

**Deanship of Graduate Studies
Al- Quds University**



**Impact of Non-fatal Injuries during War on Gaza on the
Quality of Life, Rafah Governorate**

Nedal Ismael Ghuneim

M.P.H. Thesis

Jerusalem – Palestine

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A thesis Submitted in Partial fulfillment of requirements for
the degree of Master of Public Health
School of Public Health – Gaza, Al-Quds University

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Al Quds University
Deanship of Graduate Studies
Master of Public Health



Thesis Approval

Impact of Non-fatal Injuries during War on Gaza on the Quality of Life, Rafah Governorate

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Dedication

This study is dedicated to the spirit of my father, which enlightened my way.

To my mother who has been a source of encouragement and inspiration to me throughout my life.

To my wife, my children with gratitude for their unfailing enthusiasm patience and support.

I also will never forget to dedicate this study to the happiness, health, and welfare of my brothers and sisters especially Nahed.

To my uncle and aunt for their support.

Nedal Ghuneim

Declaration

I certify that this thesis submitted for the degree of Master, is the result of my own research, except where otherwise acknowledged, and that this study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed

Nedal Ismail Ghuneim

Date:

Acknowledgement

Praise and thanks are due to Allah the most beneficent and merciful who has helped me to accomplish this research.

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Abstract

On 27 December 2008, the Israeli Army began the "Cast Lead" Operation against the Gaza Strip which resulted in more than 1400 martyrs and more than 5000 injuries. This study aims to assess the consequences of non-fatal injuries during the last War on Gaza on the quality of life of the injured. A cross-sectional study was conducted in Rafah Governorate which had been directly affected by the war. All persons with non-fatal injuries were enrolled in this study. A total of 321 injured completed the self-constructed questionnaire based on Short Form SF-36 items questionnaire with 36 questions, which measure eight sub-scales aggregated together to construct two main summary measures, physical (PCS) and mental (MCS) component summary measures. Demographic information, history of injuries and other relevant information were also collected. The response rate was 100%.

Finding revealed that the majority of the injured were male (78.2%) in their productive age, who's were internally displaced (53.9 %), and mostly injured during the first week of the war (55.5%). Almost (77 %) were injured as a result of bombardment and wounded by fragments. The War on Gaza resulted in low QOL level for the population on all outcomes, compared with other normal populations. The highest scores were for Physical functioning (mean: 73.77) and the lowest for Emotional well being (mean: 60.14). The study concluded that older age groups, low educated and economically disadvantaged were associated with poorer QOL. Injuries caused by other than bombardment, fragments and injuries which are not severe in nature were associated with significantly higher QOL (By increasing the severity the QOL decreased).

As the level of QOL for emotional well being was the lowest among all scores, so there is a need for an increase of mental health services and facilities to care for these people. There should be an increase of trained mental health care professionals and mental health education programs in psychosocial aspects and social support to assist in lowering the impact of injuries. The first aid for those should be carried out at PHC level, according to international standards and to the MOH plan. Further studies of Palestinians population and their QOL were suggested to identify the normal level of QOL in Palestine.

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List of abbreviations

ADL	Activities of Daily Living
AIP	Amnesty International Publications
AIP	Amnesty International Publications
AJPH	American Journal of Public Health
B.C.	Before Century
BEU	Behavioral Epidemiology Unit
BMC	BioMed Central
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
DIME	Dense inert metal explosive
DU	Depleted uranium
DUEP	Depleted Uranium Education Project
DWI	Dirty War Index
EGH	European Gaza Hospital
EMRO	Eastern Mediterranean Region
GCs	Geneva Conventions
HIV	Human Immunodeficiency Virus
HRQOL	Health-related quality of life
ICCPR	International covenant on civil and political rights
ICD-10	International Statistical Classification of Diseases and Related Health Problems, Tenth Revision
ICF	The International Classification of Functioning
ICIDH	International Classification of Impairments, Disabilities and Handicaps
ICRC	International Committee of the Red Cross
IHL	International humanitarian law
JECH	Journal of Epidemiology and Community Health
MCS	Mental Component Summary
MOH	Ministry of Health
MOS SF-12	Medical Outcome Study Short Form-12
MOS SF-36	Medical Outcome Study Short Form-36
NBS	Norm-based scoring
NEJM	New England Journal of Medicine

NSFHS	National Survey of Functional Health Status
OPT	Occupied Palestinian Territories
OUP	Oxford University Press
PCBS	Palestinian central bureau of statistics
PCS	Physical Component Summary
PRO	Patient Reported Outcomes
RAND	Research ANd Development Corporation
RDD	Radiological dispersion device
SALW	Small arms and light weapons
SJP	Scandinavian Journal of Public Health
UK	United Kingdom
UN	United Nation
US	United State
USSR	Union of Soviet Socialist Republics
WHO	World Health Organization
WP	White phosphorus

Chapter one

Introduction

Chapter One

1 Introduction

1.1 Background

War has a catastrophic effect on the health and well being of nations. Throughout time, the casualties of war have transcended all geographical, ethnic, and cultural boundaries. Although the methods of warfare have changed, the injuries that result have remained constant over time (Pare and Johnson as cited in Christoph, 2005). Violence has been identified as a pandemic by the World Health Organization (WHO, 1996). Weapons, and particularly firearms, play a significant role in violence in countries which are engaged in military conflicts (ICRC, 1999) as well as countries which are considered peaceful. The use of weapons against people or targets containing people inevitably has a direct impact on the health of those people. This impact is related to factors dependent on the type of weapons and on their use. Factors dependent on the user, such as discipline and desire to avoid or injure civilians, determine the number and kind of people injured and may, in the case of bullets, determine the pattern of injury "which part of the body is injured". This century has seen an increased proportion of civilians injured during wars. This is usually ascribed to military weapons passing into the hands of those with no respect for the civilian population or the Fourth Geneva Convention, which protects civilians (Coupland and Samnegaard, 1999). The 20th century already stands out as the most productive and destructive century on record. No other comes close to it in terms of social progress - in the education, health, and wealth it has provided for the population. Yet it is also evident that no other century on record equals the 20th in uncivilized civil violence, in the number of conflicts waged the hordes of refugees created, the millions of people killed in wars, and the vast expenditures for "defense" (Sivard and Lumpe, 1996). This modern century has already been responsible for 250 wars and 109,746,000 war-related deaths, a number somewhat larger than the total current population of France, Belgium, the Netherlands, and the four Scandinavian countries (Denmark, Finland, Norway, and Sweden). Since mid-century, wars have become more frequent and much more deadly. There have been six times as many deaths per war in the 20th century as in the 19th (Sivard and Lumpe, 1996). Technological advances have transferred wars from the battlefield to the civilian world. In addition, we are seeing a different discourse on the impact of war, referring not only to physical wounds but also psychological wounds of combatants, civilians and their children

(Masalha, 2003). War has an enormous and tragic impact – both directly and indirectly- on public health. It accounts for more death, maim and disability than many major diseases. Fatal and non-fatal injury, as well as long-term disability and psychological trauma are major health related effects of the war on civilian populations. Death as a result of wars is simply the "tip of the iceberg". Other consequences, besides death, are not well documented. They include poverty, malnutrition, disability, economic and social decline, to mention only a few (Murthy and Lakshminarayana, 2006).

Approximately, 90% of all deaths related to recent wars were among civilians including long-term physical and psychological effects. War destroys families, communities, and sometimes whole cultures, causing damage to the social fabric of society, displacement of people, damage to the environment (Levy, 2002). It directs scarce resources away from health and other human services, and often destroys the infrastructure for these services... despite all of the effects of war (Benjamine, 2007).

For many decades outcome assessment in medicine has focused on mortality, morbidity and, more recently, on health status. Although necessary and valuable, such outcome measures do not reflect patients' health-related quality of life (HRQOL). Quality of life (QOL) is a descriptive term that refers to people's emotional, social and physical wellbeing, and their ability to function in the ordinary tasks of living (Donald, 2003). QOL issues have become steadily more important in health care practice and research. QOL was identified as a construct that can highlight the health outcomes of excessive exposure to violence. QOL analyses are particularly helpful for: Investigating the social, emotional and physical effects of treatments and disease processes on people's daily lives; Analyzing the effects of treatment or disease from the patient's perspective; and Determining the need for social, emotional and physical support during illness (Donald, 2003). In public health and in medicine, the concept of health-related quality of life refers to a person or group's perceived physical and mental health over time and it has several dimensions. Physicians have often used HRQOL to measure the effects of chronic illness on their patients in order to improve understand how an illness interferes with a person's day-to-day life. Similarly, public health professionals use HRQOL to measure the effects of numerous disorders, short- and long-term disabilities, and diseases in different populations. Tracking HRQOL in different populations can identify subgroups with poor physical or mental health and can help guide policies or interventions to improve their health.

In the context of the occupied Palestinian territories (OPT), QOL measures offer the opportunity for a deeper understanding of the impact of protracted conflict on population's health. Our people are poor and their quality of life is low. Measuring HRQOL can help determine the burden of preventable diseases, injuries, and disabilities.

At 11.30am on 27 December 2008, Israeli forces began a devastating bombing campaign on the Gaza Strip codenamed Operation "Cast Lead". Hundreds of Palestinians were killed within the first five minutes, and hundreds wounded. In the following days, the military continued the aerial bombing and artillery shelling of buildings and sites (B'tselem, 2009). During the aggression the civilian population suffered enormously along 23 days. What happened in Gaza was beyond imagination, against the loss of 10 Israeli soldiers and four civilians, more than 1,380 Palestinians have been killed; 5380 people were injured; around 10% of the population have been displaced by the fighting; 100,000 people were left homeless out of a population of 1.5 million; 4,000 homes have been totally destroyed, and 21,000 suffered serious damage as stated by WHO (MOH as cited in WHO, 2009). According to Amnesty Report^{1,2} ... Palestinians had been killed, including some 300 children and hundreds of other unarmed civilians, and large areas of Gaza had been razed to the ground, leaving many thousands homeless and the already dire economy in ruins. Thousands of civilian homes, businesses and public buildings were destroyed (Amnesty, 2009, pp. 1-2).

War of such intensity can leave no inhabitants untouched, though some were harmed far more than others. Such traumatic, often life-threatening events have been reported to be the main factor predicting posttraumatic stress disorder. The head of the United Nations (UN) Mission in Gaza declared that excessive use of force resulted in injury rather than death, and constitutes violations of the principle of non-discrimination in the ICCPR (article 2) as well as under Article 27 of the Fourth Geneva Convention. And the risks it posed to the civilian population and civilian objects in the area under attack were excessive in relation to the specific military advantages sought (Goldstone, 2009).

As a part of the Gaza strip, the Rafah Governorate in the south of the Strip took its portion during the war on Gaza. Rafah has been ravaged by wars and several Israeli invasions during the last few years. The civilian population has suffered uncounted traumatic events, such as a bombing, torture, killings, persecution, and many other adverse life circumstances that usually accompany armed conflict. At the same time, the conflict has

resulted in periodic mass displacement of the population. The total displacement was mainly on the side of the border with Egypt which is considered as a high density area where most of the War takes place.

1.2 Problem Statement

WHO declared that the areas of the world with the highest number of war-related deaths were Africa and the Eastern Mediterranean region (WHO, 2004). Every Israeli aggression was aimed to maximize casualties among our unprotected civilian population and that was very clear and obvious during the last War on Gaza. One Israeli squad leader who fought in Gaza during War on Gaza reported that he argued with his commander over the permissive rules of engagement that allowed the clearing out of houses by shooting without warning the residents beforehand. After the orders were changed, the squad leader's soldiers complained that "we should kill everyone there (in the center of Gaza). Everyone there is a terrorist" (Harel, 2009, 01 jan.). An Israeli company commander in a security briefing to soldiers during Operation "Cast Lead" is reported to have said that "I want aggressiveness – if there's someone suspicious on the upper floor of a house, we'll shell it. If we have suspicions about a house, we'll take it down. There will be no hesitation... Nobody will deliberate – let the mistakes be over their lives, not ours" (Israeli Channel 10 TV, 21 March 2009 as cited in AIP, 2009). Some military leaders may find it more advantageous to wound rather than to kill enemy personnel, military or civilian, since the opponents must then consume valuable resources to take care of their wounded (Victor, 1995). Dr. Sh'hadeh one of the surgeon working in El-Najjar hospital reported that he found rounded serrated metal segmentations like a saw in the almost amputated thigh of one injured during the war (Sh'hadeh, July 2009, Private communication). The last War on Gaza left a huge number of injuries which were beyond imagination. Indeed, we can determine the magnitude of the War on Gaza by examining not only death, but also injuries and disability as a result of the War on Gaza.

Analysis of HRQOL surveillance data can identify subgroups with relatively poor perceived health and help to guide interventions to improve their situations and avert more serious consequences. Interpretation and publication of these data can garner support for health policies and legislation, help to allocate resources based on unmet needs, guide the development of strategic plans, and monitor the effectiveness of broad community interventions.

In Palestinian society there is insufficient interest in these injuries at the national level. The Ministry Of Health (MOH) to date still lacks the needed information about the injured. There is also a lack of follow up of the injured, and a lack of tertiary prevention and rehabilitation institutions. Given this general insufficient attention to the injured, it becomes necessary to assess their status, their problems and their needs in order to plan for their care and their rehabilitation.

1.3 Justification of the study

War is gory, not glory. War has a profound impact on human health. Direct consequences of war include injury, illness, disability, and death, often affecting civilians. The indirect consequences of war can be as serious and widespread as the direct consequences, and all worsen public health. It is believed that, on average ten civilians are injured for every person killed (Coupland and Tabak, 2005). The use of weapons with intent to cause physical harm can be analyzed in terms of health because, ultimately, it affects people's physical, psychological or social well-being.

The Palestinians' tragic and painful experiences of recurrent wars by the Israeli Army recognize our people as major victims of war, and our conflict with the Israeli state unlikely to end in the near future. The war is very intractable and the threat or fear of harm continues to be expected by everyone, and is real. Even the intervals between the wars have not been filled by peace but by bombs, raids, assassination policy and which continue to increase the number of casualties. So Palestinians must know that immediately after a post war episode, are also at a high risk of a future war, which can lead to an increase in the number of wounded civilians. As has been noted during the last war on Gaza Strip, the surprise elements played an important role in the determining the high number of civilian casualties, and this should be remembered as a future lesson to learn not as a part of the past. It is important to tally the negative consequences of war on health, including finding out who is disabled, their future needs and their quality of life. There is a need to collect such information periodically, because the wars are periodic, and there are insufficient records and documented data about injured and their complications. Palestinians need to be prepared for future wars by having understood the effects of previous wars on the population. To better quantify the health consequences of armed conflict and better forecasts the effects of war, Palestinians need more reliable data than what is currently available, in order to make the problem accessible and visible to policy makers and other

key actors. This is needed in order to ensure that appropriate strategies are developed for prevention, treatment and rehabilitation.

1.4 Aim of the Study

This study aims to assess the consequences of non-fatal injuries during the War on Gaza December 27, 2008 – January 18, 2009 on the quality of life of the injured in order to inform policy and implement interventions aimed at improving the health and quality of life of the injured.

1.5 General objective

To examine the impact of non-fatal injuries during last War on Gaza on quality of life.

1.6 Specific objectives

1. To determine the characteristics of war-related injuries.
2. To determine the overall level of QOL among study population and compare it with other populations
3. To identify if there is a relation between QOL and socio-demographic characteristics of the study population.
4. To assess relationship between QOL and place of injury, severity of injury, and of mechanism of injury
5. To identify subgroups with relatively poor perceived health and help to guide interventions to improve their situations and avert more serious consequences.

1.7 Research questions

1. What is the overall level of QOL among the injured during War on Gaza?
2. What is the consequence of non-fatal war related injuries on physical functioning?
3. What is the consequence of non-fatal war related injuries on mental functioning?
4. Is there an association between QOL and socio-demographic characteristics?
5. Is the outcome of the war among Palestinians similar to those in other countries?

1.8 Demographic context

The Palestinian region stretches from Ras Al-Naqoura in the north to Rafah in the south. The entire area of Palestine is about 27000 sq. /km, including Tabaria, El-Hula lakes and half of the area of Dead Sea. The Palestinians of today, who call themselves Palestinian Arabs, are Muslims and Christians. According to the Palestinian Central Bureau of Statistics, the total area is 6.020 sq km with total population living in is 3.767.126 individuals in 2007 with capita per sq km 626 (PCBS, 2009).

The Gaza Strip is a very narrow territory extending from the northern Sinai Peninsula into Palestine's Mediterranean coastal plain. The Gaza strip is a very crowded place with an area of 378 sq km of the total Palestinian territory land. The Gaza Strip has a population of 1.416.543 people (PCBS. 2009). Population density is very high, at 3747 inhabitants per sq km. Gaza's population is divided into categories according to residential status indigenous Gazans, permanently settled refugees, and residents of refugee camp. Indigenous Gazans compose only 32% of the area's total population, with the rest being refugees of the 1948 and 1967 wars with Israel (PCBS 2009). The Gaza Strip has an extremely high population growth rate of over 5%, and as a result some 60% of the population is under the age of 15. Economically, the Gaza Strip continues to be dependent on the Israeli Occupation State, which is considered as its primary trading partner and was also the foremost provider of employment for Gazans up till 2000 and especially since the strict siege which began in 2006.

Rafah is a Palestinian city in the southern part of Gaza Strip, and also extends into the Sinai Peninsula in Egypt. Located about 30 kilometers south of Gaza. Rafah is the site of the Rafah Border Crossing, the only crossing between the Gaza Strip and Egypt. According to the peace treaty between Egypt and Israel at Camp David in 1982, Rafah was divided into two parts: One part was assigned to Egypt, the other part to the Gaza Strip (Palestine). In a 2007 census by the Palestinian Central Bureau of Statistics (PCBS), Rafah and its adjacent camp had a combined population of 173.372 which constitute 12.2% of the total population in Gaza Strip. Refugees made up 67.9% of the entire population. Gender distribution was 50.4% male and 49.6% female (PCBS, 2009).

1.9 Political context

Under the Ottoman Turks in 1914, Palestine's population was composed of 634000 Muslim and Christian Arabs and 55000 Jews who had immigrated from Europe, mainly from Russia. Immediately after the publication of the Balfor Declaration in 1917, disturbances took place between Jews and Arabs in Palestine. The United Nation Assembly voted on 29 November 1947, supports the partition of Palestine into two states (one Arab and one Jewish), with Jerusalem to be under international control. The Zionists agreed to the partition plan and established an Israeli state in May 1948, although more land than was stipulated for by the UN was taken away from Palestinians. Since then the area was entered into multiple wars which have not ended till now. These wars are:

First war: In 1947 after the Zionist settlers declared independence in 1948, Egypt, Transjordan (now Jordan) and Syria entered Palestine. The new Israeli army captured some of the territory awarded to the Arabs in the UN Partition agreement. The Egyptians captured the Gaza strip. The West Bank was annexed to Hashemite Kingdom of Jordan.

Second war: In 1956 there was a second war between Israel and Egypt assisted by Britain and France who were trying to regain control of the Suez Canal (which had been nationalized by Jamal Abdel Nasser). The Israelis were made to withdraw by the UN.

Third war: Another war in 1967 resulted in the capture of the West Bank from Jordan, the Gaza strip, Sinai and the banks of the Canal from Egypt, and Golan heights from Syria.

Fourth war: After the fourth war in 1973 the Sinai and the banks of the Canal were returned to Egypt following a peace agreement - and the Canal reopened.

Fifth war: In 1982 Israel invaded Lebanon and controlled the Southern area for many years, but has withdrawn since then.

Sixth war (2002-3): Israeli forces invaded the occupied Palestinian territory looking for organizations that train martyred guerrillas, who execute operations in the Israeli area. These invasions in turn encouraged more Palestinians to prepare themselves for martyred attacks. The Sharon government started to build a wall to separate the Occupied Territories from Israel.

In August 2005 Israel evacuated its settlers from the occupied Gaza strip, which included all existing Israeli settlements (22) and the occupied Northern area of West Bank with existing Israeli settlements (4). In reality, the Israeli unilateral disengagement imposed huge prison conditions for the Palestinian people, introduced by Israeli government for the first time in modern world. This is the newest and most dangerous reoccupation of people with disavowal of their rights and the entitlement to live with self determination in their occupied land. In addition, these Israeli activities violate the UN human rights convention and UN decisions.

2006 War: Ariel Sharon left office after a stroke in January 2006. The Palestinians elected a government composed of Hamas which declared that it would not recognize the right of Israel to exist. A group of guerrillas entered Israel through a tunnel in June 2006 and took an Israeli soldier as prisoner of war. Israel then invaded the Gaza strip again and bombed various buildings. The war continues, endlessly, at the same time as a war in Lebanon erupted in July 2006.

December 2008: Another war broke out at the end of December. Israeli air forces bombed Gaza city and destroyed many buildings and killed several hundred people. They claimed they were retaliating for rockets fired into Israel, by Hamas supporters (who had seized power within the Gaza Strip). After a few days Israeli forces entered the Strip with tanks (MOH as cited at WHO, 2009).

1.10 Health care system

In principle, the Ministry of Health (MOH) has the prime responsibility for the health of the entire population, The MOH is the health authority responsible for supervision, regulation, licensure, and control of the whole health services. The MOH provides both primary and secondary health services and purchases tertiary services from private providers domestically and abroad. (MOH, 2001)

The MOH is working with other health sectors in providing the primary health services mainly with UNRWA, and NGOs sector. At the end of 2005, there are 654 PHC centers in Palestine; these centers are cared for about 3.7 million people (129 centers in Gaza and 525 centers in West Bank). Classification of PHC according to providers shows that, the MOH is considered the main provider with 63.6% from the total PHC

centers, followed by the NGOs with 28.3%, then UNRWA with 8.1%. It is worth to mention that, Private sector plays an important role in providing PHC services to Palestinian people but, there is limited information about these centers. The average ratio of persons per center was 5,752 (10,774 in Gaza Strip and 4,519 in West Bank). The Number of PHC centers per 10,000 persons was 1.7 in 2005 while it was 1.9 in 2000 (MOH, 2006).

In Rafah Governorate, the Ministry of Health (MOH) has the prime responsibility for the health of the entire population through its Primary Health Care (PHC) centers and El-Najjar hospital, the only hospital in the Rafah Governorate. The hospital was constituted after the uprising of the Intifada 2000. Initially the place where the hospital constituted was one of the PHC centers. And therefore the center was transformed into the hospital according to the immerge situation. The hospital offers accessible and affordable health services for all Palestinians in the Governorate.

According to WHO report "During the War on Gaza 1380 Palestinians were killed, of whom 431 were children and 112 women. At least 5380 people were injured, including 1872 children and 800 women. Among the casualties, 16 health staff were killed and 25 injured while on-duty. Injuries were often multiple traumas with head injuries, thorax and abdominal wounds. Israeli fatalities were 14, and 183 were injured. Vital infrastructure has been compromised or destroyed, resulting in a lack of shelter and energy sources, deterioration of water and sanitation services, food insecurity and overcrowding. An estimated 100 000 people were newly displaced; 49 693 of them were residing in 50 shelters organized by United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), the remaining being sheltered with host families. Fifteen hospitals and 41 primary health care (PHC) clinics in the Strip were damaged during the strike. Twenty-nine ambulances were damaged or destroyed. 21 out of 56 Ministry of Health (MoH) and three out of 17 UNRWA PHC centres were closed during part or all of the period of the crisis. Access to health care was severely restricted and hampered by security constraints. Maternal and child health services at PHC level were disrupted. Despite the critical conditions, maternity assistance for normal deliveries was provided as well as specialized health care for obstetric and neonatal complications, though many times in improvised settings within health facilities where maternity wards and operating theatres were transformed into trauma units. The consequences are unclear in terms of maternal and child morbidity and mortality among the 3500 deliveries that were expected to have taken place during the 23 days of military operations. Findings from a recent UNFPA assessment indicate that, during that period, there was an increased number in miscarriage cases in the surveyed hospitals (Shifa, Al Aqsa, Naser, Rafah) and an increased neonatal mortality in Shifa Hospital, in Gaza City. Specific concerns exist for the chronically sick. It is estimated that, during the military operation, 40% of the chronically ill interrupted their treatment. These concerns were exacerbated by the

virtual halt of referrals of ordinary patients outside Gaza as life-threatening injuries had a higher priority in an overwhelmed system. Elective surgery and non-urgent routine medical interventions were delayed or interrupted during the crisis. This indicates that a growing number of patients, mainly with chronic conditions, are awaiting treatment (WHO, 2009)

Chapter two

Literature review

Chapter Two

2 Literature review

2.1 Wars through history

Wars have been affecting humans' lives before recorded history. Back in prehistory, weapons were found buried with fighters and bones showed signs of wounds (WHO, 2007). Oppenheim defined war as a contention between two or more states through their armed forces, for the purpose of overpowering each other and imposing such conditions of peace as the victor pleases. (Oppenheim as cited by Dinstein, 2005). The definition of war given by Grotius was that war is the state or condition of governments contending by force. The Grotius's definition is more acceptable than Oppenheim because he used the word "governments" and not "states", because the laws of war belong equally to insurgents not yet recognized as a state but recognized as having belligerent rights, which they could not be if they did not possess a government (University of California, 1913).

War by definition is risky and hazardous. That is one of the reasons that the outcome of a war, once started, is unforeseeable and that, therefore, war is a basically irrational means of settling conflicts. That is why right-thinking people all over the world repudiate and abhor aggressive wars. It is an essence of war that one or the other side must lose. Indeed, experienced generals and statesmen knew this when they drafted the rules and customs of land warfare (Farben and Krupp 1949).

Armed conflict between warring states and groups within states have been major causes of ill health and mortality for most of human history. Worldwide, there were over 45 million deaths among military personnel during the twentieth century—a mean annual military death rate of 183 deaths per 1 million population. This rate was more than sixteen times greater than the reported rate for the nineteenth century, despite enormous progress in surgical treatment of war injuries and in the prevention and treatment of infectious diseases. In addition, since an increasing percentage of wars are civil wars or are indiscriminate in the use of weapons, civilians are increasingly caught in the crossfire. The proportion of civilian war related deaths has increased from 19% in World War I (Elmore-Meegan, 1993), 48% in World War II (Garfield, 1991), to more than 80% in the 1990s (Aboutanos, 1997). Studies have shown that conflict situations cause more mortality and

disability than any major disease. Moreover, during civil wars civilians may find it difficult to receive medical care and may be unable to obtain adequate and safe food and water, shelter, medicinal care, and public health services. The physical, mental, and social impacts of war on civilians are especially severe for vulnerable populations, including women, children, the elderly, the ill, and the disabled. Further, war is responsible for many million refugees and internally displaced persons. In this context I think that improved collaboration between political scientists and experts in public health would benefit measurement, prediction, and prevention of conflict related death.

