Socioeconomic Inequality in Health Domains in Oman: Evidence from Oman World Health Survey

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Abstract: Socioeconomic inequality in health domains is a major challenge in public health in both developed and developing countries. The objective of this study was to assess the socioeconomic inequalities in various health domains in Oman. Data for the study was obtained from the 2008 World Health Survey in Oman, which covered a nationally representative sample of 3,370 Omani adults. Overall self-rated health (SRH) status and the functional difficulties with eight health domains: mobility; self-care, pain and discomfort, cognition, interpersonal activities, vision, sleep and energy, and affect, were used as the outcome variables. Level of education and wealth quintiles were used as the proxy measures of the socioeconomic status (SES). Both descriptive and inferential statistical techniques were used for data analysis. The results revealed significant socioeconomic inequalities in health outcomes for most of the health domains and for overall SRH in Oman. Adults with no education as well as with poorest wealth quintiles had significantly higher rate of poor health. For most of the health domains, a descending gradient in the prevalence of poor health with the level of education and wealth quintiles have been observed. However, education-related inequalities in poor health across the eight domains and the overall health status were found to be more pronounced and consistent than the wealth-related inequalities in poor health. Wealth quintiles showed no significant association with overall SRH and many health domains. The prevailing educational and wealth related inequalities in health underscores the need for policy-making in regard to reduce the inequalities in specific domains of health and overall health. There is a need for research to examine the ways in which socioeconomic factors mediate changes in health domains as well as overall health. The results from this study are of relevance to public health policymakers in developing interventions for specific health domains and overall health status.

Keywords: Socio-Economic Inequality, Health Domain, Poor Health, Education, Functional Health and Oman.

INTRODUCTION

Socioeconomic inequality in health is a major challenge in public health in both developed and developing countries. Socioeconomic status (SES) - measured by social determinants such as education, income or occupation, capturing social circumstances across the life course - is a strong predictor of health status. It has been observed that lower SES, have strong positive association with the poorer health across the world and the health burden increased with population ageing (Mackenbac et al., 2008; Onadja et al., 2017; Eikemo et al. 2008; Hosseinpoor et al. 2012; von dem Knesebeck et al. 2006). It is said that a vicious cycle is working between poor health and poverty: poverty exposes people to the behavioral risk factors for poor health, (poor people cannot afford adequate health care, healthy food, and are subject to living in less healthful environments and unhealthy housing conditions associated with a higher likelihood of illness and disease), which in turn become an important driver to the downward spiral that leads families towards poverty (Lantz et al. 2005; Herd et al. 2007; Mirowsky and Ross 2003). The strong positive relationship between low SES and poor health have increased recognition of its central place in efforts to understand and improve overall population health around the world (Herd et al. 2007).

According to the World Health Organization (WHO), socioeconomic inequality of health is an essential element of the performance of healthcare system of a country (Murray and Evans, 2006). To measure health status, self-rated health (SRH) is widely used in recent population surveys. Empirically SRH is a strong predictor of morbidity and mortality risk, even after accounting for known socioeconomic and medical risk factors (Chen et al., 2007; DeSalvo et al., 2006; Frankenberg and Jones, 2004; Benjamins et al., 2004; Idler and Benyamini, 1997).

In recent decades the measurement of health and its core elements has been operationalized through a set of elements, or domains, that together constitute an understanding of overall health (Sadana et al., 2011). The WHO developed eight such core domains of health that have been widely accepted as being of fundamental importance to all human beings irrespective of their social or socioeconomic circumstances (Hosseinpoor et al., 2012). These domains are: mobility, self-care, pain and discomfort, cognition, interpersonal activities, vision, sleep and energy, and affect. Research has shown that the WHO health domains are highly consistent across countries and cultures (Üstün et al., 2003; Chatterji et al., 2008; Mavaddat et al. 2011).

Since the beginning of the World Health survey (WHS) in 2002, many studies were conducted to investigate the relationship between SES and health status, but most of these research have been conducted in Western countries, with a few exception in eastern Asia and African region. To generalize the SES-health relation, more studies are needed in different socio-cultural setting. To our knowledge, there has been no study conducted on the socioeconomic inequality of different health domains in the Middle Eastern countries including Oman. Oman is an oil-rich high income country of Arabian Peninsula. With rapid socioeconomic development in recent time, the country is passing through crucial phase of demographic and health transition. It is, therefore, important to gain insight about socioeconomic inequality in health, so that appropriate policy can be developed to improve the population health by reducing the gap across different levels of SES. Analysis of summary measures of overall health alone may mask differences in the domains of health. For designing a better health care system and targeted intervention, detailed information about the association between different domains of health and SES is essential. Thus the aim of this study is to investigate the socioeconomic inequalities in the individual domains of health developed by the WHO and the overall health measure in Oman.

