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Article

Comparative evaluation of Quality of Life indicators: towards developing a comprehensive standard model for measuring Quality of Life

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Abstract. This study aims to improve the understanding of quality of life (QoL) by evaluating key indicators, identifying influential factors, and assessing their relative weights. This study utilizes panel data from 181 cases across 32 European countries (2012-2017). The study employs exploratory and confirmatory factor analyses to create a comprehensive QoL measurement model. Four primary factors were found to influence QoL in Europe: economy, health, education, and governance quality. The study compares five common QoL indicators—income, GDP, life expectancy, the Human Development Index (HDI), and the Legatum Prosperity Index—against this model. Results show that the HDI is the most balanced indicator, while others exhibit biases. The study emphasizes the need for more precise and comprehensive QoL measures and recommends applying exploratory and confirmatory factor analyses to enhance them. Future research should validate the model in other regions and further improve QoL measurement.

Keywords: Quality of Life; Human Development Index; Legatum Prosperity Index
JEL classification: I31; A1

1. Introduction

The concept of Quality of Life (QoL) is inherently complex and multidimensional, making it difficult to define in a scientifically rigorous manner. This complexity arises from the open nature of the concept and the lack of a unified theoretical framework, which has led to ongoing debates about the possibility of developing a comprehensive QoL theory. Furthermore, the indicators used to measure QoL are often criticized for being either too simplistic, failing to provide a complete representation of reality, or overly complicated, raising concerns about their validity. Studies have revealed significant variations among these indicators, including their sensitivity to different variables, the diversity of approaches, and the weight assigned to each factor. Given these challenges, it is essential to evaluate and compare these diverse indicators to better understand their strengths and weaknesses. Such an analysis will not only clarify the QoL concept but also strengthen its theoretical

foundations, thereby improving the effectiveness of QoL measurements.

This study presents a novel standard model for measuring QoL, developed using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The model identifies four core factors influencing QoL in Europe: economic quality, health quality, education quality, and governance quality. These factors are then used to evaluate five commonly employed QoL indicators: income, Gross Domestic Product (GDP), life expectancy at birth, the Human Development Index (HDI), and the Legatum Prosperity Index. Through multiple regression analysis, the study examines the relative weights and biases of these indicators, highlighting the strengths and limitations inherent in each. The results provide critical insights, with HDI emerging as the most balanced indicator, while others, such as GDP and the Legatum Prosperity Index exhibit distinct biases toward economic and governance factors, respectively. This empirical analysis provides evidence for the need to reassess how QoL indicators are weighted and suggests improvements for more accurate and inclusive measurement.

The significance of this research lies in its contribution to the development of a more comprehensive and balanced framework for assessing QoL. The proposed standard model and the findings of this study offer valuable insights for policymakers and researchers seeking to refine QoL measurements in Europe and beyond.

This study follows a structured approach to provide a comprehensive analysis of the topic of Quality of Life. After the abstract, the first chapter presents an introduction that outlines the general framework of the study, highlighting its significance and objectives. The second chapter reviews the relevant literature, focusing on the concept of Quality of Life, its theoretical foundations based on Maslow's Hierarchy of Needs, and the methods used for its measurement. The third chapter details the methodology and data used in the analysis. This is followed by the fourth chapter, which presents the empirical results, beginning with Exploratory Factor Analysis (EFA) to identify the key determinants of Quality of Life in Europe, followed by Confirmatory Factor Analysis (CFA) to establish a standardized measurement model, and finally, Multiple Regression Analysis to assess the impact of these factors on key Quality of Life indicators. The fifth chapter provides the main conclusions and recommendations derived from the study. Finally, the research includes a list of references supporting the analysis and findings.

2. Literature review

2.1 Concept of Quality of Life

Brown, Bowling, & Flynn (2004) note that quality of life concept is often based on expert opinions rather than individual perspectives, which limits their relevance. Nonetheless, quality of life isn't entirely subjective, especially politically, where satisfaction plays a crucial role. Costanza, et al. (2007) define quality of life as the degree of satisfaction or dissatisfaction in various life areas. Oxford University (2011) explains that satisfaction comes from fulfilling desires, expectations, or needs, representing a subjective judgment influenced by past experiences and current expectations (Campbell, Converse, & Rodgers, 1976; Campbell, 1981; Morris & Winter, 1978; Potter & Cantarero, 2014). Community satisfaction pertains to how well individuals feel their community meets their needs (Matarrita-Cascante, 2010).

Deseran (1978) argues that society is subjectively reconstituted as an objective reality,

making it a multidimensional phenomenon. Consequently, community satisfaction cannot always be objectively measured (Christensen & Levinson, 2003). Marans & Rodgers (1975) note that satisfaction depends on both objective conditions and individual values and expectations, meaning objective characteristics alone do not reflect personal feelings. Studies indicate that individuals can be satisfied with their communities even in suboptimal environments (Campbell, Converse, & Rodgers, 1976; Gulick, Bowerman, & Back, 1962; Hollingshead & Rogler, 1963). Furthermore, research shows that rural residents are often more satisfied with their communities than urban residents (Campbell, 1981; Marans & Rodgers, 1975; Theodori, 2001).

The World Health Organization (2012) defines quality of life as individuals' perceptions of their position in life within their cultural and value contexts. Malkina-Pykh & Pykh (2008) describe quality of life as reflecting overall experience and well-being. Brown, Bowling, & Flynn (2004) identify two dimensions: societal (income, employment, housing, education, and environmental conditions) and individual (perceptions, values, well-being, happiness, and life satisfaction). Thus, quality of life is a multidimensional concept that extends beyond economic status (Eurostat, 2015) and includes social, biomedical, psychological, economic, and environmental factors (Alan Walker, 2005). This complex concept encompasses objective and subjective elements, communal and individual aspects, and both positive and negative interactions (Lawton, 1991; von Tesch-Ro & Motel-Klingebiel, 2001).

Quality of life is a dynamic and complex concept, lacking a clear scientific definition and consensus (Hajdouva, Andrejovsky, Gajdos, & Andrejkovic, 2011; Alan Walker, 2005). This ambiguity arises from its open nature, individual focus, and lack of theoretical foundations. Cultural values and preferences further complicate its universal definition and measurement (Diener, Oishi, & Tay, 2018; Walker & Van der, 2004). The possibility of a unified theory of quality of life is debated due to its multidimensional nature (Alan Walker, 2005). However, such a theory could improve the application of quality of life measures in policy (Noll, 2002).

