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ORIGINAL ARTICLE

Socio-economic status and chronic disease in the West Bank and the Gaza Strip: in and outside refugee camps

Marie Jonassen[1] · Amira Shaheen[2] · Mohammed Duraidi[3] · Khaled Qalalwa[3] · Bernard Jeune[4] · Henrik Brønnum-Hansen[1]

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Abstract

Objectives The study investigated the association between socio-economic status (SES) and self-reported chronic disease (CD) among the Palestinian population in the Occupied Palestinian Territory, and whether this association was similar in the refugee camps.

Methods We used data from representative samples in 2006 and 2010 collected by the Palestinian Central Bureau of Statistics. SES was defined by education, wealth and employment status. Associations between SES and CD were analysed and stratified by living in or outside refugee camps.

Results CD prevalence increased among men and decreased among women in all SES categories and the Odds Ratio for CD was higher inside than outside the refugee camps, except for women in 2006. In both 2006 and 2010 the odds ratio of CD was higher among the lowest SES groups. The pattern of the negative association between SES and CD was similar in and outside the refugee camps.

Conclusions We found that the highest burden of CD is among those with low SES. In spite of a higher CD Odds Ratio in the refugee camps, the pattern of association between SES and CD did not differ in the refugee camps.

Keywords Palestinian · Socio-economic factors · Chronic disease · Refugees

Introduction

The burden of chronic disease is globally on the rise especially in the low- and middle-income countries (World Health Organization 2010). Also the population in the Middle East, including the Palestinian population living in the UN defined Occupied Palestinian Territories (OPT), is challenged by increasing prevalence of chronic disease, such as cardiovascular diseases, diabetes and cancer (Mokdad et al. 2014; Husseini et al. 2009; GBD 2017a, b). This threatens the quality and sustenance of life in a region already facing health challenges because of communicable diseases, injuries and psychological traumas (Shahraz et al. 2014; Mokdad et al. 2014; Abu-Rmeileh et al. 2012).

It is well known that there is a link between socio-economic status (SES) and development of disease through various mechanisms. SES in terms of education, wealth and employment influences people's exposure and vulnerability to disease, as well as healthcare outcomes and social consequences of having a chronic disease (Kaplan 2001; Daniel 2008; Evans et al. 2001). Epidemiological studies in the Middle East region confirm the relation between SES and chronic disease such as hypertension, cardiovascular disease, diabetes and asthma (Salame et al. 2014; Zabaneh et al. 2008; Shah et al. 2010; Jackson et al. 2002; Abukhdeir et al. 2013; Christos et al. 2014).

The West Bank and the Gaza Strip are facing high unemployment rate (Batniji et al. 2009), food insecurity (Palestinian Central Bureau of Statistics et al. 2012) and poverty in terms of low household consumption

✉ Marie Jonassen
mariejo2400@gmail.com

[1] Department of Public Health, University of Copenhagen, Copenhagen, Denmark

[2] Public Health Division, An-Najah National University, Nablus, Palestine

[3] Palestinian Central Bureau of Statistics, Ramallah, Palestine

[4] Institute of Public Health, University of Southern Denmark, Odense, Denmark

(Palestinian Central Bureau of Statistics 2014). The socio-economic conditions could very likely be associated with the development of chronic disease in the West Bank and the Gaza Strip.

In 2013 the numbers of registered refugees living in the West Bank were 914,192 and in the Gaza Strip it was 1,307,014. But not all Palestinian refugees are living in camps (The United Nations Relief and Works Agency 2014). Around 520,000 in the Gaza Strip and around 170,000 Palestinians in the West Bank live in camps (The United Nations Relief and Works Agency 2016).

Measured by household consumption, the level of poverty in the refugee camps is much higher than in the rest of the Palestinian population living in the West bank and the Gaza Strip: 35.4% of the households in refugee camps are considered to be poor compared with 25.8% of the total population, and the proportion of deep poverty among households is larger in the refugee camps (16.2%) compared with the population in total (12.9%) (Palestinian Central Bureau of Statistics 2014). The refugee camps started out as tent camps and have consecutively been replaced over time by housing constructions, but they are still limited by the same size of land. Thus, life in refugee camps is characterized by high population density, small houses and lack of adequate space between the houses in all directions (Al-Khatib et al. 2003). Results of studies in the Middle East indicate that living in refugee camps has negative consequences for the health of the individuals, resulting in a higher risk of chronic disease (Chaaban et al. 2010; Al-Khatib et al. 2005). However, apparently it remains unclear whether the relation between SES and chronic disease differs between the refugee camps and the surrounding area. One hypothesis could be that the accumulation of various risk factors, such as overcrowding, lack of supporting social networks and low SES, results in a synergetic overload and thereby increased vulnerability, among camp residents, which may strengthen the relation of socio-economic factors, such as low education, poverty and unemployment, with chronic disease. Another hypothesis could be that the living conditions in the camps are equally harsh for all levels of SES, so that the association between SES and chronic disease is unchanged or even weaker.

