AMERICAN UNIVERSITY OF BEIRUT

THE IMPACT OF PSYCHOLOGICAL MALTREATMENT AND SOCIAL SUPPORT ON SELF-PERCEIVED HEALTH IN A LARGE NATIONALLY REPRESENTATIVE SAMPLE OF ELDERLY MEN AND WOMEN ABOVE 60 YEARS OLD IN LEBANON

by
KARIM MOHAMMAD FIRIKH

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AN ABSTRACT OF THE THESIS OF

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Title: The impact of psychological maltreatment and social support on self-perceived health in a large nationally representative sample of elderly men and women above 60 years old in Lebanon

Psychological maltreatment, or emotional maltreatment, is just one of many forms of elder maltreatment/abuse. Unlike others, elder psychological mistreatment can happen easily without one even knowing; 5% of the elderly around the world have experienced abuse at home, and in USA 1 out of 5 elderly are being abused (WHO, 2011). It is estimated that by 2050 the number of older adults will outgrow the number of children in the world. All of which, will disrupt the social support systems of the elderly and weaken the familial and community bonds. The only study in Lebanon that looked into elder abuse showed that psychological mistreatment is the number one form of abuse among the Lebanese elderly population, and the only study that looked into elder social support proved that the literature in Lebanon around this topic is still inadequate. Psychological maltreatment and social support and their relationship with self-perceived health (SPH) is still understudied despite the growing attention it has brought to the public and despite the fact that poor SPH can accurately predict morbidity and mortality later in life. This study aimed to assess the association between psychological elder abuse inside and outside the family, and social support with SPH. **Methods**: This is a cross-sectional population-based study based on a secondary data analysis from the 2004 Pan Arab Population and Family Household Health Survey (PAPFAM). The survey targeted 1812 older people, aged 65-100 years, in Lebanon. The independent variables and outcome were assessed using logistic regression models. Different models were derived and compared using Information criteria and test of Goodness of fit (GoF). **Results**: It was found that females have worse SPH than males and that psychological maltreatment inside and outside the family and social support significantly affect the elderly ratings of SPH; with the latter being stronger in predicting the association since it alone was significant after adjusting for all covariates while psychological maltreatment inside and outside the family kept their significance only when adjusting for age, gender and marital status. Co-morbidities, disabilities, education and arrangement of the house were significantly associated with SPH. **Conclusion**: Elderly social support is more of an accurate predictor of SPH than psychological mistreatment alone, since other risk factors (co-morbidities, disability, and arrangement of the house) are important in studying the relationship between SPH and psychological maltreatment. Awareness to the public regarding psychological elder

abuse should be raised; social bonds and networks should be strengthened, especially between the elderly and their close family members.

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ABBREVIATIONS

SPH	Self-perceived health
NCEA	Nation Center for Elder Abuse
MENA	Middle East and North Africa
WHO	World Health Organization
PAPFAM	Pan Arab Project for Family Health
GoF	Goodness of Fit
IC	Information Criteria
AIC	Akaike Information Criteria
BIC	Bayesian Information Criteria
SPSS	Statistical Package for the Social Sciences

DEDICATION

I dedicate this thesis to my father Mohammad-Rajab. I hope this achievement will be the stepping stone for me to complete the dreams you had for me all those many years ago when you chose to give me the best education you could.

CHAPTER I

INTRODUCTION

A. Introduction

One thing is inevitable in life, and it is ageing. It's of no surprise that last year's World Health Day theme was "Ageing and Health." The new trend is the demographic transition: decreased fertility rates and increased life expectancy at birth (WHO, 2011). Older people are cherished for their wisdom and experience, and cultural and religious mores across the globe. This sets a moral obligation to show the utmost respect and care for older people. Unfortunately, however, a lot of older people around the world are facing many obstacles that stand between them living a decent and healthy aging life; a significant proportion of them are increasingly becoming victims of the ever changing modernization world; children no longer afford having the sufficient time for their senior parents. As a result, family ties are broken, if not lost, and the elderly social support system is collapsing. Not to mention, many others are personally being exposed to abuse, or maltreatment, leading to diminished functioning, compromised needs and exacerbated concerns (WHO 2011).

Many people consider physical mistreatment as the sole component of elder abuse; although it is a major type, elder maltreatment comprises, in its definition, many other forms that violate the basic principles of human rights; for instance financial abuse, verbal abuse, sexual abuse, and psychological/emotional abuse . The Action on Elder Abuse in the UK defined elder abuse as "a single, or repeated act, or lack of appropriate

action, occurring within any relationship where there is an expectation of trust which causes harm or distress to an older person" (Action on Elder Abuse 1995).

As for the elderly social support system, as it is defined by many around the world as the availability of psychological support from either family, friends, or government (Luo, 2011 & Zullig 2006) is important to alleviate the external stressors and to maintain the elderly functioning and well-being in the community (Elovainio, 2000 & Wong, 2007). Regarding prevalence of abuse, despite the fact that there isn't a population based tracking database in USA that detects and records elder abuse, the estimations do shed light on the importance and seriousness of the case. It is estimated that around 1.5 million seniors are being abused every year in the USA (Bonnie, 2003). Canada is not different, according to the "Institute of Marriage and Family Canada", the incidence of elder abuse in 2005 was 160 physical abuses per 100,000 seniors, and this statistic had increased by 20% since 1998 (IMFC, 2009).

Most of the studies in the MENA region come from The Occupied Palestinian Territories, where the prevalence of elder abuse was estimated to be 18% of the elderly population (Siegel-Itzkovich, 2005). Little is mentioned about the prevalence of abuse in the other Arab Countries.

It's known that physical abuse inflicts, in addition to physical harm, psychological deteriorations (Lachs, 1995) leading to a decreased self-perceived health (SPH). Little is known, however, regarding the effect of psychological abuse on physical health. Of the recent studies worldwide that have looked into this kind of a relationship, is the study by Olofsson et al. in 2012. It included the older population in Sweden and looked at

psychological abuse and its association with ill health. The results showed increased odds of medically diagnosed negative health outcomes (poor general health, diabetes, overweight, etc…) when psychological abuse existed (Olofsson, 2012). Another recent study in the United States assessed emotional abuse among elderly; its findings showed that older adults with few psychological resources are more at risk of being victims of elder maltreatment (Luo, 2011) in different aspects.

