

Original Article

Exploration of Life Satisfaction and Healthy Ageing in Relation to Vulnerability Status

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Abstract

Introduction: Life satisfaction refers to a subjective assessment of well-being. On the contrary, vulnerability refers to a situation that can hinder the path to healthy ageing and negatively affect life satisfaction.

Aim: In this study, an attempt was made to investigate the level of life satisfaction and the wellness in ageing in relation to both the absence and presence of vulnerability.

Material & Methods: The study sample consisted of 116 people aged ≥ 60 without neurocognitive disorders, living in Greece. Study tools were: a) structured socio-demographic questionnaire, b) Tilburg Vulnerability Index (TFI) c) Life Satisfaction Scale and d) supplementary questions in relation to key components of Healthy Ageing. The survey data was processed using the IBM SPSS 25 program.

Results: Subjects with a sign of vulnerability compared to those with an absence of it had a significantly lower mean life satisfaction score of -14.5% (23.5 vs 27.4; $p < 0.001$). Also in those with Healthy Ageing components had a lower Interlace of -24.3% (2.3 vs 3.0; $p = 0.001$), Resilience of -14.7% (3.2 vs 3.7; $p = 0.001$), Intimacy of -27.3% (2.9 vs 4.0; $p < 0.001$), Utility of -10.2% (3.8 vs 4.2; $p = 0.013$) or Prosperity by -15.5% (2.8 vs 3.4, $p = 0.003$) while they do not differ in Spirituality ($p > 0.05$).

Conclusions: Vulnerability has a notable impact on life satisfaction, negatively affecting the health and well-being of the individual, including the wider health care system. As vulnerability is often preventable and manageable, the development of policies to manage it is a realistic instrument to promote well-being per se.

Keywords: Vulnerability, life satisfaction, ageing, healthy ageing

Introduction

"Everyone wants to live long, but nobody wants to grow old" - Jonathan Swift's words

capture man's long-standing concern towards old age. At the same time, the scientific community analyzes the phenomenon of ageing with various approaches, still

considered a 'black box' (Boccardi & Boccardi, 2019; Fernández-Ballesteros, 2019). While ageing is a normal phenomenon in the evolution of all living organisms, it is a process universal, evolutionary and continuous, while presenting at the same time great heterogeneity referred to as a long, broad and deep process, which occurs throughout life, incorporating various factors and often remaining invisible (Gaspar et al., 2017; Boccardi & Boccardi, 2019; Baltes & Carstensen, 1996; Lee, Choi & Lee, 2020; Gastmans, et al., 2022).

Diener (1982) defined Life Satisfaction as "a cognitive, critical, global assessment of one's life, which may be affected by emotion but is not itself a direct measure of emotion". According to him, it is a part of the triptych of subjective well-being, along with the presence of positive emotions such as joy and the absence of unpleasant emotions such as anger and sadness (Doerwald et al., 2021; Gana et al., 2020). The literature review shows that the key factors that affect life satisfaction can be summarized as follows: the level of social participation, changes in living conditions, significant life events, functionality, psychological health, extent of social contacts, personality type, as well as socio-demographic characteristics such as gender, education, marital status and income. (Active Ageing Index, 2019; Berglund et al., 2016; Chen, 2001; Shrestha et al., 2019; Varshney, 2007; Wöbbeking-Sánchez et al., 2020).

Bengston et al., (2016), observed that the term "Happy Ageing" has many uses and is treated as a theory, a model, a process, a clinical program or a target. Healthy ageing, on the other hand, is the process of developing and maintaining functional capacity that enhances well-being at an older age. At first glance, the term "healthy" ageing may appear biomedical and narrower than "active" (Bengston et al., 2016; WHO, 2020).

The term 'vulnerability' may be defined as a separate clinical syndrome, which is related to advanced age, but is not an integral part of the normal process of ageing. This syndrome involves reduced physical and psycho-social endurance due to the inadequacy of the mechanisms of faulty balance and adjustment,

thus making the person vulnerable to internal and external stress factors, often with serious consequences on their quality of life, independence and survival. It also increases the risk of disability, hospitalization and mortality (Belloni & Cesari, 2019; Bessa et al., 2021; Clegg et al., 2013; Chen, Gan & How, 2018; Dugravot et al., 2020; Fried et al., 2001; Frieswijk et al., 2004; Hale, Shah & Clegg, 2019; Palomo-Vélez et al., 2020; Rezaei-Shahsavarloo et al., 2020). For the past two decades, we have come across two dominant conceptual models of vulnerability. One that studies the physical dimension of the phenomenon and the other that has a wider and multidimensional perspective (Fried et al., 2001; Mitnitski et al., 2001).