This study investigates the association between socio-economic status and self-reported chronic disease among the Palestinian population living in the West Bank and the Gaza Strip, especially whether the association differs among those living in refugee camps.

Methods

The study was based on cross-sectional data from two representative samples of the Palestinian population in the West Bank and the Gaza Strip collected by the Palestinian Central Bureau of Statistics in 2006 and 2010 as a part of the Palestinian Family Survey. The data were collected in clusters regarded as representative of the geographic and demographic characteristics of the reference population and furthermore the data were weighted in order to compensate for missing cases, so that the samples were representative on characteristics such as region, sex and age structure (Palestinian Central Bureau of Statistics 2007, 2013).

This study was restricted to individuals aged 25 or older because chronic disease is rare among young people and because a higher education is rarely completed before the age of 25. This limitation reduced the study population to around one-third from 38,688 to 13,426 persons in 2006 and from 81,500 to 30,084 persons in 2010.

The participants were categorized as having a chronic disease if they reported to have been diagnosed with at least one chronic disease by a medical physician and received treatment for the disease.

Three indicators were chosen to measure the level of SES:

1. Completed level of education divided in four levels: illiterate or acquainted; elementary or preparatory; secondary, bachelor or higher degree.
2. Wealth in terms of the household assets and conditions such as type of dwelling unit, material assets, access to electricity and water. The statistical procedure, known as principal components analysis, placed individual households on a continuous scale of relative wealth. All interviewed households were further separated into quintiles of wealth (Palestinian Central Bureau of Statistics 2013).
3. Employment status divided in three categories: employment; unemployment; and being outside the labour force, with unemployed defined as all of those of working age population, who are not in employment but are available to take up job if given the opportunity. Students, retired people, household keepers and disabled people who are not able to maintain a job belong to the group of those being outside the labour force.

Statistical analysis

Preliminary calculations detected a strong correlation between the SES variables. Therefore, the SES variables were separated in the statistical analysis.

Using a logistic regression model stratified on gender, the occurrence of reported chronic disease was compared between those living in refugee camps and those outside the camps adjusted for the SES indicators.

Using a logistic regression model stratified on gender, odds ratios (ORs) expressed the association between chronic disease and SES combined by residence. Thus, each SES group was split in two: living in a refugee camp or living in the surrounding Palestinian society. For instance, employment and residence were combined into six categories: outside labour force and living in camp; outside labour force and living outside camp; unemployed and living in camp; unemployed and living outside camp; employed and living in camp; and employed and living outside camp.

In order to optimize the precision of the OR estimates, the SES group with most participants was chosen as reference group.

The logistic regression models included covariates selected after performing a literature review on Middle East studies, and bivariate and three-dimensional analyses. The covariates were type of area (rural, urban or refugee camp), smoking status (smokers, ex-smokers or never-smokers), gender, age (25–39, 40–59 or 60 + years), region (the West Bank or Gaza Strip), marital status (single, married, divorced/separated or widower).

Results

Table 1 presents the characteristics of the study population by survey year, gender, region, SES and age.

The overall prevalence of chronic disease in 2006 (24.9%) and 2010 (24.4%) was almost the same, and the prevalence of specific diseases did not change much. The West Bank residents reported a higher prevalence of chronic disease than the Gaza population in both years (Table 2).

After adjustment for each of the socio-economic variables, the odds of self-reported chronic disease were about 40% higher among Palestinians living in refugee camps compared to those living outside refugee camps except for women in 2006, where no difference was seen (Table 3).

