

Research Article

Burden of Chronic Diseases in the Palestinian Healthcare Sector Using Disability-Adjusted Life Years (DALY), Palestine

Marwan Mosleh¹, Yousef Aljeesh², Koustuv Dalal¹

¹School of Health Sciences, Orebro University, Sweden

²Associate Professor, Islamic University, Palestine

ABSTRACT

Background: Chronic diseases are considered the greatest public health concern globally, and contributor to a large burden of disease in developed world, and increasing rapidly in developing countries as well as Palestine. Where, Palestine is experiencing an epidemiological transition and a rapid increasing burden of chronic diseases as a consequence of rapid modifications in people behaviors. The Global Burden of Disease (GBD) project has made possible a new methodological approach and conceptual framework to estimate the burden of diseases and other health problems in populations everywhere nationally and globally.

Objective: We quantify the burden of chronic diseases using disability – adjusted life years (DALYs) for 2010 in the Palestinian healthcare sector.

Methodology: In this study, we adapted Global Burden of Diseases (GBD) methodology for measuring the burden of chronic diseases in the main two entities of Palestinian territories, using Disability-Adjusted Life Years (DALYs) measurement. The measurement tools and their standards templates were specially designed for assessing the burden of disease, developed by the World Health Organization (WHO) to estimate and quantify the burden of chronic diseases. The study used secondary data extracted from multiple sources including Ministry of Health (MOH) materials and annual reports about chronic diseases mortalities registered in 2010 and also data about chronic diseases morbidity collected by Palestinian Central Bureau of Statistics (PCBS) Demographic & Health Survey data 2010 (DHS) performed in the West Bank and Gaza Strip.

Results: In 2010, DALYS lost due to selected chronic diseases in the current study were estimated as (60/1000 DALYs) in the West Bank while (57/1000 DALYs) in Gaza Strip respectively, considering that each one DALY is thought of as one lost year of ideal healthy life. Ischemic heart disease (IHD) and hypertension contributed to the highest proportion of DALYs among males and females in 2010 in the West Bank and Gaza strip followed with cancer (lung cancer in males vs. breast cancer in females) and then respiratory disease (COPD) with small difference in rank order. There also were sex and region differences. Heart diseases specifically Ischemic heart disease (IHD) also continued to rank highly as a cause of both YLLs and mortality, followed by cancer among Palestinian populations in both the West Bank and Gaza strip for both sexes in 2010, indicating the major causes of chronic diseases burden in Palestine in 2010.

Conclusion: Our study demonstrates that heart diseases followed with cancer remains the major chronic diseases burden in the Palestinian healthcare sector in the Palestinian territories in both Gaza strip and West bank. Our study recommends that further studies using more recent data are important and needed. Additionally, our study findings indicate the need for basic intervention to tackle these burdens. In general, attention has to be increasingly paid to chronic noncommunicable diseases (NCDs) in the Palestinian territories.

Keywords: Chronic disease; Burden of disease; Disability-adjusted life year; Mortality; Gaza strip; West Bank; Palestinian territories

Introduction

Chronic diseases are known as a major public health concern globally, and contributor to a large burden of diseases in developed countries, and increasing rapidly in developing states [1]. “Chronic diseases, also known as non-communicable diseases (NCDs), are not transmitted from one to one. They are known of long duration and generally slow progression. The four main kinds of chronic NCDs are cardiovascular diseases, cancers, respiratory diseases and also diabetes mellitus [2]. It is by far the first leading cause of mortality [3, 4], representing more than 75% of all deaths worldwide [5]. Chronic diseases are increasing globally and projected to become the major leading causes of both mortality and disability by 2030 [6]. They are

formed a substantial challenge to health system worldwide. By 2020, they will estimate for more than 60% of the global burden of health problems. The increasing burden of chronic illness threatens the ongoing delivering and sustainability of medical care services and health systems as well [7]. Since, the vast majority of cases of chronic disease could be better prevented or managed [8]. About 80% of deaths from chronic NCDs reported in low- and middle-income countries and they are considered as the single greater cause of mortality among people of working age, and their occurrence among adults are substantially greater in the developing countries than in developed states. The major causes of chronic diseases related deaths are cardiovascular disease (30% of total deaths), cancers (about 13%), respiratory illness (7%) and diabetes mellitus about (2% of the total

mortality) [9]. These four types of diseases account for about 82% of all chronic disease mortalities [2]. Chronic diseases became a major public health concern as a consequence of the continuous increase aging of the population [10].