On the other hand, a growing body of literature exists on the many ways social support can contribute to one's health in the elderly population (Fratiglioni, 2004). Adults with a better structure of social support were shown to have lower rates of death and later morbidity (Seeman, 1993 & Taylor, 2004), especially when non-communicable diseases (NCD) were targeted (Vogt, 1992). Seniors with a lower degree of social networks and bonding, among other factors, were more vulnerable to death (Clausen, 2007). Not only does it contribute to health, social support however can be related with psychological maltreatment since the abuse might be inflicted by people inside the house, the spouse or children; or by people in the community and the society around the elderly, the nurse at the primary care center or an employee during face to face interactions and errands. In addition, people are working longer hours and are migrating and as a result, family bonds and connections are destroyed. The loss of these ties between the elderly and the rest of the family has been linked to an increased risk of psychological elder abuse (Dong et al, 2011). With both the loss of family bonds and modernization, the adult children no longer find appropriate and sufficient time to look after their parents, all of which increase the risk of psychological abuse.

Whether the abuse comes from within the family or outside it, it distresses the psychological well-being leaving the older person ineffective socially. The lack of social involvement by the elderly was shown to decrease the subjective well-being constituted of life satisfaction and happiness (Pinquart, 2000) which in its turn mediates self-perceived health (Zullig, 2006). Social involvement constitutes in its definition visiting or visited by the children, going to social clubs in the nearby community, or interacting with a group of friends and exchanging visits. Social ties and contacts, along with life satisfaction and religiousness, were shown to increase the quality of life of elderly Park, 2011). In addition, social network ties with the spouse, close friends/relatives, and religious groups were shown to be associated with elder mortality (Seeman, 1987). For elderly above 60 years, ties with close friends/relatives were of a greater importance and significance (Seeman, 1987).

B. Relevance and significance of the study

In Lebanon, the aging population has increased up to 7% in 1995 and is speculated to become 10% of the total population in 2025 (Sibai et al, 2004). Despite its increase, the aging population is still faced with many challenges that render them vulnerable and weak. Up till today, no retirement plans or pension system exist, and the near future doesn't seem bright as policy developers didn't prioritized these issues on their agenda. All of which force the elderly to be dependents on their families, if ever the support existed. Although social support is common in Lebanon, however westernization and modernization are weakening these social networks and in-laws relationships are worsening the family bonds.

In addition, the lack of government actions and media towards awareness and detection of elder abuse leave the people ignorant of the real definition of elder maltreatment; making them unaware that it is mistreatment they are actually committing. More shockingly, there is not a single center, organization or foundation to where elder abuse cases can be reported and no laws are being implemented to stop or prevent abuse from happening.

Besides the lack of governmental plans for elder care, Lebanon lacks studies regarding elder abuse in general and psychological abuse in particular. Only one study on elder abuse was accomplished by the elderly institution "Al Omr Al Madid" and it was back in 2001. It discussed elder maltreatment in general, and the most prevalent type of abuse was found to be emotional/psychological abuse (Al Omr AL Madid, 2001). When a case of psychological elder abuse is "committed", no one would report it and the elderly will not be able to stand up for themselves in front of the authorities, if ever existed, since psychological abuse has no immediate, noticeable and tangible signs and symptoms. These cases will just go unreported and many times even unrecognized!

Social support in Lebanon is also understudied and more research is needed evident regarding social relations during elderly life span (Ajrouch et al, 2013). Among the older population studied (60+ years), it was shown that negative social relations and support are proxy for stress and depressive symptoms (Ajrouch, 2013).

This study will be the first in the country to assess both the psychological abuse elderly are facing and the strength of their social support and their effect on their self-perceived health. This study will open doors for more research regarding this topic in the

hopes that psychological elder mistreatment, which is in nature subtle, and social support will no longer remain underrated and develop to become an appreciated importance and priority, as it is naturally becoming.

C. Objectives and hypotheses:

The main objectives of the current study are:

- To study the association of elderly psychological abuse on their self-perceived health using a large representative sample of elderly men and women above 60 years old in Lebanon.

- To study the association of elderly social support on their self-perceived health using a large representative sample of elderly men and women above 60 years old in Lebanon.

We hypothesize that:

- H1: psychological abuse inside the family is independently associated with poor self-perceived health (SPH).
- H2: psychological abuse outside the family is independently associated with poor self-perceived health (SPH).
- H3: social support is independently associated with poor self-perceived health (SPH).

CHAPTER II

LITERATURE REVIEW

Whether we want to admit or not, people *are* living longer and the demographic transition is not ceasing anytime soon. In fact, WHO projected that by 2050; there will be more elderly than children in the world (WHO, 2011). From 1950 till 2010, the percentage of the population in the USA aged 60+ increased by 6% to become almost 20% in 2013 (Gapminder, 2013). Unfortunately, along the process of ageing accompanies the degenerative and non-communicable diseases, especially cardiovascular diseases that are the number one cause of mortality in the world (Étienne, 2002). Healthy ageing, the right for every elderly, should be granted along with an obstacle-free lifestyle and living.

A. Self-perceived Health:

Although a simple question like: "How do you currently rate your health" exists in almost every health status questionnaire, little is known regarding its prospective significance and rationale. Taking into account both the physical and psychological aspects, self-perceived health is an important tool to detecting later life morbidity and mortality as shown in a study by Burstrom et al. (2001). The same study showed that the relationship between poor self-perceived health and mortality was significant in both genders, but stronger in younger ages than older ones. A meta-analysis done by DeSalvo et al. (2005) showed that worse general self-rated health (GSRH) is significantly correlated

with increased risk of death, even after adjusting for possible covariates (functional status, mental status). However when controlled for co-morbidities this relationship decreased. In line with these studies, stands a study by Dorly et al. which found that poor self-perceived health and mortality were associated but only within males and not females, especially for the long-term follow-up (Dorly, 2003).

A number of factors contribute to poor self-perceived health. Ranging from uncontrollable aspects like demographics and health to manageable facets like abuse and social/psychological support, these factors mediate SPH to estimate a poor or a good outcome.