As presented in Table 4, the OR increases with lower level of SES in both of the two subpopulations of

Table 1 Characteristic of the study population 2006 and 2010

	2006 *N* (%)	2010 *N* (%)
Among Palestinians aged 25+ in the Occupied Palestinian Territory (the West Bank and the Gaza Strip)		
Total	13426 (100%)	30084 (100%)
Female	6684 (49.8%)	14956 (49.7%)
Male	6742 (50.2%)	15128 (50.3%)
The West Bank	9001 (67.0%)	19684 (65.4%)
The Gaza Strip	4425 (33.0%)	10400 (34.6%)
Refugee camp	2161 (16.1%)	2851 (9.5%)
Employed	5190 (38.7%)	12634 (42.0%)
Unemployed	1850 (13.8%)	2516 (8.4%)
Outside labour force	6384 (47.5%)	14923 (49.6%)
Bachelor or higher degree	2193 (16.3%)	6168 (20.5%)
Secondary	2200 (16.4%)	5147 (17.1%)
Elementary or preparatory	6308 (47.4%)	13653 (45.4%)
Illiterate or acquainted	2716 (20.2%)	5068 (16.8%)
Richest	2783 (20.7%)	6430 (21.4%)
Fourth	2655 (19.8%)	6115 (20.3%)
Middle	2747 (20.5%)	5944 (19.8%)
Second	2603 (19.4%)	5738 (19.1%)
Poorest	2631 (19.6%)	5857 (19.5%)
25–39 years old	7245 (54%)	15825 (52.6%)
40–59 years old	4549 (33.9%)	10657 (35.4%)
60 years or older	1632 (12.2%)	3602 (12.0%)

Table 2 Prevalence of the most reported chronic diseases (2006 and 2010)

2006	Female		Male		The West Bank		The Gaza strip		Total	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%
Among Palestinians aged 25+ in the Occupied Palestinian Territory (the West Bank and the Gaza Strip)										
Chronic disease	2029	30.4	1307	19.4	2374	26.4	962	21.8	3336	24.9
Hypertension	868	13.0	391	5.8	837	9.3	421	9.5	1258	9.4
Diabetes	591	8.8	409	6.1	673	7.5	327	7.4	1000	7.5
Peptic ulcer	244	3.7	160	2.4	339	3.8	66	1.5	405	3.0
Cardiac disease	217	3.2	207	3.1	309	3.4	114	2.6	423	3.2
Cancer	29	0.4	16	0.2	36	0.4	9	0.2	45	0.3
2010										
Chronic disease	4048	27.1	3280	21.7	5042	25.6	2286	22.0	7328	24.4
Hypertension	2000	13.4	1190	7.9	2113	10.7	1077	10.4	3190	10.6
Diabetes	1334	8.9	1109	7.3	1649	8.4	794	7.6	2443	8.1
Peptic ulcer	311	2.1	371	2.5	558	2.8	124	1.2	682	2.3
Cardiac disease	478	3.2	551	3.6	734	3.7	295	2.8	1029	3.4
Cancer	75	0.5	48	0.3	86	0.4	37	0.4	123	0.4

Table 3 Reported chronic disease compared between residents living in refugee camps or not

Reference: living outside the camps	Men 2006 OR; 95% CI	Women 2006 OR; 95% CI	Men 2010 OR; 95% CI	Women 2010 OR; 95% CI
Among Palestinians aged 25+ in the Occupied Palestinian Territory 2006 and 2010 (the West Bank and the Gaza Strip)				
Living in camps not adjusted by SES	1.37; 1.13–1.65	0.99; 0.83–1.18	1.49; 1.29–1.71	1.37; 1.19–1.59
Living in camps adjusted by education	1.36; 1.13–1.64	1.01; 0.84–1.20	1.47; 1.27–1.70	1.37; 1.18–1.58
Living in camps adjusted by wealth	1.39; 1.15–1.67	0.98; 0.83–1.18	1.47; 1.27–1.70	1.33; 1.16–1.54
Living in camps adjusted by employment	1.33; 1.10–1.61	1.00; 0.84–1.20	1.45; 1.25–1.68	1.37; 1.19–1.58

Adjusted by age, marital status, region, smoking; *OR* odds ratio, *CI* confidence interval

residence. Although the OR for each SES category was higher in refugee camps than outside, the pattern of association between SES and reported chronic disease appears to be similar. A social gradient in the prevalence of chronic disease was found in both subpopulations as OR declined by increasing level of education. The trend was similar regardless of living in a refugee camp or not (Table 4). Similar patterns of the association between wealth and chronic disease were seen, with a stepwise higher OR with every lower level of wealth in both subpopulations and with a higher OR among the camp residents (Table 4). Also OR for unemployed was higher compared to employed among men in both subpopulations, although apparently not among women. In both genders the highest OR was estimated among those outside the labour force (Table 4).