"Academic institutions and independent organizations such as Project Ploughshares have agreed to define an armed conflict as a "political conflict in which armed combat involves the armed forces of at least one state (or one or more armed factions seeking to gain control of all or part of the state), and in which at least 1000 people have been killed by the fighting during the course of the conflict" albeit not all wars have political label. While the international community spent much of 2002 deciding whether or not to start a new war in Iraq, 37 other armed conflicts were already underway, directly affecting the lives of millions of men, women, and children in 29 countries. The total number of armed conflicts remained unchanged from the previous year (the 2001 total of 37 conflicts in 30 countries was a 10 per cent drop from the 2000 totals), and in the majority of the 2002 conflicts the intensity declined or was unchanged. Although armed conflict is a worldwide phenomenon, some regions are more affected than others. In 2002 the Middle East and Africa were the most war-torn regions, with more than one-quarter of the countries in each region (29 and 28 per cent respectively) hosting armed conflicts on their territory. In 2003, there were 36 armed conflicts in 28 countries around the world. Of those, 23 had been fought for more than 10 years and eight for more than 25 years. The Iraq invasion was the only international war in 2003. War and conflicts are directly related to the level of economic and human development. Almost half (47%) of the countries in the bottom third of the human development index (HDI) ranking in 2003 were at war in the past 10 years. But only 5% of states in the top third were at war in the same period" (Project Ploughshares 2003).

In fact, William Foege's study on arms and public health claims that throughout history infectious diseases have killed more soldiers than have weapons. While today's soldiers are less likely to die from war-related diseases, their effects on civilian populations living in wartime remain a serious concern.(Student Pugwash, 1997). The international community recognizes the need to protect civilians in war. However, new programs to strengthen public health often encounter difficulties in times of conflict. With modern developments in technology and growing interdependence among nations, the link between disease and war is a matter of global concern.

Despite the size of the health consequences, military conflict has not received the same attention from public health research and policy as many other causes of illness and death. In contrast, political scientists have long studied the causes of war for a long time but have primarily been interested in the decision of elite groups to go to war, not in human death and misery (Murray, King, Lopez, Tomijima and Krug, 2002). Armed conflict has been a major cause of ill health and death throughout history but has not received the same attention from public health practitioners and researchers as other causes of illness.

Historically, most research on wars focused on battlefield casualties among military personnel and on the acute destruction of physical infrastructure for purposes of military planning. More recently, however, particularly since the Second World War, data have been extended to study the effects of warfare on morbidity and mortality among the civilian population (Garfield and Neugut, 1991).

2.2 Types of weapons

One of the most tragic manifestations of the post cold war world is the proliferation of weapons. One consequence of the change in the scope and nature of conflicts is that far greater numbers of non-combatants are being directly and indirectly injured, maimed, and killed by weapons that used to be thought of as weapons of war, to be directed against combatants. The study by Coupland shows starkly that innocent non-combatants are increasingly both victims and targets of all types of weapons, not just light arms but also landmines, and, importantly, fragmentation munitions (Coupland and Samnegaard, 1999).

Prevention of war and, if war is initiated, lessening of its health consequences require reduction or elimination of weapons. The main types of weapons are described below (Wikipedia, 2009):

2.2.1 Nuclear weapons are an explosive device that derives its destructive force from nuclear reactions, either fission or a combination of fission and fusion. The nuclear bombs detonated over Japan in 1945 each had an explosive force equivalent to about 15,000 tons of TNT. Each killed or fatally wounded about 100,000 people and caused additional thousands of injuries and illnesses from the blast, heat, and radiation. The nations known to possess stock-piles of nuclear weapons are the US, Russian Federation, China, UK, France, India, Pakistan and Israel. There are still approximately 34,000 nuclear weapons in these

eight stockpiles combined, with an estimated explosive yield of 650,000 Hiroshima-sized bombs.

2.2.2 Radiological weapons or radiological dispersion device (RDD) is any weapon that is designed to spread radioactive material with the intent to kill, and cause disruption upon a city or nation. Depleted uranium, a toxic and radioactive material, has been used as a shell casing in recent years because of its density and pyrophoric qualities (igniting spontaneously on contact with air).

2.2.3 Chemical weapons are classified as weapons of mass destruction by the United Nations, and their production and stockpiling was outlawed by the Chemical Weapons Convention of 1993. It prohibits all development, production, acquisition, stockpiling, transfer, and use of chemical weapons. The serious toxic effects of chemical weapons can include permanent disability and death. In 1994 and 1995, terrorist attacks using sarin gas in the underground railways of two Japanese cities caused 19 deaths and many serious injuries.

2.2.4 Biological weapons, also known as germ warfare, is the use of pathogens such as viruses, bacteria, other disease-causing biological agents, or the toxins produced by them as biological weapons. A biological weapon may be intended to kill, incapacitate, or seriously impair a person, group of people, or even an entire population. They are designed to cause disease, disability, and death in humans or animals. The 1975 Biological Weapons Convention prohibits the development, production, stockpiling, retention, and acquisition of biological agents or toxins of any type or quantity that do not have protective, medical, or other peaceful purposes, and of any weapons or means of delivery for them.

2.2.5 Anti-personnel mines are a form of mines designed for use against humans as opposed to anti-tank mines, which are designed for use against vehicles. Anti-personnel landmines have been called ‘weapons of mass destruction, one person at a time’. Civilians are the most likely to be injured or killed by landmines, which have been inserted into the ground of many nations.

2.2.6 Small arms and light weapons "SALW": SALW include all arms that can be used by one person alone and all associated ammunition. SALW is a term used in arms control protocols to refer to two main classes of weapons:

Small arms: hand-held small caliber firearms, usually consisting of handguns, rifles, shotguns, manual, semi-automatic, and full automatic weapons and man-portable machineguns.

Light weapons: Includes a wide range of medium-caliber and explosive ordnance, including man-portable and vehicle-mounted antipersonnel, antitank and antiaircraft rockets, missiles, landmines, antiaircraft guns, mortars, hand grenades and rocket-propelled grenades, and so on.

2.2.7 White phosphorus (WP) is a flare- and smoke-producing agent and an incendiary agent that is made from a common allotrope of the chemical element phosphorus. The main utility of white phosphorus munitions is to create smokescreens to mask movement from the enemy, or to mask his fire. In contrast to other smoke-causing munitions, WP burns quickly causing an instant bank of smoke. White phosphorus burns quite fiercely and can set cloth, fuel, ammunition and other combustibles on fire. It also can function as an anti-personnel weapon with the compound capable of causing serious burns or death.

White phosphorus weapons are controversial today because of their potential use against civilians. While the Chemical Weapons Convention does not designate WP as a chemical weapon, various groups[who?] consider it to be one. In recent years, the United States, Israel, United Kingdom, Sri Lanka and Russia have used white phosphorus in combat.

During the last War on Gaza Israel used white phosphorous according to Goldstone report. The Mission investigated and confirmed allegations about the use of weapons whose potential long-term impact on individual victims' health raises concern. They include allegations of the use of weapons containing chemical pollutants such as tungsten and white phosphorus. At least seven white phosphorous container shells struck the UN workshop and warehouse area of the compound only causing massive damage as a result of ensuing fires. The firing of white phosphorus shells over the United Nations Relief and Works Agency for Palestine in the near east (UNRWA) school in Gaza City is one of such cases in which precautions were not taken in the choice of weapons and methods in the attack (Goldstone, 2009). The Mission added that so-called dense inert metal explosive (DIME) munitions were used by the Israeli armed forces according to reports received from Palestinian and foreign doctors who operated in Gaza during the military operations of a high percentage of patients with injuries compatible with their impact. Finally, the

Mission received allegations that depleted and non-depleted uranium were used by Israeli forces in Gaza. These allegations were not further investigated by the Mission.

2.3 Impact of war

War has an enormous and tragic impact -- both directly and indirectly -- on public health. War accounts for more death and disability than many major diseases combined. It destroys families, communities, and some-times whole cultures. It directs scarce resources away from health and other human services, and often destroys the infrastructure for these services. (Benjamine, 2007). The effects of war on civilian health are varied and cumulative, especially in situations of chronic protracted conflict. War and conflict not only lead to increasing death, injury and disability, but also affect physical and mental health in a variety of cumulative ways. Nonetheless, disabilities are chronic conditions which require care and not cure (Smart, 2007). War-related effects such as displaced populations, the breakdown of health and social services, and disease transmission also take a toll on public health. It is very difficult to measure mortality accurately, however, because war also often causes health information systems to break down, and available information may be politicized.

In conflict, the nature and severity of impairments and disabilities associated with the injury differ greatly from peacetime counterparts. Several factors may contribute to prognosis and outcome. Evacuation time, access to timely and adequate medical resources, and strategies adopted to treat a potentially large number of severely wounded cases in an often short period of time affect the medical management of the injured. Civilian populations, who are socially or economically vulnerable, are more susceptible to mental disorders and to physical ill-being with displacement and war stressors delaying recovery. Many of the impairments and disabilities were predictable consequences of a particular injury site.

The impact of war on populations arises both from the direct effects of combat—namely, battle deaths—and from the indirect consequences of war, which may occur for several years after a conflict ends. Indirect effects of conflict on mortality can be formally defined as the number of deaths following a war minus the number of deaths that would have occurred in the same period if the war had not occurred (Murray, 2002).

War has profound impacts on human health. In addition to direct consequences, including the fact that 90% of all deaths related to recent wars were among civilians, war has several indirect consequences, including long-term physical and psychological adverse health effects, damage to the social fabric and infrastructure of society, displacement of people, damage to the environment, drainage of human, financial, and other resources away from public health and other socially productive activities, and fostering of a culture of violence. Many public health issues can be both a consequence and a cause of war, including infectious diseases, mental health disorders, vulnerability of population groups, disparities in health status within and among countries, and weakening of human rights. We, health professionals, can promote peace in many ways and facilitate this work by demonstrating our values, vision, and leadership (Levy, 2002).

Barry Levy in his article Health and Peace publicized that "The indirect consequences of war can be as serious and widespread as the direct consequences, and all worsen public health. The indirect consequences are the following: a) the individuals physically or psychologically injured during war may have long-term effects, ranging from chronic physical disabilities to long-term psychological trauma; b) war damages the social fabric of society such that work and education, the practice of religion, the programs of government agencies and civil society organizations, and all activities of normal life are disrupted; c) the infrastructure of society – clinics and hospitals, distribution systems for safe food and clean water, electricity network – are destroyed, and often not completely restored until months or years after conflict has ended; d) war displaces people, making them refugees in other countries or internally displaced persons within their own countries; e) war, and the preparation for war, damages the environment by depleting non-renewable natural resources and by contaminating the environment with hazardous materials; f) war, and the preparation for war, drains human, financial, and other resources away from more productive activities, such as public health; and g) war fosters a culture of violence – a society where conflicts are resolved by violent means" (Levy, 2002, pp. 114-116).

An estimate of the indirect effects of military conflict, also from the WHO, found that war was the 19th leading cause of loss of disability-adjusted life years (the number of potential years of life lost due to premature death and disability). Other causes ranked similarly include heart disease, falls, cirrhosis, and drug use (WHO, 2001).

War also has a severe, indirect impact on humans and the environment through the diversion of human and economic resources. The governments of many developing countries spend five to twenty-five times more on military than on health expenditures.

From this culture of violence people learn at an early age that violence is the way to try to resolve conflicts. War and preparation for war use huge amounts of nonrenewable resources, such as fossil fuels, as well as toxic and radioactive substances that cause pollution of the air, water, and land (Sidel and Levy, 2002).

In addition to the health consequences of the direct use of arms, there are health consequences attributable to militarization and arms even if the weapons are never used. These health consequences of unused weapons include:

- Environmental consequences of weapons production, testing, and storage, and even of their abandonment or destruction.
- Social, psychological, and even physical consequences produced by threats to use the weapons.
- Cost of the weapons: the producing or purchasing nation diverts funds and skilled staff from providing needed health and other human services and from economic development.

The environmental consequences associated with arms even before their use in war have been widely described, and the worldwide environmental pollution associated with nuclear weapons has been detailed in various studies (Sidel, 1995). Threats to use weaponry can cause trauma even if they are not carried out. Again the best known examples are the social and psychological consequences of the nuclear threat, but the threat of use of other weapons can also produce long-lasting severe problems.

2.4 Non-fatal outcomes and conflict

The burden of conflict includes a wide range of non-fatal health injuries. While some variation in disability is to be expected from conflict to conflict, difficulties in measuring the incidence of non-fatal outcomes means there is substantial uncertainty about the true level. In most cases disabilities due to war have been assessed from patients attending health facilities (Coupland, 1991). Even though these sources may underestimate the non-fatal health outcomes, the overall impact of these health effects is likely to be substantial. The reported ratio of people injured to those killed in modern conflicts ranges from 1.9 to 13.0. In 1990 the Global Burden of Disease study estimated that non-fatal

outcomes of war resulted in 4.8 million disability adjusted life years worldwide, about the same as fires and more than half that caused by road traffic injuries.

Many of the impairments and disabilities were predictable consequences of a particular injury site. The World Health Organization's International Classification of Impairments, Disabilities and Handicaps (ICIDH) are a descriptive schema which may be used to describe the impact of wars on injuries. 'Impairments' are abnormalities of psychological, physiological or anatomical structure or function (for example, weakness or breathlessness). 'Disabilities' refer to the performance of individual tasks and activities (such as dressing or rising from a chair). 'Handicap' is the disadvantage suffered by an individual as a result of ill-health compared with what is normal for someone of the same age, sex and background. Each level is a conceptually different manifestation of the effects of having a disease or combination of diseases.

2.5 Epidemiology of war wounds

Musculoskeletal injuries represent approximately 70% of all war wounds and, although associated with a very low mortality rate when isolated, are responsible for significant morbidity. The ratio of lower limb/upper limb injuries is approximately 3/2 and more than 50% of extremity fractures are open. Injuries to the head, chest, and/or abdomen have a higher mortality rate, as expected. Bullets have been, until recently, the main cause of penetrating injury to the limbs, but in recent conflicts, this has been replaced by fragmenting weapons such as bombs, shells, grenades, and landmines. Blast injuries are in general dirtier than gunshot wounds and carry a higher potential for infection (Gosselin, 2005). War wounds are different from most wounds seen in civilian practice in a developed country. War wounds are often worse than they appear. High-energy projectiles, deep penetration of foreign material, dirty field conditions, delayed evacuation, and/or ill-advised initial treatment such as prolonged use of tourniquet or primary wound closure may all contribute to wounds with extensive tissue damage and severe contamination. Unless evacuation time is short, which for civilians is usually the exception, life-threatening injuries will have already self-triaged (Gosselin, 2005). Different classifications and protocols have been described, but they all revolve around the same principle: “do the best for the most” (as opposed to “treat the most serious one first” seen in civilian practice in developed countries). Time should not be wasted on those who have a very poor survival prognosis if this compromises the survival of others less critically

wounded. Depending on the number of casualties, priorities need to be established rapidly and decisively, and surgery performed quickly and efficiently (Gosselin, 2005).

2.6 War on Gaza

The blockade which was enforced on Gaza strip comprises measures such as closure of border crossings for people, goods and services, cuts on the provision of fuel and electricity, reduction of the fishing zone, establishment of a “buffer zone” along the border between Gaza and Israel which reduces the land available for agriculture and industrial activity. In addition to creating an emergency situation, the blockade significantly weakened the capacities of the population and of the health, water and other public sectors to react to the emergency created by the military operations (Goldstone, 2009). All these measures negatively affect the general health of population and especially their QOL. One study for Thabet and others showed that the most common items of siege of Gaza were: learning problems due to shortage of electricity, shortage of fuel, absent of transportation, very high prices, teachers unable to come to schools and others (Thabet, Abu Tawahina, El Sarraj, Vostanis, 2009). Another study concluded that the siege has several dangerous effects on social, political, economical, educational, as well as psychological impacts. The siege limits the entrance of medical equipments and instruments, drugs and medication, goods, and all life basics. Furthermore, the limited resources in Gaza strip due to siege created socio-economical gap in all life walks. The Palestinian people suffer from poverty, low income, and high prices for every thing they want to achieve (Lubbad, Thabet, 2009).

In the last War on Gaza on 27 December 2008, Israel deployed its navy, air force and army in the operation it codenamed “Operation Cast Lead”. The military operations in the Gaza Strip included two main phases, the air phase and the air-land phase, and lasted from 27 December 2008 to 18 January 2009. The Israeli army began with a week-long air attack, from 27 December 2008 until 3 January 2009. The air force continued to play an important role in assisting and covering the ground forces from 3 January 2009 to 18 January 2009. The army was responsible for the ground invasion, which began on 3 January 2009 when ground troops entered Gaza from the north and from the east. By 18 January 2009, when unilateral ceasefires were announced by both Israel and Hamas, some 1,400 Palestinians had been killed, including some 300 children and hundreds of other unarmed civilians, and large areas of Gaza had been razed to the ground, leaving many thousands homeless and the already dire economy in ruins.

Hundreds of civilians were killed in attacks carried out using high-precision weapons – air delivered bombs and missiles, and tank shells. Others, including women and children, were shot at short range when posing no threat to the lives of the Israeli soldiers. Aerial bombardments launched from Israeli F-16 combat aircraft targeted and destroyed civilian homes without warning, killing and injuring scores of their inhabitants, often while they slept. Children playing on the roofs of their homes or in the street and other civilians going about their daily business, as well as medical staff attending the wounded were killed in broad daylight by Hellfire and other highly accurate missiles launched from helicopters and unmanned aerial vehicles (UAVs), or drones, and by precision projectiles fired from tanks (AIP, 2009). White phosphorus, a highly incendiary substance, was repeatedly fired indiscriminately over densely populated residential areas, killing and wounding civilians and destroying civilian property. It was often launched from artillery shells in air-burst mode, which aggravated the already devastating consequences of the attacks. Each shell ejected over a hundred felt wedges impregnated with highly incendiary white phosphorus, which rained down over houses and streets, igniting on exposure to oxygen and setting fire to people and property.

One distinctive characteristic of Operation Cast Lead was the fact that civilians had nowhere to flee in order to escape the danger. Unlike other places in the world, in which long lines of refugees are seen carrying their few remaining possessions, Gaza civilians remained trapped within a small area, since Israel left the crossings out of the Gaza Strip closed and Egypt refused to open the Rafah Crossing ((B'tselem, 2009).

The United Nations Fact Finding Mission on the Gaza Conflict finds that the conduct of the Israeli armed forces constitutes grave breaches of the Fourth Geneva Convention in respect of willful killings and willfully causing great suffering to protected persons and as such give rise to individual criminal responsibility. It also finds that the direct targeting and arbitrary killing of Palestinian civilians is a violation of the right to life (Goldstone, 2009). Based on the Mission's investigation of incidents involving the use of certain weapons such as white phosphorous and flechette missiles, the Mission finds that the Israeli armed forces were systematically reckless in determining its use in built-up areas. Moreover, doctors who treated patients with white phosphorous wounds spoke about the severity and sometimes untreatable nature of the burns caused by the substance.

2.7 International humanitarian law

Throughout history, humanity has known war. All human societies have developed customary rules that regulate how wars are fought. Over 500 cartels, codes of conduct, covenants and other texts designed to regulate hostilities had been recorded before the advent of contemporary humanitarian law (Giannou and Baldan, 2009). Just as there is no society of any sort that does not have its own set of rules, so there has never been a war that did not have some vague or precise rules covering the outbreak and end of hostilities, as well as how they were to be conducted. The Geneva Conventions (GCs) as they stand today are the result of a long process. Over the years, the First Geneva Convention has been extended to meet the changing needs of modern warfare. Three other Conventions were adopted, one after the other, covering victims other than wounded soldiers: shipwrecked sailors, prisoners of war, and civilian populations. The four Geneva Conventions of 1949 and their two Additional Protocols of 1977, in particular, as well as other written treaties and customary law, constitute international humanitarian law (IHL): i.e. what is and what is not permitted during international and non-international conflicts. The four Geneva Conventions are mainly designed to regulate the behavior of combatants and to protect persons who are not (or are no longer) taking part in hostilities in armed conflicts between States (international conflicts).

I. Convention for the amelioration of the condition of the wounded and sick in armed forces in the field (GC I: Revision of the 1864 Convention).

II. Convention for the amelioration of the condition of wounded, sick and shipwrecked members of armed forces at sea (GC II: revision of the 1899 Convention).

III. Convention relative to the treatment of prisoners of war (GC III: revision of the 1929 Convention).

IV. Convention relative to the protection of civilian persons in time of war (GC IV: new Convention adopted in 1949).

In response to new needs in contemporary armed conflicts, the Conventions were developed and supplemented in 1977 by two further agreements: the Additional Protocols I and II relating to the protection, respectively, of victims of international and internal armed conflicts.

IHL regulates humanitarian issues in times of war; it aims to define the rights and obligations of the parties to a conflict in the conduct of warfare and to protect persons who are not (or are no longer) taking part in hostilities (civilians, wounded or sick soldiers, prisoners of war). These persons must be respected, protected and treated humanely by all parties. All the wounded and sick must also receive the medical care required by their condition. Those who provide such care must be respected and protected, as long as they are involved in their humanitarian tasks.

2.8 Quality of life

In recent years, use of the patient's point of view to monitor the quality of medical care has been emphasized. However, evaluation of medical interventions has usually focused on biological outcomes (Hays, Sherbourne and Mazel, 1995). Although the term "quality of life" (QOL) did not exist in the Greek language of 2000 years ago, Aristotle clearly appreciated that QOL not only means different things to different people but also varies according to a person's current situation. Some say one thing and some another, indeed very often the same man says different things at different times: When he falls sick he thinks health is happiness, when he is poor, wealth is most important (Aristotle as cited on Fayers and Machain, 2000). Happiness, life satisfaction and subjective well-being are mutually interrelated – and indeed they are all closely connected with the notion of quality of life – but they are also highly contested constructs (Susnienė, and Jurkauskas, 2009). ‘Happiness’ is perhaps the most contested; indeed, the disagreement about happiness is at an absolutely basic level. In 1962, Abraham Maslow published his book “Towards a Psychology of Being”, and established a theory of quality of life, which is still considered a consistent theory of quality of life. Maslow based his theory for development towards happiness and true being on the concept of human needs. He described his approach as an existentialistic psychology of self-actualization, based on personal growth. Maslow tried to solve this difficult problem by giving a universal roadmap of personal development, applying a progressive series of needs, where the next need is revealed as you realize the previous. In this way, Maslow established a form of staircase, which obtained its popular interpretation in the pyramid or his hierarchy of needs. Maslow described the ideal life as a long journey through the eight needs, which takes its departure from the concrete and down to earth to the abstract and divine — transcendent in his own word (Annex 5). In

order to fulfill them one by one, we must develop our beings to be more spontaneous, independent, active, and responsible (Susnienė and Jurkauskas, 2009).

It can be stated that happiness is difficult to define because it is very personal. It depends on person's values, propensities, character, even genes and other factors.

For measuring QOL, happiness may not be enough because it doesn't take in consideration the dissatisfaction dimension. Quality of life, which has gained prominence in social research studies since 1970s, is a broad concept concerned with overall well-being within society. QOL is an ill-defined term. The concept of HRQOL and its determinants have evolved since the 1980s to encompass those aspects of overall quality of life that can be clearly shown to affect health either physical or mental. The World Health Organization (WHO, 1948) has declared health to be "a state of complete physical, mental and social well-being, and not merely the absence of disease". Many other definitions of both "health" and "quality of life" have been attempted, often linking the two and, for QOL, frequently emphasizing components of happiness and satisfaction with life. In the absence of any universally accepted definition, some investigators argue that most people, in the western world at least, are familiar with the expression "quality of life" and have an intuitive understanding of what it comprises. However, it is clear that QOL means different things to different people, and takes on different meanings according to the area of application. In the context of clinical trials we are rarely interested in QOL in such a broad sense, but are concerned only with evaluating those aspects that are affected by disease or treatment for disease. This may sometimes be extended to include indirect consequences of disease such as unemployment or financial difficulties. Quality of life (QOL) is a popular term that conveys an overall sense of well-being, including aspects of happiness and satisfaction with life as a whole. It is broad and subjective rather than specific and objective. Quality of life is a descriptive term that refers to people's emotional, social and physical wellbeing, and their ability to function in the ordinary tasks of living (Donald, 2001). QOL analyses are particularly helpful for investigating the social, emotional and physical effects of treatments and disease processes on people's daily lives; analyzing the effects of treatment or disease from the patient's perspective; and determining the need for social, emotional and physical support during illness. QOL measures can therefore help to decide between different treatments, to inform patients about the likely effects of treatments, to monitor the

success of treatments from the patient's perspective, and to plan and coordinate care packages.

There is no universally accepted definition of quality of life. Usually it is referred to the definition of the World Health Organization introduced in 1995 – "Quality of life" is an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, values and concerns incorporating physical health, psychological state, level of independence, social relations, personal beliefs (WHO, 1996). The CDC has defined HRQOL as "an individual's or group's perceived physical and mental health over time".

According to Wasserman on his book *Quality of Life and Human Difference* "One of the most basic, and recalcitrant, issues in assessing quality of life is whether it should be regarded as subjective, based on the patient's own judgments and feelings, on objective measures of functioning and participation, or on some combination of the two. Is it enough to look at subjective measures, the individual's satisfaction with his health status or condition, or should we also include measures of physiological functioning, bodily performance, role fulfillment, and social participation in our assessment? Most HRQOL instruments in fact include both types of measure, to varying extents, but this inclusiveness itself needs justification. Otherwise, it obscures sharp disagreements about the extent to which quality of life or HRQOL is an objective matter; it risks treating conflicting accounts of quality of life as if they were just different aspects of a complex phenomenon. The objective measures incorporated in HRQOL instruments typically concern "functional status," which refers to the full range of human functions: (1) physiological functions, such as blood pressure, digestion, and respiration rate; (2) the capacity to perform basic physical and cognitive activities, such as walking, reaching, focusing attention, and communicating, or the various combinations of these needed to perform routine activities of daily living, such as eating, bathing, dressing, transferring, and toileting; and (3) socially shaped tasks or life roles, such as those needed by children for school and play and those needed by adults for work, household maintenance, and participation in social activities" (Wasserman, et al. 2005 pp.7-8).