Life satisfaction has been a topic of investigation since the early stages of research on healthy ageing. Moreover, it has been seen as an integral part of it or even as an identical concept to it. Its assessment may not answer 'what' is exactly what makes each elderly person achieve healthy ageing, but it is an undeniably a safe indicator of positive life experiences.

Taking all of this into account, as well as after careful investigation of the existing literature, the present study was undertaken in order to investigate life satisfaction, ageing and well-being in relation to the absence or presence of vulnerability.

Material and Methods

Design and sample selection: This is a cross-sectional survey and a convenience sampling was used in order to include men and women aged ≥ 60 years, without neurocognitive disorder, residing in the community in Greece. Of the 127 who received the questionnaire, 11 were excluded (3 due to age under 60 and 8 due to difficulty in completing the survey data). Thus, the final number of participants included in the survey was 116 (46 men, 70 women). Data was collected using an anonymous set of questionnaires. Although the questionnaires were self-completed, most participants needed some help from the researchers to complete them.

Ethical Issues: The confidentiality of the information relating to the respondents was ensured and their anonymity was secured by codifying the data to which only the principal investigators could access. The participants

were informed about the purposes, context of the survey and the confidentiality of their personal data. Their informed consent was obtained prior to proceeding and they were informed that they could terminate the proceeding at any time they wished. The study received ethical approval from the Ethics Committee of the "Management of Ageing and Chronic Diseases" Master Program.

Survey questionnaires:

1. Tilburg Frailty Index (TFI): The Tilburg Frailty Indicator is a simple-to-use tool, a questionnaire that evaluates biological, social, psychological factors that may expose fragility. Another element that distinguishes TFI is that it does not mention ailments and disabilities as they are treated as separate entities (Gobbens et al., 2020). The TFI consists of 15 self-referenced elements distributed in three dimensions: physical, psychological and social. The score is obtained from the sum of the units with a range of 0 to 15 and the values ≥ 5 are considered a sign of vulnerability. It has been validated in the Greek population with a Cronbach's α of 0.72. (Zhang X, et al., 2020).

2. Life Satisfaction Scale (LSS): This was developed by Diener, Emmons, Larsen & Griffin (1985), and measures overall life satisfaction as a cognitive dimension of subjective wellness. It includes 5 questions which are rated on a seven-point Likert scale with 1 corresponding to strongly disagree and 7 agree very much. The questions are broad and non-specific in order to allow the respondent to answer subjectively and therefore exhibit great reliability and impartiality against variables such as gender, nationality and age. It is characterized by good psychometric properties, high retest coefficient and a good level of internal consistency (Galanakis et al., 2017). The validation in a Greek population was done by Malikioti & Anderson (1994).

3. Components of Healthy Ageing (CoHA): the questionnaire consists of 6 sentences corresponding to 6 major age-related components. These are evaluated on a five-step Likert scale between: not at all, a little, medium, much, very much. The proposals were as follows: I am participating in activities outside my home (linking / participating component). I feel strong through the difficulties of life (component of

mental resilience). It is important for me to sleep next to a partner/spouse (intimacy component). I feel useful to my family and to society (a sense of meaning and purpose of life component). My income is sufficient to meet my needs (a component of financial resources). I feel in my life the presence of God or a higher power (component of spirituality).

4. Socio-demographic information: The biological gender, age, education (none, primary, secondary school, vocational school, university graduate, master's, doctorate), marital status (single, married, divorced, cohabitation, widowed), children or not, and the municipality of residence were also recorded.