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MATERIALS AND METHODS

Study Population and Sampling

This study uses data from the 2008 Oman World Health Survey (OWHS). The survey was implemented by the Ministry of Health of Oman in collaboration and technical support of the World Health Organization (WHO). It was a part of the World Health Survey (WHS) series which was developed by the WHO as a means to collect comprehensive baseline information on the health of populations in different countries across the world. The target population of the 2008 OWHS was the adult population of age 18 and above irrespective of their marital status and nationality. The details of the methodology of the survey have been published elsewhere (Al Riyami et al. 2012). A multi-stage stratified cluster sampling design was employed. Administratively Oman is divided into 10 health regions and each region is again divided into urban and rural areas. For sample selection, these regions and urban-rural ares were treated as strata. Thus there were 10 urban and 10 rural strata. To achieve a nationally representative sample, 10 clusters from rural strata and 10 clusters from urban strata were selected targeting 5000 eligible respondents from 5000 households. Each member of the households were listed by the household informant. Within each household, an adult aged 18 years and older was randomly selected using a Kish table to complete the survey (Kish, 1965). Ultimately 4,717 adults were successfully interviewed in the survey, of which 3,370 (71%) were Omani nationals. In this study we have considered only 3,370 Omani nationals as our study subjects.

Variables

Outcome Variables

This study considered overall self-rated health (SRH) status and the functional difficulties with eight health domains: mobility; self-care, pain and discomfort, cognition, interpersonal activities, vision, sleep and energy, and affect, as the outcome variables. The survey participants were asked to rate their general health and the degree of difficulties they had experienced in each of the eight health domains in the previous thirty days. The response categories were: 1 = very good, 2 = good, 3 = moderate, 4 = bad, and 5 = very bad. However, for analytical purpose, we dichotomized the outcome variables into good health (combing the categories 'very good' and 'good' into one category) and poor health (combining the categories 'moderate', 'bad' and 'very bad' into one category). The binary outcome variable was calculated for each health domain and for overall health. Many previous studies also adopted similar binary approach (Baigi et al., 2018; Hosseinpoor et al., 2012; Onadja et al., 2017).

Explanatory Variables

The study used SES measured by the level of education and wealth status as the main explanatory variables. The levels of education were categorized as no formal schooling, primary, secondary and higher. For wealth, a composite index of wealth quintiles was derived from a set of variables on housing characteristics and ownership of household durable goods (such as TV, car, computer etc.) by using principal component analysis (PCA) (Filmer and Pritchat, 2001). The wealth scores obtained through PCA is attached to each household to indicate their relative wealth status. The wealth scores were then divided into quintiles (five categories): the lowest quintile being the poorest, then poorer, middle, richer and the highest quintile as richest. The socio-demographic variables considered as covariates were: respondent's sex (male vs. female), age, marital status and place of residence.

Statistical Analysis

We begin with the frequency distribution to examine the background characteristics of the respondents and estimated the overall prevalence of poor health across the eight health domains and the prevalence of overall poor health status. Then cross tabulation and chi-square test were used to examine the unadjusted bivariate associations between SES (as measured by education and wealth quintiles) and poor health across the eight health domains and the overall poor health status. A p-value of <0.05 was considered as statistically significant. Finally, multiple logistic regression analysis was done to examine the adjusted association between poor health and SES (i.e. education and wealth quintiles) after controlling for age, sex, marital status and place of residence. Separate logistic regression models were fitted for each of the eight health domains and overall health status.

RESULTS

Background Characteristics

Table 1 presents the percentage distribution of the respondents according to their selected socio-economic and demographic characteristics. Of the total 3,370 Omani adult respondents of age 18 years and above, 53% were female and 47% were male. About half (51%) of the respondents were young adult of age below 35 years of age, and about 9% respondents were from elderly group (65 years and above). The average age of the respondents was 38.0 years. Most (71%) of the respondents were ever married, with 59% currently married and 12% were either widowed or divorced or separated. About 29% respondents were unmarried. More than one-fourth (28.7%) of the respondents had no education, while 12% had more than secondary level of education. Most of the respondents (72%) were from urban areas.