2.2 Maslow's theory and the hierarchy of needs as a basis for the concept of Quality of Life

The complexity of the concept of quality of life stems from the complexity of human nature, as it revolves around fulfilling human needs and expectations, which, when met, bring satisfaction and happiness. Assessments of quality of life vary among researchers due to the subjective nature of needs and priorities, making reliance on individual satisfaction insufficient. For instance, a poor person may feel content when receiving a free daily meal, whereas a billionaire may experience dissatisfaction despite their wealth. This illustrates that the feeling of satisfaction does not necessarily reflect actual quality of life, and material well-being alone does not appear to be a sufficient measure of quality of life. According to Maslow (1943), as cited in Green (2000), some individuals lose ambition under conditions of poverty, leading to the satisfaction and disappearance of less critical goals such as love, self-esteem, focusing solely on physiological needs, security, and stability, thereby distorting the concept of satisfaction. Accordingly, the measurement of quality of life should be based on objective scientific criteria that rely on a deep understanding of human psychology and the mechanisms for achieving stability, happiness, and true satisfaction, rather than

on varying personal opinions.

Additionally, according to Maslow (1943), as cited in Green (2000), desires and behaviors vary superficially across cultures, yet fundamental human needs remain universal. The more individuals engage with different societies, the greater their awareness of the similarity in human needs, while differences remain confined to behavioral patterns and their expression. Therefore, it can be argued that the concept of quality of life is a singular notion that does not fundamentally differ across cultures, with variations existing only in behavioral patterns and their modes of expression.
Maslow's (1943) theory of the hierarchy of human needs, as cited in Green (2000), can serve as a solid scientific and objective foundation for the concept of quality of life. This theory posits that individuals seek to fulfill their needs hierarchically, beginning with physiological needs (food, water, shelter), followed by safety needs (financial and health stability), then social needs (belonging and social relationships), esteem needs (achievement and social recognition), and finally self-actualization (personal development and goal fulfillment). Humans are inherently driven by desire, with their needs shaped by biological, cultural, and contextual factors. The emergence of one need depends on the satisfaction of a stronger, lower-level need in the hierarchy. A person cannot attain higher levels unless the lower levels are adequately met (Maslow, 1943, as cited in Green, 2000).

Physiological needs are the strongest of all needs. If these needs remain unmet, other needs, such as safety, freedom, and love, recede into the background. For example, an individual experiencing extreme hunger may define their ideal world as a place abundant in food, believing that securing food for life would bring complete happiness and eliminate all other desires. If physiological needs are well satisfied, safety needs emerge as the next dominant priority, with security and stability becoming the primary goals. Once safety needs are fulfilled, social needs become the next focus, and a person may intensely feel the absence of friends or a romantic partner, even though they may have once dismissed love as trivial when struggling with hunger and poverty. Upon satisfying social needs, esteem needs emerge, which are divided into two subcategories: the first involves self-confidence, self-respect, and the desire for power, achievement, competence, independence, and freedom. The second encompasses the need for reputation, fame, recognition, and attention based on respect or appreciation from others. The failure to fulfill esteem needs leads to feelings of inferiority, weakness, and helplessness. Once esteem needs are met, self-actualization needs emerge, representing the highest level of the hierarchy, where individuals strive to develop their abilities and achieve their full potential. Self-actualization is not necessarily linked to creativity; rather, it reflects a person's desire to become more and more of what they are (Maslow, 1943, as cited in Green, 2000). Most individuals only partially satisfy their basic needs, with satisfaction levels decreasing as they ascend Maslow's hierarchy. For example, an average person may achieve 85% satisfaction in physiological needs, 70% in safety needs, 50% in social needs, 40% in esteem needs, and only 10% in self-actualization. Each new level emerges gradually as the lower level is satisfied, often unnoticed at first. These needs are often unconscious, with unconscious motivation playing a larger role, although this becomes more apparent among intellectually developed and educated individuals (Maslow, 1943, as cited in Green, 2000).

Other human needs are not ending in themselves but are interconnected sub-goals tied to fundamental needs. For example, cognitive needs—such as the pursuit of knowledge, understanding, and analysis—serve as a means to achieve security for the average person, while they represent a

form of self-actualization for highly intelligent individuals. Thus, cognitive needs are an integral part of the fundamental hierarchy of needs. Moreover, the hierarchy of needs is not entirely fixed; the sequence may be altered for some individuals due to psychological or social factors. For example, some people may view self-esteem as more important than love, leading them to exhibit aggressive behavior as a display of power. This can be explained by the fact that they actually lack love and seek it by imitating the traits of lovable individuals, who are often perceived as powerful.

If fundamental needs remain unmet, this results in psychological imbalances that can be considered a form of "illness," just as nutritional deficiencies are regarded as health issues. A psychologically healthy person strives to realize their full potential, and if they are driven by secondary desires rather than fundamental needs, this reflects an unhealthy state. Therefore, understanding quality of life necessitates focusing on the extent to which individuals can fulfill their essential needs, as this directly impacts their psychological and social well-being.

When examining quality of life through the lens of the hierarchy of basic human needs, it becomes evident that it is influenced by the level of satisfaction of these needs. If an individual experiences deprivation in physiological needs, their quality of life will be low. Conversely, achieving higher-level needs, such as self-actualization, should correspond to a high quality of life, even in the absence of some material resources. Based on this premise, quality of life can be defined as the extent to which an individual is able to meet their fundamental needs, including physiological needs, safety needs, social needs, esteem needs, and finally, self-actualization needs. A society with a high quality of life is one that provides individuals with the appropriate environment to achieve self-actualization, where the primary motivation for a healthy person is the development of their full potential and capabilities. From this perspective, any deficiency in meeting these needs can be considered a form of illness, much like deficiencies in vitamins or minerals, which are recognized as health issues.