Statistical analysis: The data of this survey was analyzed using the IBM SPSS 25.0 program. Demographic characteristic distributions of the 116 study participants were assessed and tests were employed to compare the frequency distributions to the Vulnerability Scale responses through the 95% confidence intervals. Response frequencies on the Likert scales were followed by a χ^2 independence test and the difference between the Life State responses on the Life Scale were assessed by the non-parametric Friedman test. In the consistency assessment of the Scales, the reliability factors were estimated by Cronbach & Kuder-Richardson and their descriptive characteristics (positioning and dispersion measures) were attributed. The format of the distribution of scales was checked by the Blom (Q-Q plot) method where slight asymmetry was found. In the correlations of scales with each other and with the characteristics of the participants, the Spearman's method was used, while in the comparison of scales between those with no vulnerability and presence of it, the parametric method of Student t-test was used without the assumption of equal variances. An acceptable level of significance was set to 0.05.

Results

Demographic characteristics of study participants

Of the 116 participants in this survey, the majority (60.3%) were women, the median age of all was 74.2 years (range:60 to 97

years) with the majority (64.7%) being married or in a cohabitation (table 1). In addition, 93.1% reported having children and more than half (51.7%) resided in provincial

municipalities (i.e. beyond the two major urban centers in Greece, namely Athens and Thessaloniki).

Table 1: Demographic characteristics of 116 study participants.

		N	%
Gender	<i>Men/women</i>	46 / 70	39.7 / 60.3
Age	<i>Mean±SD [min-max]</i>	74.2±8.5	[60. 97]
Family Status	<i>Married or cohabitation</i>	75	64.7
	<i>unmarried, divorced, widowed</i>	41	35.3
Children	<i>Yes/no</i>	108 / 8	93.1 / 6.9
Residence	<i>Major city</i>	56	48.3
	<i>Province</i>	60	51.7

Table 2 shows the correlation of the levels of the TFI, LSS and CoHA with key characteristics of the 116 study participants. The Vulnerability Index appears to be significantly related to the female sex (rho=0.238, p<0.05), older ages (rho=0.296, p<0.05), those who are unmarried or divorced or widowed (rho=0.437, p<0.05), those who have no children (rho=-0.210, p<0.05) or reside in the municipalities of Athens & Thessaloniki (rho=-0,296, p<0,05), and similarly almost applicable to the physical component. Also, the highest Life

Satisfaction levels seem to be related with those who have children (rho=0.195, p<0.05). In the components of Healthy Ageing with higher levels of Social Inclusion are related to the lower ages (rho=-0.305, p<0.05) or those who reside in the provincial municipalities (rho=0,207, p<0,05). Higher levels of Intimacy are related to the male gender (rho=-0,270, p<0,05), those who are married or cohabiting (rho=-0.414, p<0.05) or have a higher level of education (rho=0.216, p<0.05).

Table 2: Correlate TILBURG Vulnerability Index, Life Satisfaction Index (DIENER) levels & Components of Healthy Ageing of the 116 study subjects with respect to their key characteristics.

<i>Scales & subscales</i>	<i>Sex (1 men 2:women)</i>	<i>Age a (years)</i>	<i>Household cat. (1: married, cohabiting, 2: single, divorced, widowed)</i>	<i>Children (1: no, 2: yes)</i>	<i>Municipality of residence (1: Attica & Thessaloniki, 2: provincial municipalities)</i>	<i>Education</i>
						<i>(1: none, 2: high school, high school, 3: University, TEI, 4: PhD MSc)</i>
rho-Spearman						
<i>Tilburg Vulnerability Index (higher score → greater indication of vulnerability)</i>	0.238 *	0.296 *	0.437 *	- 0.210 *	- 0.296 *	0.105
<i>Physical component</i>	0.194 *	0.302 *	0.286 *	-0.111	- 0.301 *	0.181

Psychological component	0.127	0.075	0.266 *	- 0.248 *	-0.128	-0.009	
Social component	0.169	0.115	0.419 *	-0.057	-0.059	-0.061	
Satisfaction from Life (DIENER) (higher score → greater satisfaction)	-0.089	0.136	-0.046	0.195 *	0.025	-0.086	
Co. Ed. of Aging (higher score → bigger clue)	Engagement	0.055	- 0.305 *	-0.143	-0.055	0.207 *	0.012
	Durability	0.005	-0.151	-0.128	0.066	0.253 *	-0.178
	Familiarity	- 0.270 *	-0.032	- 0.414 *	0.143	-0.004	0.216 *
	Usefulness	-0.084	-0.122	-0.144	0.144	0.148	-0.056
	Prosperity	-0.089	0.050	-0.082	0.043	0.242 *	-0.174
Spirituality	0.170	0.111	-0.009	-0.096	-0.177	-0.078	