B. Factors associated with self-perceived health

1. Elder maltreatment:

Prevalence of elder abuse and the nature of the association between SPH

In the last decades, an impediment arose that wasn't until recently that came to public's attention and concern. Elder abuse, in selected developed countries, is experienced by 5% of the elderly population (WHO, 2013), and because of underreporting, these numbers may not truly reflect the victims accurately. A study done in Netherlands by Comijs et al. examined the prevalence and consequences of elder abuse, showed that the prevalence of abuse was 5.6% and it was observed in its different types (verbal, physical, financial and neglect). The perpetrators were mostly identified as family members or close friends, which resulted in anger, disappointment and grief by the elderly (Comijs, 1998). Although in Britain an official prevalence of elder mistreatment wasn't been achieved by that time, a survey conducted by Ogg et al. (1993) showed that 2.7% of the abused elderly interviewed

reported physical maltreatment and 70% of the adults interviewed admitted and reported abuse to elderly people. In Australia the prevalence was estimated to be 6% (Kurrle, 2004). Almost all the countries prevalence ranges between 3% and 6%, except for the cases of Hong Kong and Occupied Palestinian Territories where prevalence of elder abuse was found to be 21% (Yan, 2001) and 18% (Lowenstein,2009), respectively.

A major understudied part of elder abuse is the psychological part. Psychological elder abuse has no apparent marks nor does it have visible consequences, such as a black eye or a broken arm. The study by Olofsson et al. showed that psychological abuse, as defined by two questions: Have you been verbally offended during the past 12 months, and have you been exposed to any threats or threats of violence that made you scared during the past 12 months, against both elderly men and women is related to higher odds of poor self-rated health (Olofsson, 2012). In agreement with this, is a study done by Fisher et al in 2006 that showed that older women who experienced psychological abuse had significantly higher odds of reporting negative health outcomes (joint problems, digestive problems, depression or anxiety, chronic pain, and high blood pressure or heart problems) (Fisher, 2006). These results agree with the South Carolina Elder Mistreatment study where it was found that a recent incident of emotional maltreatment was associated with poor self-rated health. An incident of emotional mistreatment was measured as an at least one affirmative answer to any of the 4 questions targeting the psychological state of the elderly (Cisler, 2010).

The actual condition of elderly in the Arab countries is still understudied. Few studies have addressed the issue of elder abuse itself, and the studies on domestic violence and other types of abuse in the Arab world rarely include the older adults group. Most of

the studies in the region are done in the Occupied Palestinian Territories, targeting only the Palestinian population. One interesting study surveyed the workers and nurses at the elderly homes; nurses were asked whether they did or not abuse elderly during their coursework. More than 50% of the respondents admitted that they have abused an older person at least once in the past year (Natan, 2010). The first national survey in Occupied Palestinian Territories, that addressed both Palestinians and Israelis, indicated that 18.4% of the elderly reported that they are being abused. The percentage of neglect was the highest (18%), and was among the highest in the world, followed by verbal (8.0%) and physical (2.0%) abuse (Siegel-Itzkovich, 2005). Another study in Occupied Palestinian Territories looked at the experiences of care recipients in foreign home care centers. It was concluded that the main factor for a healthy care-giving arrangement is trust, and violation in the establishment of trust lead to abuse or neglect (Ayalon, 2009). In Egypt, a study by Essmat Gemeay on elder persons residing in a geriatric home looked at the effect of elder abuse on their life satisfaction. The study showed that one fourth of the respondents were exposed to all kinds of abuse and how ashamed and scared the elderly are regarding abuse. Most of them fear the idea of not being believed if they ever confessed. The results of the study also revealed that a very small percentage (>2%) were satisfied in life. This could be related to feelings of "low self-esteem and loss of dignity" because of repeated acts of abuse (Gemeay, 2011).

In Lebanon, the qualitative study, by "Al Omr Al Madid", constituted of eight focus groups: six with elderly (60-90 years) and two with health workers. The results showed that the elderly perceived themselves as "lonely, neglected, disrespected and

marginalized" not to mention living a "miserable" life lacking basic needs and human rights. The most reported type of abuse by the elderly was psychological mistreatment. (Al Omr AL Madid, 2001) In fact, a group in this study mentioned that the mother-in-law daughter-in-law relationship increases the risk of psychological abuse, because often the husband/wife stands up against their parents favoring their spouse over them. According to all of the elderly groups, they confirmed they were abused psychologically and emotionally more than any other kind (Al Omr AL Madid, 2001).

2. Social support system:

To better cope with sudden life changes, obstacles and unusual stressors, a structured psychological support is indispensable. Psychological resources, as defined by Luo et al (2011), consist of "social connections, social support, and personal coping resources" One study compared the social ties between the elderly families and society in 3 different districts. Its results suggested that social ties were a significant predictor of mortality in only two of the communities (Seeman et al, 1993). In line with this study is a more recent one that examined the association of social wellbeing and mortality. It showed that elderly with lowest levels of social network and engagement had an increased risk of mortality (Dong et al, 2011). Social support doesn't seem to affect later life mortality, many studies were able to correlate poor social networks and bonding with rapid deterioration, morbidity, poor health-related quality of life (HRQOL). The study by Clausen et al. (2007) identified elderly that lack of social support is associated with later morbidity and shorter survival in the community. A study in Norwegian nursing homes interviewed around 200 mentally intact elderly and gathered information on their social

support and HRQOL. The results showed a significant association between the two factors and that social support heightened the elderly well-being later in life (Drageset et al, 2009).

In the MENA region, the current literature and evidence is insufficient to establish a correlation between social support and health in the older populations of the middle-eastern countries, according to a systematic review done by Tajvar et al. (2013). In Lebanon specifically, the literature is also inadequate, and more research is needed on social relations and stressors over the course of life (Ajrouch et al, 2013). In reference to this study, it was shown that poor quality of support moderates the association of stress elderly psychological health. A number of studies looked at social support as a buffer to the effect of mistreatment or as a tool that prevents it from happening in the first place, which indirectly has a positive influence on health. The results revealed that the availability of such support in the elderly life will decrease the risk of being abused by others and increase the odds of good self-rated health (Lachs, 2004; Kopp, 2000), while the absence of such support will increase the odds of the elderly being abused (Laumann, 2008).

3. Living arrangement:

A lot of people consider co-residency with the older person is a way to support them financially and ensure they have a good social support system. Although this is true, however it may decrease elderly autonomy (Sibai et al, 2009) and hatred kinships might develop. Thus they will either be dislocated from the very same home they grew up in, or

staying in the house and suffering the consequences of unfriendly family ties. In both cases their psychological state is negatively affected (Sibai et al, 2009).