Table 4 only presents figures from 2010. Analysing data collected in the 2006 survey resulted in similar results.

Discussion

The main finding of this study is a clear social gradient in self-reported chronic disease in terms of education, wealth and employment status, in the Palestinian population living in the OPT. Those with the lowest level of SES had the largest burden of disease. This pattern of association was similar for Palestinians living in and outside the refugee camps, although the OR of chronic disease was higher in the refugee camps.

The relation between low education and a greater burden of chronic disease was also found in studies from Syria, Iran (Boutayeb et al. 2013), Lebanon (Salame et al. 2014; Zabaneh et al. 2008) and Qatar (Christos et al. 2014).

Regarding employment the highest OR was found among those outside the labour force. However, this result is difficult to interpret, because the category involves many different groups, including those reported to be disabled or being ill, students and retired people. Unemployment being strongly associated with reported chronic disease was also found in a study on the Egyptian labour force and in the

Table 4 Association between SES and reported chronic disease by residence (living in camp or not)

	Men 2010				Women 2010			
	Live in camps		Live outside camps		Live in camps		Live outside camps	
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
Among Palestinians in the Occupied Palestinian Territory (the West Bank and the Gaza Strip) 2010								
Ref.: outside camps and elementary education	25 years+				25 years+			
Illiterate	1.81	1.26–2.60	1.41	1.23–1.61	1.85	1.39–2.46	1.43	1.27–1.61
Elementary education	1.81	1.48–2.21	1		1.34	1.09–1.66	1	
Secondary education	0.89	0.63–1.25	0.72	0.63–0.83	0.87	0.61–1.25	0.69	0.60–0.80
Bachelor or higher edu.	0.79	0.56–1.11	0.73	0.64–0.82	0.77	0.53–1.12	0.43	0.37–0.50
Ref.: Outside camps and richest								
Richest	1.99	1.34–2.97	1		1.56	1.01–2.39	1	
Second richest	1.62	1.20–2.18	1.14	0.99–1.32	1.77	1.30–2.42	1.33	1.16–1.54
Middle level of wealth	1.80	1.34–2.42	1.41	1.22–1.62	1.70	1.26–2.29	1.59	1.38–1.83
Second poorest	2.11	1.58–2.83	1.38	1.19–1.60	2.15	1.59–2.91	1.70	1.47–1.96
Poorest	2.36	1.69–3.29	1.64	1.43–1.90	2.78	2.05–3.75	1.69	1.47–1.95
Ref.: Outside camps and outside labour force	25–65 years				25–65 years			
Outside labour force	1.76	1.21–2.54	1		1.37	1.66–1.61	1	
Unemployed	0.44	0.31–0.63	0.30	0.25–0.36	1.24	0.55–2.79	0.62	0.41–0.94
Employed	0.30	0.24–0.37	0.20	0.17–0.23	0.74	0.46–1.19	0.60	0.52–0.69

Adjusted by age, marital status, region, smoking; *CI* confidence interval

Palestinian population in the OPT (Rocco et al. 2011; Abukhdeir et al. 2013). Another study of the Palestinian Family Survey (women's health questionnaire) from 2010 found that employed women reported better self-rated health than women who were unemployed. As in this study no significant difference between unemployed and employed women in terms of self-reported chronic disease was found in the study by Bates et al. (2017). This difference of the association between employment and, respectively, self-rated health and self-reported chronic disease may be influenced by contextual features, which is further addressed later in this section.

That the poorest participants seemingly have the largest burden of chronic disease is also found in other Middle East studies, for example in studies among Palestinians living in refugee camps in Lebanon (Chaaban et al. 2010). In contrast, some other studies concluded that higher wealth might increase the prevalence of chronic diseases such as diabetes, maybe partly due to a higher detection rate, which has been found in Qatar, defined as a high-income country (Christos et al. 2014).

The similar socio-economic association with reported chronic disease in and outside the refugee camps suggests that SES is an important factor related to chronic disease regardless of residence status. At the same time, for all SES groups the OR of chronic disease was higher among the camp residents than outside the camps, which indicate that features of the camps increase the occurrence of chronic disease in every level of SES. This interpretation is further supported by the fact that even after adjusting for every SES variables, the OR for chronic disease was higher among Palestinians living in refugee camps than among those who lived outside the refugee camps.