To distinguish between QOL in its more general sense and the requirements of clinical medicine and clinical trials, the term "health-related quality of life" (HRQOL) is frequently used in order to remove ambiguity (Fayers and Machin, 2000). Health-related quality of life (HRQOL) is still a loose definition. What aspects of QOL should be included? It is generally agreed that the relevant aspects may vary from study to study, but can include general health, physical functioning, physical symptoms and toxicity, emotional functioning, cognitive functioning, role functioning, social well-being and functioning,

sexual functioning and existential issues. HRQOL assessment tools evolved from older mortality and morbidity indicators augmented by measures of functional status, subjective health experience, and perceived components of “social health”. These instruments were designed to assess the patient’s performance in, or satisfaction with, areas of activity affected by his physical and mental functioning. Since virtually all areas of activity are affected by health, however, these measures had to limit themselves to the areas most directly or substantially affected by health. Yet without an understanding of what counts as “health-related” in this sense, that term does more to label than to resolve the issue (Wasserman, et al., 2005). The lack of agreement about what falls within the bounds of health poses a serious practical problem, because narrower measures of health cannot serve as adequate proxies for broader ones. The notion of HRQOL depends, both historically and conceptually, on the common observation that there is an uncertain relationship between diagnostic categories – the signs and symptoms that doctors use to identify disease, injury, and other conditions of ill health – and the full range of outcomes that, arguably, should be taken into account in assessing the success of a health intervention. HRQOL analyses measure the impact of treatments and disease processes on these holistic aspects of a person's life (Donald, 2001). HRQOL is a patient-reported outcome usually measured with carefully designed and validated instruments such as questionnaires or semi-structured interview schedules. The construct of HRQOL broadens the traditional notion of health to meet the expressed physical and mental health needs of the population. HRQOL is rapidly gaining acceptance as a measurable outcome. HRQOL questions about perceived physical and mental health and function have become an important component of health surveillance and are generally considered valid indicators of service needs and intervention outcomes.

In recent years, several organizations have found these Healthy Days measures useful at the national level for: 1) identifying health disparities, 2) tracking population trends, and 3) building broad coalitions around a measure of population health compatible with the World Health Organization’s definition of health. Healthy People 2010 identify the Behavioral Risk Factor Surveillance System (BRFSS) as a key source for tracking several HRQOL measures. As knowledge builds about the value of HRQOL surveillance and how to use it, these validated measures and accumulating data give states and communities a unique resource for tracking adult physical and mental health over time, identifying unmet health needs, and guiding broad community efforts to improve population health (CDC, 2000).

Healthy People 2000 and 2010 both identified the increase quality and years of healthy life as a central public health goal. Measuring HRQOL can help determine the burden of preventable disease, injuries, and disabilities, and it can provide valuable new insights into the relationships between HRQOL and risk factors.

As was mentioned before happiness is mutually interrelated and indeed it is closely connected with the notion of quality of life. Happiness is the meaning and the purpose of life, the whole aim and end of human existence. Happiness as an indicator is very important in assessing quality of life. Most people use the word happiness with caution, because it has special significance. They use it with respect. Being happy is not just being cheerful and content. It is a special feeling that is precious and very desirable, but hard to attain. Happiness is something deep in the individual that involves a special balance or symmetry. Happiness is closely associated with the body, but is not limited to it. It comprises an individual's whole existence and is signified by a certain intensity of an experience, which is also the case with unhappiness. The intensity of the experience is a dimension that does not separate happiness from more superficial aspects of the quality of life such as being satisfied with life and well-being. Typically, happiness is associated with non-rational dimensions, such as love, close ties with nature, etc., but not with money, state of health, and other objective factors (Susniene, and Jurkauskas, 2009).

2.9 Measurement of HRQOL

Because many of the components of quality of life cannot be observed directly, they are typically evaluated according to the classic principles of item-measurement theory (Lord as cited on Testa, and Simonson, 1996). This theory proposes that there is a true quality-of-life value, Q , that cannot be measured directly, but that can be measured indirectly by asking a series of questions known as "items," each of which measures the same true concept or construct. These questions are then asked of the patient, and the answers are converted to numerical scores that are then combined to yield "scale scores," which may also be combined to yield domain scores or other statistically computed summary scores. If the items have been chosen properly, the resulting scale of measurement, Z , should differ from the corresponding true value, Q , only by random error of measurement and should possess several important properties. The measurement of quality of life should address — that is, cover — each objective and subjective component (symptom, condition, or social

role) that is important to members of the patient population and susceptible to being affected, positively or negatively, by interventions (see later).

One of the first instruments that broadened the assessment of patients beyond physiological and clinical examination was the Karnofsky Performance Scale proposed in 1947 for use in clinical settings. This is a simple scale ranging from 0 for "dead" to 100 indicating "normal, no complaints, no evidence of disease". Health-care staff does this assessment. Over the years, it has led to a number of other scales for functional ability, physical functioning, and "activities of daily living" (ADL). Although these questionnaires are still sometimes described as QOL instruments, they capture only one aspect of it and provide an inadequate representation of patients' overall well-being and QOL. The next generation of questionnaires, in the late 1970s and early 1980s, that quantified health status was used for the general evaluation of health. These instruments focused on physical functioning, physical and psychological symptoms, impact of illness, perceived distress, and life satisfaction. Examples of such instruments include the Medical Outcome Short Form (SF-12 and SF-36), the Sickness Impact Profile and the Nottingham Health Profile. Although these instruments are frequently described as QOL questionnaires, their authors neither designed them nor claimed them as QOL instruments. These instruments have different aspects or dimensions of QOL, and therefore include items relating to several concepts. Although there is disagreement about what components should be evaluated, most investigators agree that a number of the dimensions should be included in QOL questionnaires, and that QOL is a multidimensional construct (Maruish, 1999). Because there are so many potential dimensions, it is impractical to try to assess all these concepts simultaneously in one instrument. Most instruments intended for health-status assessment include at least some items that focus upon physical, emotional and social functioning. For example, if emotional functioning is accepted as being one aspect of QOL that should be investigated, then several questions could evaluate anxiety, tension, irritability, depression, and so on. Thus instruments may contain many items. Although a single "global" question, such as "How would you rate your overall quality of life?", is a useful adjunct to multi-item instruments, global questions are often regarded as too vague and non-specific to be used on their own. A large number of questionnaires or instruments have been developed for quality of life assessment and they have been used in a wide variety of circumstances (Fayers and Machin, 2000).

2.10 Objective and subjective assessment

Quality of life is assessed with the help of both objective and subjective indicators: objective assessments of functioning or health status (the y axis in Annex 6), and more subjective perceptions of health (the x axis).

In quality of life research, one often distinguishes between the subjective and objective quality of life. Objective quality of life is about fulfilling the societal and cultural demands for material wealth, social status and physical well-being and is important in defining a patient's degree of health. Subjective quality of life is about feeling good and being satisfied with things in general and translate that objective assessment into the actual quality of life experienced (Testa and Simonson, 2009). Accordingly, objective indicators exist in the society and they can be monitored and assessed by their amount and frequency rate. Whereas subjective indicators exist in the consciousness of an individual and they can be identified only from the person's answers to important subjects to him. Comprehensive quality of life survey must include both types of indicators. Since expectations regarding health and the ability to cope with limitations and disability can greatly affect a person's perception of health and satisfaction with life, two people with the same health status may have very different qualities of life. Each domain of health has many components that need to be measured (Testa and Simonson, 2009).

This spectrum, from the subjective to the objective quality of life via the quality of life in the existential depths, incorporates a number of existing QOL theories. Therefore this spectrum is called the integrative quality-of-life (IQOL) theory (Annex 7) (Ventegodt as cited on Susniene, 2009). The individual can best be compared to a green apple with red patches (a subjective and an objective quality of life, respectively, at the surface of an individual's existence) with a hidden nucleus (humanity's inner depth). When this picture is combined with the picture of humanity as an onion with a number of layers between the surface and the nucleus, the taxonomy underlying the quality-of-life analysis is achieved. Between life's surface and its inexpressible depth lays well being, satisfaction, harmony, and meaning and deep concord.

Some quality of life measures are generic, they may be used to assess the impact of any treatment or disease process. Others are disease-specific designed to assess treatments and the disease process of a particular condition. Generic measures can help to compare the

impact of a wide variety of treatments and diseases on patient's lives. They may lack precision, however, in measuring outcomes that are relevant to a particular disease process, for which disease-specific measures are better suited.

In conclusion, it can be said that a lot of criteria and methods can be found for measuring quality of life. Some can be discussed, and others can be accepted, but in all cases we must agree that there is no absolute truth – all the reasoning has grounds and more or less can reflect real life situation.

2.11 Medical outcomes study 36-Item, Short Form (SF-36)

Because the patient is the best source of information about his HRQOL, a number of practical tools have been developed that rely on patient self-ratings. Arguably one of the most important and frequently used generic HRQOL assessment is the SF-36. The SF-36 developed by Ware et al. (1993) in the USA evaluates general health status, and was intended to fill a gap between the much more lengthy questionnaires and other relatively coarse single-item measures. It is designed to provide assessments involving generic health concepts that are not specific to any age, disease or treatment group (generic measure). Accordingly, the SF-36 has proven useful in surveys of general and specific populations, comparing the relative burden of diseases, and in differentiating the health benefits produced by a wide range of different treatments (Ware, n.d.). Emphasis is placed upon physical, social and emotional functioning. The SF-36 has become the most widely used of the general health status measures. It can be either self-assessed or administered by a trained interviewer (Fayers and Machin, 2000). The SF-36 enables people to describe their health status from their own perspective. The SF-36 has been translated, evaluated in various languages and used in over 40 countries worldwide although it has not been used in Palestine. The usefulness of the SF-36 in estimating disease burden and comparing disease-specific benchmarks with general population norms is illustrated in articles describing more than 200 diseases and conditions.

2.11.1 Construction of the SF-36

As the name implies, SF-36 is a short-form health survey with only 36 questions addressing eight health concepts (a simpler 12-question form, the SF-12, is also available). The SF-36 was found to be well accepted with established reliability and validity, easy to

administer and was constructed to satisfy minimum psychometric standards necessary for group comparisons. The eight health concepts were selected from 40 included in the Medical Outcomes Study (MOS). Those chosen represent the most frequently measured concepts in widely-used health surveys and those most affected by disease and treatment. The questionnaire items selected also represent multiple operational indicators of health, including: behavioral function and dysfunction, distress and well-being, objective reports and subjective ratings, and both favorable and unfavorable self-evaluations of general health status (Ware, n.d). There are two summary measures, physical health and mental health. Physical health is divided into sub-scales for physical functioning (10 items), role-physical (4), bodily pain (2) and general health (5). Mental health comprises sub-scales for vitality (4 items), social functioning (2), role-emotional (3) and mental health (5). There is also a general health transition question included, which asks: "Compared to one year ago, how would you rate your general health now?". Most questions refer to the past four weeks, although some relate to the present. A few questions, such as those for "role-physical", take yes/no responses, while some, such as the physical functioning items, have three categories (limited a lot, limited a little, not limited at all), and other items have five or six categories for responses. All responses to questions in are printed in a left-to-right (also referred to as "horizontal") format, rather than with the mixture of horizontal and vertical listings of response choices that were printed below questions in the MOS and in the original SF-36. Mixed formats of response choices confuse respondents and cause missing and inconsistent responses, particularly among the elderly. Other improvements include more consistent use of indenting, numbering of instructions, deletion of useless item labels, and a simpler formatting of boxes that are checked by respondents (Ware, n.d).

The designers of the SF-36 selected, standardized and tested the items so that they can be scored using the standard scoring method. Most of the items appear broadly sensible. However, the physical functioning sub-scale, in common with many similar sub-scales, poses questions about interpretation (Fayers and Machin, 2000). Questions ask whether your health limits you in "vigorous activities, such as more than a mile" It is not clear how those who never participate in such activities should respond their health may be severely impaired, and yet they should respond "No, not limited at all" and will therefore receive a score indicating better functioning than might be expected.

Annex 8 shows the conceptual model for the SF-36 health survey. Orthogonal (uncorrelated) model assumes the correlation between physical and mental health constructs is fixed at 0 ($\Phi = 0$). Oblique (correlated) model allows correlation between the physical and mental health constructs. δ denotes error terms (uniqueness terms) associated with each sub-scale. Directional associations exist between the physical and mental health and the 8 sub-scales (as indicated by the arrows); however, the associations vary from large (e.g. physical functioning on physical health) to close to zero (e.g., emotional well-being on physical health).

Questionnaires for assessing QOL usually contain multiple questions, although a few may attempt to rely upon a single global question. Some QOL questionnaires are designed such that all items are combined together; for example items might be averaged, to produce an overall score for QOL. Most instruments, however, recognize that QOL has many dimensions and will attempt to group the items into separate "sub-scales" corresponding to the different dimensions. Thus we explore the relationship between items and sub-scales, and introduce the concepts underlying scales and their measurement. Each question on the QOL questionnaire is an expression in words for an item. Most QOL instruments consist of many questions, representing many items. Some of these items may aim to measure a simple aspect of QOL, such as a physical symptom. In such cases, sometimes a single item will suffice to encapsulate all that is required. Other QOL concepts may be more complex, and the developers of an instrument might decide that it is preferable to use several questions that can be combined to form a multi-item scale.

The SF-36 has been used in literatures in thousands of general and specific population surveys, permitting comparison of the relative burden of diseases, and differentiating the health benefits or harms of diverse treatments (Dubernard, Rouzier, David-Montefiore, Bazot, and Darai, 2008; Hemingway, Nicholson, and Marmnot, 1997). The respondent burden is not great but an even shorter validated version, the SF-12, comprised of 12 items, is also available. The instrument has been translated using backwards and forwards methodology into approximately 50 languages. One of the many arguments against incorporating QOL assessment either in clinical trials or more often in routine clinics is that the analysis and interpretation of data is too complex.

However, the symptoms assessed in QOL scales may cause a change in QOL. If a patient acquires serious symptoms their overall QOL is changed by those symptoms. In fact, the

reason for including symptoms in QOL instruments is principally because they are believed to affect QOL. Conversely, having a poor QOL does not imply that the patient has specific symptoms. Symptoms and similar items can be called causal variables. Symptoms and side-effects are good examples of causal variables in relation to overall QOL (Fayers, 2000). Although symptoms are indicator variables for diseases, and side-effects are indicator variables for treatments, neither treatment nor disease is the main concern when assessing QOL, and so for this purpose symptoms and side-effects are purely causal. How can one identify causal variables? Perhaps the easiest method is the "thought test" For example, if we consider vomiting: think of the question "could severe vomiting affect QOL level?" Yes, almost certainly. "Could QOL level affect vomiting?" Possibly, but it is more likely that vomiting is a consequence of the treatment or the disease. Hence, most would conclude, vomiting is likely to be a causal variable (Fayers, 2000).

Description of sub-scales of medical outcome study 36-item short-form used to assess the health of injured population during the War on Gaza:

2.11.1.1 Physical functioning: Refers to the performance of or the capacity to perform a variety of physical activities normal for people in good health. It assesses the overall condition of a living organism at a given time, and the condition of optimal well-being. These physical activities include climbing stairs, or putting on tights because of stiffness or the ability to perform vigorous and moderate activities, lift or carry groceries, climb the stairs, bend, kneel, or stoop, walk, bath or dress.

Limitation of physical activities is frequently due to physical health problems such as shortness of breath, joint problems, back problem etc.

2.11.1.2 Role-physical: Whether there are whole activities that you cannot do because of your health problems, like cutting down the amount of time spent on activities, accomplishing less, feeling limited in physical activities due to physical difficulties, had difficulty, or accomplished less than wanted during the past 4 weeks .

2.11.1.3 Bodily pain: Intensity of bodily pain and interference of pain with usual daily activities (including work and housework).

2.11.1.4 General health: Self-perceived health, perception of getting ill more easily than others, expectance of health worsening, feeling healthy as others.

2.11.1.5 Vitality: Amount of time in past month felt full of pep, worn out, tired, or had a lot of energy.

2.11.1.6 Social functioning: "limitations in social activities because of physical or emotional problems" is a very important part in creating and maintaining a balanced and healthy lifestyle. It measures whether people feel able to join in the activities with their family and friends that are expected of them, and to which extent and frequency physical health and emotional problems are interfering with normal social activities.

2.11.1.7 Role-emotional: (Subjective) Limitations in work or other regular daily activities due to emotional problems during the past 4 weeks, including cutting down amount of time spent, accomplished less than wanted, did not do work as carefully as usual.

2.11.1.8 Emotional well being: (levels of psychological stress and anxiety) - this sub-category is about how people are feeling. High scores indicate feeling happy, peaceful and calm and low scores reflect feeling nervous, downhearted and depressed. This scale measures depression and feeling of anxiety.

The World Health Organization defines mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community. Mental health is as important as physical health to the overall well-being of individuals, societies and countries. Advances in neuroscience and behavioral medicine have shown that, like many physical illnesses, mental and behavioral disorders are the result of a complex interaction between biological, psychological and social factors (Annex 9). Mental Health is the balance between all aspects of life - social, physical, spiritual and emotional and is far more than the absence of mental illness.

2.11.1.9 Health transition: Health at the present moment compared to health a year ago.

2.11.2 Validity and Reliability

The validity (degree to which an instrument measures what it is supposed to measure) and reliability (degree to which an instrument can produce consistent results, and consistent results on different occasions, when there is no evidence of change) of the SF-36 in populations has been confirmed in studies in the United States. Moreover, the sub-scales

measuring physical health best distinguished groups differing in presence and severity of physical health conditions, whilst the sub-scales measuring mental health best distinguished between groups differing in the presence and severity of psychiatric disorders (BEU, 1995).

2.11.3 Scaling, scoring and norms

With the release of SF-36, norms were updated using data from the 1998 National Survey of Functional Health Status (NSFHS) and norm-based scoring (NBS) algorithms were introduced for all eight sub-scales. NBS, which employs a linear T-score transformation with mean = 50 and standard deviation = 10, makes it possible to meaningfully compare scores for the eight sub-scale profile and the physical and mental summary measures in the same graph (Ware, n.d).

Annex 10 illustrates the taxonomy of items and concepts underlying the construction of the SF-36 sub-scales and summary measures. The taxonomy has three levels: (1) items; (2) eight sub-scales that aggregate 2-10 items each; and, (3) two summary measures that aggregate sub-scales. All but one of the 36 items (self-reported health transition) are used to score the eight SF-36 sub-scales. Each item is used in scoring only one sub-scale.

The interpretation of results has been made much easier with the standardization of mean scores and standard deviations for all SF-36 sub-scales. Specifically, norm-based scoring has proven to be very useful when interpreting differences across sub-scales in the SF-36 profile and for monitoring disease groups over time. The advantages of norm-based scoring can be illustrated by comparing the SF-36 profile scored using the original 0–100 scoring algorithms based on the summated ratings method and the norm-based scoring algorithms. In norm-based scoring, each sub-scale was scored to have same average (50) and the same standard deviation (10 points). Without referring to norms, it is clear that anytime a sub-scale score is below 50, health status is below average, and each point is one-tenth of a standard deviation.

Scoring the 36-Item Health Survey according to RAND (Research AND Development Corporation) 36-item Health Survey 1.0 is a two-step process. All questions are scored on a scale from 0 to 100, with 0 representing the least preferred health state (death) and 100 representing the highest level of functioning possible. Aggregate scores are compiled as a

percentage of the total points possible, using scoring table (1). The scores from those questions that address each specific area of functional health status are then averaged together, for a final score within each of the 8 dimensions measured. (eg pain, physical functioning etc.) table (2). All 8 categories are scored in the same way. Using this questionnaire at the beginning and during the course of care, we can track the progress of the 8 parameters.

Table 1: Recoding items

Item Number	Change original response category	To recoded value of:
1,2,20,22,34,36	1	100
	2	75
	3	50
	4	25
	5	0
3,4,5,6,7,.8,9,10,11,12	1	0
	2	50
	3	100
13,14,15,16,17,18,19	1	0
	2	100
21,23,26,27,30	1	100
	2	80
	3	60
	4	40
	5	20
	6	0
24,25,28,29,31	1	0
	2	20
	3	40
	4	60
	5	80
	6	100
32,33,35	1	0
	2	25
	3	50
	4	75
	5	100

Table 2: Averaging items to form sub-scales

Sub-scales	Number of items	After recording as per table (1), average the following items
Physical functioning	10	3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Role limitations due to physical health	4	13, 14, 15, 16
Bodily pain	2	21, 22
General health	5	1, 33, 34, 35, 36
Vitality	4	23, 27, 29, 31
Social functioning	2	20, 32
Role limitations due to emotional problems	3	17, 18, 19
Emotional well being	5	24, 25, 26, 28, 30

Table 3: Descriptions of lowest and highest sub-scale scores

SF-36	Meaning of scores	
	Lowest possible (floor)	Highest possible (ceiling)
Physical functioning	Limited a lot in performing all physical activities including bathing or dressing, due to health	Performs all types of physical activities including the most vigorous, without limitations due to health
Role-Physical	Problems with work or other daily activities as a result of physical health	No problems with work or other daily activities as a result of physical health
Bodily pain	Very severe and extremely limiting pain	No pain or limitations due to pain
General Health	Evaluates personal health as poor and believes it likely to get worse	Evaluates personal health as excellent
Vitality	Feels tired and worn out all of the time	Feels full of energy all the time
Social functioning	Extreme and frequent interference with normal social activities due to physical or emotional problems	Performs normal social activities without interference due to physical or emotional problems
Role-Emotional	Problems with work or other daily activities as a result of emotional problems	No problems with work or other daily activities as a result of emotional problems
Emotional well being	Feelings of nervousness and depression all of the time	Feels peaceful, happy and calm all of the time

2.12 QOL measures and response shift theory

QOL can mean different things to different people at different times. Indeed, many QOL measures have been specifically crafted to be as generic as possible to circumvent such differences. Unfortunately, pervasive paradoxical and counterintuitive findings raise questions about what QOL measures actually assess and how scores should be interpreted: people with severe chronic illnesses report QOL equal or superior to less severely ill or healthy people, and consistent disparities arise between clinical measures of health and patients' own evaluations (Rapkin and Schwartz, 2004).

Pre- and post-intervention surveys do not always accurately reflect a true shift in knowledge, since the participants may not have enough information to accurately judge their state before the intervention. These inconsistent findings support the notion of underlying these differences about chronic or life-threatening illness of individual or other sources of stress rather than reflecting lack of validity, measurement bias or denial. These phenomenological factors may reflect individual differences and intra-individual changes in internal standards, values, and meaning of QOL (Rapkin and Schwartz, 2004). Evaluations of change in patient-reported outcomes (PRO) pre- and post-intervention may result in misleading conclusions about the effectiveness of interventions or clinical care. So the concept of response shift theory arises. With chronic diseases, a major part of the management is helping the patient adapt or cope – which leads to “response shift”. As one patient mentioned: “During therapy I became more tired. At the start (before treatment), I may have thought I was tired, but now I say No, I was not tired at all. Now I am tired”.

Response Shift is a change in the meaning of one’s self- evaluation of a target construct, as a result of:

- A change in the respondent’s internal standards of measurement (Scale “Recalibration”)
- A change in the respondent’s values (“Reprioritisation”)
- A change in the respondent’s definition of the construct (“Reconceptualisation”)

Response shift may distort the estimates of treatment effect, may obscure potentially important treatment effects, or may overestimate other treatment effects. Response shift cannot be ignored – but it remains an elusive and challenging concept! (Fayers, 2004).

2.13 The Dirty War Index

Documentation, analysis, and prevention of the harmful effects of armed conflict on populations are established public health priorities. In this paper, we introduce the “Dirty War Index” (DWI): a data-driven public health tool based on laws of war that systematically identifies rates of particularly undesirable or prohibited, i.e., “dirty,” war outcomes inflicted on populations during armed conflict (e.g., civilian death, child injury, or torture). DWIs are explicitly linked to international humanitarian law to make public health outcomes directly relevant to prevention, monitoring, and humanitarian intervention for the moderation of war’s effects. A DWI is calculated as: $(\text{Number of “dirty,” i.e., undesirable or prohibited cases} / \text{Total number of cases}) \times 100$. DWIs are designed for direct, easy translation of war’s public health outcomes into the human rights, policy, and interdisciplinary work needed to address war’s practice (Hicks and Spagat, 2008). The best possible DWI value is 0, indicating that the objectionable outcome is identified in no measured cases. The worst possible DWI value is 100, indicating that the objectionable outcome is identified in 100% of measured cases. Any rate above 0 for prohibited actions or war crimes is unacceptable, and eliminating violations is imperative.

2.14 Related researches

One study was held in Gaza Strip to show the effect of siege and quality of life of Palestinians in the Gaza Strip. The results showed that only 11.8% of Palestinians were satisfied with their general health and only 8% said that they enjoy their life. Out of them, 38.9% were satisfied with their personal relationships, 30.91% had negative feelings, such as blue mood, despair, anxiety, depression, 30.5% satisfied with their spirituality, religion and personal beliefs, 29.09% satisfied with their bodily appearance and 26.5% had pain and discomfort. The results showed that quality of life scores mean was 64.19 (Thabet, Abu Tawahina, El Sarraj, Vostanis, 2008).

One study was done by Dr. Mataria and others in 2007 examined the The quality of life of Palestinians living in chronic conflict. The study concluded that low distress levels are associated with a better QOL and 42% of respondents ranked the physical domain as the most important factor affecting their QOL compared to only 4% for the social domain. Years of schooling were positively associated with the overall WHOQOL score and the physical and psychological domain scores (Mataria, 2007).

Another study was done by Margaret D. 2002 examined Health-related Quality of Life in Gulf War Era Military Personnel used SF-36 questionnaire. The study concluded that non-deployed participants reported excellent health more often than deployed participants. SF-36 scores for deployed participants were poorer than those for non-deployed controls across all health domains. Deployed veterans reported slightly poorer HRQL even after the authors adjusted for other risk factors (Margaret, 2002).

2.15 Conceptual Framework

Public health is an approach of medicine that is concerned with the health of the community as a whole. Public health is community health. It has been said that: "Health care is vital to all of us some of the time, but public health is vital to all of us all of the time" (Medicine Terms, 2001). Public health includes a whole series of activities designed to promote health and prevent disease, injury, and premature death—generally, to assure conditions in which we can all be safe and healthy. According to the office of the High Commissioner on Human Rights (UNHCHR), safety is a state in which hazards and conditions leading to physical, psychological or material harm are controlled in order to preserve the health and well-being of individuals and the community (UNHCHR, 2001).

All populations may live in a situation of war conditions or peace condition. Each condition had its own risk factors. Health is closely related to peace and both are basic human rights. One can not have peace without health, or health without peace. So in order to strengthen the peace, the leaders of public health must write about the war. "War" is regarded as organized violence between two factions, one of which is, or aspires to be, a state, and in the current episode of which there have been at least 1,000 deaths. A physicians' definition of war might be more like "A deliberate use of maiming, killing and disease for political purposes by two or more factions..."(Barbara, 2004).

In war, each person is at risk, nobody is safe. Everybody became involved in war. One consequence of the change in the scope and nature of conflicts is that far greater numbers of non-combatants are being directly and indirectly injured, maimed, and killed by weapons that used to be thought of as weapons of war, to be directed against combatants. So medicine in general and public health in particular have a responsibility to move from cure to prevention, from disease to health, from war to peace. Therefore, we should minimize civilian casualties caused by war by analyzing and discussing the role of public

health during and after the war. The most important issue in this site is to analyze causal factors.