* p-value<0.05

Finally, Table 3 presents the comparison of levels of Life Satisfaction Scales & Components of Healthy Ageing with respect to the absence & presence of Vulnerability of the 116 participants in the study. In addition to the mean scores, the percentage difference between the two groups, those with absence and those with evidence of presence of vulnerability, was also assessed. In particular, it appears that participants/substances with evidence of vulnerability compared to those

with absence have a significantly lower mean Life Satisfaction score of -14.5% (23.5 versus 27.4; p<0.001). Also, in Healthy Ageing Components have a significantly lower Interlace of -24.3% (2.3 versus 3.0; p=0.001), Resilience of -14.7% (3.2 versus 3.7; p=0.001), Familiarity by 27.3% (2.9 vs 4.0, p<0.001), Utility by -10.2% (3.8 vs 4.2, p=0.013) or Affluence by -15.5% (2.8 vs 3.4, p=0.003) while not differ in Spirituality (p>0.05).

Table 3: Comparison of levels of Life Satisfaction Scales (DIENER) & Components of Healthy Ageing with respect to the absence/presence of Vulnerability of 116 participants in the study.

Their Scales & Subscales	Tilburg Vulnerability Index score				D-difference	p-value	
	Absence of vulnerability (0-4)		Vulnerability Indicator (5+)				
	mean	SD	mean	SD			
Satisfaction from Life (DIENER) (higher score → greater satisfaction)	27.4	4.7	23.5	6.5	- 14.5 %	<0.001	
SE Aging (higher score → greater indication)	Engagement	3.0	1.3	2.3	1.1	- 24.3 %	0.001
	Durability	3.7	0.7	3.2	1.0	-14.7%	0.001
	Familiarity	4.0	1.3	2.9	1.5	-27.3%	<0.001
	Usefulness	4.2	0.7	3.8	1.1	-10.2%	0.013
	Prosperity	3.4	0.7	2.8	1.1	-15.5%	0.003
Spirituality	4.2	0.8	4.3	0.9	2.4%	0.500	

tests (equal variances not assumed).

Discussion

This cross-sectional study was an attempt to assess the correlation between Vulnerability, Life Satisfaction and important components of Happy Ageing, in a population ≥ 60 years, residents of Greek city and rural communities, without neurological disorders.

The hypothesis that Vulnerability is negatively related to Life Satisfaction and important components of Healthy Ageing was confirmed by our results as the Vulnerability Index appears to be significantly related to lower ($\rho = -0,387$, $p < 0,05$) components, except that of Spirituality.

In terms of demographic characteristics, the Vulnerability Index appeared to be significantly related to the female sex ($\rho = 0,238$, $p < 0,05$), older ages ($\rho = 0,296$, $p < 0,05$), those who are unmarried or divorced or widowed ($\rho = 0,437$, $p < 0,05$), those who had no children ($\rho = -0,210$, $p < 0,05$) and those who live in the municipalities of Athens and Thessaloniki ($\rho = -0,296$, $p < 0,05$). Our results are in line with those of other studies where the vulnerable were older, usually women, more often unmarried or single and had a lower level of education than the non-vulnerable (Gabrovec & Antoniadou, 2019; Op het Veld et al., 2015; Clegg, A et al., 2013; Ye et al., 2021; Silva, 2014; Paralikas, 2021).

In our study participants with a sign of vulnerability compared to those with absence have a significantly lower mean Life Satisfaction score of -14.5% (23.5 versus 27.4, $p < 0,001$). Other studies have also verified this result using the Life Satisfaction scale) and showed that vulnerable elderly people reported lower Life Satisfaction rates than those not susceptible to vulnerability (Palomo - Velez et al., 2020).