Like other developing countries, Palestine is experiencing a rapid epidemiological transition, with increasing the burden of chronic diseases [11]. Nowadays, Palestinian population has witnessed a remarkable change in lifestyles, nutritional behaviors and environmental conditions [12]. They alone contribute to a substantial proportion of total mortality and magnitude among Palestinian population. For instance, CVDs and diabetes are highly prevalent in the Palestinian society. Tobacco-related cancer account for a large number of all cancers. Tobacco consumption is very common, especially among the poorer. Hypertension and dyslipidemia, although common, and are inadequately detected and treated [11]. It was estimated that nearly two-thirds of elderly Palestinian complains from chronic diseases [13]. Most importantly, the disease is also known as the leading cause of deaths among the adult Palestinian populations as well [14]. In Palestine, insufficient or no complete national data are available in quantity, quality and scope on the burden of chronic NCDs. Only a few or insufficient reports try to address this significant phenomena to public health field in the Palestinian context. During twenty years ago, the population health measurement was given a greater attention by the World Health Organization (WHO) Global Burden of Disease (GBD) programme. Since, the population health metrics still have a significant space of research and improvement [15]. Therefore, this study seeks to explore and quantify the burden of chronic diseases in the Palestinian healthcare sector in order to improve health policy and public health responses in Palestine. In this study we will use Disability Adjusted Life Years (DALY) measurement at a local level in both Gaza strip and West Bank using available data to describe and estimate the health state of the Palestinian population.

The disability-adjusted life year (DALY) is a practical tool of public health field that is widely utilized to estimate and quantifying the burden of disease [16]. Findings from this study will be expected to provide essential and useful information to health care providers, decision and health policy makers in order to develop an appropriate and effective intervention for Palestinian people.

Methods

In this study, we used Global Burden of Diseases (GBD) methodology in order to calculate and estimate the burden of chronic diseases in the Palestinian territories, using Disability-Adjusted Life Years (DALYs) measurement and their templates. The measurement tools and their standards templates were specially designed for assessing the burden of disease, developed by the (WHO) to estimate and quantify the burden of disease by calculating years of life lost due to premature mortality (YLLs), years lived with disability (YLD) and disability-adjusted life years (DALYs). This approach is derived from those updated and developed in the original GBD project. Since, this method is increasingly used by the researchers to estimate and quantify the burden of diseases in different settings worldwide [17]. The DALY was introduced and developed during the 1980-90s. In

1993, the (WHO) and World Bank (WB) in cooperation with School of Public health at Harvard University evaluated the GBD utilizing this crucial measure. Hence, multiple studies were undertaken to calculate the burden of diseases globally and nationally using the DALY measure. This measure is a population-level measure and it assesses the difference between current health status and optimal health at community level among the population locally and globally [15].

In this study, the authors followed this methodology to estimate and quantify the burden and distribution of chronic NCDs in the Palestinian populations (GS and WB) by computing DALYs in terms of causes, sex, place of residence and age group for 2010 statistics.

Data description

In this study, we used two sources of data to measure the burden of chronic diseases in the Palestinian territories because we were interested to make a comparison of both Palestinian contexts. The first secondary data source was about Morbidity and demographics on chronic diseases were extracted from (Demographic and health survey 2010) conducted by the Palestinian Central Bureau of Statistics (PCBS) in 2010, since the survey covered all the Palestinian households who are permanently residence in the Palestine and the data are representative for all regions and localities in both the Gaza strip and the West bank with all locality type (rural, camps and urban) in all Palestinian governorates. The number of households in the sample who were surveyed by (PCBS) in 2010 comprised of about 15,355 (10,027 in the West bank & 5,328 in Gaza strip). Since the sample was allocated proportionally using constructed strata of the regions and the locality type according to the proportion of the population. The survey was designed to gather, analyze, and publish demographic and health data including family planning, fertility, demographics, child and maternal health as well as chronic diseases concerning the Palestinian populations living in the Palestinian Territories [18], whereas the second source of data was about mortality due to chronic diseases. It comprised all mortalities reported by MOH registries due to chronic diseases over the year 2010, since all mortalities were distributed by age groups, sex and residency. Since, the MOH issues reports and materials about mortality statistics and figures by cause for all age groups, sex and residency annually [19, 20].