2.3 Measuring Quality of Life

Given the complexity of the concept and differing perspectives, it is unsurprising that there is no consensus on defining and measuring quality of life. Despite this, scientific research on the topic has significantly increased in citations (Alan Walker, 2005). Though extensive research has been conducted, a consensus on conceptualization and measurement remains elusive. Various organizations and authors propose sets of dimensions and composite indicators to measure progress and facilitate comparisons between countries (Estes & Sirgy, 2019).

Brown, Bowling, & Flynn (2004) identify eight models of quality of life: objective social indicators like living standards, health, and longevity (Walker & Van der, 2004); fulfillment of human needs (Maslow, 1954; Bigelow, McFarland, & Olson 1991); subjective indicators such as life satisfaction, psychological well-being, morale, self-respect, personal achievement, and happiness (Clarke, Marshall, Ryff, & Rosenthal, 2000); social capital in the form of personal resources (Knipscheer, de Jong-Gierveld, van Tilburg, & Dykstra, 1995); environmental and neighborhood resources (Scharf, Phillipson, & Smith, 2004); health and performance focusing on physical and mental capabilities (Graham & Kenealy, 2004); psychological models of factors (Grundy & Bowling, 1999); and interpretive approaches that emphasize individual values, interpretations, and perceptions (Gabriel & Bowling, 2004).

Quality of life is considered a dynamic, multifaceted concept that reflects the interplay

between objective and subjective aspects, macro and micro levels, and both positive and negative influences. Therefore, it is often measured through various domains (Hughes, 1990; Grundy & Bowling, 1999). A multidimensional approach is necessary to capture the complexities of people's experiences and assess their well-being accurately. This approach helps policymakers understand the challenges faced by individuals or communities more comprehensively and develop targeted interventions (Diener & Biswas-Diener, 2002).

Numerous models and measures of quality of life exist, ranging from simple single-variable models to complex multi-variable ones. For this paper, we have selected five commonly used indicators: income, Gross Domestic Product (GDP), life expectancy at birth, Human Development Index (HDI), and the Legatum Prosperity Index. These indicators will be evaluated and analyzed to determine which best represents quality of life.

2.3.1 Income as an indicator of Quality of Life

Income refers to the money individuals or households regularly receive from sources such as wages, salaries, investments, or government benefits. It is a crucial indicator of quality of life and economic well-being, providing insight into the financial resources available to meet basic needs and pursue personal growth (Stiglitz et al. 2009). Income is commonly used to reflect an individual or household's financial resources and is considered a key factor in determining living standards (Diener & Biswas-Diener, 2002).

There is scientific consensus that income is positively associated with quality of life due to its influence on various aspects of well-being, such as better housing, healthcare, education, recreational activities, savings, and cultural experiences (Diener & Biswas-Diener, 2002). Higher-income individuals generally enjoy a higher standard of living. Additionally, studies suggest that income can enhance quality of life when spent on meaningful activities, like social networks and charitable activities (Dunn, Aknin, & Norton, 2008). Research indicates that well-being increases with income, even above $75,000 a year (Kahneman & Deaton, 2010). However, the relationship is not linear; beyond a certain point, additional income does not significantly improve quality of life (Easterlin, 1974). Conversely, an excessive desire for wealth can negatively affect job satisfaction and quality of life (Tang, 2007). Thus, income's impact on quality of life varies depending on how it is perceived and used.

Income inequality and disparities in income distribution significantly impact the overall quality of life within societies. Such disparities affect individuals' access to critical resources necessary for enhancing well-being. Those with lower incomes often struggle to afford basic necessities like food, shelter, and healthcare, severely impacting their quality of life (Diener & Biswas-Diener, 2002).

Moreover, wide gaps between high and low-income earners can lead to social fragmentation, higher crime rates, reduced community trust, and limited access to essential services such as education and healthcare (Stiglitz, Sen, & Fitoussi, 2009). This inequality also restricts opportunities for social mobility and hinders the formation of social capital within communities.

Therefore, income serves as a complex and multidimensional indicator of quality of life, and its impact varies significantly depending on individual circumstances and broader societal contexts.

Addressing income inequality is crucial for promoting more equitable access to resources and improving overall quality of life for all members of society.

2.3.2 Gross Domestic Product (GDP) as an indicator of Quality of Life

Gross Domestic Product (GDP) is a widely recognized measure of a country's economic health and well-being. It represents the total value of all goods and services produced within a specific period. Gross Domestic Product (GDP) is often used as an indicator of the standard of living, reflecting the material well-being and quality of life of a country's population. It is extensively utilized due to its simplicity, availability of data, and its ability to provide a comparative overview between countries, enabling policymakers to identify trends and patterns related to economic growth. Higher Gross Domestic Product (GDP) levels are frequently associated with increased access to resources such as healthcare, education, and infrastructure, thus implying an improvement in quality of life.

2.3.3 Life Expectancy at Birth (LEX) as an Indicator of Quality of Life

Life expectancy at birth is a fundamental measure indicating the average lifespan individuals can expect, based on current mortality rates (World Health Organization, 2012). It serves as a critical indicator of quality of life by reflecting the overall health status and living conditions within communities and societies. Higher life expectancy values typically signify advancements in public health policies, healthcare systems, living standards, and social conditions. These advancements contribute to longer and healthier lives, enabling individuals to potentially experience more fulfilling life events and make positive contributions to society. Moreover, longer life spans offer individuals increased opportunities for personal growth and self-fulfillment (World Health Organization, 2012). Life expectancy at birth varies widely among countries and regions due to several factors including economic development, healthcare systems, public health policies, prevalence of infectious diseases, social behaviors, and environmental conditions (Eurostat, Quality of life indicators - measuring quality of life, 2024; Raleigh, 2019). Advances in healthcare, such as medical technologies, early diagnosis, disease treatment, and preventive measures, significantly contribute to increasing life expectancy and enhancing quality of life (World Health Organization, 2019; Murray et al., 2020).

Education also plays a crucial role in improving both longevity and quality of life. Educated individuals tend to make healthier lifestyle choices informed by knowledge and awareness, such as maintaining regular exercise routines, adopting balanced diets, and avoiding harmful habits like smoking or excessive alcohol consumption (Cutler & Lleras-Muney, 2010). Education empowers individuals to make informed decisions about their health needs and encourages proactive health management (Baker et al., 2011).

