménages, l'éducation, le statut professionnel, l'origine ethnique et le lieu de résidence.

Résultats : Le score global moyen (écart type) de risque de maladie non transmissible était de 39,26 (22,4). Le score de risque pour les femmes était significativement plus élevé que pour les hommes (41,75 contre 36,84 ; p