Calculation of DALY

DALY is recognized as “a measure of overall burden of disease and described as the number of years lost due to ill-health, disability or premature mortality” [21, 22]. DALYs for a specific disease or health problem can be computed as the sum of years of life lost (YLL) related to premature death plus years lost due to disability [YLD] as stated in the equation below [21].

Where, each one estimated DALY is thought of as one lost year of ideal (optimum) healthy life. The sum of these DALYs among population, or disease burden, can be thought of as a measurement of the gap between actual health condition and an ideal (optimum) health condition.

Calculating YLLs and YLD

WHO templates were used in calculation the YLLs and YLD. This is Microsoft Excel spreadsheet templates specially

designed and widely used as a method to quantifying GBD on a national or sub-national level by estimating both YLLs and YLD [23].

YLL calculation

The YLL basically equal the number of deaths multiplied by the standard life expectancy at the age of deaths in year. The formula for YLL is stated as: $YLL=N \times L$

Where, N=number of deaths, L=standard life expectancy at age of death in years.

YLD calculation

We used an updated GBD approach in calculation YLD based on prevalence rather than incidence. $YLD=P \times DW$

Where, P=number of prevalent cases, DW=Disability Weight.

Ethical aspect

Ethical approval was obtained from Palestinian Health Research Council under license No. (PHRC/HC/61/15) The data handling approval was also obtained from Palestinian Central Bureau of Statistics (PCBS) for the use of Micro Data License No. (PLN2015-7-11).

Results

As shown in (Table 1), Ischemic heart disease was ranked the first as the leading cause of both mortality and YLLs (40%, 9.8/1000) from reported chronic diseases in Gaza strip in 2010. Whereas, Cancer was ranked the second as the leading cause of mortality and YLLs (20%, 6.4/1000) respectively, followed by cerebrovascular disease CVD of crude mortality but ranked the fourth of YLLs (13%, 2.9/1000) respectively. Respiratory disease was ranked the fourth of crude mortality but the third of YLLs (10.4%, 3.1/1000) among reported chronic diseases in Gaza strip population for both sexes in 2010. In West Bank, Ischemic heart disease was also found to be the first leading cause of both mortality and YLLs (36.7%, 9.1/1000) respectively from reported chronic diseases in 2010. While, CVA was ranked the second cause of crude mortality but third of YLLs (17.4%, 3.8/1000) respectively. Cancer was found to be the third of crude mortality but the second of YLLs (15.6%, 4.6/1000) respectively. Respiratory disease was the fourth leading cause of both mortality and YLLs (12.1%, 3.5/1000) respectively, from reported chronic diseases among population in the West Bank for both sexes in 2010 (Table 2). The figures

showed that deaths and years life lost due to heart diseases among population were higher in Gaza strip (40%, 9.8/1000) compared with the West bank (36.7%, 9.1/1000) respectively, indicating that heart diseases constituting the main burden of chronic diseases in Palestine (Tables 1 and 2).

Overall, the top leading causes that found to be the most disease burden in 2010 for both sexes in Gaza strip, expressed as a percentage of DALYs, were hypertension (34%), heart disease (32.6%) and cancer (lung cancer among males and breast cancer among females) (13.5%) respectively (Table 3). On the other hand, in the West Bank, the top three causes that account for the most disease burden in 2010 for both sexes in, expressed as a percentage of DALYs, were heart disease (35.2%), hypertension (34%), and respiratory disease (12.2%) respectively (Table 3). As shown in Table 3, heart disease constituted as the most disease burden in the West bank compared with Gaza strip, since it was ranked first in the West bank however ranked second in the Gaza strip. On the other hand, hypertension was ranked first in the Gaza strip but ranked second in the West bank in term of DALYs.