Socioeconomic conditions are also influential factors in life expectancy and quality of life. Higher socioeconomic status typically correlates with better access to healthcare services, improved living conditions, and greater opportunities for personal development. Conversely, individuals from lower economic backgrounds often face barriers that limit their access to essential resources and opportunities for growth (Marmot, Friel, Bell, Houweling, & Taylor, 2008).

In summary, life expectancy at birth serves as a comprehensive indicator of quality of life by reflecting the interplay of healthcare, education, and socioeconomic factors that contribute to

individuals' overall well-being and longevity.

2.3.4 Human Development Index (HDI) as an indicator of Quality of Life

The Human Development Index (HDI) is a widely used composite statistical measure that evaluates the quality of life and human development in various countries. HDI encompasses three primary dimensions: a long and healthy life, knowledge, and a decent standard of living. This indicator aims to provide a comprehensive understanding of well-being beyond economic metrics alone, positing that people and their capabilities should be the ultimate criteria for assessing a country's development, not just economic growth. Developed by Pakistani economist Mahbub ul Haq, HDI is used by the Human Development Report Office of the United Nations Development Program (Elizabeth, 2007). HDI is a simple and easy-to-understand measure covering multiple dimensions of human development relevant to all countries, allowing for comparisons of human development between countries and regions and tracking progress over time. Organizations like the World Bank and the World Economic Forum use it to gauge countries' progress towards achieving sustainable development goals.

Before 2010, HDI was calculated using three dimensions: health (measured by life expectancy at birth), education (measured by adult literacy rate and gross enrollment ratio), and standard of living (measured by Gross Domestic Product (GDP) per capita at purchasing power parity). The (UNDP, 2010) updated HDI calculation to include three dimensions: health (measured by the life expectancy index, with a maximum value of 1 at 85 years and a minimum value of 0 at 20 years), education (measured by the mean years of schooling index with a maximum of 15 years and the expected years of schooling index with a maximum of 18 years in most countries), and standard of living (measured by the income index, with a maximum value of 1 at $75,000 GNI per capita and a minimum value of 0 at $100 GNI per capita). The HDI is calculated as the geometric mean of normalized indices for each of the three dimensions.

2.3.5 Legatum Prosperity Index (LEG) as an Indicator of Quality of Life

The Legatum Prosperity Index, developed by the Legatum Institute in 2007, is a comprehensive tool designed to assess the overall quality of life and prosperity in various countries. To provide a holistic evaluation of prosperity, the index divides dimensions into three main domains encompassing 12 pillars: inclusive societies, open economies, and empowered people. The inclusive societies domain consists of safety and security, personal freedom, governance, and social capital. The open economies domain includes investment environment, enterprise conditions, market access and infrastructure, and economic quality. The empowered people domain consists of living conditions, health, education, and the natural environment. These pillars are represented by 67 elements, each comprising a set of 300 indicators selected based on their ability to create a good representation of the relevant element, supported by conceptual and statistical reasons from academic literature. Indicators are also chosen to be likely causes of wealth and well-being. After selecting indicators and filling in missing data points, the data undergo a normalization process and are aggregated to produce composite scores at the element level, then further aggregated at the pillar and domain levels, and finally for the index as a whole.

2.3.6 Criticisms of Quality of Life indicators

The aforementioned indicators and others have been criticized individually and collectively. For instance, income indicators can be misleading due to inflationary effects or differences in the cost of living across regions or countries. Life expectancy at birth does not account for the distribution of mortality across different age groups. GDP does not reflect income equality and wealth distribution. HDI can be sensitive to the choice of indicators, weights, and aggregation methods. The Legatum Prosperity Index faces criticism over the selection and weighting of indicators, as different stakeholders might have varying opinions on the most important dimensions or how to measure them. While the Legatum Prosperity Index has been criticized for its complexity, income indicators, life expectancy at birth, GDP, and HDI have been criticized for their simplicity, as they do not capture the complexity of the quality of life concept and overlook other crucial aspects such as wealth distribution, social justice, human rights, political freedom and participation, political stability, social support systems, social cohesion, psychological well-being, personal values, job security, work-life balance, environmental quality, and cultural differences (Diener & Seligman, 2004; Stiglitz, Sen, & Fitoussi, 2009; World Bank Group, 2018; Ryff & Singer, 2008; World Health Organization, 2012).

After reviewing the five indicators of quality of life and the related literature, significant differences in opinions can be observed between supporters and critics. Criticism is directed at all indicators. Some criticize simple indicators for not reflecting the complexity and multidimensionality of the concept of quality of life. Others criticize composite and complex indicators, questioning the selection of variables and their relative weights. This reflects a lack of consensus on a clear theory of quality of life.

The study of quality of life remains a branch of social science where definitive conclusions cannot be reached. Each indicator for measuring quality of life has its strengths and weaknesses, highlighting the importance of comparing them to discover which is the most representative of the concept of quality of life. Comparing these indicators allows for the observation of their differences and opens the door to their development or the creation of more representative indicators.

Beslerová & Dzuričková (2014) observed significant differences between the Human Development Index (HDI) and the Legatum Prosperity Index. These differences are mainly due to the diversity and sensitivity of the sub-indicators used. The Legatum Prosperity Index includes a wider range of sub-indicators compared to the HDI, reflecting a broader spectrum of information and various aspects. In contrast, the HDI does not adequately cover many dimensions of human development, such as income distribution equity, poverty, gender equality, housing, access to public services, human rights, and personal safety. Based on this, the researchers suggested the need for further research on the sensitivity of sub-indicators to improve the measures used in developing these critical areas and supporting the overall development of countries.

Otoiu, Titan, & Dumitrescu (2014) conducted a cluster analysis to explore the variables that determine well-being and human progress in three well-known composite indices and found that the Happy Planet Index was the least reliable compared to the HDI and the Legatum Prosperity Index. They concluded that a robust classification of countries based on multidimensional well-being can be achieved using a small number of variables, reducing the risk of including unreliable or unavailable variables.

Hsieh (2013) studied the effect of non-inclusive domains on assessing the importance of

weighting in quality of life measures. The results indicated that common methods for assessing weighting, such as correlation and moderate regression analysis, can lead to misleading results if quality of life measures are not constructed using a formative indicator approach.