Prevalence and SES differentials of poor health in different domains and SRH

Table 2 shows the prevalence of poor health in different health domains and self-rated health. Overall, about one-fifth (21.3%) Omani adults rated their health as poor. Among the health functional domains, the lowest prevalence of poor health was observed in the 'Self-care' domain (2.7%), while the highest prevalence was seen in the 'Pain and discomfort' domain (19.3%). Table 2 also presents the unadjusted bivariate relationships between SES (education and wealth quintile) and each of the eight functional domains and SRH. Levels of education showed a significant negative association with poor SRH and the poor health status across all the health domains. As

Characteristics	Number	Percent
Total	3370	100.0
Gender		
Male	1579	46.9
Female	1791	53.1
Age		
18-24	779	23.1
25-34	941	27.9
35-44	632	18.7
45-54	398	11.8
55-64	321	9.5
65-74	204	6.1
75+	95	2.8
Mean(SD)	38.0(16.2)	
Marital status		
Never married	983	29.2
Married	1995	59.2
Widowed/divorced/separated	392	11.6
Education		
No education	936	27.8
Primary	618	18.3
Secondary	1397	41.5
Higher	419	12.4
Wealth Quintiles		
Q1(poorest)	565	16.8
Q2	815	24.2
Q3	755	22.4
Q4	677	20.1
Q5(richest)	558	16.5
Place of residence		
Urban	2433	72.2
Rural	937	27.8
Region		
Muscat	555	16.5
Dhofar	369	11.0
AdDakhiliyah	480	14.2
North AshSharqiya	249	7.4
South AshSharqiya	323	9.6
North AlBatinah	734	21.8
South AlBatinah	410	12.2
AdDhahira	251	7.4

Table 1: Percentage distribution of respondents according to their background characteristics, Oman WHS 2008.

expected, poor functional health was found to be more prevalent among adults with no formal education than among people with higher level of education. For all functional domains, a descending gradient in the prevalence of poor functional health was observed, running from the lowest to the highest level of education (Table 2). The most striking educational differences were found in 'mobility' and 'self-care'. For 'mobility', poor health was found to be about 12 times as high in persons with no education (22.1%) as in more highly educated persons

(1.9%). For 'self-care', poor health was found to be about 8 times as high in persons with no education (6.9%) as in more highly educated persons (0.8%). Poor functional health and SRH were found to be over two times as high in uneducated individuals as in more highly educated individuals in all other health domains.

For all health domains and SRH, poor health was more prevalent in the poorest wealth quintile group than in the richer or the richest groups. There was a descending gradient in the prevalence of poor health, moving from the poorest wealth quintile to richest, in all the domains of health and in overall health. The most striking wealth difference was found in 'interpersonal activity' where poor health was found to be about five times as high in persons with poorest quintile (11.5%) as in more highly educated persons (2.3%). However, the effects were significant for SRH, self-care, interpersonal activity, sleep and energy, and vision.

Adjusted effect of SES on poor health domains and SRH

Table 3 presents the results of the logistic regression models for poor functional health across functional domains by education level and wealth quintiles, after controlling for age, gender, marital status and place of residence. The odds of poor SRH decrease with the education. The odds of poor SRH was found to be 1.56 times higher among individuals with no education compared to individuals with higher education (OR=1.56; 95% CI: 1.10 – 2.92). However, SRH showed no significant association with the wealth quintiles. We found that there is a decrease in the odds of poor functional health with increasing education level (except sleep and energy). For health domain sleep and energy, the odds of poor health increase with the education. Educational inequalities in health (i.e., to the detriment of individuals without education) are statistically significant for most of the functional domains (except for pain and discomfort, affect and vision), after adjusting for age, sex, marital status, and place of residence. However, the size of these inequalities varies across the functional domains. The odds of poor mobility was estimated to be about three times as high for individuals with no education as for individuals with higher level of education (OR=2.85; 95% CI:1.28 - 6.31). For the functional domains self-care, cognition and interpersonal activities, the odds of poor functional health for these domains were estimated to be about twice as high for persons with no education as for persons with higher education.