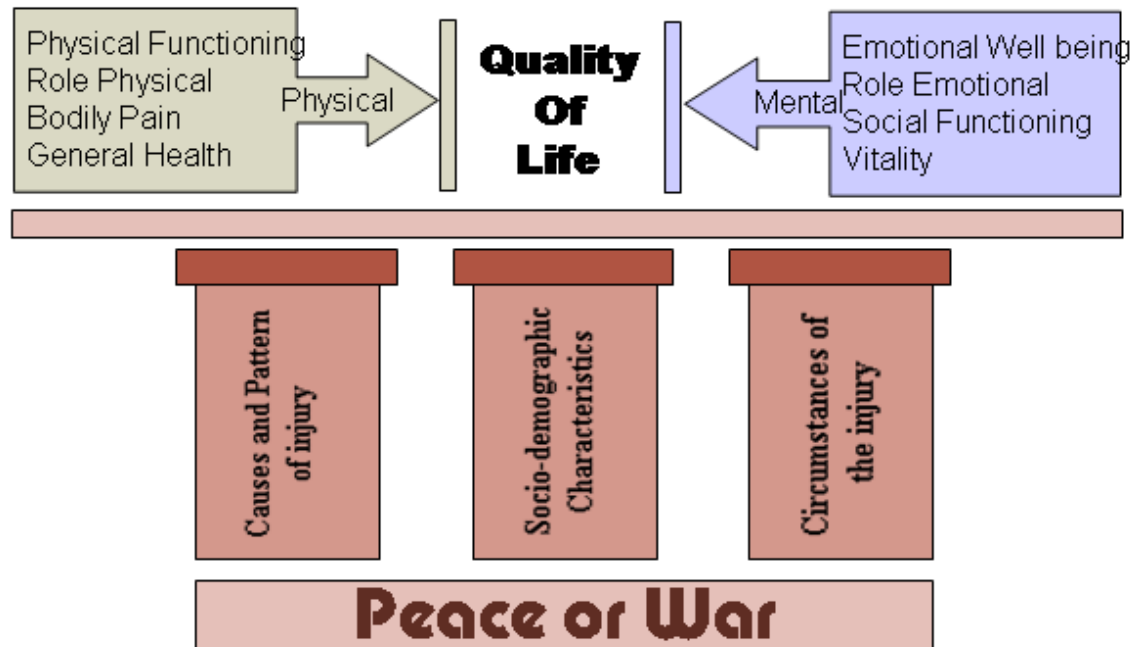


Figure 1: Conceptual Framework

The nature of wounds and injury during war times somewhat differ from these seen during peace time. In peace times we have specific well known risk factors which affect all population leading to so called peace time diseases. The situation during war time is different. These risk factors which affect peace time are still unchanged or become more aggressive added to them the factors specific for war times. These factors are several in nature and leave more injured and severely injured people which increase the toll among civilians.

The major risk factors for injury during war are socio-demographic factors like gender, age, education and occupation. Almost four times as many males as females were injured or killed during the last war on the Gaza Strip. Not only to be male but with age ranged from 15 to 49 is also an issue.

Other risk factor is the place of injury, and activities at the time of injury. However, this risk is not limited to males or females.

The patterns of injury are considered as one of the main risk factors for injury during war. The majority of injuries during the War on Gaza were due to jet-airplane bombing or fragments noticed for the first time during the long protracted war with Israel. The extent, severity, and impact of injury are largely determined by the amount of war-related injuries left after the end of the war.

All these factors play an important role in affecting the human health (whether physical or mental). The physical health is regarded as a combination of four main sub-scales which are physical functioning, role physical, bodily pain and general health. The mental health is also regarded as a combination of four main sub-scales which are emotional well being, role emotional, social functioning and vitality. These two components are then combined together to give us the QOL construct which reflect the over all population level of well-being.

All above mentioned eight sub-scales which could be affected by war must be strengthened in order to get accepted health condition for population. When we achieve good health conditions, this will be reflected on our population QOL which is vulnerable in situations like ours. The combination of Physical and Mental Component Summary give us the level of QOL for the population (weather is low or high). All the society needs to work together in order to raise this level.

Chapter three

Methodology

Chapter Three

3 Methodology

3.1 Study design

This study is a descriptive analytic study. It is descriptive because it describes the occurrence of the war and its implication on civilians and analytical since it analyzes the relationship between variables in the study. It measures the outcome of the war and the associated exposures. The cross sectional study is relatively easy to conduct, economical, carried out over a short period of time, and useful for investigating of different exposures as well as policy and interventions.

3.2 Study population

The study population included all persons who had non-fatal war-related injuries in Rafah Governorate during War on Gaza December 27, 2008 to January 18, 2009 no matter if the injury resulted in impairments/disabilities or not and they constitute 443 injured.

3.3 Time of the study

The study was conducted after the end of the War on Gaza December 27, 2008 to January 18, 2009. At this moment approximately most of the injured persons were able to evaluate their general health condition. An ethical oral letter was sent to the Director of El-Najjar Hospital in June 2009 asking about the names and addresses of all injured individuals during the war. This hospital was the only one where the injured were admitted. The questionnaire was done and validated by nine competent experts. Afterwards the questionnaires were checked for completeness by the researcher. Actual data were collected from July 8, 2009 till September 25, 2009 by the researcher himself with one other assistant. Data analysis was completed by the end of October, 2009.

3.4 Place of the study

The study was carried out at Rafah Governorate, which is located at the Southern site of Gaza Strip.

3.5 Sample size

All non-fatal war related injured in Rafah Governorate during the aggression included in the study as a sample size. The list of the names of injured people and their addresses was compiled from one governmental source which is El-Najjar Hospital. According to this source there were 443 injured with different age groups.

3.6 Selection criteria

3.6.1 Inclusion criteria:

All non-fatal injured victims during the last War on Gaza December 27, 2008 – January 18, 2009 who were administered in El-Najjar Hospital are eligible to be included in the study.

3.6.2 Exclusion criteria:

1. People who could not be traced,
2. People who live outside Rafah governorate,
3. People who have no records of their specific addresses,
4. People who went abroad for treatment and till now they have not returned.

3.7 Data collection

Data was collected by administering the questionnaire which was revised several times to include all factors of interest. The used questionnaire was translated into Arabic and was available through internet. The researcher changed some un-understandable sentences and adapted them into more understandable one to be relevant to Gaza population. Then it was validated by the nine competent experts. The researcher collected data by himself and other one assistant together for each individual. The assistant was graduated from a pharmaceutical institute, trained and well prepared by the researcher on how to interview patients, collect data, filling questionnaires and providing clarification item by item were provided. The team visited respondents at their place of residency and interviewed the injured people or their proxies. Collection of data was carried out sequentially by face to face interviews, which increased data quality of the SF-36 questionnaire. Moreover consent was already obtained before the interviews. After proper introduction, the

interviewer explained the research purpose. Participants were told that participation was voluntary, data obtaining are confidential and provided verbal informed consent. They were informed about the lack of risk, and the benefits from the study as well as about their right to withdraw or to refuse participation.

Proxy interviews were held on behalf of persons who were severely disabled. Other proxy interviews were conducted with parents on behalf of children who couldn't fill the questionnaire, or if the injured was not at home at the time of the survey or on behalf of those who still under treatment abroad at the time of data collection. The proxies must be mainly the careers and/or close relatives of the injured, such as parents, siblings, spouses and sons or daughters.

3.8 Construction of the questionnaire

The instrument used in this study was a structured questionnaire based on the SF-36 (Annex 3 in English language and Annex 4 in Arabic). The researcher constructed the questionnaire based on the review of the literature, and his observations and personal experiences in health services. The questionnaire consisted of some sections that made us able to determine selected aspects surrounding the respondents, their living status, activities, cause of injuries, impact of injuries and its severity. The questionnaire consisted of 75 items divided into seven main sections which are:

3.8.1 Basic socio-demographic characteristics

Personal factors are the individual background of an individual's life and living, composed of features of the individual that are not part of a health condition or health state. These may include age, gender, educational background, residency, other health conditions, lifestyle, habits, social background, profession beside past and current experience. The section consists of 8 items.

3.8.2 Circumstances of the injury

The activity carried out by the injured at the moment of injury (working, playing, traveling, farming, walking, fighting, etc). The section consists of 7 items asking about:

1. The place of injury according to areas,

2. Date of injury,
3. The activity that individual was engaged in at the time of the War.

3.8.3 Causes of injuries

The section consists of one item asking about the cause of injury like unexploded ordnance, jet airplanes or helicopters, blunt trauma and other causes.

3.8.4 The pattern of injury.

According to Central American Clinical Report (CACR) the classification of wounds includes three stages: Minor or superficial (e.g., bruises, minor cuts), moderate, requiring some skilled treatment (e.g., fractures, sutures) and severe, requiring intensive medical/surgical management (e.g., internal hemorrhage, punctured organs, severed blood vessels) (CACR, n.d.).

3.8.5 The war related traumas (impairment)

This section is a complementary to SF-36. This section consist of 10 items.

3.8.6 Short Form (SF-36)

The impact of war on QOL was measured using the short-form health survey with 36 questions addressing eight health concepts Those chosen represent the most frequently measured concepts in widely-used health surveys. The SF-36 was found to be well accepted, easy to administer and was constructed to satisfy minimum psychometric standards necessary for group comparisons. The goals of QOL measures include differentiating between people who have a better QOL and those who have a worse QOL.

3.8.7 The severity of the impairment and needs assessment

In this study the severity of the impairment was categorized as either temporary or long term depending on expected chronicity. Those whose condition had been medically diagnosed and was expected to prevail for a relatively limited period of time (up to 12 months after the injury) were classified as having temporary impairment; while those whose condition was not expected to improve within the defined period were classified as having long term or permanent impairment (Sibai, 2000). The impairment was assessed in

some defined areas in which were uncovered in the SF-36 questionnaire like difficulty of vision, hearing, speaking, and body pain.

3.9 Pilot study

A study was executed using a sample of 9 injured people selected randomly by SPSS. They were interviewed in order to examine the clarity, feasibility and suitability of the items included in the instrument, including the adequacy of translation into Arabic in terms of capturing the meaning contained in the English before starting data collection, and to find the weak areas in the provided items. Then the items were coded and entered onto the computer program SPSS by the researcher himself. Some un-understandable items were changed into more understandable and sometimes some phrases were omitted. The pilot subjects were excluded from the study population to prevent bias and some modifications of the questionnaire were done after piloting.

3.10 Data entry

Over-viewing of the questionnaires was the first step prior to data entry. The useable number of questionnaires was 321. This step was followed by designing an entry model using the computer software Statistical Package for Social Sciences (SPSS). The coded questionnaires were entered into the computer by the researcher. Data cleaning was done through checking out a random number of questionnaires and through exploring descriptive statistics and frequencies for all variables. All missed values were checked by revising the available questionnaires.

3.11 Data analysis

The researcher used SPSS version 13 for analysis, many different statistical tests were used through frequency of the study items, description of the study population. Frequency, and Cross-tabulation of the results were used to demonstrate the study items. Appropriate advanced statistical analysis was conducted to explore the potential relationships between variables. Therefore, an independent T-test, Chi-square and One way ANOVA (Including LSD-Post Hoc test) tests were carried out to investigate the relationships between the independent study variables with the total, sub-scales and dimensions scores of QOL level. The researcher tries to avoid over-analyzing of data to avoid any misunderstanding of the results.

3.12 Response rate

The total number of 321 injured filled the questionnaire from the 410 according to the eligibility criteria, which constitute a participation rate of 78.3% and response rate of 100%. According to the list of the names of injured people from El-Najjar Hospital there are approximately 443 injured. From the total number, 14 individuals were from outside Rafah, 9 were used for the pilot, 5 individuals told us that they were diseased not injured, 2 individuals were abroad for treatment, 3 were un-available. Those 33 persons were excluded from the study and the remaining 410 were considered as the study population. Among those 321 participant filled the questionnaire and the rest 89 were very difficult for the researcher to find them. No-one refused to participate. There were un-obvious names (only personal and family name were wrote) and without addresses. The researcher tried to find there addresses by using the population registry but without benefit.

3.13 Limitation of the study

The researcher's position as a doctor and the nature of data collection as the researcher must go to everyone at home were two constraints of the study which have reflected in the response rate. However, the serious limitations was that due to the War on Gaza a lot of injured were obligated to change the place of residency. It causes a lot of problems to the researcher to found them.:

3.13 Ethical matters

1. An official letter of approval to conduct the research was obtained from the Helsinki Committee-Gaza Strip (Ethical committee) (Annex 1)
2. Every injured in the study received a complete explanation about the research purposes and confidentiality of information.
3. Every injured in the study population knew that participation in the research is optional.
4. Consent form was obtained from each injured in the study verbally (Annex 2).
5. All the relevant ethical concepts were considered: Respect for people and respect for truth.
6. Anonymity and confidentiality was maintained.

Chapter four

Results and Discussion

Chapter Four

4 Results and Discussion

To date, the association of non-fatal war related injuries and QOL have not been sufficiently investigated in the literature. To researcher knowledge this is the first study of the general and psychosocial health status of War injured population in Gaza strip. This study shows the assessment of QOL among injuries during the War on Gaza using the SF-36 questionnaire. Because of the increased use of the SF-36, it has become possible to compare mean sub-scale scores among different populations injured in the wars.

4.1 Frequency analysis

This chapter presents the main results of statistical analysis of the study variables in a comparative way. The differences between the selected variables and scores of the SF-36 sub-scales were explored by using different analytical tests and presented as detailed below.

4.1.1 Socio-demographic characteristics

The socio-demographic characteristics of the total population are shown in table (4). A total of 321 injured completed the questionnaire. The majority of injured were male 251 (78.2%), and the overall male: female ratio being 4:1. The observed differences between men and women were more likely to represent differences in baseline characteristics of the population at risk during the attack period rather than differentials in population structures. The males move out of their homes more frequently, are more actively working than females, are more likely engaged in activities that put them at risk and to considered as targeted victim for Israel.

According to the study held by Hicks and Spagat measuring DWI from September 29, 2000 to April 30, 2007, the Israeli Army killed 213 females among 4057 Palestinians and DWI was 5 (Hicks and Spagat, 2008). In our study DWI is 21.8 which shows the higher discrimination of female targets by Israeli Army during the last war.

Table 4: Socio-demographic characteristics of the study population.

Variables	Category	No	%
Sex	Male	251	78.2
	Female	70	21.8
Age group	1 – 15	65	20.2
	16 – 25	123	38.3
	26 – 35	63	19.6
	36 – 45	35	10.9
	46 – 55	24	7.5
	56 - 65	6	1.9
	66 and more	5	1.6
Marital status	Currently Non-married	173	53.9
	Currently Married	148	46.1
Years spend at school	8 years and less	105	32.7
	From 9 to 12 years	132	41.1
	13 years and more	84	26.2
Family income	Not-enough	177	55.1
	Moderately enough	97	30.2
	Enough	47	14.6
Residency	Non-Bordered area	217	67.6
	Bordered area	104	32.4
Work status	Not-Working	124	38.6
	Working	95	29.6
	Students	102	31.8
Displacement	Internally Displaced	173	53.9
	Not Displaced	148	46.1

The median age for all was 23 year, and the mean age for males was 24.5 year (SD = 12.14) and 31 years for females (SD =19.4). The women were, on average, 6.5 years older than the men were, but this difference didn't reach statistically significant level. This could be explained culturally that at this age female have more freedom to get out of the house.

The age of patients varied from two years to 85 years in contrast to one study held by Helweg and found that during the period before the Intifada 2000 the victims were men, and no one was younger than 10 years. During the Intifada 2000, 9% were women, 3% below 10 years, and 9% aged 10 - 14 years (Helweg, 2004). These differences show that the Israeli army did not distinguish between child, female or male and no respect was paid to the Fourth Geneva Convention.

The majority of the injured, or 243 (75.7 %), were young and in their productive age (15 – 49). From the all population 123 (38.3%) were included in the second group. Most of injured 173 (53.9 %) were currently non-married and those who were married constituted 148 (46.1%). These findings are close to findings concluded by Sibai and others that the highest proportion of injured people (73%) during war are people in their productive age (15-59 years) and those who are married constituted 44% (Sibai, Shaar and El-Yassir, 1996). Thus although all of the Gaza population was at risk, there is a specific group which is considered more risky and targeted by Israel.

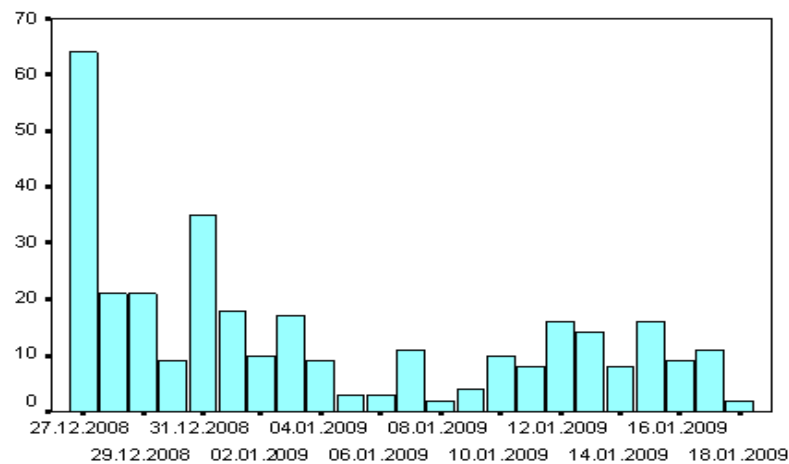
As shown on table (4), 132 (41.1%) of the study population had attended secondary school and more than one fourth 84 (26.2%) received Diploma or University education. The mean years of education were 9.8 years (SD: 4.6 years). These results were close to the result of El-Haj study on Gaza Strip revealing the mean years of 9 years (SD: 5.6 years) for the studied population(El-Haj, 2008). Although this study held among diseased population not post-war.

Most of the injured 177 (55.1 %) reported insufficient family income, and about one third 97 (30.2%) reported moderate family income. About one third 124 (38.6%) of the injured were not-working, about one third 102 (31.8%) were students and the remaining third 95 (29.6%) were working at the time of the survey.

The majority of the injured 173 (53.9 %) were internally displaced due to war. About one third from the injured were living in bordered areas 104 (32 .4 %) and the remaining majority of 217 (67.6%) were from non-bordered areas.

4.1.2 Circumstances and causes of the injury

Table (5) and graph (1) shows that the majority were injured during the first week of the war at more than half of injured 178 (55.5%). This week was the most bloody and gory due to the fact that the war was sudden and acute in nature and the Israeli Army began the War with a week-long air attack, from 27 December until 3 January 2009, by killing every moving object, and explaining the high rate of injury during just the first week of the war on Gaza.



Graph 1: Distribution of number of injured by date

As shown in Graph (1) the first day of the war, 27 December 2008, has the largest number of injured 64 (19.9 %) because the war was sudden and acute, followed by the fifth day 35 (10.9 %).

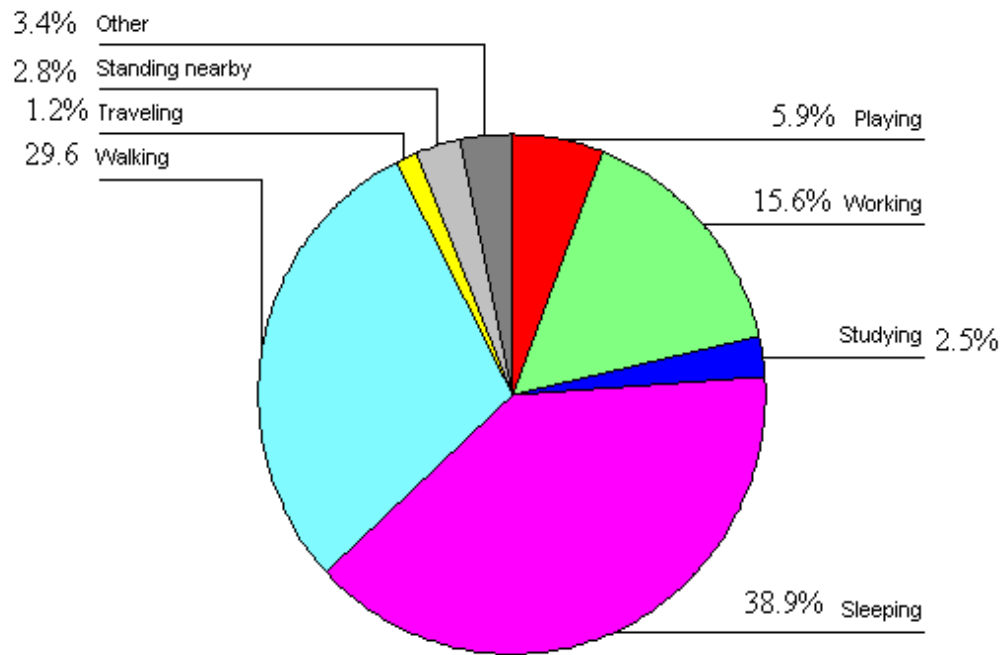
One half of all injured 154 (48 %) were in homes or schools during the first attack, about one third 113 (35.2%) were in streets and the others 54 (16.8%) were in other places like farm, transport, working at the factory etc.

The majority of the injured, or 216 (67.3 %), reported that their area where they were was out of risk. That could be seen since the majority of the injured 178 (55.5 %) were inhabitant and were in their homes, and it makes sense to think that the home is a safe place to be, although in Gaza, the home is no longer safe.

Table 5: Characteristics of the study population by circumstances and causes of the injuries

Variables	Category	No	%
Date of injury	First Week	178	55.5
	Second Week	59	18.3
	Third Week	84	26.2
Place of injury	Home & school	154	48
	Street	113	35.2
	Others	54	16.8
Activity during injury	Rest or study	133	41.4
	Walking	118	36.8
	Others	70	21.8
Highly exposed area	No	216	67.3
	Yes	105	32.7
Frequency going there	Habitant	178	55.5
	Sometimes going	120	37.4
	Never going	23	7.2
Other injured	Yes	243	75.7
	NO	78	24.3
Mechanism of injury	Jet-airplane & Fragments	248	77.3
	Explosion	32	10
	Others	41	12.7

The main activities that were being performed by the injured at time of injury were resting at 133 (41.1 %), followed by about one third or 113 (35.2 %) who's were on streets and the rest 70 (21.8%) who were working, studying, traveling etc.. The distribution of patients according to activity at the time of war is shown in graph (2).



Graph 2: distribution of patients according to activity during injury

The majority of all war injured 248 (77.3 %) were injured as a result of Jet-airplane bombing and being hit by fragments, which in this war, caused more injuries than gun shots and explosions did according to previous experienced, followed by explosions with 32 (10%) and the rest 41 (12.7%) were injured as a result of gunshot, blunt trauma, falling down etc. Other mechanisms of injury like rocket-propelled grenades, gun shots, blunt trauma and others caused about 41 injured (12.7 %) of injuries. Helweg found that prior to the Intifada 2000 all injuries were caused by blunt force. During the Intifada 65% of the injuries were caused by firearms or explosives, 19% by beating and 6% by gaseous substances (Helweg, 2004).

4.1.3 The pattern of injury

According to our study more than one half of injured 188 (58.6 %) have arrived in the hospital by ambulance and 132 (41.1 %) have arrived by other vehicles. The majority of the injured, or 176 (54.8 %) were treated and discharged on the same day. About one third 113 (35.2 %) were admitted to the hospital and 32 (10 %) were referred to other hospital due to their dangerous general condition especially European Gaza Hospital (EGH).

According to the anatomical place of the injury the majority of injured 116 (36.1%) were with combined injury, followed by the injury of upper and lower limbs 95 (29.6%). The injury of the head took the third place and concerned 88 (27.4%) of all injuries, and the rest 22 (6.9%) were injuries to the abdomen and chest. According to Sibai study, the most common site of injuries was injuries to the lower limbs (45.4%) (Sibai, Shaar and El-Yassir, 1996).

Most injuries, 180 (56.1%), were of the moderate type. One third of the injured 108 (33.6%) were with minor injury. Only 33 (10.3%) of injured were with severe injury which demanded the transfer of patients to other hospitals.

Table 6: Distribution of the study population by the pattern of the injury

Variables	Category	No	%
Mode of arrival	Ambulance	188	58.6
	Other vehicle	132	41.1
Disposition	Treated and discharge	176	54.8
	Admitted to hospital	113	35.2
	Referred to other hospital	32	10
Anatomical place of injury	Head	88	27.4
	Upper & lower limbs	95	29.6
	Abdomen & chest	22	6.9
	Combined injury	116	36.1
Type of injury	Wounds	211	65.7
	Fractures	26	8.1
	Combined injury	71	22.1
	Others	13	4
Severity of injury	Minor	108	33.6
	Moderate	180	56.1
	Severe	33	10.3

According to the type of injury, most of the injuries were due to wounds, which consisted of 211 (65.7%) of all the injured. 71 injured (22.1%) were diagnosed with combined

injury. Fractures constituted 26 (8.1%), while other injuries like burns, muscular trauma, laceration, abrasion, head trauma and other injuries composed the rest percent 13 (4%).

4.1.4 War related traumas (Impairments)

Table (7-A) shows that only one case ended with right upper limb amputation and two cases with right lower limb amputation.

Table 7-A: Distribution of the study population by the war related traumas

Variables	Category	No	%
Amputation of the limbs	None	318	99.1
	Right upper limb	1	0.3
	Right lower limb	2	0.6
Vision problem	None	275	85.7
	Right eye	11	3.4
	Left eye	12	3.7
	Both eyes	23	7.2
Difficulty affected eye	Never	277	86.3
	Mild	14	4.4
	Moderate	21	6.5
	Severe	9	2.8
Hearing problem	None	276	86
	Right ear	10	3.1
	Left ear	4	1.2
	Both ears	31	9.7
Difficulty affected ear	Never	277	86.3
	Mild	11	3.4
	Moderate	30	9.3
	Severe	3	0.9

Some injured 23 (7.2%) had problems on both eyes. Twenty one injured (6.5%) were with moderate injuries followed by 14 injured (14.4%) with mild problems. Only 9 injured (2.8%) were with severe eye problems.

Thirty one injured (9.7%) were with problems in both ears. Those with moderate problems account for 30 (9.3%) followed by mild ear problems 11 (3.4%). Only three injured (0.9%) were with severe injury.

Sleeping problems affected 117 (36.4%) injured out of them 61 (19%) were with moderate problems on sleeping and 28 (8.7%) with mild problems. The same number with severe sleeping problems (table 7-B).