As shown in Table 4 below, the top three causes of YLLs from reported chronic diseases were heart disease, cancer and respiratory disease among both males and females in Gaza strip in 2010. In the West Bank the leading three causes of YLLs were also; heart disease, cancer and respiratory disease among males, while the results found that heart disease, cancer and CVA were the leading cause of YLLs among females for the same year (Table 5). In terms of DALYs, the leading three causes that account for the most disease burden in 2010 by sex in Gaza Strip, expressed as DALYs, were; heart disease, hypertension and cancer among males, whereas, hypertension, heart disease and cancer found to be the most leading causes of DALYs among females in Gaza strip in 2010 (Table 4). In the West bank, the most leading causes of DALYs were heart disease, hypertension and respiratory disease among males whilst, hypertension, heart disease and respiratory disease among females (Table 5). In 2010, DALYs from heart diseases and hypertension were the highest among both males and females in the West bank as well as in Gaza strip, constituting the highest burden of chronic diseases in the Palestinian territories.

Discussion

This study, which used secondary data extracted from health survey 2010 and MOH data to quantify the burden of chronic diseases in Palestinian territories, is an immediate response to the call of epidemiologic assessment of the disease in Palestine.

Table 1: Disease categorize of crude mortality and years life lost (YLL) due to premature mortality of chronic diseases for both sexes, Gaza Strip.

Rank	Cause	Total deaths (per 100,000 people) (%)	Rank	Cause	YLLs (per 1000)
1	Heart diseases (IHD)	72.8 (40.0)	1	Heart diseases (IHD)	9.8
2	Cancer (lung & breast)	36.6 (20.0)	2	Cancer (lung & breast)	6.4
3	Cerebrovascular disease	23.3 (13.0)	3	Respiratory disease (COPD)	3.1
4	Respiratory disease (COPD)	18.9 (10.4)	4	Cerebrovascular disease	2.9
5	Chronic kidney Disease	11.2 (6.2)	5	Chronic kidney Disease	1.5
6	Hypertension	10.5 (5.8)	6	Hypertension	1.3
7	Diabetes Mellitus	8.5 (4.6)	7	Diabetes Mellitus	1.1

Table 2: Disease categorize of crude mortality and years life lost (YLL) due to premature mortality of chronic diseases for both sexes, West Bank.

Rank	Cause	Total deaths (per 100,000 people) (%)	Rank	Cause	YLLs (per 1000)
1	Heart diseases (IHD)	68.4 (36.7)	1	Heart diseases (IHD)	9.1
2	Cerebrovascular disease	32.5 (17.4)	2	Cancer (lung & breast)	4.6
3	Cancer (lung & breast)	29.0 (15.6)	3	Cerebrovascular disease	3.8
4	Respiratory disease (COPD)	22.6 (12.1)	4	Respiratory disease (COPD)	3.5
5	Diabetes Mellitus	15.3 (8.2)	5	Diabetes Mellitus	1.8
6	Chronic kidney Disease	10.3 (5.5)	6	Chronic kidney Disease	1.4
7	Hypertension	8.3 (4.5)	7	Hypertension	0.95

Table 3: Disability-adjusted life years (DALYs) for both sexes, Gaza Strip and West Bank, 2010.

Gaza strip			West Bank		
Rank	Cause	Total DALYs (per 1000 people) %	Rank	Cause	Total DALYs (per 1000 people) %
1	Hypertension	19.4 (34.0)	1	Heart disease (IHD)	21.1 (35.2)
2	Heart disease (IHD)	18.6 (32.6)	2	Hypertension	20.4 (34.0)
3	Cancer (lung & breast)	7.7 (13.5)	3	Respiratory disease (COPD)	7.3 (12.2)
4	Respiratory disease (COPD)	7.2 (12.6)	4	Cancer (lung & breast)	6.32 (10.5)
5	Chronic kidney Disease	2.2 (4.0)	5	Diabetes Mellitus	2.73 (4.5)
6	Diabetes Mellitus	1.9 (3.3)	6	Chronic kidney Disease	2.14 (3.6)
Total		57.0 (100)	Total		60.0 (100)

Table 4: Disease categorize of years life lost (YLL) due to premature mortality and disability-adjusted life years (DALYs) by sex, Gaza Strip.