Wealth quintiles showed significant association with the poor health domains like mobility, self-care, interpersonal activity and sleep and energy. We found that there is a decrease in the odds of poor functional health for these domains with increasing wealth quintiles. The odds of poor health for these domains was found to be about two to four times higher among the persons with poorest wealth quintiles than the persons with richest wealth quintiles. However, the poor functional health for other domains such as pain and discomfort, cognition, affect and vision showed no consistent pattern of significant association with the wealth quintiles.

SES	Poor health across health domains and self-rated health								
	SRH	Mobility	Self-care	Pain and discomfort	Cognition	Iinterpersonal activity	Sleep and energy	Affect	Vision
All	21.3	9.0	2.7	19.3	13.3	4.9	11.3	9.7	12.5
Education									
No education	39.2	22.1	6.9	32.4	25.7	9.7	18.6	11.3	27.4
Primary	20.4	7.1	2.1	17.6	11.5	5.0	7.4	6.8	7.3
Secondary	12.6	3.2	1.0	13.3	7.4	1.9	8.4	10.5	6.5
Higher	11.7	1.9	0.8	12.9	7.9	3.6	10.5	7.6	9.3
P - value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.001
Wealth quintiles									
Poorest	26.2	16.3	5.5	22.5	17.0	11.5	13.6	12.0	18.2
Poorer	20.2	7.9	2.0	17.6	13.6	2.8	10.4	9.0	11.2
Middle	21.5	8.3	2.9	20.8	12.3	4.4	12.5	9.4	10.2
Richer	19.2	7.5	2.4	18.8	11.7	4.4	8.7	8.9	13.1
Richest	20.6	6.1	1.1	17.4	12.7	2.3	11.8	9.7	12.6
P - value	<0.001	<0.001	<0.001	0.101	0.061	<0.001	0.042	0.331	<0.001

Table 2: Prevalence of poor functional health across different health domains and poor self-rated health among adults aged 18 and older by education and wealth quintiles, Oman WHS 2008.

SES	SRH	Mobility	Self-care	Pain and discomfort	Cognition	Interpersonal activity	Sleep and energy	Aaffect	Vision
Education									
No education	1.56**(1.10-2.92)	2.85***(1.28 - 6.31)	2.08***(1.14 – 4.43)	1.01(0.67 - 1.52)	1.98***(1.19 - 4.11)	1.92**(1.17 – 3.21)	0.48**(0.30 -0.87)	1.01(0.59 -1.71)	1.14(0.71 - 1.83)
Primary	1.48*(1.05-2.72)	2.07**(1.10 - 4.55)	1.63**(1.15 – 3.87)	0.95(0.64 - 1.38)	1.46**(1.08 -3.84)	1.70*(1.12 - 2.88)	0.75**(0.47 -0.92)	0.71(0.42-1.17)	0.52(0.32-0.85)
Secondary	1.31*(1.02-2.52)	1.91(0.89 - 4.12)	1.12(0.23 – 2.33)	1.19(0.84-1.67)	1.05(0.69 -1.61)	0.51**(0.26 - 0.98)	0.86*(0.59 -0.26)	1.44(0.95 -2.18)	0.86(0.57-1.30)
Higher	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Wealth quintiles									
Poorest	1.08(0.66- 2.35)	1.87**(1.16 - 3.02)	3.01***(1.16 - 7.82)	0.99(0.65 - 1.29)	0.88(0.60 - 1.29)	3.09***(2.08 - 7.87)	0.94**(0.43 -0.81)	1.23(0.81- 1.88)	0.99(0.67 - 1.47)
Poorer	1.02(0.69-1.89)	1.21*(1.08 - 2.94)	1.69(0.63 - 4.52)	0.92(0.68 - 1.26)	0.96(0.68 - 1.36)	1.22(0.59 - 2.49)	0.90(0.62 -1.31)	0.89(0.60 -1.32)	0.85(0.59 - 1.24)
Middle	1.09(0.80-1.78)	1.37(0.85 - 2.18)	2.63**(1.01 - 6.82)	1.23(0.91-1.65)	0.89(0.62 - 1.26)	2.08**(1.07 - 4.06)	1.10(0.77 -1.56)	0.89(0.61 -1.31)	0.78(0.54 - 1.13)
Richer	0.97(0.56-1.65)	1.03(0.63 - 1.66)	1.84(0.68 - 4.92)	0.96(0.71 - 1.31)	0.75(0.53 - 1.08)	1.75(0.89 - 3.43)	0.66*(0.45 -0.97)	0.83(0.56 -1.24)	0.96(0.67 - 1.37)
Richest	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference

* p < 0.05; ** p < 0.01; *** p < 0.001

Table 3: Odds ratios (95% confidence intervals) for poor functional health across functional domains among adults aged 18 and older by education and wealth quintiles, Oman WHS 2008.