Table 7-B: Distribution of the study population by the war related traumas

Variables	Category	No	%
Sleeping problem	Never	204	63.6
	Mild	28	8.7
	Moderate	61	19
	Severe	28	8.7
Breathing difficulty	Never	253	78.8
	Mild	17	5.3
	Moderate	36	11.2
	Severe	15	4.7
Speaking difficulty	Never	282	87.2
	Mild	16	5
	Moderate	16	5
	Severe	7	2.2
Body pain	Never	183	57
	Mild	29	9
	Moderate	64	19.9
	Severe	45	14
System problem	Never	265	82.6
	Mild	8	2.5
	Moderate	36	11.2
	Severe	12	3.7

Thirty six persons (11.2%) suffered from moderate breathing difficulties and only 15 (4.7%) injured had severe difficulties due to war.

Sixteen injured (5%) had mild difficulty on speaking and the same number with moderate difficulty. Only 7 injured (2.2%) were with severe speaking difficulty.

138 (43%) injured suffered from body pain due to injury. Of those 64 (19.9%) suffered from moderate body pain followed by 45 (14%) with severe body pain. Thirty six injured (11.2%) suffered from moderate system problems other than the place of injury and 12 (3.7%) injured were with severe system problems.

As seen on table (8), the majority of injured without impairment, and 131 (87.9%) think that their condition will improve during 12 months.

Table 8: Relationship between impairment and improved general condition

Impairment	Improved general condition					
	Less than 12 months		More than 12 months		Total	
	No	%	No	%	No	%
Without impairment	131	40.8	18	5.6	149	46.4
With impairment	95	29.6	77	24	172	53.6
Total	226	70.4	95	29.6	321	100

The majority of the impaired 172 (53.6%) reported multiple impairments. One fourth of the injured 83 (25.9%) reported only one impairment and the rest with different impairment. Among those with no any type of impairment 149 (46.4%), the majority 114 (76.5%) were male and 35 (23.5%) were female. Those who have temporary impairment 226 (70.4%) were much higher than those with permanent impairment 95 (29.6%). The finding revealed by Sibai shows that 47.3% were with permanent impairment and the majority of the impaired reported a single impairment (Sibai, Shaar and El-Yassir, 1996).

4.1.5 Quality of life of injured using Short Form (SF-36)

4.1.5.1 Physical functioning

More than one third of our study population 117 (36.4%) said that their health now limits them a lot in conducting vigorous activities like running or lifting heavy objects while more than one third 127 (39.6%) thought that their health now does not at all limit them to do these activities now (table 9).

About one half of the study population 157 (48.9%) thought that their health at the time of the survey does not limit them at all to complete moderate activities like moving a table, pushing a vacuum cleaner etc., and only 55 (15.1%) thought that these activity are limited due to there health condition. The remaining percentage, these activities limit them a little.

Table 9: Distribution of the study population by the physical functioning items

Variables	Mean	Category	No	%
Vigorous activity	51.56	Yes, limited a lot	117	36.4
		Yes, limited a little	77	24
		No, not limited at all	127	39.6
Moderate activity	56.89	Yes, limited a lot	55	17.1
		Yes, limited a little	109	34
		No, not limited at all	157	48.9
Lifting or carrying groceries	79.75	Yes, limited a lot	30	9.3
		Yes, limited a little	70	21.8
		No, not limited at all	221	68.8
Climbing several flights of stairs	63.86	Yes, limited a lot	73	22.7
		Yes, limited a little	86	26.8
		No, not limited at all	162	50.5
Climbing one flight of stairs	78.04	Yes, limited a lot	29	9
		Yes, limited a little	83	25.9
		No, not limited at all	209	65.1
Bending, Kneeling or Stooping	79.28	Yes, limited a lot	34	10.6
		Yes, limited a little	65	20.2
		No, not limited at all	222	69.2
Walking more than one and half kilometer	68.69	Yes, limited a lot	50	15.6
		Yes, limited a little	101	31.5
		No, not limited at all	170	53
Walking several blocks	74.77	Yes, limited a lot	38	11.8
		Yes, limited a little	86	26.8
		No, not limited at all	197	61.4
Walking one block	84.89	Yes, limited a lot	24	7.5
		Yes, limited a little	49	15.3
		No, not limited at all	248	77.3
Bathing or dressing yourself	90.97	Yes, limited a lot	20	6.2
		Yes, limited a little	18	5.6
		No, not limited at all	283	88.2

Two hundred and twenty one injured (68.8%) did not think that their health now limits them lifting or carrying groceries and only 30 injured (9.3%) reported that their health now limits them a lot on doing this things now.

On climbing several flights of stairs, 83 (25.9%) of the injured thought that their health now limits them a little and only 29 (9%) reported that their health now limited them a lot.

Only 29 (9%) reported that their health now limit them from climbing one flight of stairs a lot and 83 (25.9%) reported that their health now limit them a little.

Thirty four of the injured (10.6%) reported that their health limits them now a lot when bending, kneeling or stooping due to their injury and 65 (20.2%) reported that their health now limits them a little.

Fifty injured (15.6%) reported that their health now limits them a lot when walking more than one mile due to their injury and 101 (31.5%) reported that their health now limits them a little.

Thirty eight injured (11.8%) reported that their health now limits them a lot in walking several blocks due to their injury and 86 (26.8%) reported think that their health now limits them a little.

Twenty four injured (7.5%) reported that their health now limit them a lot when walking one block due to their injury and 49 (15.3%) reported that their health now limits them a little.

Twenty injured (6.2%) reported that their health now limit them a lot when bathing or dressing themselves due to their injury and 18 (5.6%) reported that their health now limits them a little.

4.1.5.2 Role limitation due to physical health

As seen on table (10) more than one third of the injured 117 (36.4%) were obliged to cut down time spent on work as a result of their physical health during the last four weeks. Almost the same number 118 (36.8%) were accomplishing less than they would like due to their health condition. One hundred and thirteen (35.2%) were limited in the kind of work or other activities that they usually did and 121 (37.7%) had difficulties performing the work or other activities which took extra time compared to before the injury.

Table 10: Distribution of the study population by the role limitation due to physical health items

Variables	Mean	Category	No	%
Cut down time spent on work	63.55	Yes	117	36.4
		No	204	63.6
Accomplished less than you would like	63.24	Yes	118	36.8
		No	203	63.2
Were limited in the kind of work	64.80	Yes	113	35.2
		No	208	64.8
Had difficulty performing the work	62.31	Yes	121	37.7
		No	200	62.3

4.1.5.3 Bodily pain

During the last 4 weeks 65 (20.2%) of the injured had severe bodily pain, 56 (17.4%) had moderate pain and 80 (24.9%) had mild pain. Among 69 (21.5%) of the injured this pain had severely interfered with their normal work including both work outside the home and housework, among 51 (15.9%) this pain had moderately interfered and among 73 (22.7%) the pain had mildly interfered with work (table 11).

Table 11: Distribution of the study population by the bodily pain items

Variables	Mean	Category	No	%
Body pain last 4 weeks	75.39	Never	120	37.4
		Mild	80	24.9
		Moderate	56	17.4
		Severe	65	20.2
Body pain interference with work	69.55	Never	128	39.9
		Mild	73	22.7
		Moderate	51	15.9
		Severe	69	21.5

4.1.5.4 General health

We found that 73 (22.7%) of our population feel that their QOL in general is poor. Although this study focused on the injured, not the general population, the findings are consistent with the finding for all the West Bank and Gaza population study held by WHO that more than 1 in 4 Palestinians (25.6%) feel their life quality is poor or very poor and more than 1 in 5 (21.2%) suffer a lot or extremely from physical/bodily health problems that negatively influences their ability to function in their life quality (WHO, 2005).

More than one third 122 (38%) reported that they seem to get sick a little easier than other people while more than one half 169 (52.6%) reported that they don't get sick easier than others (table 12).

More than one half of injured 186 (57.9%) reported that they are as healthy as anyone and more than one third 108 (33.6%) reported that this is false.

Table 12: Distribution of the study population by the general health items

Variables	Mean	Category	No	%
Health condition	60.59	Excellent	67	20.9
		Good	181	56.4
		Bad	73	22.7
Get sick easier than others	57.87	True	122	38
		Don't know	30	9.3
		False	169	52.6
As healthy as anyone	62.62	True	186	57.9
		Don't know	27	8.4
		False	108	33.6
Expect my health to get worse	61.99	True	95	29.6
		Don't know	50	15.6
		False	176	54.8
Excellent health	61.60	True	184	57.3
		Don't know	23	7.2
		False	114	35.5

One hundred and seventy six injured (54.8%) don't expect that their health will get worse and about one third 95 (29.6%) expect that their health will get worse.

The majority of injured 184 (57.3%) find that their health is excellent and about one third 114 (35.5%) think that their health is not.

4.1.5.5 Emotional well being

Table (13) shows that more than one third of the injured 111 (34.6%) are nervous most off the time due to their injury and only 18 (5.6%) are nervous all of the time.

Ninety two injured (28.7%) are feeling so down in the dumps and nothing could cheer them up a good bit of the time and only 9 (2.8%) are feeling the same all the time.

Table 13: Distribution of the study population by the mental health items

Variables	Mean	No	Category					
			All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
Nervous person	48.41	No	18	111	47	59	35	51
		%	5.6	34.6	14.6	18.4	10.9	15.9
Feeling down	59.81	No	9	39	92	48	72	61
		%	2.8	12.1	28.7	15.0	22.4	19
Feeling calm and peaceful	56.61	No	56	122	61	39	24	19
		%	17.4	38.0	19.0	12.1	7.5	5.9
Feeling downhearted and blue	57.38	No	14	79	57	37	53	81
		%	4.4	24.6	17.8	11.5	16.5	25.2
Happy person	69.47	No	63	139	47	36	31	5
		%	19.6	43.3	14.6	11.2	9.7	1.6

More than one third of injured 122 (38%) are feeling calm and peaceful most of the time and only 19 (5.9%) don't feel calm and peaceful at all.

Seventy nine injured (24.6%) are feeling downhearted and blue most of the time and 81 (25.2%) don't feel themselves downhearted and blue at all. In contrast to Thabet and others study, that 30.91 had negative feelings, such as blue mood, anxiety and depression (Thabet, Abu Tawahina, El Sarraj and Vostanis, 2008).

One hundred and thirty nine of injured (43.3%) see that they are happy persons most of the time and only 5 (1.6%) see that they are not happy at all.

4.1.5.6 Role limitation due to mental health

Table 14: Distribution of the study population by the role limitation due to emotional problems items

Variables	Mean	Yes		No	
		No	%	No	%
Cut down time spent on work	69.47	98	30.5	223	69.5
Accomplished less than you would like	70.72	94	29.3	227	70.7
Don't do work carefully	71.65	91	28.3	230	71.7

As seen on table (14) about one third of injured 98 (30.5%) were obliged to cut down time spent on work as a result of their mental health during the last four weeks. Almost the same number 94 (29.3%) were accomplished less than they would like due to their health condition. Ninety one injured (28.3%) don't do work carefully due to their emotional problems.

4.1.5.7 Social functioning

Only 60 (18.7%) of our total study population reported that there are severe health interference (physical or emotional) with social activities with family as a result of the injury and 145 (45.2%) reported that there are none.

More than one third 123 (38.3%) reported that there is not any health interferences (physical or emotional) with social activities with relatives and 112 (34.9%) reported that there are like interferences most of the time.

Table 15: Distribution of the study population by the social functioning items

Variables	Mean	Category	No	%
Health interference with social activity (Family)	73.29	Never	145	45.2
		Mild	79	24.6
		Moderate	37	11.5
		Severe	60	18.7
Health interference with social activity (Relatives)	67.60	All of the time	5	1.6
		Most of the time	112	34.9
		Some of the time	81	25.2
		None of the time	123	38.3

4.1.5.8 Vitality

As seen on table (16) about 151 (47%) injured are feeling full of pep during the last four weeks, 91 (28.3%) are feeling full of pep some of the time, 75 (23.4%) all of the time and only 4 (1.2%) are not feeling full of pep at all.

The majority of the injured 198 (61.7%) reported feeling that they have energy most of the time and only 4 (1.2%) feeling as not having energy at all.

One hundred and fifty two injured (47.4%) reported feeling worn out most of the time, about one third 98 (30.5%) reported feeling worn out some of the time and only 4 (1.2%) are feeling worn out all the time.

One hundred and fifty one injured (47%) reported feeling tired most of the time, about one third 98 (30.5%) reported feeling tired some of the time and only 8 (2.5%) are feeling tired all the time.

Table 16: Distribution of the study population by vitality items

Variables	Mean	Category	No	%
Full of pep	66.42	All of the time	75	23.4
		Most of the time	151	47
		Some of the time	91	28.3
		None of the time	4	1.2
Having energy	64.11	All of the time	36	11.2
		Most of the time	198	61.7
		Some of the time	83	25.9
		None of the time	4	1.2
Feeling worn out	56.88	All of the time	4	1.2
		Most of the time	152	47.4
		Some of the time	98	30.5
		None of the time	67	20.9
Feeling tired	55.51	All of the time	8	2.5
		Most of the time	151	47
		Some of the time	98	30.5
		None of the time	64	19.9

4.1.5.9 Reported health transition**Table 17: Distribution of the study population by the health transition**

Variables	Mean	Category	No	%
Health condition compared to one year ago	32.87	Better now	26	8.1
		The same	98	30.5
		Worse now	197	61.4

As seen on table (17) the majority of the injured 197 (61.4%) considered their health condition to be worse now compared to one year ago and only 26 (8.1%) considered their health condition to be better now than one year ago.

4.1.6 The severity of the impairment and priority needed

Table 18: Distribution of the study population by the severity of the impairment and priority needed.

Variables	Category	No	%
Improvement general condition	Less than 12 months	226	70.4
	More than 12 months	95	29.6
Needed for medical follow up	Yes	115	35.8
	No	206	64.2
Needed for regular treatment	Yes	113	35.2
	No	208	64.8
Using any accessory device	Yes	18	5.6
	No	303	94.4
Types of accessory device	No need	303	94.4
	Wheelchair	1	0.3
	Special bed	1	0.3
	Crutch	5	1.6
	Audio-phone	2	0.6
	Others	9	2.8
Need for accessory device but cannot own	Yes	18	5.6
	No	303	94.4
Accessory device needed	No need	304	94.7
	Artificial Prosthesis	1	0.3
	Wheelchair	1	0.3
	Special bed	1	0.3
	Audio-phone	3	0.9
	Others	11	3.4
Priority needed	Money	174	54.2
	Additional treatment	67	20.9
	Others	11	3.4
	Nothing	69	21.5

Table (18) shows the distribution of the study population by the severity of the impairment and priority needed. 226 (70.4%) among the injured expect their general condition to be improved during 12 months and the others 95 (29.6%) with more severe injuries reported that their general condition will take more than one year to be improved. Only 18 (5.6%) of injured are using accessory devices (mainly crutches). Some of injured, or 18 (5.6%) would need accessory devices but they are not able to own them due to money shortage or un-availability to buy. Of course these needs don't reflect the real need for the injured because the study was held about 9-10 months after the end of the war where the majority of injured needed for any devices were offered by some organizations.

Our study concluded that 174 (54.5%) had their priority for money merely for living or treatment compared with WHO finding that more than 4 out of 10 (42.6%) do not have money at all or a little money to meet their individual or family needs. The rest of the injured 146 (45.5%) need mainly additional treatment or need nothing. These result could be explained by the fact that the majority of the injured by the time of this study were cured, so there was no need for further treatment.

Despite the acute and early relief services provided by all those concerned at the time of the injury, when asked about priority needs, the majority of the impaired 174 (54.2%) reported the need for money and the rest had a need for additional services mostly medical in nature. In a situation like ours, this is expected, because about one third of the injured are not working, and some who were previously working, and in line with changes in the political situation, were exposed to salary severance policy, UNRWA didn't offer financial support and some other reasons put people under this demand.

4.2 Relationship between variables

Given the large number of variables, this section will use summary measures, Physical Component Summary (PCS) and Mental Component Summary (MCS) to analyze the data and interpret the results. Summary measures will reduce the number of statistical requirements and provide a useful interpretation with a little loss of information.

4.2.1 Short Form- 36 (FS-36)

Estimated QOL domains scores "as per RAND SF-36 Health survey" were calculated and were transformed to a 0 to100 scale. The transformation converted the lowest and highest

possible scores to 0 and 100, respectively. The scores from all items that address each specific area of functional health status were averaged together, for a final score within each of the 8 dimensions measured as seen on table (19) (e.g. pain, physical functioning etc.). As seen on table (19) the results of the SF-36 health survey for the study were 64.84 for all sub-scales, 66.54 for PCS, 64.43 for MCS, 73.3 for Physical functioning, 61.86 for Role physical, 71.82 for Bodily pain, 59.18 for General health, 59.60 for Vitality, 69.75 for Social functioning, 68.98 for Role emotional and 59.40 for Emotional well being.

Physical functioning is a relatively “objective” indicator of physical health because it describes physical ability among our population and should reflect real physical health. Emotional well being is a relatively “subjective” indicator of mental health and the study showed that it's the worst among our population. Even though our sample focuses on those injured during war, our results are consistent with reports from Banaszak and others study that mental health is worse in the whole population directly affected by war (Banaszak, Kovaèiae, Kovaèeviae, Vuletiae, Mujkiae and Ebling, 2002).

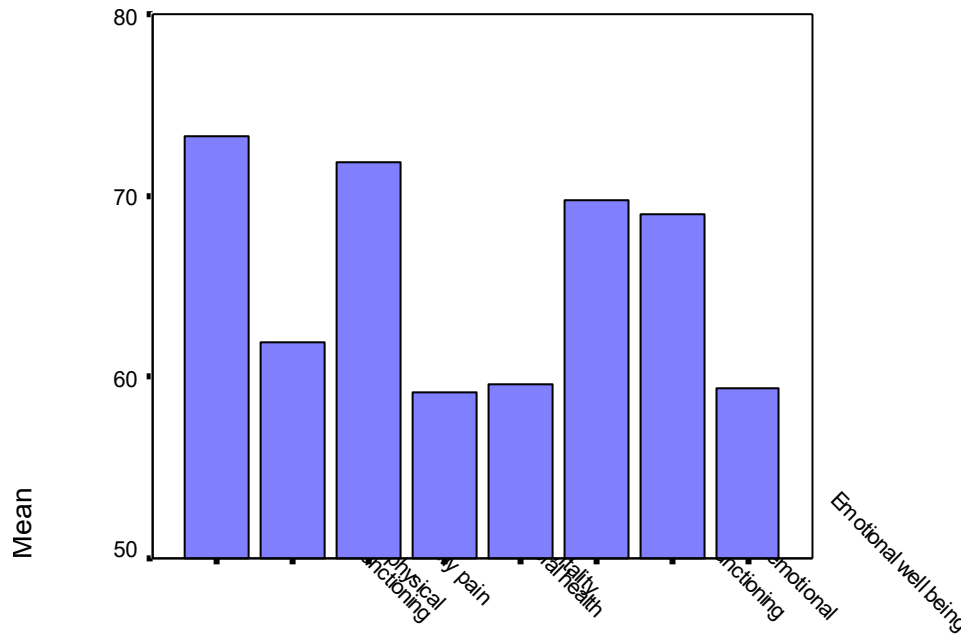
The study was held by Thabet and others measuring the QOL among Palestinians in the Gaza Strip showed that quality of life scores mean was 64.19, physical domain mean was 18.37, psychological domain mean was 17.67 and social domain mean was 8.71 (Thabet, Abu Tawahina, El Sarraj, and Vostanis, 2008).

As table (19) show, there are no statistically significant differences among all these means and sex.

The SF-36 total score was slightly higher by male (65.33; SD: 22.6) compared with that by female (62.79; SD: 24.9), but this difference was not statistically significant (P-value 0.471).

The scores of our study population were compared with the total scores for normal US and Turkish populations using one sample T-test. The comparison reveals that our study populations score (mean: 64.84) reported significantly worse QOL measures than the US (mean: 76.55) and Turkish (mean: 80.2) population. This result can be explained by the fact that the US and Turkish populations were taken from populations with known healthy conditions and it was expected that our population was selected from only a post-war population, and focused on those injured. One sample T-test showed that the US and

Turkish scores were significantly higher than the norms for our population (P-value: 0.000), only Vitality reveal non-statistically significant differences with US population (P-value was 0.363).



Graph 3: Post-war scoring SF-36 for all sub-scales (Gaza, 2009)

The scores of our study population were compared with the total post-war scores for Croatian population (Banaszak, Kovačević, Kovačević, Vuletić, Mujkić and Ebling, 2002) using one sample T-test (table 20). The comparison reveals that our study population's scores were higher than others for all mean sub-scales and the relations between our population and the Croatian populations reveal statistically significant levels (P-value: 0.000) almost in all sub-scales. Only Social functioning and Emotional well-being didn't reveal statistically significant levels (P-values were 0.355 and 0.224 respectively).

Table 19: Characteristics of all SF-36 sub-scales

SF-36 sub-scales	Total Mean	Total SD	Male		Female		P-value
			Mean	SD	Mean	SD	
All score	64.84	23	65.33	22.6	62.79	24.9	0.471
PCS	66.54	27.4	66.92	27.4	64.96	27.8	0.642
MCS	64.43	22.9	65.10	22.1	61.63	26.2	0.323
Physical functioning	73.3	27.6	74.05	27.2	70.28	29.2	0.373
Role physical	61.86	46.2	62.22	46.4	60.38	45.3	0.795
Bodily pain	71.82	26.7	72.40	26.6	69.39	27.2	0.462
General health	59.18	28.5	59.03	28.9	59.81	26.7	0.857
Vitality	59.60	23.7	59.8	23.6	58.77	24.1	0.778
Social functioning	69.75	26.2	70.42	25.7	66.98	27.9	0.391
Role emotional	68.98	44.1	70.44	43.4	62.89	46.9	0.264
Emotional well being	59.40	20.6	59.76	20.1	57.89	22.6	0.552

As occupied Palestinian territories is under Israeli occupation, there are a lot of humanitarian aid agencies operating in the area, especially the Gaza Strip after the War on Gaza. This may be a factor in explaining the scores, in that people receive help to deal with the essentials of life. For example, UNRWA ensures care (medical, educational and social affairs) for about 67.9% refugees from the total population in Gaza Strip according to PCBS (PCBS, 2009). Arab countries support our institutions and ministries who care about populations. A lot of foreign organizations also support our population. Almost all who were injured or damaged have been given a financial support directly after the war. All these factors over and above the religious factor can play a role in raising the QOL and having a positive impact on improving the general condition among Palestinians after war. This explanation could be supported by the fact that 30.5% from one sample (386) in Gaza Strip were satisfied with their spirituality, religion and personal beliefs (Thabet, Abu Tawahina, El Sarraj, and Vostanis, 2008).

Table 20: Comparison of our population means for all sub-scales with post-war Croatian population

SF-36 sub-scales	Means scores		
	Our Pop.	Croatia	
All scores	64.84	58.01	0.000
PCS	66.54	56.32	0.000
MCS	64.43	59.7	0.001
Physical functioning	73.32	64.21	0.000
Role physical	61.86	52.70	0.001
Bodily pain	71.82	59.35	0.000
General health	59.18	49.02	0.000
Vitality	59.60	49.52	0.000
Social functioning	69.75	68.29	0.355
Role emotional	68.98	63.02	0.026
Emotional well being	59.40	57.95	0.224

In general, as a country under siege and war our population scores were relatively high. The study which was held by Thabet and others shows that impact of siege is so obvious in Palestinians live in Gaza Strip and bad quality of life is expected if people are not able to receive medical care, can not find necessary things, stocked in Gaza Strip and feel as in prison, being dependent in food from NGOs (Thabet, Abu Tawahina, El Sarraj and Vostanis, 2008). Albeit that, chronic exposure to traumatic events is associated with higher levels of mental health problems and poorer physical health (McFarlane and De Girolamo as cited in De Jong, 2007), and witnessing and self-experienced extreme violence is also associated with psychosocial and mental health problems (De Jong, 2007), our situation reveal inverse results. No one can deny that QOL has dramatically deteriorated for Palestinians in general and for those who live in Gaza Strip in particular since September 2000. I think that our bad current population's level of life are consider by our population as a normal level and they became adapted to this level. If this could not explain these results, we could explain them by response shift theory especially recalibration scale. All the above mentioned factors play a role in raising the level of QOL among our population.

There was a concern that the proxies have biased the results because about 47 (14.6%) questionnaires were filled on behalf of persons who were absent at the moment of interview. So a relation of proxies and non-proxies with all SF-36 scores was done as seen on table (21).

According to table (21) there were a statistically significant differences among these variables towards proxy questionnaires, only in General Health, MCS, and Vitality. So we can conclude that proxies are somewhat affect the results and they will be excluded in all following relationships.

Table 21: : Distribution of population means for all sub-scales according to proxies

SF-36 sub-scales	Proxy		P-value for all groups
	By himself	By others	
	Mean	Mean	
All score	64.84	71.69	0.060
PCS	66.54	74.18	0.077
MCS	64.43	71.59	0.047
Physical functioning	73.32	76.38	0.488
Role physical	61.86	72.87	0.130
Bodily pain	71.82	76.28	0.291
General health	59.18	71.17	0.007
Vitality	59.60	67.34	0.038
Social functioning	69.75	64.43	0.255
Role emotional	68.98	80.14	0.104
Emotional well being	59.40	64.43	0.123

All SF-36 scoring variables were transformed into two groups, first group including all scores below 50 and the second group includes all other scores. The results are shown on table (22).

The results indicated that patients particularly scored lower on Vitality, general health, Role physical and Emotional well being. This perhaps is an indication that patients need more support from the healthcare system. In spite of that, about 222 (81%) of injured

scored higher in Physical functioning. The apparently paradoxical results of this study remain unexplained and require further investigation.

Table 22: Distribution of population means for all sub-scales according to the mean 50

SF-36 sub-scales	Scores by category			
	50 and less		ELSE	
	No	%	No	%
All score	77	28.1	197	71.9
PCS	87	31.8	187	68.2
MCS	75	27.4	199	72.6
Physical functioning	52	19	222	81
Role physical	112	40.9	162	59.1
Bodily pain	64	23.4	210	76.6
General health	116	42.3	158	57.7
Vitality	122	44.5	152	55.5
Social functioning	83	30.3	191	69.7
Role emotional	84	30.7	190	69.3
Emotional well being	102	37.2	172	62.8

According to table (23), among male, only one fourth 56 (25.3%) reported having poor QOL (there scores were less than 50) and the rest majority were with high QOL. Among female more than one third 21 (39.6%) reported having poor QOL and the rest were with high QOL.