Our study also showed the relationship of vulnerability and Social Engagement (SE) which was found negative by - 24.3%. In contrast, higher levels of SE are related to the lower age groups ($\rho = -0,305$, $p < 0,05$) and the residents in provincial municipalities ($\rho = 0,207$, $p < 0,05$). Respectively, as identified in other surveys, SE as the most

frequent activity outside the home, was associated with better self-reported health (Silva, 2014; Kotrotsiou, 2023). This probably explains why in the present study the SE was found to be significantly related to age, as older people as mentioned above most often experience some degree of vulnerability. In our study, it was also shown that the SE was related to residing in non-urban areas; indeed, the literature confirms that in rural areas people are more active outside of the home especially in agricultural work (Triado et al., 2009). One explanation that can be given for the association of the interlace with the place of residence is so that social contacts in small communities are easier than in less friendly urban environments.

At the same time, as the present investigation has shown, the prevalence of vulnerability is higher in urban centers and, as mentioned above, vulnerability is negatively correlated with SE. In addition to the agricultural work mentioned above, religious events are also an activity that contributes to the interlocking and socialization of the elderly. Admittedly, life in the provinces retains much more proximity to such customs and traditions. At the same time, such a finding may be linked to factors such as road safety and crime. Urban dwellers are often prevented from doing business outside their own homes because of such risks.

Susceptible participants were found to have significantly lower Resistance by -14.7% ($p = 0,001$). Research also showed that resistance was significantly lower in susceptible ($p = 0,010$), however, this cross-sectional research cannot explain to us whether vulnerability is a cause or cause of reduced resistance (Lenti et al., 2022).

Vulnerable also appeared to be associated with a worse financial situation (-15.5% ($p = 0,003$)). The analysis of researchers in the Whitehall II cohort study data showed that the socioeconomic situation affects the risk of developing a vulnerability syndrome (Dugravot et al., 2020). Vulnerability also negatively affected the Intimacy component

by -27.3%. Accordingly, in a cross-sectional survey conducted with 250 elderly Brazilians, it appeared that the affective relationships was negatively correlated with vulnerability indicators such as reduced strength ($p = -0.254$; $p < 0.001$) and walking speed ($p = -0.207$; $p = 0.001$). (de Souza Júnior et al., 2022).

Limitations: The present study is the result of the investigation of life satisfaction and healthy ageing in relation to absence and presence of vulnerability. But there were also significant limitations to this process, one major one being the lack of sufficient Greek-population-weighted evaluation tools. In particular, at present there is no tool available to assess Ageing Performance per se. Thus, questions were drawn up based on important components of Healthy Ageing, but they could not have the reliability and validity of a weighted tool. The limited survey sample is also a disadvantage of the study, as a larger number is needed to generalize the results. Finally, cross-sectional studies cannot establish a cause-and-effect relationship.

Conclusions: This study offers important conclusions on the relationship between vulnerability, life satisfaction and healthy ageing in a population of over 60 years of age living in Greece. These conclusions are an important addition in the field of gerontology and social psychology, providing insight into the understanding of the parameters that affect the healthy ageing and quality of life of the elderly. In summary, the study supports the hypothesis that the risk of vulnerability is clearly associated with advanced age, life satisfaction levels, healthy ageing status, economic status, resilience, and intimacy levels. In addition, demographic checks may provide rich information on personal characteristics associated with vulnerability.

Based on the findings of the survey, future proposals that can be considered include: (a) Development of programs aimed at increasing life satisfaction among vulnerable groups through actions such as psychosocial support, education and active lifestyle promotion. (b) Creation of programs promoting healthy ageing, taking into account factors affecting vulnerability, such as social activity and economic security. (c) Initiation of programs providing personalized support to vulnerable

groups in order to improve their financial situation and reduce their vulnerability. (d) Development of resilience-enhancing programs, which will promote addressing difficulties and redefining positive aspects of life, even in difficult situations.

Development of programs promoting the social integration of vulnerable groups, with the aim of increasing social contacts and promoting emotional support is a current social and health necessity. Finally, education and awareness programs on vulnerability and the factors that affect it, which will be targeted at vulnerable people as well as their families, the local communities as well as health and social care professionals. These proposals can provide a basis for future actions and programs aimed at improving the quality of life and reducing vulnerability in the elderly population.

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