Rank	Cause	YLLs (per 1000)	Rank	Cause	Total DALYs (per 1000 people)
<i>Males</i>					
1	Heart diseases (IHD)	9.2	1	Heart diseases (IHD)	17.1
2	Cancer (lung)	6.0	2	Hypertension	14.2
3	Respiratory disease	3.0	3	Cancer (lung)	7.5
4	Cerebrovascular disease	2.6	4	Respiratory disease (COPD)	7.2
5	Chronic kidney Disease	1.4	5	Chronic kidney Disease	2.1
6	Hypertension	1.2	6	Diabetes Mellitus	1.7
7	Diabetes Mellitus	1.0			
<i>Females</i>					
1	Heart diseases (IHD)	10.3	1	Hypertension	24.5
2	Cancer (breast)	6.7	2	Heart diseases (IHD)	20.0
3	Respiratory disease	3.2	3	Cancer (breast)	7.7
4	Cerebrovascular disease	3.1	4	Respiratory disease (COPD)	7.03
5	Chronic kidney Disease	1.6	5	Chronic kidney Disease	2.2
6	Hypertension	1.4	6	Diabetes Mellitus	2.0
7	Diabetes Mellitus	1.1			

To the best of authors' knowledge, this is the first study that has tried to use DALYs measurement to assess the burden of chronic diseases in the Palestinian territories. Since, it highlighted the most significant health problem in Palestinian population. Most importantly, this study is considered original, as it is comparing two main different Palestinian entities, the Northern governorates (West Bank) and the Southern governorates (Gaza strip) in terms of burden of chronic diseases using DALYs. The information obtained from this paper is based on different

sources of data which the authors used in order to get the most scientifically accurate figures possible. The outcomes from our study may somewhat differ from other local or international statistics depending on the variations in data sources and approach or methodology used.

Our study demonstrates that Palestinian territories are confronting an increasing burden of chronic diseases particularly heart diseases, cancer and hypertension in term of mortality and DALYs. Since, Palestine is encountering a rapid

Table 5: Disease categorize of years life lost (YLL) due to premature mortality and disability-adjusted life years (DALYs) by sex, West Bank.

Rank	Cause	YLLs (per 1000)	Rank	Cause	Total DALYs (per 1000 people)
<i>Males</i>					
1	Heart diseases (IHD)	10.7			
2	Cancer (lung)	4.2	1	Heart diseases (IHD)	23.4
3	Respiratory disease	3.9	2	Hypertension	15.2
4	Cerebrovascular disease	3.1	3	Respiratory disease	7.40
5	Diabetes Mellitus	1.5	4	Cancer (lung)	5.70
6	Kidney Disease (failure)	1.4	5	Diabetes Mellitus	2.34
7	Hypertension	0.7	6	Chronic kidney Disease	2.24
<i>Females</i>					
		7.4			
1	Heart diseases (IHD)	5.0	1	Hypertension	25.6
2	Cancer (breast)	4.5	2	Heart diseases (IHD)	18.8
3	Cerebrovascular disease	3.0	3	Respiratory disease (COPD)	7.20
4	Respiratory disease	2.1	4	Cancer (breast)	6.94
5	Diabetes Mellitus	1.4	5	Diabetes Mellitus	3.12
6	Chronic kidney Disease	1.2	6	Chronic kidney Disease	2.03
7	Hypertension				

epidemiological transition from infectious diseases to chronic diseases, with highly increasing burden and magnitude of chronic NCDs [11]. Prior literatures elucidate that Palestinian populations showed a great change in their lifestyles, behaviors, nutritional habits and environmental modifications [12]. Where, those factors contribute mostly to a huge proportion of crude mortality and burden of the problem among people in Palestine. CVDs and diabetes for, example are greatly prevalent among population. Interestingly, it was reported that about two-thirds of elderly population in Palestine suffers from chronic diseases [13], indicating that these figures agreed with our findings in this study. The diseases are also known as the mean leading cause of deaths among adults in Palestine [14]. The higher numbers of chronic diseases mortality and DALYs are a clear alarm and warning of the need for immediate strategic intervention and effective management to tackle the epidemic increase of the problem in Palestine. From my point of view, the major challenge for Palestinian health system is tackling the rapid increase of the burden and magnitude of chronic diseases and their risk factors.

Our study provides some interesting findings on the burden of chronic illness which might be important and taken into our account in prioritizing, reorienting and planning of Palestinian health needs. Where, global burden project emphasized that poor of health conditions caused by diseases and disability play an important role in identifying the entire health condition of populations everywhere in the world including low-income and high-income countries [24].