Table 23: Relationship of Scores by category and sex

Scores by category	Sex			
	Male		Female	
	No	%	No	%
50 and less	56	25.3	21	39.6
ELSE	165	74.7	32	60.4

4.2.2 Socio-demographic variable

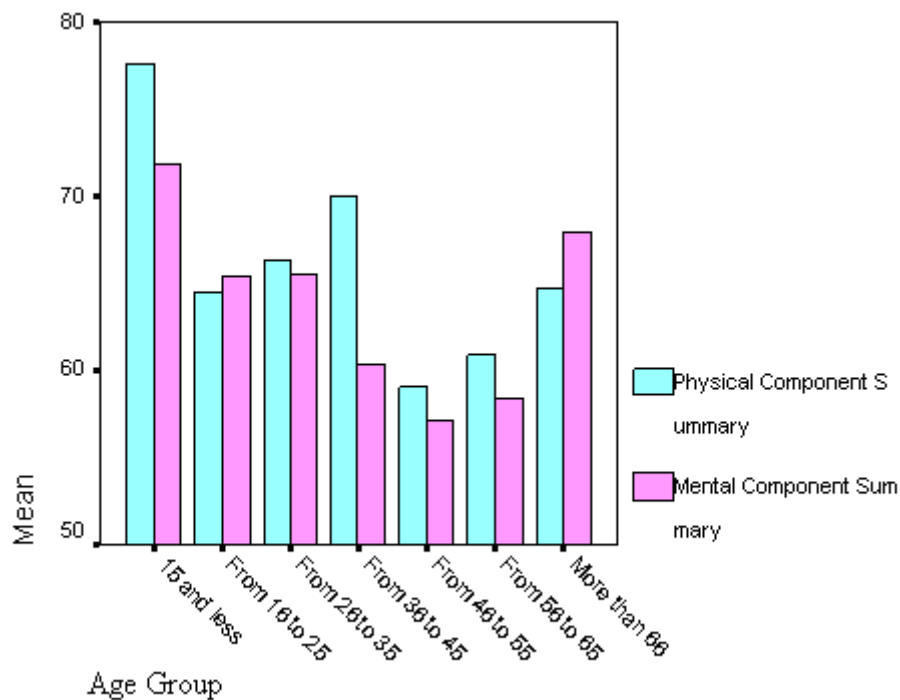
4.2.2.1 Sex

Males and females reported differences in their overall QOL scores. Males had higher scores almost in all sub-scales (only for General Health female had slightly higher scores). In contrast, Giacaman study revealed that there was a significant trend for higher QOL domain scores for women in the sample (Giacaman, Mataria, Stefanini, Nirmala, Kowal and Chatterji, 2008), although their sample was of all the population of the West Bank and Gaza Strip and ours focused on injured people only. These results need further research for adequate explanation.

4.2.2.2 Age

The age was categorized into seven groups. The first group included all less than 15 years; the second group included all from 16 year to 25 year; the third group included all from 26 year to 35 year; the fourth group included all from 36 year to 45 year; the fifth group included all from 46 year to 55 year; the sixth group included all from 56 year to 65 year; and the last seventh group included all more than 66 years.

As seen on graph (4), as age increase the QOL become poor in PCS and MCS but the age group more than 66 have high QOL level.. Among the same age group MCS become better than PCS. This perhaps is an indication that patients need more support from the healthcare system. This results are relative with Giacaman results that physical QOL declined with age (Giacaman, Mataria, Stefanini, Nirmala, Kowal and Chatterji, 2008). As we know, ageing constitutes a lot of interacting factors, including biological and social vulnerabilities, resulting in a particular health status at older ages (Naess, Hernes and Blane, 2005). The case of inhabitants in the OPT demonstrates the additional negative impact of exposure to life-long conflict, violence and insecurity. The inter-acting dynamics of these issues are manifested by the significant lower QOL scores (overall and domain specific scores) for older adults in the sample.



Graph 4: Relationship of PCS and MCS with age groups

The total mean SF-36 scores for injured in the first group less than 15 years old was 73.54, for the second group from 16 to 25 years old was 63.98, for the third group from 26 to 35 years old was 65.69, for the fourth group from 36 to 45 years old was 65.06, for the fifth group from 46 to 55 years old was 58.14, for the sixth group from 56 to 65 years old was 59.72 and for the seventh group 66 years and more was 63.42. Almost the highest values for all variables were observed in the first age group less than 15 in contrast to the study held in Turkey where the highest values for all variables were observed in the "18 to 44" age group (Demiral, 2006). Another study by Salma shows that people with 65 years and older show good self perception of health and quality of life and this tendency corresponds to a specific coping mechanism that fosters adaptation to health-related losses during old age. (Salma and Shah, 2007)

Almost all category have better scores in PCS than MCS only for the second group and seventh group the scores were high in MCS. Differences according to age group were statistically significant in PSC (P-value-0.036), Role Physical (P-value-0.008) and Vitality (P-value-0.015).

Table 24: Distribution of all means of SF-36 sub-scales by Age group

SF-36 sub-scales	Age category							
	Less than 15	16-25	26-35	36-45	46-55	56-65	66 and more	P-value
All score	73.54	63.98	65.69	65.06	58.14	59.72	63.42	0.078
PCS	77.55	64.57	66.36	70.02	59.01	60.83	64.75	0.036
MCS	71.89	65.41	65.57	60.26	57.15	58.38	67.93	0.094
Physical functioning	80.69	69.27	76.03	78.86	69.17	67.50	60.00	0.089
Role physical	82.31	58.74	54.76	70.00	52.08	50.00	70.00	0.008
Bodily pain	79.27	70.85	72.10	74.07	63.96	70.00	61.00	0.224
General health	67.92	59.43	62.54	57.14	50.83	55.83	68.00	0.193
Vitality	67.69	62.24	60.00	51.29	51.88	57.50	55.00	0.015
Social functioning	76.35	68.90	69.05	72.14	63.02	66.67	77.50	0.375
Role emotional	82.05	68.02	73.54	62.86	59.72	50.00	80.00	0.151
Emotional well being	61.48	62.47	59.68	54.74	54.00	59.33	59.20	0.379

4.2.2.3 Marital status

Marital status was categorized into two groups, currently married and currently unmarried. Cross tabulation was done between marital status and work status. More than one half 143 (52.2%) were currently unmarried, among them the majority are students. One third of all population 87 (31.8%) were student and only 6 (2.2%) are married. Chi square testing shows (table 25) statistically significant differences between these groups (P-value: 0.000).

Table 25: Relationship between Work status and Marital status

Marital status	Work status						Chi square
	Working		Student		Not-working		
	No	%	No	%	No	%	
Currently unmarried	14	5.1	81	29.6	48	17.5	0.000
Currently married	70	25.5	6	2.2	103	37.6	

Cross tabulation was done between marital status and work status and the result reach statistically significant among these groups.

Independent sample T-test was done with all means score (table 26) but didn't found significant difference in between (P-value: 0.054). As seen on the same table there are a statistically significant differences between the mean for MCS (P-value: 0.033), Role Physical (P-value: 0.021) and Vitality (P-value: 0.005).

Table 26: Relationship between all SF-36 sub-scales and marital status

SF-36 sub-scales	Marital status		P-value for all groups
	Currently married	Currently un-married	
All score	67.40	62.05	0.054
PCS	69.48	63.34	0.064
MCS	67.25	61.36	0.033
Physical functioning	73.92	72.67	0.710
Role physical	68.01	55.15	0.021
Bodily pain	73.90	69.54	0.178
General health	62.10	55.99	0.076
Vitality	63.46	55.38	0.005
Social functioning	70.89	68.51	0.453
Role emotional	73.89	63.61	0.054
Emotional well being	60.76	57.92	0.256

The quality of life level was higher among those who currently married in all sub-scales which may be explained according to Maslow's hierarchy, that married individuals are

realize belonging need by having love and being a part of group. This make them more relative to self esteem than unmarried and having high QOL level.

4.2.2.4 School years (Education)

Table 27: Relationship between education in years and other variables

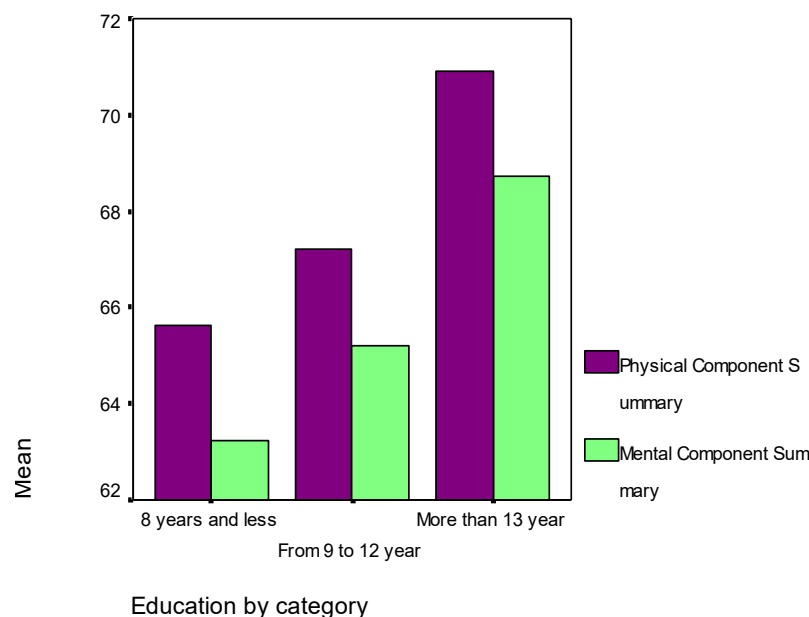
Other variables		Education in years						Chi square
		8 years and less		From 9 to 12 years		More than 13 years		
		No	%	No	%	No	%	
Sex	Male	67	24.5	90	32.8	64	23.4	0.647
	Female	18	6.6	23	8.4	12	4.4	
Age	15 and less	42	15.3	5	1.8	0	0	0.000
	From 16 - 25	20	7.3	56	20.4	36	13.1	
	From 26 – 35	7	26	23	8.4	23	8.4	
	From 36 – 45	5	1.8	17	6.2	10	3.6	
	From 46 – 55	6	2.2	9	3.3	6	2.2	
	From 56 – 65	3	1.1	2	0.7	1	0.4	
	66 and more	2	0.7	1	0.4	0	0	
Family income	Not enough	57	20.8	60	21.9	31	11.3	0.013
	Moderately enough	22	8	35	12.8	29	10.6	
	Enough	6	2.2	18	6.6	16	5.6	
Work status	Working	8	2.9	36	13.1	40	14.6	0.000
	Students	32	11.7	32	11.7	23	8.4	
	Not-working	45	16.4	45	16.4	13	4.7	
Marital status	Married	64	23.4	51	18.6	28	10.2	0.000
	Un-married	21	7.7	62	22.6	48	17.5	

School years were categorized into three groups. The first group includes those who spent 8 years and less in the school, second group include those who spent 9 to 12 years and third group include those who spend more than 13 years. Cross tabulation was done between sex and years spent on school. The majority of both genders were included in the

second group especially male 90 (40.7%). Chi square didn't show statistically significant differences between these groups and sex (P-value: 0.647).

Statistically significant differences were shown between education and age by category (P-value: 0.000), family income by category (P-value: 0.013), work status (P-value: 0.000), and marital status (P-value: 0.000). I think that married people are emotionally more stable than unmarried and this stability has been gained from the family not from medical support.

Those who rating their health as excellent or very good were within the second educational group and constitute 28 (8.7%) and 36 (11.2%) respectively from the total population. According to one study that the percentage rating their health as excellent or very good increased with educational level (Hatice, Matthew, Mary and Marci, 2007).



Graph 5: Relationship of PCS and MCS with education by category

Mean SF-36 scale scores for injured within the first group (8 years and less) ranged from 54.82 for General health to 69.76 for Physical functioning. For the second group it ranged from 58.32 for General health to 73.85 for Physical functioning. For the third group it ranged from 62.63 for Vitality to 77.37 for Bodily pain. Only Bodily pain was reached

statistically level (P-value: 0.026) towards those who spent more than 13 years in the school..

Table 28: Distribution of all means of SF-36 sub-scales by school years

SF-36 sub-scales	School Years by categories			P-value for all groups
	8 years and less	From 9 to 12 years	More than 13 years	
All score	61.86	64.50	68.68	0.168
Physical functioning	69.76	73.85	76.51	0.292
Role physical	61.18	60.84	64.14	0.879
Bodily pain	66.09	72.39	77.37	0.026
General health	54.82	58.32	65.33	0.059
Vitality	57.65	59.03	62.63	0.389
Social functioning	67.94	67.37	75.33	0.091
Role emotional	67.06	68.44	71.93	0.773
Emotional well being	55.67	59.47	63.47	0.056

As seen from table (28) and graph (5) as the years of educations increased the mean scores also for all sub-scales increased (Direct relation) except for Role Physical which mean improvement in patient perceived health status in all sub-scales but these findings reached statistically significant level only with emotional well being (P-value: 0.027). These finding were consistent with Mier study that the less educated had worse scores in most of the eight sub-scales, except for role emotional (Mier, Ory, Zhan, Conkling, Sharkey and Burdine, 2008). Graph (5) also shows that the level of physical health always higher than the mental one. These finding may be explained by the fact that individuals try always to complains with physical complaints because the physician will give more attention to their physical symptoms. Over and above the stigma of mental illness which consider as the main obstacle to receive mental health services.

4.2.2.5 Family Income:

Family income was categorized into three groups. The first group included those whose income is not-enough, second group whose income is moderately enough and third group whose income is enough. More than half from the total population 148 (54%) were with

not-enough family income and only 40 (14.6%) from the total population were with enough family income. Those with lower income are accompanied by lower QOL scores among all of the sub-scales (table 29) and this difference reaches statistically significant level (P-value: 0.001).

Table 29: Distribution of all means of SF-36 sub-scales by family income

SF-36 sub-scales	Family Income			P-value for all groups
	Not-enough	Moderately enough	Enough	
All score	60.03	70.62	70.24	0.001
PCS	61.26	72.50	73.28	0.002
MCS	60.25	69.69	68.59	0.004
Physical functioning	68.51	78.43	80.13	0.007
Role physical	57.60	67.44	65.63	0.249
Bodily pain	66.03	77.67	80.63	0.000
General health	52.91	66.45	66.75	0.000
Vitality	55.34	65.93	61.75	0.003
Social functioning	65.29	73.55	78.13	0.006
Role emotional	66.44	72.09	71.67	0.588
Emotional well being	53.95	67.21	62.80	0.000

These finding are close to Yamazaki and others findings that comparisons of the estimated mean SF-36 scores showed that low household income was associated with lower SF-36 scores (Yamazaki, 2005). The relation between income and education in our study is statistically significant (P-value: 0.013). In our society after getting any certificate you are gaining one step in the salary regardless of that this certificate will help you in your work or not so it evident to be statistically significant relation between income and education.

As seen on table (29), as income increases the mean scores of all sub-scales of SF-36 are increased also and these relations reached statistically significant level almost in all sub-scales only for Role physical and Role emotional (P-value: 0.249 and 0.588 respectively). The proxies were excluded but there were no differences in the results.

4.2.2.6 Residency

All Rafah areas according to Rafah Governorate map were aggregated into two groups, bordered (these areas which located across the border) and non-bordered. Cross-tabulation was done between residency and displacement status. From total population 151 (55.1%) were from non-bordered areas and about one half from them were internally displaced (44.9%). More than one half from those who lived across the border 76 (55.1%) were internally displaced. The relation was statistically significant (Chi square: 0.000). These findings make sense and can be explained by the fact that there was no place safer than other during the war.

Table 30: Relationship between means of SF-36 sub-scales and residency

SF-36 sub-scales	Residency		P-value for all groups
	Bordered	Non-bordered	
All score	64.64	65.01	0.895
PCS	66.34	66.71	0.912
MCS	64.42	64.44	0.994
Physical functioning	72.44	74.04	0.634
Role physical	63.41	60.60	0.616
Bodily pain	71.59	72.00	0.898
General health	57.93	60.20	0.512
Vitality	60.24	59.07	0.684
Social functioning	69.41	70.03	0.845
Role emotional	68.29	69.54	0.817
Emotional well being	59.74	59.13	0.807

Cross-tabulation was done between residency and the severity of injury but didn't reach statistically significant level (Chi square: 0.389), also between residency and the work status no statistically significant level was reached (Chi square: 0.935).

Mean scores for injured in bordered areas ranged from 57.93 for General health to 72.44 for Physical functioning scale. Mean scores for injured in non-bordered areas ranged from 59.07 for Vitality to 74.04 for Physical functioning scale. The majority of mean scales scores were high for non-bordered injured which mean slight improvement in patient

perceived health status in these sub-scales but these relations didn't reach statistically significant level.

4.2.2.7 Work status

The work status variable was categorized into three groups, the first group included all working injured, second group included student injured and third group included only not-working. Among male about more than one third were working 79 (35.7%), one third were not-working 32 (60.4%) and one third were students 71 (32.1%). Among female the majority were not-working 32 (60.4%). Cross-tabulation was done between these variables (work status and sex) and found statistically significant differences in between (Chi square test: 0.000) towards men who are working.

Table 31: Relationship between sex and work status

Work status	Sex				P-value
	Male		Female		
	No	%	No	%	
Working	88	27.4	6	1.9	0.000
Students	82	25.5	20	6.2	
Not-working	81	25.2	44	13.7	

Mean SF-36 sub-scale scores for injured within first group ranged from 59.23 for Role Physical to 77.23 for Social functioning, for second group it ranged from 65.43 for Emotional well being to 79.31 for Emotional well being and for third group it ranged from 49.76 for General Health to 67.62 for Physical functioning. As seen on table (32) students have higher scores than working and working have higher scores than not working. Using Anova test to compare between these variables, the result showed that almost all these variables reached statistically significant levels (table 32).

Table 32: Relationship between means of SF-36 sub-scales and work status

SF-36 sub-scales	Work Status			P-value for all groups
	Working	Student	Not-working	
All score	66.40	72.23	57.33	0.000
PCS	68.36	74.73	58.15	0.000
MCS	66.20	72.30	56.35	0.000
Physical functioning	76.19	77.30	67.62	0.028
Role physical	59.23	75.29	52.67	0.003
Bodily pain	76.19	78.56	62.55	0.000
General health	61.85	67.76	49.76	0.000
Vitality	59.76	69.60	51.02	0.000
Social functioning	77.23	74.86	59.34	0.000
Role emotional	67.86	79.31	61.17	0.017
Emotional well being	59.95	65.43	53.86	0.000

As students are younger and have higher scores, there are a suspicion that age is a confounder. After controlling for age the results remain statistically significant which means that the age was not a confounder in this issue.

4.2.3 Circumstances of the injury

4.2.3.1 Place of injury

The place of injury variable was categorized into three groups, the first group included those who were injured in homes or schools, the second group included those who were injured on streets and third group included all other injured. Among male 102 (46.2%) were in homes or schools and 92 (41.6%) were on streets. The majority among female were in homes or schools 41 (77.4%). Cross-tabulation was done between these variables (place of injury and sex) and found statistically significant differences (Chi square test: 0.000).

Table 33: Relationship between place of injury and sex

Place of injury	Sex of the injured				Chi square
	Male		Female		
	Number	%	Number	%	
Home & School	102	46.2	41	77.4	0.000
Street	92	41.6	12	22.5	
Others	27	12.2	0	0	

These results are compatible with local culture, where usually, men are much freer to go out to different places, while women tend to stay home. They also confirm our observation that there were more men going around in streets during the war, while women and children stayed home. This can explain the differences in the place of injury between men and women.

Table 34: Relationship between means of SF-36 sub-scales and Place of injury

SF-36 sub-scales	Place of injury			P-value for all groups
	Home & school	Street	Others	
All score	64.46	67.43	56.90	0.102
PCS	67.43	67.77	57.11	0.169
MCS	62.84	68.30	58.00	0.055
Physical functioning	73.22	75.58	65.19	0.219
Role physical	64.86	60.58	50.93	0.334
Bodily pain	72.15	73.68	62.87	0.169
General health	59.51	61.25	49.44	0.155
Vitality	58.29	63.46	51.67	0.043
Social functioning	70.19	70.55	64.35	0.527
Role emotional	66.20	74.36	62.96	0.271
Emotional well being	56.67	64.81	53.04	0.002

Mean SF-36 sub-scale scores for injured within first group ranged from 56.67 for Emotional well being to 73.22 for Physical functioning, for second group it ranged from 60.58 for Role Physical to 75.58 for Physical functioning and for the third group it ranged from 49.44 for General Health to 65.19 for Physical functioning. Only Vitality and

Emotional well being reached statistically significant levels (P-value was 0.043 and 0.002 respectively) (see table 34). Those who were injured in other places than home, schools and streets had significantly lower HRQOL. These findings could explained by that: perhaps injury outside the home was accompanied by less help for the injured compared to home, when family would have jumped to the rescue. The proxies were excluded but there were no differences in the results.

4.2.3.2 Activity

The activity at the time of injury variable was categorized into three groups. The first group included those who were resting in homes or studying , the second group included those who was walking at the time of injury and third group included all other injured. Among male 100 (45.2%) were walking on streets and about one third 66 (29.9%) were resting or studying. The majority among female 34 (64.2%) were resting or studying. Cross-tabulation was done between these variables (Activity and sex) and found statistically significant differences (Chi square test: 0.000).

Table 35: Relationship between means of activity and Sex of the injured

Activity	Sex of the injured				Chi square
	Male		Female		
	Number	%	Number	%	
Rest & study	66	29.9	34	64.2	0.000
Walking	100	45.2	16	30.2	
Others	55	24.9	3	5.7	

Mean SF-36 sub-scale scores for injured within first group ranged from 57.48 for Emotional well being to 75.50 for Physical functioning, for the second group it ranged from 58.19 for General health to 74.14 for Role Emotional and for the third group ranged from 50.86 for Role Physical to 71.47 for Physical functioning. Only Role Emotional reached statistically significant levels (P-value was 0.017) (see table 36). Those who were engaged in other activities than rest, study or walking at the time of injury had significantly lower HRQOL. Those who were resting or studding at the time of injury had significantly higher scores (high health related quality of life.

Table 36: Relationship between means of SF-36 sub-scales and activity

SF-36 sub-scales	Activity at the time of injury			P-value for all groups
	Rest or study	Walking	Others	
All score	66.69	65.09	61.17	0.346
PCS	69.89	65.81	62.25	0.225
MCS	65.06	65.93	60.36	0.301
Physical functioning	75.50	72.37	71.47	0.601
Role physical	68.25	61.85	50.86	0.073
Bodily pain	73.70	70.82	70.56	0.676
General health	62.10	58.19	56.12	0.395
Vitality	60.05	60.13	57.76	0.801
Social functioning	71.38	68.21	70.04	0.674
Role emotional	71.33	74.14	54.60	0.017
Emotional well being	57.48	61.24	59.03	0.405

4.2.3.3 Frequency going there

The frequency of being in the place of injury variable was categorized into three groups. The first group included those who never went there and there presence there was accidently, the second group included those who sometimes go there and the third group included only those who are inhabitant in these areas. Among male about one half 103 (46.6%) are inhabitant. The majority among female 37 (69.8%) also are inhabitant. Cross-tabulation was done between these variables (Frequency going there and sex) and found statistically significant differences (Chi square test: 0.007).

Table 37: Relationship between Frequency going there and sex

Frequency going there	Sex of the injured				Chi square
	Male		Female		
	Number	%	Number	%	
Never	20	9.0	1	1.9	0.007
Sometimes	98	44.3	15	28.3	
Inhabitant	103	46.6	37	69.8	

4.2.4 Mechanism of injury

The mechanism of injury variable was categorized into three groups, the first group included those who were injured by Jet airplane bombs or fragments, the second group included those who were injured by explosion, and the third group included those who were injured due to other causes. The majority among males 174 (78.7%) and female 38 (71.7%) were injured by jet airplane bombing or fragments (total of 212, 77.4%). According to our previous experiences with the Israeli army's attacks on the Gaza Strip, this is the first time that we observe that the majority of those injured were injured by Jet airplane bombing or fragments, which suggests that the Israeli army was exaggerated the use of power by airplane shelling. These results are consistent with the result of the Coupland and Samnegaard study which concludes that there were higher proportion of civilians injured by fragments rather than bullets in war which can be explained by the link between the technology of weapons and how civilians are wounded. Both increased destructive force and increased distance between user and victim are features of military efficiency of a weapon system used and at least 61% of those injured by fragments were civilians (Coupland and Samnegaard, 1999). They added that compared with using a rifle, there is distance and no visual contact between the user and the victim in space (shells, bombs, and mortars) or time (mines). The user thus feels less responsible for his or her actions, the psychology of the user perhaps changing with the weapon used. These data show that the number of civilian injuries is related not only to whether weapons are in the hands of untrained and undisciplined users but also to the type of weapon in those hands.

Table 38: Relationship between Mechanism of injury and sex

Mechanism of injury	Sex of the injured				Chi square
	Male		Female		
	Number	%	Number	%	
Jet airplane & Fragments	174	78.7	38	71.7	0.530
Explosion	14	6.3	4	7.5	
Others	33	14.9	11	20.8	

Cross-tabulation was done between these variables (Mechanism of injury and sex) and there were no statistically significant differences between the groups (Chi square test: 0.530).

Cross-tabulation was done between Mechanism of injury and improved general condition and found statistically significant differences (Chi square test: 0.001).

Table 39: Relationship between means of SF-36 sub-scales and mechanism of injury

SF-36 sub-scales	Mechanism of injury			P-value for all groups
	Jet-airplane & Fragments	Explosion	Others	
All score	65.10	48.23	70.39	0.002
PCS	67.05	49.17	71.21	0.013
MCS	64.36	43.59	73.33	0.000
Physical functioning	73.25	63.33	77.73	0.175
Role physical	62.85	36.11	67.61	0.040
Bodily pain	72.36	54.44	76.31	0.011
General health	59.74	42.78	63.18	0.031
Vitality	59.88	41.67	65.57	0.001
Social functioning	69.04	52.08	80.40	0.000
Role emotional	68.55	31.48	86.36	0.000
Emotional well being	59.94	49.11	61.00	0.086

Mean SF-36 sub-scale scores for injured within first group it ranged from 59.74 for General Health to 73.25 for Physical functioning, for second group it ranged from 31.48 for Role Emotional to 63.33 for Physical functioning and for third group it ranged from 61.00 for Emotional well being to 86.36 for Role Emotional. Almost all these variables reached statistically significant levels except for Physical functioning and Emotional well being (see table 39). Those who were injured due to other causes than by Jet airplane, fragments or explosion had significantly higher HRQOL (high health related quality of life).

Those who were injured by explosion had significantly lower scores (low health related quality of life (see table 39). Indeed, explosions seem to have negatively affected HRQOL, perhaps because of the proximity of the explosion to the injured. These results need further research for adequate explanation.