Maričić (2019) pointed out three notable shortcomings in current composite indicators: the uneven inclusion of objective indicators, high instability, and potential bias in the weighting process. For this reason, she proposed the development of a new composite index known as the "European Index of Life Satisfaction" (EILS), which relies on a two-pronged approach: applying Principal Component Analysis (PCA) to determine the required number of dimensions, and the eSS-CIDI approach to propose unequal weights, focusing on satisfaction with time use as the most important indicator. Similarly, Wang, Hopke, Hancewicz, & Zhang (2003) emphasized the necessity of using multiple weighting methods when determining weights in composite indicators.

3. Methodology and data

The aim of this study is to evaluate the key indicators used to measure quality of life and to identify the determining factors and their relative weights. To achieve this, Confirmatory Factor Analysis (CFA) is employed to model the quality of life in European countries as a latent variable, which minimizes bias, inconsistency, and arbitrary weights of explanatory factors. This results in the development of a standardized model that optimally measures and describes quality of life.

Exploratory Factor Analysis (EFA) is employed to reduce a set of 14 observed variables ($X_1, X_2 \ldots, X_{14}$) into fewer unobserved latent factors (F_1, F_2, F_3, F_4) that explain the variance across the variables. The relationship can be expressed as:

$$X_i = \lambda_{i1} F1 + \lambda_{i2} F2 + \lambda_{i3} F3 + \lambda_{i4} F4 + \boldsymbol{\epsilon}_i \quad [1]$$

where λ_{ij} are the factor loadings representing the contribution of each factor to the observed variables, and $\boldsymbol{\epsilon}_i$ is the error term for each variable X_i. The goal of EFA is to maximize the variance explained by the factors and to reduce the dimensionality of the data. Each factor is formed independently using Principal Component Analysis (PCA) with Varimax rotation to enhance interpretability. The resulting factor scores serve as input for Confirmatory Factor Analysis (CFA), ensuring a structured and statistically validated model for measuring QoL.

Confirmatory Factor Analysis (CFA) is used to confirm the factor structure derived from EFA. In CFA, the QoL is modeled as a latent variable F_{QoL} represented by the factors F1, F2, F3, F4. The model can be expressed as

$$F_{QoL} = \beta_1 F_1 + \beta_2 F_2 + \beta_3 F_3 + \beta_4 F_4 + \delta \quad [2]$$

where β1, β2, β3, and β4 are the factor loadings and δ is the error term for the latent QoL variable. CFA ensures that the model fits the data well by estimating the relationships between the latent variables and observed indicators. This approach minimizes bias and inconsistency by allowing the model to estimate the optimal factor loadings rather than assigning arbitrary weights. The model is

estimated using maximum likelihood estimation (MLE) to ensure statistical robustness. The final outcome is a standardized model for measuring and describing QoL, along with the standardized relative weights of its components, forming the basis for constructing the Quality of Life Index (QoL).

Subsequently, the study employs multiple regression analysis using the Ordinary Least Squares (OLS) method to assess the impact of the four factors that constitute the standard model for measuring quality of life on commonly used quality of life indicators, aiming to determine their relative weights in each index. The study then uses the best model as a standardized benchmark for comparison with the main indicators used to measure quality of life in order to evaluate them. The study evaluates five indicators used to measure quality of life: Income, Gross Domestic Product (GDP), Life Expectancy at Birth, Human Development Index (HDI), and The Legatum Prosperity Index. Let Y_j represent one of the QoL indicators (such as income, GDP, life expectancy, HDI, and the Legatum Prosperity Index), and the regression equation can be written as

$$Y_j = \alpha_j + \beta_{1j}F_1 + \beta_{2j}F_2 + \beta_{3j}F_3 + \beta_{4j}F_4 + \boldsymbol{\epsilon}_j \quad [3]$$

where αj is the intercept, β_{ij} are the regression coefficients, and $\boldsymbol{\epsilon}_j$ is the error term. This model estimates the relative weights of the factors in influencing each QoL indicator.

The sample panel data consists of 181 cases, representing annual observations for 32 European countries over the period from 2012 to 2017. The selection of countries was based on data availability, resulting in a varying number of countries per year: 30 in 2012, 29 in 2013, 31 in 2014, 32 in 2015, 30 in 2016, and 29 in 2017. The dataset was compiled from four sources: Our World in Data[1], World Data[2], The Legatum Institute[3], and Eurostat[4]. The countries included in the study are: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, and Turkey. For data analysis, three software packages were used: IBM SPSS Statistics 26.0, AMOS 26.0, and Excel 2019. The data underpinning the analysis reported in this paper are deposited at Harvard Dataverse at https://doi.org/10.7910/DVN/MTTFJR . (Figure 1) illustrates the Research Process Flowchart, outlining the key steps and analytical approach used in this study.

[1] https://ourworldindata.org/
[2] https://www.worlddata.info/quality-of-life.php#tab
[3] https://www.prosperity.com
[4] https://ec.europa.eu/eurostat/en/