It is worth mentioning that, by identifying the top chronic disease causes of mortality and DALYs, we have to give the practitioners and healthcare providers and other decision – makers with practical guidance for future planning health

decisions and reorientation of health care. Such guidance may contribute in improving of preventive measures, health services and then reducing the risk of chronic diseases and their negative impact on population health and governmental and non-governmental resources.

Our study also shows that the five leading causes of mortality and DALYs for Palestinian population in 2010 were compared with published DALYs evaluation in other low and middle income countries in 2005. All figures indicated that heart disease particularly IHD was the first leading cause of deaths, YLLs and DALYs in Palestinian populations as well as in those developing countries. The findings of our study is consistent with that study conducted in 2005 in twenty three low-income and middle-income countries to estimate the disease burden, mainly heart disease, chronic respiratory disease, cancer and Diabetes. Where, the study demonstrated that IHD, cancer and respiratory chronic disease showed the top three causes that account for the most disease burden in 2010 with small differences in rank order [25].

It is important to explain that the results drawn from our study show that mortality and DALYs indicate that the burden of disease in Palestine arises initially from heart disease and cancer as these diseases were the major causes of lost life years of good health as measured by DALYs, considering the differences between the two entities, where the results showed that the West Bank had slightly a higher figures of DALYs than Gaza strip (60 DALYs per 1000 vs. 57 DALYs per 1000) respectively. Since, each one DALY is thought of as one lost year of optimum healthy life [23]. From my opinion, further studies are important in order to get in-depth understanding the underlying reasons behind that, because the two parts of Palestinian territories have different situation, sociodemographic and political status,

where Food and Agriculture Organization (FAO) of the United Nations (UN), explaining that Gaza strip has a greater level of food insecurity, poorer people and has poorer socioeconomic condition [26]. In terms of the number of (YLLs) due to premature mortality in Palestine, heart disease, hypertension, CVA and respiratory disease were the highest ranking causes in 2010. The results of our study also agree with the figures presented in the MOH annual report 2012 which have shown that heart disease was the top leading cause of deaths in Palestine in 2012, indicating that the heart disease remains the first disease among chronic NCDs disease that account for the most disease burden nowadays [27, 28]. Furthermore, the findings of our study were in agreement with previous study conducted in Eastern Mediterranean Region (EMR), which showed that CVDs were the major cause of disease burden and mortality in the EMR [29]. Other previous studies on the burden of chronic NCDs and mortality which were conducted in Arab countries for the years 1990-2010 revealed that heart diseases mainly IHD ranked the top leading causes of chronic diseases mortality in Arab countries. The results of the study performed in all Arab countries including (Oman, Qatar, Bahrain, Kingdom of Saudi Arabia, United Arab Emirates, Kuwait, Sudan, Algeria, Tunisia, Lebanon, Syria, Jordan, Morocco, Libya, Iraq, Egypt, Somalia, Mauritania, Djibouti, Comoros, Yemen and Occupied Palestinian Territories) are of great importance to be compared with the outcome of our study, demonstrating that Palestinian populations have the same health problems and burden of chronic diseases, indicating that both Arab countries together with Palestinian territories might share the same higher risk factors which requires an immediate response and a greater attention as well as serious collaboration to be paid to this major and significant health issue [30]. Why we compared Palestinian figures with other countries, because by comparing Palestinian conditions in term of chronic diseases against other countries may give us a key insight into public health strengths and weaknesses. Accordingly, we can solve weaknesses, identifying health priorities and enhancing and developing strengths in the health system. Where, a new report by UNRWA published recently in 2014 emphasized that the number of patients diagnosed and detected with chronic diseases is increasing sharply by about 5% a year. This has posed a big challenge for quality healthcare supply, increasing workload for healthcare providers and budget problems for the agency [31]. Most interestingly, the burden of chronic diseases particularly heart diseases reflect their adverse impact on clinics visits, where the MOH reports documented that visiting to chronic diseases care centers have been registered the highest visits among all diseases in the Palestinian territories specially across Gaza strip, which needs more attentions to be paid by decision makers in order to reduce the magnitude of the problem [32]. If no adequate preventive measures, actions and effective efforts are made to tackle the risk of chronic diseases burden, starting with reducing the most common risk factors in Palestinian regions, a lot of resources will be lost from cardiovascular diseases, cancer, respiratory disease, diabetes and other chronic diseases in Palestine. Where, previous literatures indicated that the most common three risk factors that found to be the causing of chronic diseases burden in Palestine are unhealthy diet, obesity or high body-mass index (BMI) and high blood pressure [33]. These risk factors can play an important role in

diseases morbidity, prevalence and could basically constitute a significant portion of DALYs component.