***4. Demographic factors*:**

Gender and age and socio-economic status are risk factors for reporting poor self-perceived health. Being an elderly woman increases the risk of worse SPH than men (Jylha, 1998; Benyamini, 2002). Another study that looked into gender and age and its association with SPH is the study by Benyamini et al. in 2002; the results showed that oldest elderly women were associated with worse SPH and higher probability of long-term mortality than young elderly women and men (Benyamini, 2002). Although older males and females have the same risk of abuse (WHO, 2011), there are certain cultures that marginalize women leaving them neglected and abandoned as they grow old.

Socio-economic status is also a risk factor for predicting poor SPH. In fact, a study done by Mossey et al. showed that the elevated risk of death that is correlated with poor SPH is more common among elderly with low-income and poor satisfaction (Mossey, 1982). Kopp et al. found that elderly with an income that merely covers their main expenses, along with other psychosocial factors (inequality, low support system), are at more risk for reporting morbid self-rated health (Kopp, 2000).

Marriage has been directly linked with social support, financial stability, and facilitated access to health care centers; all of which benefit the psychological and physical health (Ben-Zur, 2012; Liu 2012). Many studies have found a positive relationship between marriage and good SPH, one of which is by Kane in 2013 who hypothesized and was able

to show that SPH is dependent on marital status and that divorced people have inferior ratings of SPH when compared to married people (Kane, 2013).

***5. Physical and mental health*:**

On the individual level, a lot of risk factors lie between reporting good and poor SPH. Physical health for instance, elderly with low scores on Activity of Daily Living (ADL) have higher odds of poor SPH (Cisler, 2010). Along physical health, disabilities, co-morbidities as well play a role in estimating SPH. According to Gemeay et al. elderly with existing chronic diseases and disabilities scored low on the life satisfaction scale (Gemeay, 2011)

Seniors with co-morbidities, especially those who are inflicted with mental diseases such as dementia, are more vulnerable to emotional abuse (Hansberry, 2005). More research on the domain of mental diseases and health status among the elderly in the region is needed (Chaaya, 2007).

Not only inherited or inflicted diseases affect SPH, but Kaleta et al. (2008) have acknowledged that harmful health behaviors and lifestyle worsen the health status. Being one of the worst harmful behaviors, smoking degrades the physical health and causes cancer, respiratory and cardiovascular problems (CDC, 2013). In fact, ex-smokers have better health than current smokers as quitting has immediate effect on the health status. Research has shown that smokers almost always report poorer SPH compared to non-smokers (Freyer-Adam et al. 2011). Similarly Kaleta et al (2008) has shown that male smokers are 8 times more likely to report worse SPH than non-smokers.

***6. Other factors*:**

Al Omr Al Madid study also shed light on the governmental role in preventing abuse; elderly with no financial support cannot live an "honorable" life because of the absence of both, rules and regulations to protect the vulnerable population, and the pension systems to ensure a decent life for the elderly after retirement. An elderly group commented that when using public services, they were not offered help; at least a chair to sit on, while waiting hours in the queue. Moreover, growing old makes a person more susceptible to diseases and infections that need medical attention and sometimes hospitalization (Dorshkind, 2009), but due to financial insufficiency, lack of insurance plans and absence of medical centers near the elderly in the rural areas, they prefer to stay home and endure whatever illness they have been inflicted with. In this context, the government is indirectly responsible for the poor SPH of the elderly.

CHAPTER III

METHODOLOGY

A. Study Design and study population

This is a cross-sectional population-based study based on a secondary data analysis from the Pan Arab Population and Family Household Health Survey that was conducted by the Lebanese Ministry of Social Affairs in collaboration with the League of Arab States in 2004 as part of the 'Pan Arab Project for Family Health' (PAPFAM). PAPFAM aims at improving family and reproductive health in 16 Arab countries. Surveys, questionnaires and researches were conducted and structured databases were developed as necessary cues for needs assessment and for the execution of effective health interventions and projects in the future. The survey targeted older people, aged 65-100 years (73±6.1), in Lebanon. The sample size was 1812. The sample was chosen using a randomized multistage cluster sampling (League of Arab States, 2004).

B. Measures and justification

Most of the participants were mentally intact and capable of answering the questions. Only a small proportion (11%) was considered by interviewer as incapable. In such cases, a proxy (the closest person to the elderly) was interviewed on behalf of the elderly.

1. Self-perceived health

It is considered a strong indicator of subsequent mortality and can be used as an accurate health outcome measure (Burström, 2001).

It was assessed using the question: How do you assess your own health? (1) "Good", (2) "Fair", (3) "Poor". It was then dichotomized to (1) & (2) as good and (3) as poor, as used elsewhere (Olofsson 2012, Lamarca 2013).

2. Psychological maltreatment:

It was assessed according to two different variables; psychological abuse from people inside the family and psychological abuse from people outside the family.

a. Psychological maltreatment inside the family: It was assessed according to the question: "Is there anyone who annoys or disturbs you within the family? (1) "Husband/Wife", (2) "Sons and daughters", (3) "Sons-in-law and daughters-in-law", (4) "Grandchildren", (5) "Others" (6) "None".

   It was then dichotomized to (1) "Yes" (at least one is selected from the first 5 answers) and (2) "No" (if 'None' was selected)

b. Psychological maltreatment outside the family: It was assessed according to the question: Is there anyone who annoys or disturbs you outside the family or in life in general? (1) "Neighbors", (2) "Health employees", (3) "Employees at the government agencies I deal with", (4) "Other", (5) "None".

   It was then dichotomized to (1) "Yes" (at least one is selected from the first 4 answers) and (2) "No" (if 'None' was selected)

These questions are similar to those used in some studies that assessed psychological maltreatment (Olofsson et al, 2012).

3. Social support score:

It was assessed according to four questions each with a dichotomized answer: (1) "Yes", (2) "No", except for the first question that had three options: (1) "Yes", (2) "No", (3) "Live with children". (1) & (3) were then grouped as "Yes" and "No" remained the same.

1. Do your children visit you?

2. Do your siblings/relatives/friends/neighbors visit you?

3. Do you visit your siblings/relatives/friends/neighbors?

4. Are you involved in any unions or alliances that work for the benefit of the area you live in?

A new scale variable was then produced constituting of these 4 questions together, labeled "Social Support Score". The scale ranged from 0-4.