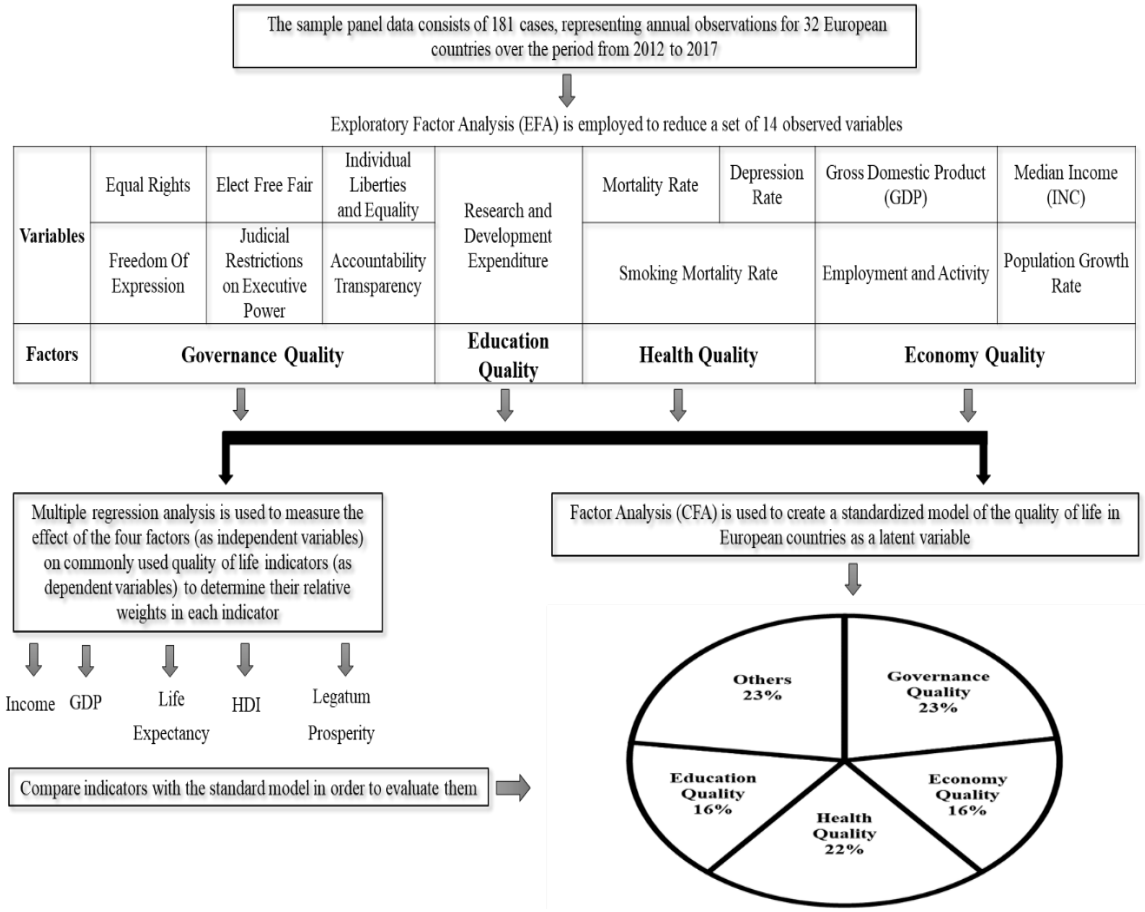

Figure 1. Research Process Flowchart. *Source:* Own design.

4. Empirical results and discussion

4.1. Exploratory factor analysis (EFA) to establish factors that determine Quality of Life in Europe

Exploratory Factor Analysis (EFA) was conducted on 14 variables to derive 4 main factors determining quality of life. Each factor was analyzed separately. (Table 1) displays the initial variables and the factors resulting from EFA, alongside quality of life indicators and their abbreviations. (Table 2) presents the EFA results.

Table 2 summarizes the key findings from the Exploratory Factor Analysis (EFA). The results highlight the importance of the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test in assessing the suitability of data for factor structure detection.

Table 1. Initial variables and factors from Exploratory Factor Analysis (EFA) with Quality of Life indicators and abbreviations.

Variables Type	Initial variables and abbreviations	Factors and abbreviations
Independent Variables	Equal Rights Elect Free Fair Individual Liberties and Equality Before the Law Freedom Of Expression Judicial Restrictions on Executive Power Accountability Transparency	Governance Quality (GOVQ)
	Gross Domestic Product at Market Prices, Euro Per Capita (GDP) Median Income, Euro (INC) Employment and Activity, Percentage of Total Population Population Growth Rate	Economy Quality (ECOQ)
	Research and Development Expenditure, Percentage of GDP	Education Quality (EDUQ)
	Mortality Rate Depression Rate Smoking Mortality Rate	Health Quality (HEAQ)
Dependent Variables	**Quality of life indicators**	
	The Legatum Prosperity Index (LEG) Human Development Index (HDI) Life Expectancy at Birth (LEX) Gross Domestic Product at Market Prices, Euro Per Capita (GDP) Median income, Euro (INC)	

Source: Own design.

The KMO measure assesses the sampling adequacy, indicating the extent to which variables share common variance that could be caused by underlying factors. A KMO value close to 1.0 suggests that factor analysis is likely appropriate for the data, whereas values below 0.5 indicate that factor analysis may not yield meaningful results. According to Kaiser (1974), a minimum KMO value of 0.5 is recommended, with values between 0.7-0.8 considered acceptable, and values above 0.9 being excellent.

Bartlett's test of sphericity evaluates whether the correlation matrix of variables is an identity matrix, implying that variables are unrelated and unsuitable for factor analysis. A significance level (p-value) less than 0.05 typically indicates that factor analysis is suitable for the data.

Based on the results presented in Table 2, both the KMO measure and Bartlett's test indicate that the data are suitable and appropriate for detecting underlying factor structures. This suggests that the variables included in the analysis share sufficient common variance and are not so highly correlated that they would render factor analysis inappropriate.

The "Total Variance Explained" column shows the quality score for each component, called the Eigenvalue. Only components with high eigenvalues are likely to represent real underlying

factors. The general rule is to choose components whose eigenvalues are at least 1. Applying this rule to the table, our variables seem to measure factors. The percentage of variance indicates the amount of variance explained by each factor. The results indicate that all loadings are relatively high, ranging from 63% to 79%.

Table 2. Summary of Exploratory Factor Analysis (EFA) results.

Factors and abbreviations	Number of variables	Kaiser-Meyer-Olkin measure of sampling adequacy (KMO)	Bartlett's test (sig.)	Total variance explained	
				Eigenvalues	% of variance
Governance Quality (GOVQ)	6	.89	<.001	4.79	79.82
Economy Quality (ECOQ)	4	.71	<.001	2.85	71.21
Education Quality (EDUQ)	1				
Health Quality (HEAQ)	3	.60	<.001	1.90	63.41

Source: Own calculations using IBM SPSS Statistics 26.0.