What previous studies provide and what our study adds

A number of previous studies have performed on the burden of diseases in terms of incidence, prevalence and mortality nationally; however, no studies addressed the problems using DALYs measure in the Palestinian territories. Therefore, our study gives a detailed evaluation of the magnitude and impact of most significant health problems in two main Palestinian populations in terms of chronic diseases using a summery health measure, which was not sufficiently addressed in previous literatures.

Limitations and strengths

Although, the interesting results drawn from current study, however, our study has limitations. Since, we used recent data on the chronic diseases prevalence from 2010 survey. It might be possible that the prevalence of diseases have changed since that time to date. Moreover, mortality data in the Palestinian territories may be underreported for some chronic diseases especially for population in Gaza strip. Besides, The DALYs estimated in this paper is developmental and additional data accuracy and completeness for all chronic diseases is needed in further studies. Additionally, comprehensive electronic data registry network on chronic diseases morbidity is unavailable at national level. The possible disadvantage of simply estimating the total burden of diseases as we have performed is that, it may not provide adequate information as to what extent can be preventable or can be managed and avoidable by interventions.

Despite recognizing these limitations in using DALYs we think that it is a useful tool to utilize at local level to estimate the burden of disease in a specific time period as a single measure. Moreover, it also demonstrates the need for further research into approaches for creating and using summery tools of health. Moreover, the main strength of our study, it compares the burden of chronic diseases between Gaza strip and the West Bank and other Arab regions. The data can be used as a baseline and basics for further studies as well as can be useful for health services policy, planning and decision making.

Conclusion

Despite the efforts and interventions programme implemented by several actors in the Palestinian territories, heart diseases and cancer remains a major burden of chronic diseases in Palestine. Accordingly, our study findings suggests the immediate need for basic intervention and more effective practical programmes and activities to tackle the rapid increase of the burden of chronic diseases in the Palestinian territories. These programmes have to be well constructed and adopted to make advantages possible. Finally, further studies are recommended to address such this significant health problems in Palestine.

Acknowledgement

The author would like to thank the Palestinian Health Research Council (PHRC) and the Palestinian Central Bureau

of Statistics (PCBS) for their cooperation. The study has not received any financial support from external sources.