4. Other variables:

According to the literature (Olofsson, 2012; Luo, 2011), it was found that the following variables may confound the association between psychological abuse and self-perceived health and therefore will be included in the study as covariates. **Gender,** a**ge**, a continuous variable that was categorized into three categories (1) Young old: 60 – 69 years old, (2) Old 70-79 years old and (3) Oldest: 80 years old and more, **marital status**: (0)

"Never married", (1) "Married". (2) "Ever married (that grouped divorced, widowed and separated)", **arrangement of the house:** It was assessed according to the question: Do you feel that the conditions of your area of residence are convenient and comfortable? (1) "Convenient and comfortable", (2) "Not convenient and comfortable", **smoking status**: (0) "Non-smoker", (1) "Ex-smoker". (2) "current-smoker" it grouped two questions: Do you currently smoke cigarettes or any other tobacco?" (1) "Yes", (2) "No" and "Have you been smoking in the past? (1) "Yes", (2) "No", **co-morbidities**: a scale from 0-28 that included 28 different co-morbidities which was later dichotomized as three or more/less than 3 , **disability** which was assessed according to one question: Do you suffer any problems that limit your daily activity? (1) "Yes", (2) "No", **income status**, which was assessed according to one question: Is your income sufficient for the main expenses? (1) "Yes", (2) "No", and finally **education** that was assessed according to the question: What is the highest degree you have attained? (1) "Illiterate", (2) "Can only read and write", (3) "Preparatory", (4) "Primary", (5) "Secondary", (6) "High school", (7) "University", (8) "BP", (9) "BT", (10) "TS", a new variable was developed that grouped the answers into 5 categories: (1) "Illiterate", (2) "Can only read and write", (3) "Primary", (4) "Secondary", (5) "University",

C. Ethical Consideration

This is based on secondary analysis of raw data as provided by the League of Arab States to AMS and was approved by the Institutional Review Board at AUB.

D. Statistical Analysis

Descriptive statistics were performed to determine the characteristics of the study sample in Lebanon (means, standard deviations and frequency tables). Three main independent variables were considered: psychological mistreatment inside the family (A), psychological mistreatment outside the family (B) and social support score (C). The association between each of the main independent variables and SPH adjusting for other covariates were studied in seven separate models: in Model 1, (A) is the main IV and (B) & (C) are not included, in Model 2 (B) is the main IV and (A) & (C) are not included, in Model 3 (A) & (B) are the main IV and (C) is not included, in Model 4 (C) is the main IV and (A) & (B) are not included, in Model 5 (A) & (C) are the main IV and (B) is not included, in Model 6 (B) & (C) are the main IV and (A) is not included, and lastly in Model 7 all (A) & (B) & (C) are the main IV. For each model, multivariate logistic regression was done to understand the effect of covariates on the relationship between the main IV and the outcome. Adjusted odds ratios and their 95% CI were computed for each logistic regression. At the end, the logistic regressions of Model 1 to 7 were compared by the test of Goodness of Fit and Information Criteria (AIC & BIC) to identify the best model. All statistical analyses were performed using SPSS 21.0.

CHAPTER IV

RESULTS

A. Characteristics of the study population:

The mean age of males was 73.46±6.26 and that of females was 73±6 with a slightly larger proportion of males (51% vs. 49%). The majority of respondents in the study sample were non-smokers (56.1%) compared to 23.3% ex-smokers and 20.6% current smokers. Most of the elderly were living with one or more existing chronic diseases (93.1%), however only 29% had three or more co-morbidities. In addition to existing conditions, 28.3% of the participants had disabilities (physical, mental, etc…) that exacerbated their activities of daily living (ADL). Almost 64% had sufficient monthly income to cover the main expenses. Most of the study subjects were illiterate (44.4%), almost 25% had primary education, 15% could read and write, 12% had secondary education and only 2.6% had a university degree/certificate. (Table 1)

The proportion of poor SPH was amounted to 28.1%; higher in females (32.1%) than males (24.2%). Out of the those who recorded poor SPH, the proportion was highest in older age groups (43.1%), in elderly with higher number of chronic diseases (49.3%) and disabilities (53.8%) living in non-convenient/comfortable houses (52.7%) and in those who are illiterate (35.9%), ex-smokers (30.3%) and economically not stable (37.7%) (Table 2).

As for psychological abuse, Table 1 shows that 5.8% of the study population disclosed being abused by one of their family members and 7.1% by a person outside the family, a total of 11.6% reported psychological mistreatment; around 40% of both reported poor SPH. Mean social support score of the elderly in the sample was 2.83 (±0.55); of the poor SPH proportion, the mean was 2.54(±0.70) (Table 2).

B. Unadjusted Analysis

To determine the crude association between psychological maltreatment inside and outside the family and social support each with SPH, a univariate analysis was done using binary logistic regression. A significant association was found between psychological mistreatment inside and outside the family with SPH. Psychological maltreatment inside the family had a stronger OR= 1.79 (1.19 – 2.70), p-value= 0.005 compared to OR=1.54 (1.06 – 2.25), p-value 0.025 for outside the family. Social support also showed a very strong relationship with SPH, having an OR of 0.28 (0.22 –0.34) and p-value < 0.001 (Table 3).

The older the elderly becomes, the higher the risk he has of reporting SPH; the oldest group, 80 years old and above, had the highest OR=2.14, 95% CI (1.43, 3.20). Divorced, separated or widowed elderly had almost 1.5 times higher odds of reporting poor SPH compared to elderly who were never married, p-value 0.32, OR=1.41, 95% CI (0.66, 3.01). Surprisingly being a smoker had a protective effect in reporting poor SPH, p-value=0.14, OR=0.91 95% CI (0.63, 1.31). Elderly with more three or more co-morbidities and disability have increased risks of reporting poor SPH, OR=2.00 and OR=2.93 respectively. Older people living in comfortable residences and houses reported lower poor

SPH compared to those living in inconvenient arrangement houses p-value=0.00, OR=0.46, 95% CI (0.30, 0.70). The same applies to financially stable OR=0.0.80) and educated elderly (Table 3).

C. Adjusted analyses – Multivariable logistic regression

To test whether the previous associations were as such truly because of psychological maltreatment and social involvement alone, the different covariates were added to the 7 models. In Model 1 containing psychological maltreatment inside the family only, we obtained an OR=1.33 95% CI (0.56, 1.55), the association no longer remained significant as it was in the univariate regression. . Model 2 had similar results; its significant relationship disappeared after adjusting for all the covariates with OR= 1.43and, 95% CI (0.90, 2.29). In Model 3, psychological maltreatment both inside and outside the house weren't significantly correlated with SPH. In Model 4, social support retained its significant association with SPH having OR = 0.43 95%CI (0.33 – 0.55) even after taking into account all the covariates (Table 4).