4.2. Confirmatory Factor Analysis for forming the standard model to measure Quality of Life in Europe

To form the best possible model for measuring and describing quality of life in Europe, first-order Confirmatory Factor Analysis (CFA) was conducted to identify the measurements that meet the requirements for the latent factor loading (quality of life). If the value is more than 0.5, the measurement is considered valid. It should be noted that the factor scores extracted from the exploratory factor analysis (EFA) in Section 4.1 were used as indicators to represent the variables related to Governance Quality, Economy Quality, Education Quality, and Health Quality. Figure 2 presents the CFA model used, showing the four variables (Governance Quality, Economy Quality, Education Quality, Health Quality) that form the best possible model for measuring and describing quality of life in Europe.

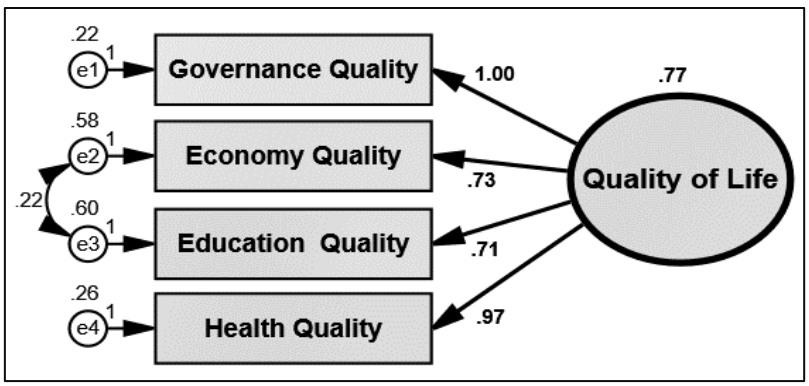

Figure 2. The best possible first-order Confirmatory Factor Analysis (CFA) model for Quality of Life in Europe.

*Notes: Model Fit Measures: CMIN= 0.001, DF= 1, P= 0.974, CMIN/DF= 0.001, CFI= 1.000, SRMR= 0.000, RMSEA= 0.000, PClose= 0.979, Regression Weights: Governance Quality: Estimate = 1. Economy Quality: Estimate = 0.731, S.E.= 0.081, C.R.= 9.022, P= ***. Health Quality: Estimate = 0.975, S.E.= 0.082, C.R.= 11.854, P= ***. Education Quality: Estimate = 0.712, S.E.= 0.082, C.R.= 8.722, P= ****

Source: Own calculations using AMOS 26.0.

In such models, reliability and validity must be established before proving the model's suitability. To establish the reliability and validity of this model, three types of validity are referenced: convergent validity, internal consistency, and composite reliability. Table 3 displays the validity results.

Table 3. Reliability and validity assessment of the Quality of Life model.

Measure	Composite Reliability (CR)	Average Variance Extraction (AVE)	Maximal Reliability (MaxR(H))	Cronbach's alpha (CA)
Estimate	0.844	0.581	0.885	0.857

Source: Own calculations using AMOS 26.0.

Reliability was assessed using Composite Reliability (CR) and Maximal Reliability (MaxR(H)). Discriminant validity could not be tested in a single-factor model. Composite reliability indicates each construct's significance in the model. For Quality of Life, CR was 0.84, exceeding the threshold of 0.7, indicating good reliability. According to Gaskin & Lim (2016), MaxR(H) values above 0.7 indicate an excellent model; here, it was 0.88. Convergent validity was confirmed with Average Variance Extracted (AVE). Alarcón & Sánchez (2015) suggest AVE should be ≥ 0.5; our model achieved 0.58 for quality of life. Internal consistency, evaluated via Cronbach's alpha, yielded a value of 0.85, surpassing the recommended threshold of 0.7 (Alarcón & Sánchez, 2015), indicating good internal consistency. Thus, values in Table 4 (CR, AVE, and MaxR(H)) affirm the model's reliability and validity.

Model fit was assessed using criteria established by Hu & Bentler (1999). The criteria for an excellent fit are Comparative Fit Index (CFI) > 0.95, Standardized Root Mean Square Residual (SRMR) < 0.08, and Root Mean Square Error of Approximation (RMSEA) < 0.06. Our model met these criteria, indicating an excellent fit. (Table 4) presents the detailed results of the model fit assessment.

Table 4. Quality of Life model fit measures.

Measure	CMIN	DF	CMIN/DF	CFI	SRMR	RMSEA	PClose
Estimate	0.001	1	0.001	1.000	0.000	0.000	0.979

Source: Own calculations using AMOS 26.0.

With the model's suitability, reliability, and validity established, it can effectively measure quality of life. Next, the study will determine the relative impact of each variable on the Quality of Life Index based on the model's findings. Figure 3 illustrates the relative weights for the standard quality of life measurement model: governance quality (23%), health quality (22%), economic quality (16%),

education quality (16%), and other factors (23%). Notably, this model emphasizes governance and health quality more than economic and education quality, distinguishing it from other indicators.