DISCUSSION

The objective of this study was to examine the socioeconomic inequality in health domains and overall health status among the adults of age 18 years or more in Oman, using education and wealth status as the key indicators of SES. The analyses used the Oman World Health survey data. The results indicate significant socioeconomic inequalities in health outcomes for most of the health domains and for overall health in Omani society. People with no education and poorest wealth quintiles were more likely to report their overall health as poor compared to their higher educated and richest counterparts. For most of the health domains and for overall health, a descending gradient in the prevalence of poor health, moving from the poorest wealth quintile to richest, and moving from the no or lower education to higher education groups have been observed. However, the education-related inequalities in poor health across the eight domains and the overall health status were found to be more pronounced and consistent than the wealth-related inequalities in poor health.

The results indicate that there is a significant decrease in poor functional health with increasing education level, and this decrease is observed in almost all the health domains (except for sleep and energy), and for overall health. However the size of these inequalities differed between health domains. Educational inequality in health outcome was found to be highest for 'mobility', closely followed by self-care, while the wealth quintile related inequality was found to be highest for 'inter personal activity', followed by 'self-care'.

Our findings of educational inequality in health domains and overall health are consistent with similar recent research in both developed and developing countries, reporting significantly higher rate of poor health outcomes among the adults with no or lower level of education than the adults with higher level of education (Onadja et al., 2017; Hosseinpoor et al. 2012; Subramanian et al., 2010). Low education levels were also found to be associated with an increased likelihood of having chronic non-communicable diseases in low and middle income countries (Onadja et al., 2013; Hosseinpoor et al. 2012a). There may be many mediating factors determining the education related inequalities in overall health and health domains, as indicated by previous studies (Onadja et al., 2013). It is likely that people with no or lower education might have less economic resources to acquire preventive and therapeutic health care as well as health insurance coverage (Herd et al. 2007). Furthermore, less educated persons may have less social support, problem-solving skills and cognitive abilities to avoid the consequences of ill health and stress (Ross and Wu 1995). Low or no educated persons may be less aware about health, hygiene, nutrition and more engaged in unhealthy behavior and life style (Wang and Geng, 2019; Lantz et al. 2005; Mirowsky and Ross 2003; Winkleby et al., 1992).

Unlike many previous studies elsewhere (Onadja et al., 2017; Hosseinpoor et al. 2012; Subramanian et al., 2010), we did not find significant decreasing gradient of overall poor health and for many health domains by wealth quintiles. We found no association between pain and discomfort, cognition, affect, vision and wealth quintiles. Although, the overall health status showed no significant association with the wealth quintiles, for many health domains like mobility, self-care, and interpersonal activity, significant decreasing gradient of poor health with the wealth quintiles were observed. The less pronounced wealth-related inequality in poor health across the health domains in Oman might be related to the government policy of free universal access to healthcare services for all social groups. Unlike the United States and many other developed countries, Oman has universal public health system. Another possible explanation could be that people with higher wealth quintiles might have relatively higher psycho-social or occupation related stress, which may undermine their health benefits. It is also likely that relatively high level social justice in wealth distribution and management is prevailing in Omani society. However, all these speculations need to be further studied, using both qualitative and quantitative study, to draw a firm conclusion.

CONCLUSION

The findings of this study indicate significant socioeconomic inequalities in health outcomes for most of the health domains and for overall SRH in Oman. The reported prevalence of overall poor health was found to be higher among people with no education and poorest wealth quintiles than the people with higher level of education and highest wealth quintiles. For most of the health domains, a descending gradient in the prevalence of poor health with the level of education and wealth quintiles have been observed. However, the association between education and poor health across the domains was found to be more pronounced and consistent than that of wealth quintiles. Wealth quintiles showed no significant association with overall SRH and many health domains. The existing education and wealth related inequalities in health domains and overall SRH underscores the need for policy-making in regard to reduce the inequalities in specific domains of health and overall health. There is need for research to examine the ways in which socioeconomic factors mediate changes in health domains as well as overall health. The results from this study are of relevance to public health policymakers in developing interventions for specific health domain and overall health status.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interests regarding the publication of this manuscript.

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