When shuffling the variables into the remaining different Models (5, 6 & 7), the association between psychological maltreatment and SPH remained insignificant in every model with ORs = 1.21 95%CI (0.68, 1.59) for psychological maltreatment inside the family (Model 5), 1.23 95%CI (0.69, 1.42) for psychological maltreatment outside the family (Model 6) and 1.28 95%CI (0.66, 1.54) and 1.62 95%CI (0.99, 2.64) for outside the family and inside the family respectively in (Model 7) . Throughout Models 5, 6 & 7, the association of social support with SPH remained significant with ORs = 0.43 95%CI (0.33, 0.55) (Table 5).

The variables age, co-morbidities, disabilities and arrangement of the house had a strong and a significant relationship with SPH, unlike smoking, marital status, economic status and education (Table 4).

D. Information criteria

Test of Goodness of Fit (GoF) was applied to describe how well the data fits the different models. Akaike information criteria (AIC) and Bayesian information criteria (BIC) were computed to identify the model that best predicts SPH. AIC and BIC are measures of the relative quality of a statistical model. With the assistance of the GoF, both would accurately detect the best model. The seven models were compared with all the covariates. Table (7) summarizes the results for each model: Model 4 has the lowest values for AIC and BIC of 968.798 and 1064.980 respectively, making it the best model to predict SPH among elderly men and women above 60 years old in Lebanon.

CHAPTER V

DISCUSSION

Self-perceived health has become a reliable tool to assess future morbidities and mortalities (Kaplan et al, 1996; Burström, 2001). In previous studies, poor self-perceived health was shown to reflect higher odds of mortality (Helvik, 2013).

Our aims in the study were to study the association between elderly psychological mistreatment and social support on the elderly self-perceived health. We hypothesized that higher social support and lower psychological mistreatment, whether inside or outside the family, would decrease the odds of reporting poor health. In this population-based study of 1771 older people from Lebanon, we have shown that social support is significantly associated with poor SPH, even after controlling for all confounders. However, it appeared that psychological maltreatment wasn't a significant predictor of poor SPH after controlling for all of the covariates. Most importantly, the study was the first of its kind to determine the Lebanese prevalence of psychological elder abuse.

A. Prevalence of psychological maltreatment

This study was able to estimate the prevalence of psychological maltreatment among the elderly population in Lebanon. Ranging from 5.8% psychological mistreatment inside the family to 7.1% outside the family, the overall psychological abuse was shown to be 11.6%. This resembles the prevalence of elder abuse in general, in Occupied Palestinian Territories (18%) and Honk Kong (21%). The prevalence is relatively high compared to other numbers all over the world: USA 5% of the whole elderly population (WHO, 2010),

Netherlands 5.6% (Comijs, 1998), UK 2.7% (Ogg, 1993) and Australia 6% (Kurrle, 2004). A report by WHO in 2010 stated that prevalence numbers might not be accurate and could be an underestimation of the real image because of underreporting (WHO, 2010), either because of lack of awareness or fear from the perpetrators.

B. Psychological maltreatment and SPH

According to the literature, it is only logical to expect that abused people are more prone to have poor health outcomes irrespective of age and gender (Danielsson, 2005; Olofsson, 2009; Porcereli, 2003; Stickley 2010). Psychological maltreatment both inside and outside the family lost its significant association with poor SPH, when adjusting for co-morbidities, disabilities and other covariates. This is in line with some minor studies that have measured the association between elder abuse and self-perceived health (Ajdukovic, 2009; Cisler, 2010; Fisher, 2006). Few nationwide studies addressed this link and some even showed that physical abuse significantly predicts poor SPH, however when the association transformed to psychological abuse and SPH, the relationship disappeared when covariates were controlled for (Cisler et al. 2010). Psychological mistreatment was shown not to be a sole factor in determining self-perceived health. Other important factors (low SES, disabilities, emotional stress) are concomitant to the relationship and may be more directly linked to SPH. Olofsson et al (2012), on the other hand, was able to show the opposite. His study in 2012, showed a strong association between psychological abuse and negative health outcomes even after controlling for all other covariates. Olofsson's huge sample population of around 10,000 elderly men and women is an important factor in better assessing other predictor factors and confounders.

These different results can also be explained by the fact that psychological abuse is a variable that is hard to assess; there isn't a fixed structured question or tool that addresses psychological abuse. All of the studies use different instruments and questions that most encompass the definition of psychological abuse; "violation of trust" and "verbal acts that inflict anguish".

C. Social support and SPH

Lack of social support and engagement in the community around the elderly was the strongest predictor of poor SPH. This study retained the significant association even after adjusting for all the other confounders. Similarly, Zunzunegui (2004) studied the relationship between social involvement and SPH and showed that it was not dependent on elder disability nor the gender of the older person. The presence of social support whether from family, friends or community is an important structure for psychological wellbeing, as proved by other studies (Luo, 2011). One study differentiated between the social networks of friends and that of the family and showed that social support from friends was not uniquely associated with SPH, while that of elderly children and family was significantly associated with SPH (Zunzunegui, 2001). A meta-analysis in 2000, focused on the difference of the quality of social involvement between friends and family. The quality of social network is better among friends than family since the relationship with the latter might be stressful because of familial obligations such as the responsibility of taking care of older adult (Pinquart, 2000). The results of this study were in line with Pinquart's meta-analysis conclusion; social involvement is a significant predictor of self-perceived health.

D. Strengths of the study

This is a population-based study, which is representative of the Lebanese population. The elderly were answering a survey about their general way of living and conditions, unlike other studies that discussed elder abuse; where the elderly had to answer abuse-related questions that may put results at a greater bias. The findings of this cross sectional study can have implications for future prospective research on these risk factors as evidenced by the this study.

E. Limitations of the study

This cross sectional study couldn't determine the temporal relationship between psychological mistreatment and SPH. Cohort/prospective studies on the predictors would provide more reliable results.