4.2.5 The pattern of injury

4.2.5.1 Disposition

Table 40: Relationship between means of SF-36 sub-scales and disposition

SF-36 sub-scales	Disposition			P-value for all groups
	Treated & Disch.	Admitted	Transferred	
All score	72.91	58.77	42.51	0.000
PCS	75.87	60.16	38.69	0.000
MCS	72.42	57.56	45.13	0.000
Physical functioning	80.23	69.10	51.03	0.000
Role physical	75.66	51.60	23.28	0.000
Bodily pain	79.83	66.86	46.12	0.000
General health	67.75	53.09	34.31	0.000
Vitality	66.03	53.40	46.21	0.000
Social functioning	77.98	62.77	49.57	0.000
Role emotional	82.34	58.87	32.18	0.000
Emotional well being	63.34	55.19	52.55	0.002

According to the disposition variable it was clear from results that those who were treated and discharged had high HRQOL but these who were referred to other hospital had low HRQOL and these results revealed high statistical significance for all sub-scales (P-value: 0.000) (table 40). Of course, this is expected, as the severity of injury is of important influence on health and life quality in health has well.

4.2.5.2 Anatomy

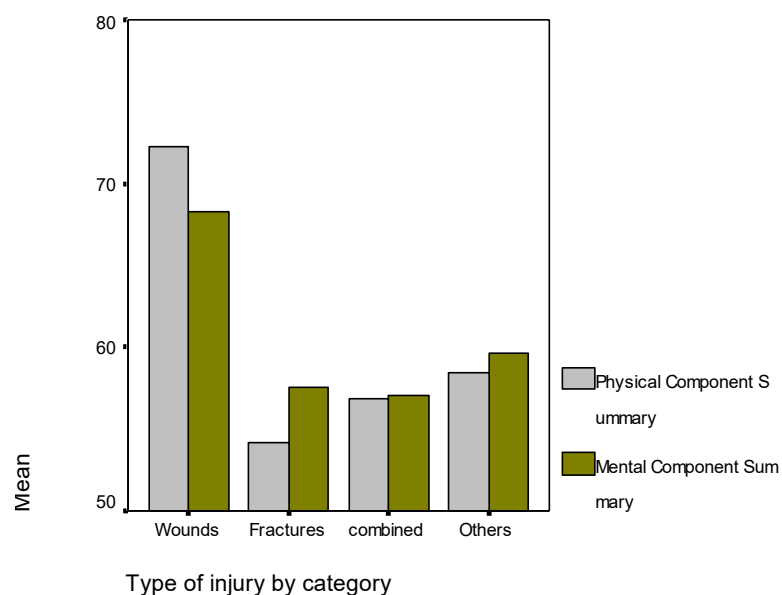
The anatomy variable (body part affected) was categorized into four groups: The first group included those with head injury, the second group included those with injury of upper and lower limbs, the third group included those with injury in the abdomen and chest and the fourth group included those with combined injury. Among males 93 (42.1%) were with combined injury, 69 (31.2%) were with upper or lower limb injury, 42 (19%) were with injury of the head and the rest of 17 (7.7%) were with injury of the abdomen and chest. The majority among females 23 (43.4%) were with head injury and about one third 15 (28.3%) were with upper or lower limb injury. Cross-tabulation was done between these

variables (anatomy and sex) and there were statistically significant differences (Chi square test: 0.002). Globally, according to ICRC statistics the majority of injuries were in limbs (65%), followed by abdomen and chest injury (17%) and finally injury of the head (15%) (Giannou and Baldan, 2009). The differences in these result may be attributed to the unexpected nature of the War on Gaza, that Israeli Army used intensive airplane bombing without distinguishing between military or civil areas. These paradoxical results may be explained by the use of excessive power and new technology not used before in order to make a lot of injuries as more as possible.

Table 41: Relationship between anatomy of the injury and sex

Anatomy	Sex of the injured				Chi square
	Male		Female		
	Number	%	Number	%	
Head	42	19.0	23	43.4	0.002
Upper and lower limbs	69	31.2	15	28.3	
Abdomen and chest	17	7.7	3	5.7	
Combined injury	93	42.1	12	22.6	

4.2.5.3 Type of Injury



Graph 6: Relationship of PCS and MCS with type of injury by category

As seen on graph (6), the level of QOL was the highest among those with wounds, followed by those whose injury was due to other injuries like burn, and muscular trauma. The lowest QOL level was for those whose injury was due to fractures. One way ANOVA was done between PCS and MCS variables and type of injury variable and revealed statistically significant relation for PCS and MCS (P-value: 0.000 and 0.002 respectively).

4.2.5.4 Severity of injury

Severity of injury has three groups: minor, moderate and severe. Cross-tabulation was done with reports on improved general condition. Those injured whose general condition was expected to be recovered within 12 months after injury were more likely to be moderately injured 108 (39.4%) according to the severity of injury. Only three injured (1.1%) among those who were severely injured were expecting to be improved during 12 months and 25 (9.1%) among those who were severely injured were expected to take more than 12 months to improve. This relation has reached statistically significant levels (Chi square: 0.000).

Table 42: Relationship between Improved general condition and severity of injury

Improved general condition	Severity of injury						Chi square test
	Minor		Moderate		Severe		
	No	%	No	%	No	%	
Less than 12 months	81	29.6	108	39.4	3	1.1	0.000
More than 12 months	14	5.1	43	15.7	25	9.1	

Mean SF-36 scores for injured within first group ranged from 59.37 for Emotional well being to 80.26 for Physical functioning, for second group ranged from 60.29 for Emotional well being to 73.81 for Physical functioning and for third group ranged from 27.68 for Role Physical to 54.71 for Emotional well being. Almost all these variables reached statistically significant levels except only for Emotional well being (P-value: 0.422) (see table 43). Those who were with minor injury had significantly higher HRQOL (By increasing the severity the QOL decreased). Almost the severity of injury variable reveals statistically significant level with all SF-36 scores (P-value: 0.000).

Table 43: Relationship between means of SF-36 sub-scales and severity of injury

SF-36 sub-scales	Severity of injury			P-value for all groups
	Minor	Moderate	Severe	
All score	69.82	65.87	42.39	0.000
PCS	72.49	68.01	38.44	0.000
MCS	69.12	64.90	46.01	0.000
Physical functioning	80.26	73.81	47.14	0.000
Role physical	67.37	64.74	27.68	0.000
Bodily pain	79.18	72.48	43.21	0.000
General health	63.16	61.03	35.71	0.000
Vitality	61.37	61.42	43.75	0.001
Social functioning	76.45	70.12	45.09	0.000
Role emotional	79.30	67.77	40.48	0.000
Emotional well being	59.37	60.29	54.71	0.422

4.2.6 The severity of the impairment needs assessment

4.2.6.1 Improved general condition

The Improvement general condition variable had two groups: The first group included those whose condition expect to be improved during the next 12 months after the injury (temporary impairment) and the second group included those whose condition expect to be improved during more than 12 months after the injury (permanent impairment). The injured whose general condition is expected to be recovered within 12 months after injury 192 (70.1%) were more likely to be male 154 (80.2%) compared with participants who did not recover during this time, more likely to be married 106 (55.2%) and students 71 (37.0%).

Cross-tabulation was done between improved general condition and work status and reveals statistically significant differences (Chi square: 0.006). For other variables no statistically significant differences were revealed (marital status, education, family income, residency, place of injury and activity)

Mean SF-36 scores for injured within first group ranged from 62.98 for Emotional well being to 82.81 for Role Emotional, for the second group it ranged from 28.66 for Role Physical to 52.01 for Physical functioning. All sub-scales had reached statistically significant levels (P-value was 0.000) (see table 44). Those whose condition expects to be improved during the next 12 months after the injury had significantly higher HRQOL (Mean: 73.92) compared to those whose condition expects to be improved during more than 12 months after the injury (Mean: 43.59). These relations were controlled for severity of the injury but the results still strongly significant. The proxies here don't played any role.

Because the most common site of injuries was injuries to the head, upper and lower limbs, the impact of the injury on reported impairments was highest for Role Physical, General Health and Role Emotional.

Table 44: Relationship between means of SF-36 sub-scales and improvement general condition

SF-36 sub-scales	Improvement general condition		P-value for all groups
	Less than 12 months	More than 12 months	
All score	73.92	43.59	0.000
PCS	77.23	41.52	0.000
MCS	72.72	45.04	0.000
Physical functioning	82.42	52.01	0.000
Role physical	76.04	28.66	0.000
Bodily pain	81.45	49.27	0.000
General health	69.01	36.16	0.000
Vitality	66.69	42.99	0.000
Social functioning	78.39	49.54	0.000
Role emotional	82.81	36.59	0.000
Emotional well being	62.98	51.02	0.000

4.2.6.2 Priority needs

Table 45: Relationship between priority needs and sex of the injured

Priority needed	Sex of the injured					
	Male		Female		Total	
	Number	%	Number	%	Number	%
Money	116	42.3	28	10.2	144	52.6
Additional treatment	52	19.0	8	2.9	60	21.9
Others	5	1.8	5	1.8	10	3.6
Nothing	48	17.5	12	4.4	60	21.9
Total	221	80.7	53	19.3	274	100

The priority needs variable was categorized into four groups: The first group included those who need for money, the second group included those who need additional treatment, the third group included those who need help other than medical or money and the fourth group included those who need nothing. As seen on table (46), the majority of injured need money 144 (52.6%), followed by these who need additional treatment or nothing 60 (21.9%) and then these who need other things 10 (3.6%). These findings must be interpreted in light of the relative long period after the war. At the time of the survey, the medical services offered to the injured were met as a part of the usual first line acute treatment. The injured with acquired physical impairments who often require a multitude of services, such as further surgical interventions, prosthesis, physiotherapy, aids and devices such as wheelchairs and crutches, other rehabilitative work and vocational training, and finally psychological interventions to help them cope with their condition, at this time were needed mostly for money in order to overcome the difficulties they face.

Mean SF-36 scores for injured within first group ranged from 56.36 for Emotional well being to 73.68 for Physical functioning, for the second group it ranged from 37.50 for Role physical to 59.79 for Social functioning, for the third group it ranged from 40.00 for Role emotional to 79.50 for Physical functioning and for the fourth group it ranged from 70.13 for Emotional well being to 91.38 for Bodily pain. All SF-36 sub-scales had reached strongly statistically significant levels (P-value: 0.000) in all priority needed groups (see table 46). As seen on table (46), the lowest QOL level was among those who need

additional treatment because they are the severely injured and their injury expected to cure during more than 12 months.

Table 46: Relationship between means of SF-36 sub-scales and priority needed

SF-36 sub-scales	Priority needed				P-value for all groups
	Money	Additional treatment	Others	Nothing	
All score	64.46	50.87	58.68	80.77	0.000
PCS	66.50	47.99	64.50	85.55	0.000
MCS	63.65	54.61	46.91	79.06	0.000
Physical functioning	73.68	58.67	79.50	86.08	0.000
Role physical	63.89	37.50	47.50	83.75	0.000
Bodily pain	70.89	54.71	70.50	91.38	0.000
General health	57.53	41.08	60.50	81.00	0.000
Vitality	58.72	49.17	45.50	74.50	0.000
Social functioning	68.23	59.79	53.75	86.04	0.000
Role emotional	71.30	51.67	40.00	85.56	0.000
Emotional well being	56.36	57.80	48.40	70.13	0.000

Chapter five

Conclusion and Recommendations

Chapter Five

5 Conclusion and Recommendations

5.1 Conclusion

This study was carried out to identify the level of QOL among the Rafah Governorate population in the aftermath of the War on Gaza in order to determine the needs of injured. Determining the QOL will identifies subgroups with poor perceived health in order to guide interventions to improve their situations and avert more serious consequences. Since the population of Gaza has been experiencing war for long time, we decided to investigate health-related quality of life in post-war period, starting with the hypothesis that the quality of life was lower in the areas that had been more severely affected by war. We focused on the population of the Rafah Governorate as a whole, not on a specific group of people, and explored the effect of war experience on their quality of life, using the short-form health survey (SF-36). Findings from our study lead to a conclusion that:

1. War affects self perceived health and physical ability as-well as emotional and mental health of all the sample that was stricken by war.
2. We found that the level and severity of injuries were having approximately the same risk whether it's bordered or un-bordered areas.
3. The present study has provided valuable additional evidence that low socioeconomic status was associated with poor health functioning. A strong association exists among family income and SF-36 scores among. As age increases the QOL becomes poorer. As the years of educations increases the mean scores also for all sub-scales increased as well.
4. Analysis of HRQOL data identified subgroups with relatively poor perceived health and those groups need more help to improve their situations and avoid more serious consequences.
5. Interpretation and publication of these data can collect support for health policies and legislation, help to allocate resources based on unmet needs, guide the development of strategic plans, and monitor the effectiveness of broad community interventions. Above all, the injured need intensive follow up, including home visiting, in order to fulfill their health and other basic needs.

5.2 Recommendations

WHO projects that the long-term effects of emergencies increase the number of people with severe mental disorders by an average of 1% above the baseline and those with mild and moderate mental disorders by an average of 5-10%. This population group requires more specialized and on-going interventions, e.g. through community mental health services (WHO, 2009). According to these data and our results which conclude that the mental health had the least scores, the researcher recommend:

1. The need for an increase of mental health services and facilities provided by all health providers to care for these people. There should be an increase of trained mental health care professionals and mental health education programs in psychosocial aspects and social support to assist in lowering the impact of injuries. The first aid for those should be carried out at PHC level, according to international standards and to the MOH plan. Therefore PHC centers should be strengthened in their capacity to screen and give a first response to these needs, as well as to appropriate referrals.
2. To satisfy the health care needs of the war injured, attention should be directed, in addition to mental needs of the injured, to the physical needs of these injured in particular those who are suffering from long-term medical problems.
3. The opinion of our population that mental health is a treatment of mental disorders and not more, should be dealt with. This is because mental health in fact covers all aspects of daily life (social, psychological and physical).
4. Continuous support must be provided not only during crisis or in the short aftermath of war, but more on the long run when all assistance comes to an end. Indeed, this is the task of our ministries and organizations.
5. Further study of QOL among the non-injured population in the Gaza Strip would be warranted to measure correctly the QOL level.
6. The study was held in Rafah governorate which is one of five governorate in Gaza Strip, so there is an advice to do more researches in all governorates using the same instrument. This will be considered as a national study which will help policy makers to make interventions, guides or help in strategic plans.
7. Other researches are needed to explain some paradoxical results in the study.

Chapter six

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Annexes

Annexes

Annex 1: Helsinki Committee Approval

Palestinian National Authority
Ministry of Health
Helsinki Committee



السلطة الوطنية الفلسطينية
وزارة الصحة
لجنة هلسنكي

التاريخ: 2009/12/7

Name:

الاسم: نضال اسماعيل غنيم

I would like to inform you that the committee
has discussed your application about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم
حول:-

**Impact of Non- fatal Injuries during the War
on Gaza on the Quality of life – Rafah
Governorate, 2009-Rafah**

In its meeting on December 2009
and decided the Following:-

و ذلك في جلستها المنعقدة لشهر 12 2009

To approve the above mention research study.

و قد قررت ما يلي:-

الموافقة على البحث المذكور عاليه.

Signature
توقيع

Member

عضو

Member

عضو

Chairperson

Conditions:-

- ❖ Valid for 2 years from the date of approval to start.
- ❖ It is necessary to notify the committee in any change in the admitted study protocol.
- ❖ The committee appreciate receiving one copy of your final research when it is completed.

نموذج موافقة

أثار الإصابات الغير قاتلة خلال الحرب على غزة على نوعية الحياة – محافظة رفح ٢٠٠٩

عزيزي المشارك:

نود إعلامكم بأنه قد تم اختياركم لتكونوا احد المشاركين في دراستي والتي ستتناول أثار الإصابات الغير قاتلة خلال الحرب على غزة على نوعية الحياة. وهذه الدراسة تعتبر متطلب لنيل شهادة الماجستير في الصحة العامة من جامعة القدس-أبو ديس. كل ما عليك عمله هو تعبئة الاستبيان. ونود إعلامكم بان كل المعلومات التي تدلون بها هي معلومات سرية للغاية وستستخدم فقط من اجل البحث العلمي. ولن يتم استخدام أي من المعلومات ضدك بأي شكل من الأشكال.

نقدر لكم مشاركتكم، ونشكركم على التعاون

الباحث:

نضال غنيم

Annex 3: Questionnaire "English Form"

Registration number:..... Interview Date: ____/____/____ Day month year	Impact of Non-fatal Injuries during War on Gaza – Rafah Governorate, 2009	Interviewer Number.....
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Basic socio-demographic characteristics

1-	Sex	☐ Male	☐ Female
2-	Date of birth	dd mm year	
3-	Marital status	☐ Never married ☐ Currently married ☐ Separated	☐ Divorced ☐ Widowed ☐
4-	Total years spent at school		☐ Years
5-	Is the total family income assure your basic needs?	☐ Never ☐ Somewhat ☐ Moderately	☐ Enough ☐ More than enough ☐
6-	Residence	☐ Mawasy Block ☐ Tal-Sultan Block ☐ West Rafah Block ☐ Rafah Camp ☐ Shaboura Block ☐ Barazil Block ☐ Kherbet El-Addas ☐ Edary Block	☐ El-Salam Block ☐ El-Joneinah Block ☐ El-Hashash Block ☐ El-Zohour Block ☐ Musabbbeh Block ☐ Tabbet Zare' Block ☐ Bayyok Block
7-	Main Work status - Occupation	☐ Governmental ☐ Non-government employee ☐ Self-employed ☐ Non-paid ☐ Student	☐ Homemaker ☐ Unemployed (able to work) ☐ Unemployed (unable to work) ☐ Retired ☐ Others
8-	Displacement status:	☐ Not displaced ☐ Internally Displaced Person	

Circumstances of the injury

9-	Date of Injury	dd mm year
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10-	Place of Injury occurrence:	☐ Home ☐ Street/highway/road ☐ Work ☐ School/Education ☐ Surroundings of military building ☐ Other specify	☐ Farm ☐ Commercial ☐ Transport area ☐ Factory ☐ Surroundings of government building
11-	Activity at time of injury:	☐ Playing ☐ Working ☐ Studying ☐ Farming ☐ Sleeping	☐ Walking ☐ Traveling ☐ Standing nearby ☐ Other
12-	Was the area known to be dangerous? ☐ Yes ☐ No		
13-	How often did the person go to the affected area?		
	☐ Never before ☐ Once a day		
	☐ A few times a week or less ☐ Habitant		
14-	Were there any other victims in the same blast or incident? ☐ Yes ☐ No		
15-	If the answer was yes, what are the ...		
	☐ Number of Martyres:..... ☐ Number of persons injured:.....		

Cause of Injury

16-	Mechanism of Injury	☐ Gunshot ☐ Jet Airplane or Helicopter ☐ Rocket-propelled Grenade ☐ Bomb and shells ☐ Unexploded Ordnance	☐ Fragment ☐ Hit with blunt trauma ☐ Falling Down ☐ Don't know ☐ Other specify
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The pattern of injury

17-	Disposition	☐ Treated and discharged ☐ Admitted to hospital	☐ Referred to other hospital
18-	Mode of arrival	☐ Ambulance ☐ Other vehicle	☐ By foot ☐ Other
19-	Anatomic Place of the Injury (more than one answer if needed)		
	☐ Head ☐ Neck ☐ Face	☐ Eyes ☐ Back ☐ Thorax	☐ Abdomen ☐ Upper extremities ☐ Lower extremities ☐ Pelvis/Genitals ☐ Others ☐
20-	Type of Injury (more than one answer if needed)		
	☐ Burn ☐ Cut wound ☐ Laceration/ Abrasion		
	☐ Dislocation ☐ Fracture ☐ Muscular trauma		
	☐ Amputation ☐ Head injury ☐ Other(specify		

21-	Severity of the injury	☐ Minor or superficial (e.g., bruises, minor cuts) ☐ Moderate, requiring some skilled treatment (e.g., fractures, sutures) ☐ Severe, requiring intensive medical/surgical management (e.g., internal hemorrhage, punctured organs, severed blood vessels)
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War related traumas

		None	Mild	Moderate	Severe	Extreme/ Cannot Do
22-	Do you have any amputated limb due to war?					
	☐ None ☐ Right upper limb ☐ Left upper limb ☐ Right lower limb ☐ Left lower limb					
23-	(Difficulty with Vision) Do you have any problems with vision due to war?					
	☐ None ☐ Right Eye ☐ Left Eye ☐ Both Eyes					
24-	How much difficulty did you have in affected eye?	1	2	3	4	5
25-	(Difficulty with Hearing) Do you have any problems with hearing due to war?					
	☐ None ☐ Right Ear ☐ Left Ear ☐ Both Ears					
26-	How much difficulty did you have in affected ear?	1	2	3	4	5
27-	How much difficulty did you have with Sleeping?	1	2	3	4	5
28-	How much difficulty did you have with Breathing?	1	2	3	4	5
29-	How much difficulty did you have with Speaking?	1	2	3	4	5
30-	Do you have any pain in any part of the body related to the injury?	1	2	3	4	5
31-	Do you have any problem in any other body system (organs) related to the injury? Specify	1	2	3	4	5

Short Form-36

32-	In general, would you say your health is:	☐ Excellent ☐ Fair	☐ Very good ☐ Poor	☐ Good
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33-	Compared to one year ago, how would you rate your health in general now? ☐ Much better now than a year ago ☐ Somewhat better now than a year ago ☐ About the same as one year ago ☐ Somewhat worse now than one year ago ☐ Much worse now than one year ago	
The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?		
34-	a-	Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
35-	b-	Moderate activities, such as moving a table, pushing a vacuum cleaner, or carrying a TV? ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
36-	c-	Lifting or carrying groceries. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
37-	d-	Climbing several flights of stairs. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
38-	e-	Climbing one flight of stairs. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
39-	f-	Bending, kneeling or stooping. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
40-	g-	Walking more than one and half kilometer. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
41-	h-	Walking several blocks. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
42-	i-	Walking one block. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
43-	j-	Bathing or dressing yourself. ☐ Yes, limited a lot ☐ Yes, limited a little ☐ No, not limited at all
During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?		
44-	a-	Cut down the amount of time you spent on work or other activities? ☐ Yes ☐ No
45-	b-	Accomplished less than you would like? ☐ Yes ☐ No
46-	c-	Were limited in the kind of work or other activities ☐ Yes ☐ No
47-	d-	Had difficulty performing the work or other activities (for example, it took extra time) ☐ Yes ☐ No
During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?		
48-	a-	Cut down the amount of time you spent on work or other activities? ☐ Yes ☐ No
49-	b-	Accomplished less than you would like ☐ Yes ☐ No

50-	c-	Didn't do work or other activities as carefully as usual ☐ Yes ☐ No
51-		During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups? ☐ Not at all ☐ Slightly ☐ Moderately ☐ Quite a bit ☐ Extremely
52-		How much bodily pain have you had during the past 4 weeks? ☐ Not at all ☐ Slightly ☐ Moderately ☐ Quite a bit ☐ Extremely
53-		During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? ☐ Not at all ☐ Slightly ☐ Moderately ☐ Quite a bit ☐ Extremely
These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks.		
54-	a-	Did you feel full of pep? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time
55-	b-	Have you been a very nervous person? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time
56-	c-	Have you felt so down in the dumps nothing could cheer you up? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time
57-	d-	Have you felt calm and peaceful? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time
58-	e-	Did you have a lot of energy? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time
59-	f-	Have you felt downhearted and blue? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time
60-	g-	Did you feel worn out? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time
61-	h-	Have you been a happy person? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time
62-	i-	Did you feel tired? ☐ All of the time ☐ Most of the time ☐ A good bit of the time ☐ Some of the time ☐ A little of the time ☐ None of the time

63-	During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?	
	☐ All of the time	☐ Most of the time ☐ Some of the time
	☐ A little of the time	☐ None of the time
How TRUE or FALSE is each of the following statements for you?		
64-	a-	I seem to get sick a little easier than other people
		☐ Definitely true ☐ Mostly true ☐ Don't know
		☐ Mostly false ☐ Definitely false
65-	b-	I am as healthy as anybody I know
		☐ Definitely true ☐ Mostly true ☐ Don't know
		☐ Mostly false ☐ Definitely false
66-	c-	I expect my health to get worse
		☐ Definitely true ☐ Mostly true ☐ Don't know
		☐ Mostly false ☐ Definitely false
67-	d-	My health is excellent
		☐ Definitely true ☐ Mostly true ☐ Don't know
		☐ Mostly false ☐ Definitely false

The severity of the impairment needs assessment

68--	During what time do you expect that your general condition will be improved ?
	☐ Less than 12 months ☐ more than 12 months
69--	Do you need medical follow up due to your injury? ☐ Yes ☐ No
70-	Do you need regular treatment due to your injury? ☐ Yes ☐ No
71-	Do you use any accessory device due to your injury? ☐ Yes ☐ No
72-	If the answer is Yes, Specify:
	☐ Artificial Prosthesis ☐ Crutch
	☐ Wheelchair ☐ Audiophone
	☐ Special Bed ☐ Others
73-	Do you need any accessory device due to your injury but you cannot own?
	☐ Yes ☐ No
74-	If the answer is Yes, Specify:
	☐ Artificial Prosthesis ☐ Crutch
	☐ Wheelchair ☐ Audiophone
	☐ Special Bed ☐ Others
75-	At the moment list your priority needs
	☐ Further treatment abroad ☐ Help in re-integrating in society.
	☐ Prosthesis/artificial limbs/eye etc ☐ Rehabilitation, physiotherapy etc
	☐ Money to live ☐ Retraining to accommodate disability
	☐ Mental health and counseling support ☐ Other, specify
	☐ Financial support for treatment ☐ Nothing
	☐ Home adjustments to allow me to be independent in the activities of daily living

This concludes our interview,

Thank you for participating.