The poor household conditions could be an explanation for the higher prevalence of chronic disease reported in the camps, as supported by other studies (Habib et al. 2009; Al-Khatib et al. 2005), as well as it could be explained by being a refugee in general (Abukhdeir et al. 2013). Another reason could be that The United Nations Relief and Works Agency (UNRWA), healthcare provider for Palestinian refugees, has prioritized a screening program of diabetes and hypertension (The United Nations Relief and Works Agency 2014), which raises the awareness, and thereby the reporting of having chronic disease among refugees in comparison with other Palestinians in the West Bank and the Gaza Strip.

Strengths and limitations

The reporting of chronic disease and socio-economic factors was based on data collected by trained staff using the detailed manual of the Multiple Indicators Cluster Survey

(MICS) developed by UNICEF. The survey was also pilot-tested before being implemented. Still, only one member of each household provided information. This might create information bias if the respondent did not have a sufficient knowledge of the other household members, though this would presumably not be related to neither the status of SES or chronic disease, and therefore, at the most it would be a non-differential bias.

Because the data used in the study are self-reported and cross-sectionally collected, no causal relation can be concluded. If the resources were at disposal, a follow-up study over a long period of time would be preferred. Furthermore, the study design would be strengthened if self-reported information on chronic disease and behavioural factors could have been combined with biochemical and physical examinations as suggested by the World Health Organization (2012). A factor relevant to self-reported chronic disease is the participants' knowledge and awareness of the disease. The public largely knows some diseases and associated symptoms, whereas other could be unknown. For example, it is striking that chronic obstructed pulmonary disease wasn't reported, taking into consideration that it is one of the most common types of chronic disease (Daniel 2008) and that the smoking prevalence among Palestinian men is relatively high (Sozmen et al. 2015). Educational status and wealth level are presumably stable variables that present socio-economic positions over a longer period of an individual's lifespan, and they are therefore appropriate variables for this cross-sectional study. However, acts of war, displacement and demolishing of houses could reduce the stability of household wealth. Other measures of poverty could have been considered such as expenditure or income. Unemployment is the most temporary variable. It would have been preferable to segregate the participants in long-time unemployed, recently unemployed and employed people, but this information was not available. Data about other lifestyle factors than smoking as covariates, such as nutrition, overweight, physical activity, would have strengthened the validity of the results. In future Palestinian population survey these indicators could be considered.

Because of the demographic composition of the Palestinian population, the data size was reduced by over a half when restricting the analyses to persons aged 25 years or above, which especially could have affected the analysis focusing on the even smaller sample of those Palestinians living in refugee camps. Furthermore, some of the younger participants may still be undertaking education and therefore their educational potential may be underestimated. If the sample instead was limited to the age of 30 years or above, the proportion of higher educated persons may be larger, but this would have reduced the data size even further.

This study focuses on socio-economic status on an individual level. To reach a deeper understanding of the combined relation between SES, self-reported chronic disease and camp residence, features of the contextual settings could have been included in both the study design and analysis. For example, there is an overall difference in healthcare offers and primary healthcare provider between the Palestinians living in camps (The United Nations Relief and Works Agency) and those outside the camps (Ministry of health). There could be a greater concentration of high quality health care facilities in the areas where the wealthier part of the population resides, providing a greater access to prevention and diagnosing diseases. Furthermore, the relation between employment and chronic disease could be caused by a high degree of stress influenced by cultural norms of being employed or by the lack of a social security if becoming without work income. These are examples of contextual features that could be valuable to include in future studies on the matter.

Conclusion

Each of the three SES measurements, education, employment and wealth, was found to be associated with self-reported chronic disease, with the highest burden on the lowest educated, poorest, those outside the labour force and unemployed men.

When comparing the group of Palestinians living in refugee camp with those outside the camps, the association between SES and self-reported chronic disease was similar; however, the residents in the refugee camps had approximately a 40% higher odds of self-reported chronic disease.

Perspective

Although the mechanisms of association between SES and chronic disease are uncertain, it seems appropriate to consider structures of socio-economic factors when planning chronic disease prevention among the Palestinians, both among those living in a refugee camp and in the rest of the population living in the OPT. Reducing poverty, illiteracy and unemployment would most likely strengthen other efforts against chronic diseases. When planning policies and implementing programs, the focus therefore needs to go beyond the health sector to other settings, such as financial, educational and urban planning.

Furthermore, physical and social features of the Palestinians refugee camps seem to have their own health implications, regardless of the inhabitants' socio-economic status. Acknowledging the interactions between individual and society, future research on the association between

SES and chronic disease could include the social and physical contextual framing.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Informed consent Participants in the study have given an informed consent to participate.

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