Second, there was no alternative answer in the questionnaire about the frequency of abuse, resulting in classifying a person as "abused" regardless of the frequency; abused daily or once per month, not to mention the questions about abuse were also weak and they may not accurately be valid measures of abuse. "Is there anyone who annoys or disturbs you inside/outside the family?" does not reflect psychological abuse per se. In previous studies that addressed psychological abuse, some used the Psychological Elder Abuse Scale, and others used questions that were related to verbal assaults and threats. These threat-oriented questions give a better insight on psychological abuse than disturbance-oriented questions that may indirectly reflect other types of abuse and not solely psychological abuse.

Lastly, the nature of the issue “elder mistreatment” may have been underreported due to social desirability as it is a “negative life experience” (Wyandt, 2004), thus our data could not reflect the accurate number and percentages of elder abuse cases.

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

Elder mistreatment has been a topic of interest over the past decades. Though elder abuse is comprised of many forms, psychological maltreatment is one major type. Its relationship with self-perceived health is still understudied despite the growing evidence that links poor SPH to later morbidity and mortality (Burstrom, 2000; DeSalvo, 2005)

The results from this study showed strong and significant associations between the lack of social support with poor SPH. The patterns of poor SPH weren't present when psychological mistreatment existed, after controlling for age, gender and marital status, unlike social support that maintained a significant relationship even after adjusting for all the covariates.

Multidisciplinary teams, government and NGOs, should work together to raise awareness on this subtle feature to prevent future morbidity and mortality and to promote healthy ageing among this vulnerable population. Whether it's inside or outside the house, psychological elder abuse can be prevented if the public is more aware and if the elderly are empowered enough to report it. Centers for reporting elder abuse must be established to protect the elderly ultimate human right of living. During elderly's lifetime, the social ties and bonds with family and friends should not be weakened but strengthened to alleviate external stressors and reinforce a decent life to their years, and not just years to their life.

Table 1: Distribution of Baseline Characteristics among Lebanese elderly in the total population.

		N(%)
SPH	Poor	497 (28.1%)
	Good	1274 (71.9%)
Gender	Female	867 (49%)
	Male	904 (51%)
Age	Young Old	561 (31.7%)
	Old	922 (52.1%)
	Oldest	288 (16.3%)
Marital Status	Never married	66 (3.7%)
	Married	1154 (65.2%)
	Ever married	551 (31.1%)
Psychological abuse inside the family	No	1669 (94.2%)
	Yes	102 (5.8%)
Psychological abuse outside the family	No	1646 (92.9%)
	Yes	125 (7.1%)
Mean Social Support Score (SD)		2.83 (0.55)
Co-morbidities	Less than 3	912 (70.9%)
	3 or more	375 (29.1%)
Disabilities	No	1269 (71.7%)
	Yes	502 (28.3%)
Arrangement of the house	Not convenient and comfortable	148 (8.4%)
	Convenient and comfortable	1623 (91.6%)
Smoking status	Non-smoker	992 (56.1%)
	Ex-smoker	413 (23.3%)
	Smoker	364 (20.6%)
Economic status	Not sufficient	634 (35.9%)
	Sufficient	1134 (64.1%)
Education	Illiterate	774 (44.4%)
	Read & write	259 (14.9%)
	Primary	443 (25.4%)
	Secondary	217 (12.5%)
	University	49 (2.8%)

Table 2: Distribution of the Baseline Characteristics by SPH

		SPH	
		Good	Poor
		N (%)	N (%)
Gender	Female	589 (67.9%)	278 (32.1%)
	Male	685 (75.8%)	219 (24.2%)
Age	Young Old	441 (78.6%)	120 (21.4%)
	Old	669 (72.6%)	253 (27.4%)
	Oldest	164 (56.9%)	124 (43.1%)
Marital Status	Never married	53 (80.3%)	13 (19.7%)
	Married	851 (73.7%)	303 (26.3%)
	Ever married	370 (67.2%)	181 (32.8%)
Psychological abuse inside the family	No	1213 (72.7%)	456 (27.3%)
	Yes	61 (59.8%)	41 (40.2%)
Psychological abuse outside the family	No	1195 (72.6%)	451 (27.4%)
	Yes	79 (63.2%)	46 (36.8%)
Mean Social Support Score (SD)		2.94 (0.43)	2.54 (0.7)
Co-morbidities	Less than 3	643 (70.5%)	269 (29.5%)
	3 or more	190 (50.7%)	185 (49.3%)
Disabilities	No	1042 (82.1%)	227 (17.9%)
	Yes	232 (46.2%)	270 (53.8%)
Arrangement of the house	Not convenient and comfortable	70 (47.3%)	78 (52.7%)
	Convenient and comfortable	1204 (74.2%)	419 (25.8%)
Smoking status	Non-smoker	702 (70.8%)	290 (29.2%)
	Ex-smoker	288 (69.7%)	125 (30.3%)
	Smoker	282 (77.5%)	82 (22.5%)
Economic status	Not sufficient	395 (62.3%)	239 (37.7%)
	Sufficient	877 (77.3%)	257 (22.7%)
Education	Illiterate	496 (64.1%)	178 (35.9%)
	Read & write	189 (73%)	70 (27%)
	Primary	349 (78.8%)	94 (21.2%)
	Secondary	180 (82.9%)	37 (17.1%)
	University	44 (89.8%)	5 (10.2%)

Table 3: Unadjusted logistic regression

		Unadjusted OR (95%CI)
Social Support Score		0.28 (0.22 –0.34)
Psychological maltreatment outside the family		1.54 (1.06 – 2.25)
Psychological maltreatment inside the family		1.79 (1.19 – 2.70)
Age	Young old	
	Old	1.39 (1.08 – 1.78)
	Oldest	2.78 (2.04 – 3.78)
Gender		0.68 (0.55 – 0.83)
Marital Status	Never Married	
	Married	1.45 (0.78 – 2.70)
	Ever Married	1.99 (1.06 – 3.75)
Co-morbidities		1.35 (1.25 – 1.46)
Disabilities		5.34 (4.26 – 6.70)
Smoking	Non smoker	
	Ex-smoker	1.05 (0.82 – 1.35)
	Current smoker	0.70 (0.53 – 0.93)
Arrangement of the house		0.31 (0.22 – 0.44)
Economic status		0.48 (0.39 – 0.60)
Education	Illiterate	
	Read & Write	0.66 (0.48 – 0.90)
	Primary	0.32 (0.15 – 0.65)
	Secondary	0.51 (0.39 – 0.68)
	University	0.47 (0.30 – 0.71)