REFERENCES

1. Thandi Puoane, Lungiswa, David Sanders and Whadhiah Parker. Chronic Non-Communicable Diseases. South Africa.
2. World Health Organization (WHO). Non communicable disease. Available from: <http://www.who.int/mediacentre/factsheets/fs355/en/> (accessed in Oct.14 2015 at 01:25 am)
3. World Health Organization (WHO). Chronic diseases and health promotion. Available from: <http://www.who.int/chp/en/> (cited 2015-09-05).
4. World Health Organization (WHO). Chronic Diseases. Available from: http://www.who.int/topics/chronic_diseases/en (cited 2015-09-04).
5. Centers for Disease Control and Prevention (2015) (CDC). CDC Global Noncommunicable Disease (NCDs). Available from: <http://www.cdc.gov/globalhealth/healthprotection/ncd/> (accessed in Oct.14 2015 at 01:31am)
6. Stephanie Lauvergeon, Bernard Burnand and Isabelle Peytremann (2012) Chronic disease management: a qualitative study investigating the barriers, facilitators and incentives perceived by Swiss healthcare stakeholders, 12:176).
7. Grant M Russell, Simone Dabrouge, William Hogg, Robert Geneau, Laura Muldoon et al. (2009). Managing Chronic Disease in Ontario, Primary Care: The Impact of Organizational Factors. Ontario, Canada, Vol.7, No.4).
8. Canadian Family Physician. Use of Chronic disease management tools. Available from: <http://www.ncbi.nlm.gov/pmc/articles/PMC3237522> (cited 5/09/2015).
9. Unwin N and Alberti KG (2006). Chronic non-communicable diseases .Newcastle. UK; 100(5-6):455-64. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16899148> (accessed Oct 14 2015 at 12:24 am).
10. Struijs JN (2008). The future health (care) burden of chronic diseases in the Netherlands (PhD Thesis). Netherlands.
11. Hani Abdeen (2006). Chronic Diseases in Palestine: The Rising Tide: Israeli-Palestinian Public Health Magazine (Bridges). Volume 2, Issue 3.
12. Heidar Abu Ghosh, Jihad Mashal, Nadim Barghuti and Suheil Aqabneh (2007). Diabetes Control in 3 Villages in Palestine: A Community-Based Quality Improvement Intervention. J Ambulatory Care Manage. Vol. 30, No. 1, pp. 74-78.
13. Wafa-Palestinian News & Info Agency. Available from: <http://english.wafa.ps/index.php?action=detail&id=22068> (accessed 6 Oct. 2015).
14. Palestinian Medical Relief Society (PMRS) (2003). Enhancing the Capacity of Primary Healthcare Clinics to Better Manage None-communicable Diseases. Palestine.
15. Dodhia H and Phillips K (2008) Measuring the burden of disease in two London boroughs using Disability Adjusted Life Years (DALYs). London, UK, Vol.30, No.3, pp. 313-321.
16. Brecht D, Arie H and Charline M (2014) Calculating disability-adjusted life years to quantify burden of disease. SSPH+ Swiss.
17. Genova-Maleras R, Alvarez-Martin E and Morant-Ginestar C (2012). Measuring the burden of disease and injury in Spain using disability-adjusted life years (DALYs): An updated and policy-oriented overview. Spain. I024-I03I.
18. Palestinian Central Bureau of Statistics (PCBS) (2016). Palestinian Family Survey 2010. Available from: <http://www.pcbs.gov.ps/PCBS-Metadata-en-v4.2/index.php/catalog/168/study-description> (cited in 10 march 2016).
19. Palestinian Health Information Center- Ministry of Health (MOH) (2011). Annual Health report; West Bank, Palestine.
20. Palestinian Health Information Center- Ministry of Health (MOH) (2011). Annual Health report; Gaza Strip, Palestine.
21. WIKIPEDIA. Disability-adjusted Life Years. Available from: https://en.wikipedia.org/wiki/Disability-adjusted_life_year (accessed 14 Oct 2015).
22. Disabled World. What is Disability Adjusted Life Year (DALY) (2015). Available from: <http://www.disabled-world.com/definitions/daly.php> (accessed 14 Oct 2015)
23. World Health Organization (WHO) (2015). Health statistics and information systems (National tools). Available from: http://www.who.int/healthinfo/global_burden_disease/tools_national/en/ (accessed 14 Oct.2015).
24. Murray C, Lopez A and Jamison D (1994). The global burden of disease (GBD) in 1990: sensitivity analysis, Summary results, and future directions. (WHO). 72, 429-445.
25. Dele OA, Colin DM and Taghreed A (2007). The burden and costs of chronic diseases in low-income and middle-income countries. Lancet; 370:1929-38.
26. Food and Agriculture Organization of the United Nations (FAO) (2015). Nutrition assessment. Available from: <http://www.fao.org/food/nutrition-assessment/nutrition-country-profiles/near-east/palestine/en/> (accessed 18).
27. Ministry of Health (MOH) (2014). Non-communicable disease and risk factors: global epidemics. Ramallah, Palestine.
28. Palestinian Health Information Center- Ministry of Health (MOH) (2012). Annual report -MOH. Palestine.
29. Mousa H, Yousef S and Riccardo F (2010). Hyperglycemia, hypertension and their risk factors in Palestine refugees served by UNRWA. 2010, EMHJ. Vol. 16 No. 6.
30. Lancet. Non-communicable diseases in Arab countries- Lancet. 2014.

31. UNRWA. Annual Health report 2014 (2014) -department of health. Amman, Jordan. p. 37-38.
32. Ministry of Health (MOH) (2013). Annual Health report of primary health care services. Gaza strip-Palestine. p. 11-12.
33. Institute for Health Metrics and Evaluation (IHME) (2010). Global Burden of Diseases, injuries, and Risk Factors Study, Palestine.

ADDRESS FOR CORRESPONDENCE

Marwan Mosleh, M.Sc., PhD Student, School of Health Sciences, Orebro University, Sweden. Email: Marwan.mosleh@oru.se

Submitted: May 27, 2016; Accepted: Jun 08, 2016; Published: Jun 15, 2016