Annex 4: Questionnaire "Arabic Form"

استبانة

رقم التسجيل:..... تاريخ المقابلة: ____/____/____	رقم الذي أجرى المقابلة	تأثير الإصابات غير القاتلة خلال الحرب على غزة على نوعية الحياة - محافظة رفح ٢٠٠٩
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المميزات الاجتماعية والديموغرافية الأساسية

١ -	الجنس	☐ ذكر ☐ أنثى
٢ -	تاريخ الميلاد	____/____/____
٣ -	الحالة الاجتماعية	☐ لم يسبق له الزواج ☐ مطلق ☐ متزوج ☐ أرمل ☐ منفصل
٤ -	عدد السنوات التي قضاها في الدراسة	____ سنة
٥ -	هل يكفي دخل الأسرة الشهري للاحتياجات الأساسية	☐ إطلاقاً ☐ بدرجة كافية ☐ إلى حد ما ☐ يكفي ويزيد ☐ بدرجة متوسطة
٦ -	مكان السكن	☐ منطقة المواسي ☐ مشروع حي السلام ☐ منطقة تل السلطان ☐ منطقة الجنيبة ☐ منطقة رفح الغربية ☐ منطقة الحشاش ☐ مخيم رفح ☐ منطقة الزهور ☐ مخيم الشابورة ☐ منطقة مصبح ☐ منطقة البرازيل ☐ منطقة تبة زارع ☐ منطقة خربة العدس ☐ منطقة البيوك ☐ منطقة الداري
٧ -	الوضع المهني	☐ موظف حكومي ☐ ربة أسرة ☐ عامل غير حكومي ☐ متقاعد ☐ عمل خاص ☐ عاطل عن العمل ☐ عمل غير مدفوع - متطوع ☐ (يستطيع العمل) ☐ أو عمل خيري مثلاً ☐ عاطل عن العمل ☐ طالب ☐ (لا يستطيع العمل) ☐ أخرى ☐
٨ -	هل تم ترحيلك من مكان سكنك؟	☐ لم يُرحَل ☐ ترحيل داخلي

الظروف المحيطة بالإصابة

٩ -	تاريخ الإصابة	____/____/____
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١٠ -	مكان حدوث الإصابة	☐ البيت ☐ الشارع / الطريق ☐ العمل ☐ المدرسة / الجامعة ☐ محيط بمباني عسكرية ☐ المزرعة ☐ مكان تجاري ☐ وسيلة مواصلات ☐ مصنع ☐ محيط بمباني حكومية
١١ -	النشاطات الممارسة أثناء وقت الإصابة	☐ اللعب ☐ العمل ☐ الدراسة ☐ الزراعة ☐ الراحة ☐ المشي ☐ السفر ☐ الوقوف بالقرب ☐ أخرى
١٢ -	هل كانت المنطقة معروفة بأنها خطيرة ومن الممكن قصفها؟	☐ نعم ☐ لا
١٣ -	هل غالبا ما تذهب إلى هذه المنطقة؟	☐ أبدا ☐ مرة في اليوم ☐ عدة مرات أسبوعيا ☐ مقيم
١٤ -	هل كان هناك احد غيرك مكان القصف؟	☐ نعم ☐ لا
١٥ -	إذا كان الجواب نعم فكم كان؟	☐ عدد الشهداء ☐ عدد الجرحى

سبب الإصابة

١٦ -	ميكانيكية الإصابة	☐ إطلاق نار ☐ قصف من الطيران ☐ قذيفة صاروخ ☐ انفجار قنبلة ☐ انفجار لقذيفة غير منفجرة ☐ شظايا ☐ ضربة غير حادة ☐ سقوط من علو ☐ لا اعرف ☐ أخرى, حدد
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نمط أو شكل الإصابة

١٧ -	وضع المصاب أثناء النقل	☐ تمت المعالجة والخروج ☐ دخول إلى المستشفى ☐ التحويل لمستشفى آخر
١٨ -	طريقة الوصول للمستشفى	☐ سيارة الإسعاف ☐ سيارة غير الإسعاف ☐ مشيا على الأقدام ☐ أخرى
١٩ -	المكان التشريحي للإصابة (أكثر من إجابة إذا لزم)	☐ الرأس ☐ العينين ☐ البطن ☐ الأطراف العلوية ☐ الأطراف السفلية ☐ الحوض ☐ الرقبة ☐ الظهر ☐ أخرى
٢٠ -	نوع الإصابة (أكثر من إجابة إذا لزم)	☐ حروق ☐ جروح ☐ كشط ☐ خلع ☐ كسور ☐ إصابة عضل ☐ بتر ☐ إصابة في الدماغ ☐ أخرى, حدد
٢١ -	شدة الإصابة	☐ خفيفة أو سطحية (كدمات, رضوض, جروح بسيطة) ☐ متوسطة علاجها يحتاج لمهارة متوسطة (كسور, غرز) ☐ شديدة وعلاجها يحتاج تدخلات جراحية أو عناية مكثفة (نزيف داخلي, جروح ثقبية نافذة, إصابة عضو داخلي)

إصابات لها علاقة بالحرب

رمز الأيام	بالغ الشدة	شدي د	متوسط	بسيط	أبدا	
٢٢-	هل تعرضت لأي عملية بتر في الأطراف جراء الحرب؟					
	☐ الأطراف السفلية اليمنى	☐ أبدا	☐ الأطراف العلوية اليمنى	☐ الأطراف السفلية اليسرى	☐ الأطراف العلوية اليسرى	
٢٣-	(مصاعب في الرؤية) هل تعاني من أي مشاكل في أي من العينين جراء الحرب؟					
	☐ العين اليسرى	☐ أبدا	☐ العين اليمنى	☐ كلتا العينين		
٢٤-	كم من المصاعب تواجهك في العين المصابة؟					
	٥	٤	٣	٢	١	
٢٥-	(مصاعب في السمع) هل تعاني من أي مشاكل في السمع جراء الحرب؟					
	☐ الأذن اليسرى	☐ أبدا	☐ الأذن اليمنى	☐ كلتا الأذنين		
٢٦-	كم من المصاعب تواجهك في الأذن المصابة؟					
	٥	٤	٣	٢	١	
٢٧-	كم من المصاعب تواجهك في النوم؟					
	٥	٤	٣	٢	١	
٢٨-	كم من المصاعب تواجهك في التنفس؟					
	٥	٤	٣	٢	١	
٢٩-	كم من المصاعب تواجهك عند الكلام؟					
	٥	٤	٣	٢	١	
٣٠-	هل تعاني من أية آلام في أي مكان في الجسم له علاقة بالإصابة؟					
	٥	٤	٣	٢	١	
٣١-	هل تعاني من أية مشاكل في أي مكان آخر في الجسم أو عضو معين له علاقة بالإصابة؟ حدد					
	٥	٤	٣	٢	١	

النموذج القصير - ٣٦

٣٢-	بشكل عام هل تستطيع أن تقول بأن صحتك:			☐ ممتازة ☐ مقبولة ☐ جيدة جدا ☐ سيئة
٣٣-	بالمقارنة قبل عام, كيف تقيم صحتك بشكل عام الآن؟			
	☐ أفضل بكثير الآن مما كان قبل عام ☐ أفضل بقليل الآن مما كان قبل عام ☐ تقريبا نفس الشيء كالعالم الماضي ☐ أسوأ بقليل الآن مما كان قبل عام ☐ أسوأ بكثير الآن مما كان قبل عام			
البنود التالية عن النشاطات التي تستطيع عملها خلال اليوم العادي. هل صحتك الآن تحد من عملك لهذه النشاطات؟ إذا كان الأمر كذلك, فكم؟				
٣٤-	أ-	النشاطات القوية كالجري, حمل مواد ثقيلة, المشاركة في الألعاب الرياضية الشاقة.		
		☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق		

٣٥-	ب-	النشاطات المتوسطة كتحريك طاولة, كتحريك الكنسة الكهربائية أو حمل تلفزيو ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
٣٦-	ج-	رفع أو حمل الأدوات المشتراة من البقال. ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
٣٧-	د-	تسلق عدة درجات من السلم. ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
٣٨-	هـ-	تسلق درجة واحدة من السلم ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
٣٩-	و-	المقدرة على الانحناء, الركوع أو حني الظهر ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
٤٠-	ز-	السير لمسافة تزيد عن ميل واحد ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
٤١-	ح-	المشي عدة بنايات سكنية ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
٤٢-	ط-	المشي لبناية سكنية واحدة ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
٤٣-	ي-	الاستحمام أو اللبس لوحده ☐ نعم تجد كثيرا ☐ نعم تجد قليلا ☐ لا تجد على الإطلاق
خلال الأربعة أسابيع السابقة, هل واجهتك واحدة من المشاكل الآتية في عملك أو خلال أي من النشاطات اليومية نتيجة وضعك الصحي الجسدي.		
٤٤-	أ-	خفض مقدار الوقت الذي تقضيه في العمل أو أي نشاط آخر ☐ نعم ☐ لا
٤٥-	ب-	انجاز أقل مما كنت تريد ☐ نعم ☐ لا
٤٦-	ج-	كنت تقوم بالحد من نوع العمل أو النشاط ☐ نعم ☐ لا
٤٧-	د-	تواجه صعوبات لانجاز العمل أو نشاطات أخرى ☐ نعم ☐ لا
خلال الأربعة أسابيع السابقة, هل واجهت أي من المشاكل الآتية في العمل أو في أي نشاطات يومية نتيجة مشاكل انفعالية (مثلا الشعور بالاكتئاب أو القلق).		
٤٨-	أ-	خفض مقدار الوقت الذي تقضيه في العمل أو أي نشاط آخر ☐ نعم ☐ لا
٤٩-	ب-	انجاز أقل مما كنت تريد ☐ نعم ☐ لا
٥٠-	ج-	لا تستطيع تنفيذ أي عمل أو نشاطات أخرى بالحرص المعتاد ☐ نعم ☐ لا
٥١-	خلال الأربعة أسابيع الماضية, إلى أي مدى وضعك الصحي الجسدي أو المشاكل العاطفية تداخلت مع الأنشطة الاجتماعية العادية داخل العائلة, مع الأصدقاء, الجيران أو الجماعات. ☐ ليس على الإطلاق ☐ بشكل قليل ☐ بشكل متوسط ☐ إلى حد كبير ☐ بدرجة كبيرة جدا	
٥٢-	كم من الآلام الجسدية واجهتك خلال الأربعة أسابيع السابقة؟ ☐ ليس على الإطلاق ☐ بشكل قليل ☐ بشكل متوسط ☐ إلى حد كبير ☐ بدرجة كبيرة جدا	

٥٣-	خلال الأربعة أسابيع السابقة, كم كان الألم متداخل مع عملك الطبيعي (شاملا العمل خارج البيت والأعمال المنزلية)	☐ ليس على الإطلاق ☐ بشكل قليل ☐ بشكل متوسط ☐ إلى حد كبير ☐ بدرجة كبيرة جدا
الأسئلة التالية عن شعورك وكيف تسير الأمور معك خلال الأربعة أسابيع السابقة. لكل سؤال أعطي جواب واحد وهو الأقرب لشعورك. كم من الوقت خلال الأربعة أسابيع الماضية:		
٥٤-	أ- هل تشعر انك بكامل حيويتك؟	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٥٥-	ب- هل أنت شخص عصبي جدا	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٥٦-	ج- هل شعرت انك مهمل ولا شيء يستطيع أن يبهجك؟	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٥٧-	د- هل شعرت بالطمأنينة والسلام؟	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٥٨-	هـ- هل شعرت بان لديك الكثير من الطاقة؟	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٥٩-	و- هل شعرت بالحزن والاكتئاب؟	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٦٠-	ز- هل شعرت بأنك منهك؟	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٦١-	ح- هل كنت رجل سعيد؟	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٦٢-	ط- هل شعرت بالتعب؟	☐ كل الوقت ☐ معظم الوقت ☐ جزء من الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
٦٣-	خلال الأربعة أسابيع السابقة, كم من الوقت تداخلت صحتك الجسدية أو المشاكل الانفعالية مع نشاطاتك الاجتماعية (كزيارة الأصدقاء, الأقارب... الخ)؟	☐ كل الوقت ☐ معظم الوقت ☐ بعض الوقت ☐ القليل من الوقت ☐ لا شيء
كم تعتبر الأسئلة التالية صحيحة أو خاطئة بالنسبة إليك؟		
٦٤-	أ- يبدو أنني من الممكن أن أصبح مريضا بسهولة اقل من الآخرين	☐ حقيقة مؤكدة ☐ حقيقة على الأرجح ☐ لا اعرف ☐ خطأ على الأرجح ☐ خطأ مؤكد
٦٥-	ب- اشعر بالصحة كأي شخص آخر اعرفه	☐ حقيقة مؤكدة ☐ حقيقة على الأرجح ☐ لا اعرف ☐ خطأ على الأرجح ☐ خطأ مؤكد

٦٦-	ج-	أتوقع أن تسوء حالتي ☐ حقيقة مؤكدة ☐ خطأ على الأرجح ☐ حقيقة على الأرجح ☐ خطأ مؤكد ☐ لا اعرف
٦٧-	د-	وضعي الصحي ممتاز ☐ حقيقة مؤكدة ☐ خطأ على الأرجح ☐ حقيقة على الأرجح ☐ خطأ مؤكد ☐ لا اعرف

شدة الإعاقة وتقييم الاحتياجات

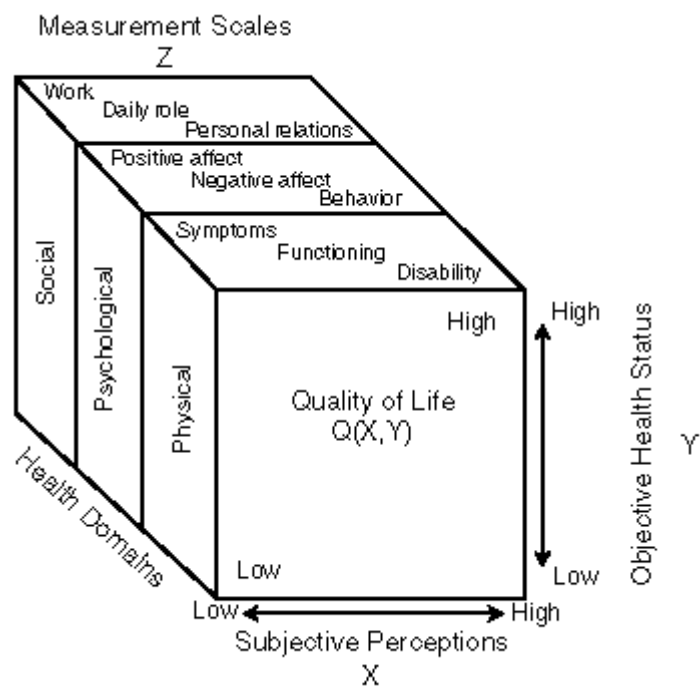
٦٨-	خلال كم من الوقت تتوقع بان يتحسن وضعك العام؟ ☐ اقل من ١٢ شهرا ☐ أكثر من ١٢ شهرا
٦٩-	هل تحتاج لمتابعة طبية بسبب إصابتك خلال الحرب؟ ☐ نعم ☐ لا
٧٠-	هل تحتاج لعلاج متواصل بسبب إصابتك خلال الحرب؟ ☐ نعم ☐ لا
٧١-	هل تستعمل أي جهاز مساعد بسبب الإصابة؟ ☐ نعم ☐ لا
٧٢-	إذا كانت الإجابة نعم فحدد: ☐ طرف صناعي ☐ عكايز ☐ كرسي متحرك ☐ جهاز سمع أو سماعات ☐ سرير أو فرشاة خاصة ☐ أخرى
٧٣-	هل أنت بحاجة لأي جهاز مساعد ولا تستطيع امتلاكه؟ ☐ نعم ☐ لا
٧٤-	إذا كانت الإجابة نعم فحدد: ☐ طرف صناعي ☐ عكايز ☐ كرسي متحرك ☐ جهاز سمع أو سماعات ☐ سرير أو فرشاة خاصة ☐ أخرى
٧٥-	في هذه اللحظة ما هي الأولويات التي تحتاجها؟ ☐ علاج إضافي في الخارج ☐ طرف صناعي ☐ أموال للمعيشة ☐ استشارة ودعم طبي عقلي ☐ دعم مالي للعلاج ☐ ملائمة (تكييف) المنزل للسماح لي بان أكون غير معتمد عند ممارسة النشاطات الحياتية. ☐ المساعدة لإعادة الاندماج في المجتمع ☐ علاج طبيعي ☐ إعادة التأهيل للتكيف مع الإعاقة ☐ أخرى, حدد ☐ لا شيء

انتهت المقابلة
شكرا جزيلا على المشاركة

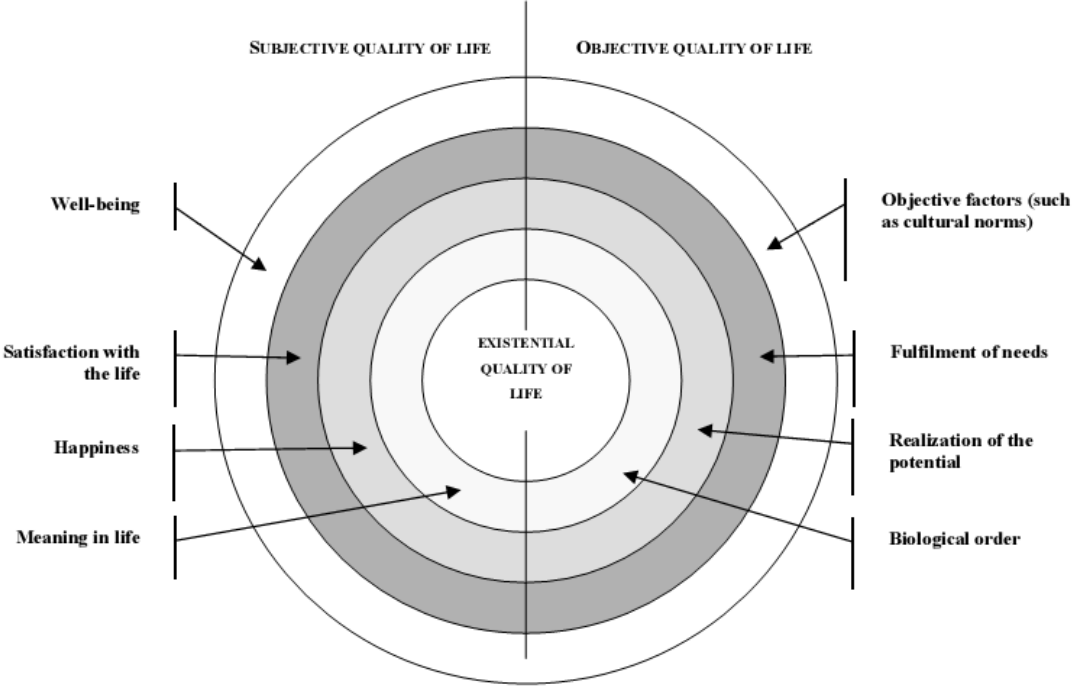
Annex 5: Maslow's Hierarchy (Tim LeBon's site, 2006)



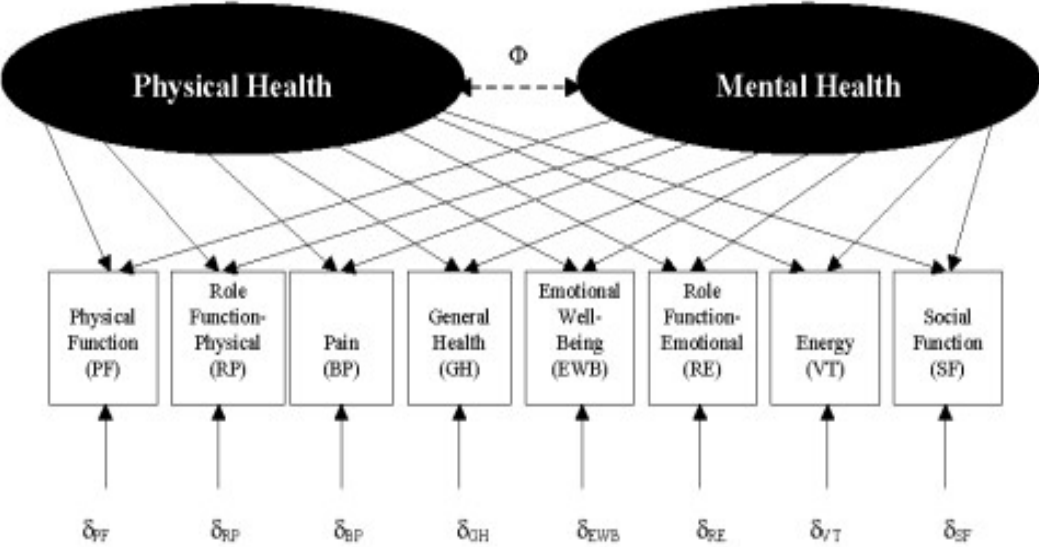
Annex 6: Conceptual scheme of the domains and variables involved in a QOL Assessment (Testa and Simonson, 2009).



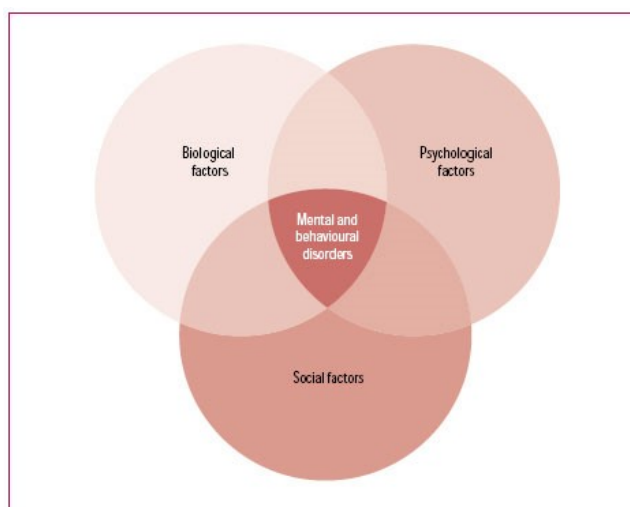
Annex 7: The integrative theory of the quality of life (Susniene, 2009)



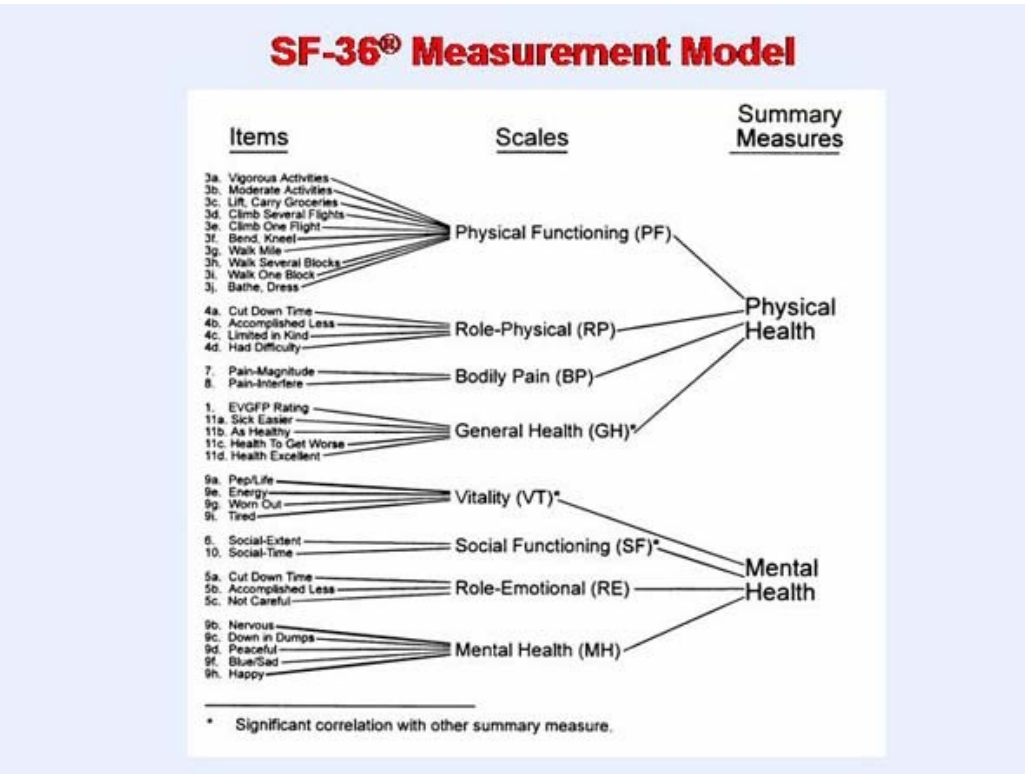
Annex 8: Conceptual model for the SF-36 health survey (Farivar, Cunningham and Hays, 2007)



Annex 9: Interaction of biological, psychological and social factors in the development (WHO, 2009)



Annex 10: Construction of the SF-36 sub-scales and summary measures (Ware, n.d.)



Annex 11: Abstract "Arabic Form"

ملخص الدراسة

بتاريخ ٢٠٠٨/١٢/٢٧ بدأ الجيش الإسرائيلي حملة باسم "الرصاص المصبوب على قطاع غزة والتي تسببت باستشهاد أكثر من ١٤٠٠ شخص وأكثر من ٥٠٠٠ جريح. إن هذه الدراسة تهدف إلى تقييم نتائج الإصابات الغير مميتة خلال الحرب على غزة على جودة حياة المصابين. لقد استخدمت دراسة مقطعية في محافظة رفح والتي تأثرت وبشكل مباشر بالحرب. لقد تم إدراج كل الإصابات الغير مميتة في هذه الدراسة. قام ٣٢١ مصاب بتعبئة الاستبانة المعتمدة على الاستبانة القصيرة التي تحتوي على ٣٦ سؤال والتي تقيس ثمانية مقاييس تتجمع معا لتكون مقياسين أساسيين هما المقياس الجسدي الموجز والمقياس النفسي الموجز. ولقد تم قياس المعلومات الديموغرافية، وتاريخ الإصابة بالإضافة إلى معلومات أخرى ذات علاقة. وقد بلغت نسبة الاستجابة للاستبانة ١٠٠٪.

أظهرت النتائج أن غالبية المصابين كانوا ذكورا (٧٨,٢٪) في عمرهم الإنجابي، وقد اضطروا للرحيل داخليا (٥٣,٩٪) وغالبية المصابين أصيبوا خلال الأسبوع الأول من الحرب (٥٥,٥٪). لقد حدثت غالبية الإصابات تقريبا (٧٧٪) بسبب قصف بالقنابل أو بسبب الإصابة بشظايا. لقد تسببت الحرب بانخفاض مستوى جودة الحياة للسكان في جميع النتائج مقارنة مع المستوى الطبيعي لشعوب أخرى. لقد كانت أعلى الدرجات للوظائف الجسدية حيث كان المتوسط ٧٣,٧٧، وكانت أقل الدرجات للصحة النفسية حيث بلغ المتوسط ٦٠,١٤. ونستنتج هنا أن الفئات الأكبر عمرا، وذوي مستوى تعليمي أقل وذوي الدخل المنخفض كانوا أقل مستوى في جودة الحياة. الإصابات التي كان ناتجة عن سبب غير القصف بالقنابل أو الشظايا أو الإصابات الغير شديدة كانت صاحبة لمستوى أعلى في جودة الحياة (كلما زادت شدة الإصابة قل مستوى جودة الحياة).

لقد بينت الحقائق والنتائج إن مستوى جودة الحياة كان الأقل لمقياس الصحة النفسية من بين كل المقاييس ولهذا فهناك حاجة لزيادة الخدمات الصحية النفسية وتسهيل الخدمة المقدمة لهؤلاء الناس. يجب أن يكون هناك زيادة في عدد مقدمي الخدمات النفسية المدربين وزياد في عدد البرامج النفسية على أساس اجتماعي نفسي ودعم اجتماعي لهم للمساهمة في خفض تأثير الإصابات. المساعدة الأولى لهم يجب أن تكون على مستوى الرعاية الأولية بحسب المقاييس الدولية وبحسب خطة وزارة الصحة. دراسات مستقبلية يجب إجرائها على الشعب الفلسطيني لمعرفة المستوى الطبيعي لجودة الحياة.