Table 4: Logistic multivariate regression of models 1 -3 with SPH

		Model (1) ***OR (95%CI)***	***Model (2)*** ***OR (95%CI)***	***Model (3)*** ***OR (95%CI)***
Social Support Score		-	-	-
Psychological maltreatment inside the family		1.33 (0.56 – 1.55)	-	1.31 (0.55 – 1.51)
Psychological maltreatment outside the family		-	1.43 (0.90 – 2.29)	1.44 (0.90 – 2.31)
Age	Young old			
	Old	1.15 (0.85 – 1.55)	1.15 (0.85 – 1.56)	1.15 (0.85 – 1.56)
	Oldest	2.14 (1.43 – 3.20)	2.17 (1.45 – 3.25)	2.16 (1.44 – 3.24)
Gender		0.79 (0.58 – 1.09)	0.78 (0.57 – 1.07)	0.78 (0.57 – 1.07)
Marital Status	Never Married			
	Married	1.98 (0.93 – 4.19)	1.98 (0.93 – 4.19)	1.99 (0.94 – 4.21)
	Ever Married	1.41 (0.66 – 3.01)	1.41 (0.66 – 3.00)	1.42 (0.66 – 3.03)
Co-morbidities		2.00 (1.51 – 2.65)	1.98 (1.50 – 2.62)	1.99 (1.50 – 2.63)
Disabilities		2.93 (2.24 – 3.83)	2.92 (2.24 – 3.82)	2.94 (2.26 – 3.83)
Smoking	Non smoker			
	Ex-smoker	1.05 (0.76 – 1.46)	1.07 (0.77 – 1.47)	1.07 (0.77 – 1.45)
	Current smoker	0.91 (0.63 – 1.31)	0.90 (0.62 – 1.30)	0.90 (0.62 – 1.30)
Arrangement of the house		0.46 (0.30 – 0.70)	0.47 (0.30 – 0.72)	0.47 (0.30 – 0.72)
Economic status		0.80 (0.61 – 1.04)	0.80 (0.61 – 1.05)	0.80 (0.61 – 1.05)
Education	Illiterate			
	Read & Write	0.80 (0.54 – 1.19)	0.81 (0.55 – 1.19)	0.81 (0.55 – 1.20)
	Primary	0.60 (0.43 – 0.83)	0.59 (0.42 – 0.82)	0.59 (0.42 – 0.82)
	Secondary	0.44 (0.28 – 0.67)	0.43 (0.27 – 0.68)	0.43 (0.27 – 0.68)
	University	0.22 (0.70 – 0.71)	0.21 (0.07 – 0.69)	0.21 (0.07 – 0.69)

Table 5: Logistic multivariate regression of models 4 – 7 with SPH

		Model (4) ***OR (95%CI)***	***Model (5)*** ***OR (95%CI)***	***Model (6)*** ***OR (95%CI)***	***Model (7)*** ***OR (95%CI)***
Social Support Score		0.43 (0.33 – 0.55)	0.43 (0.33 – 0.55)	0.43 (0.33 – 0.55)	0.42 (0.33 – 0.55)
Psychological maltreatment inside the family		-	1.21 (0.68 – 1.59)	-	1.28 (0.66 – 1.54)
Psychological maltreatment outside the family		-	-	1.23 (0.69 – 1.42)	1.62 (0.99 – 2.64)
Age	Young old				
	Old	1.16 (0.84 – 1.60)	1.16 (0.84 – 1.59)	1.61 (0.85 – 1.60)	1.16 (0.84 – 1.59)
	Oldest	1.87 (1.22 – 2.86)	1.86 (1.21 – 2.85)	1.90 (1.23 – 2.90)	1.88 (1.22 – 2.89)
Gender		0.76 (0.54 – 1.06)	0.76 (0.54 – 1.06)	0.75 (0.56 – 0.98)	0.74 (0.53 – 1.04)
Marital Status	Never Married				
	Married	2.04 (1.03 – 4.01)	2.02 (0.97 – 4.24)	2.28 (1.06 – 4.86)	1.91 (0.88 – 4.12)
	Ever Married	1.71 (0.86 – 3.37)	1.50 (0.71 – 3.14)	1.58 (0.74 – 3.40)	1.30 (0.60 – 2.83)
Co-morbidities		1.90 (1.41 – 2.54)	1.91 (1.42 – 2.56)	1.87 (1.39 – 2.51)	1.88 (1.40 – 2.53)
Disabilities		2.24 (1.76 – 3.12)	2.36 (1.77 – 3.15)	2.33 (1.75 – 3.01)	2.35 (1.76 – 3.14)
Smoking	Non smoker				
	Ex-smoker	1.15 (0.82 – 1.61)	1.12 (0.82 – 1.61)	1.16 (0.82 – 1.63)	1.17 (0.83 – 1.65)
	Current smoker	0.99 (0.98 – 1.46)	1.01 (0.68 – 1.47)	0.99 (0.67 – 1.45)	0.99 (0.69 – 1.47)
Arrangement of the house		0.51 (0.32 – 0.80)	0.50 (0.32 – 0.78)	0.52 (0.30 – 0.82)	0.51 (0.32 – 0.81)
Economic status		0.81 (0.61 – 1.08)	0.81 (0.61 – 1.07)	0.82 (0.62 – 1.09)	0.81 (0.61 – 1.08)
Education	Illiterate				
	Read & Write	0.78 (0.52 – 1.18)	0.78 (0.52 – 1.18)	0.78 (0.52 – 1.18)	0.78 (0.52 – 1.19)
	Primary	0.67 (0.47 – 0.94)	0.67 (0.47 – 0.95)	0.66 (0.47 – 0.93)	0.66 (0.47 – 0.93)
	Secondary	0.42 (0.25 – 0.70)	0.42 (0.25 – 0.70)	0.41 (0.24 – 0.68)	0.40 (0.24 - 0.68)
	University	0.34 (0.10 – 1.10)	0.39 (0.10 – 1.10)	0.32 (0.09 – 1.04)	0.31 (0.09 – 1.04)

Table 6: Information Criteria and Test of Goodness of Fit

	AIC	BIC	GoF p-value
Model 1	1020.019	1107.380	0.073
Model 2	1021.184	1108.544	0.090
Model 3	1058.610	1151.109	0.077
Model 4	968.798	1064.980	0.341
Model 5	1002.747	1103.991	0.273
Model 6	1005.011	1106.255	0.314
Model 7	1032.808	1139.114	0.293

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