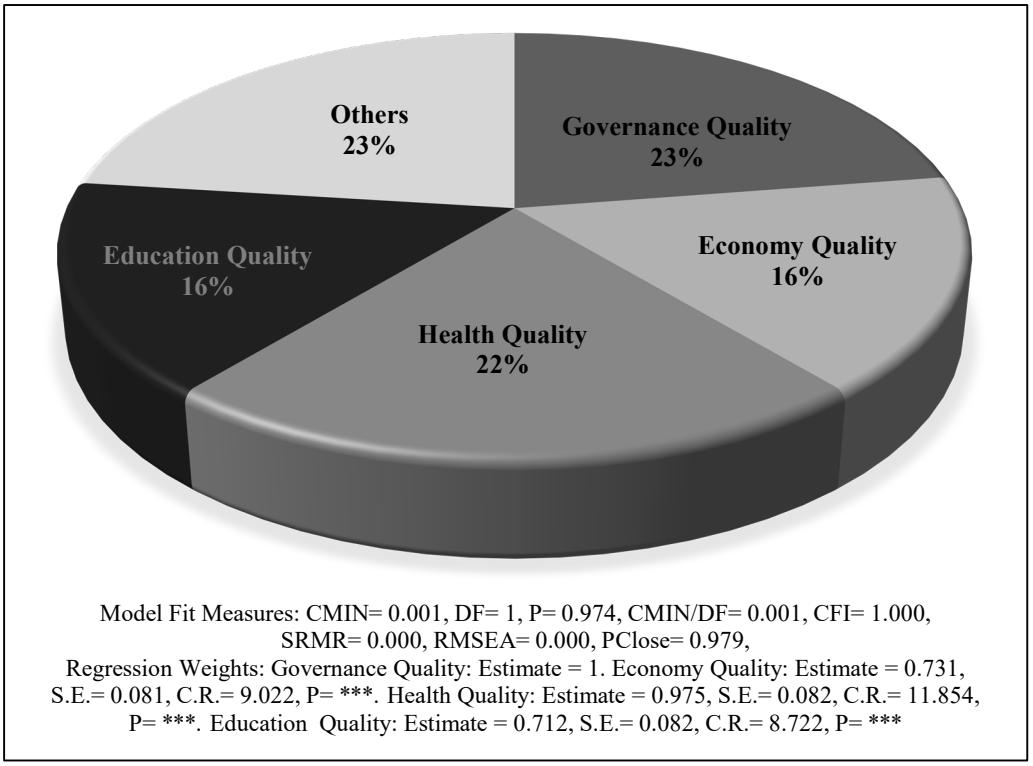

Figure 3. Relative weights of factors in the standard Quality of Life measurement model derived from multiple regression analysis**.** *Source: Own calculations using AMOS 26.0 and Excel 2019.*

4.3. Multiple regression analysis to measure the effect of factors on key Quality of Life indicators

The study also uses multiple regression analysis using the Ordinary Least Squares (OLS) method to determine the relative weight of factors adopted by the standard model for measuring quality of life in forming key indicators used to measure quality of life. The regression equation that expresses the linear relationships between a single dependent variable and the independent variables is outlined in equation 4:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \boldsymbol{\epsilon} \quad [4]$$

In equation 1, Y is the predicted value of the dependent variable. The values of the independent variables are denoted as X1, X2, X3, X4. α is the constant, β1, β2, β3, β4 are the regression coefficients, and $\boldsymbol{\epsilon}$ is a random factor. The constants' values are assigned based on the principle of least squares. LEG, HDI, LEX, GDP, and INC are the indices that measure quality of life influenced by 4 factors (inputs): GOVQ, ECOQ, EDUQ, and HEAQ. It should be noted that the factor scores extracted from the exploratory factor analysis (EFA) in Section 4.1 were used as indicators to represent the variables related to Governance Quality, Economy Quality, Education Quality, and Health Quality. By applying

the study variables to the above equation, 4 equations can be formed as follows.

$$LEG = \alpha + \beta 1\ GOVQ + \beta 2\ ECOQ + \beta 3\ EDUQ + \beta 4\ HEAQ + \epsilon \quad [5]$$

$$HDI = \alpha + \beta 1\ GOVQ + \beta 2\ ECOQ + \beta 3\ EDUQ + \beta 4\ HEAQ + \epsilon \quad [6]$$

$$LEX = \alpha + \beta 1\ GOVQ + \beta 2\ ECOQ + \beta 3\ EDUQ + \beta 4\ HEAQ + \epsilon \quad [7]$$

$$GDP = \alpha + \beta 1\ GOVQ + \beta 2\ ECOQ + \beta 3\ EDUQ + \beta 4\ HEAQ + \epsilon \quad [8]$$

$$INC = \alpha + \beta 1\ GOVQ + \beta 2\ ECOQ + \beta 3\ EDUQ + \beta 4\ HEAQ + \epsilon \quad [9]$$

Figures 4-8 below display the results of the five multiple regression models. According to the results in Figure 4, the factors affecting INC include economic quality (82%), education quality (8%), health quality (8%), and other factors (-2%). This index notably excludes governance quality and heavily emphasizes economic factors. However, it offers broader coverage compared to the Gross Domestic Product (GDP) index, incorporating more diverse factors, as detailed later in the study.

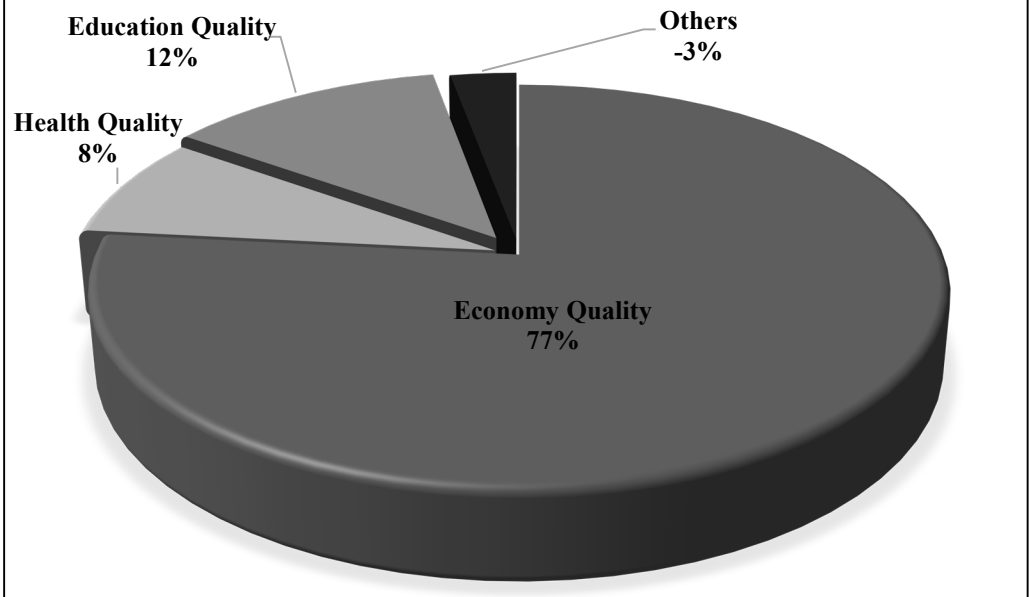

Figure 4. Relative weights of factors in the income index (INC) derived from multiple regression analysis. *Source: Own calculations using IBM SPSS Statistics 26.0 and Excel 2019.*

The results in Figure 5 indicate that factors influencing the Gross Domestic Product (GDP) index are primarily economic quality (85%), with minor impacts from education (-8%) and other factors (7%). This index lacks consideration for governance and health factors and is negatively influenced by education, showing a strong bias towards economic quality.

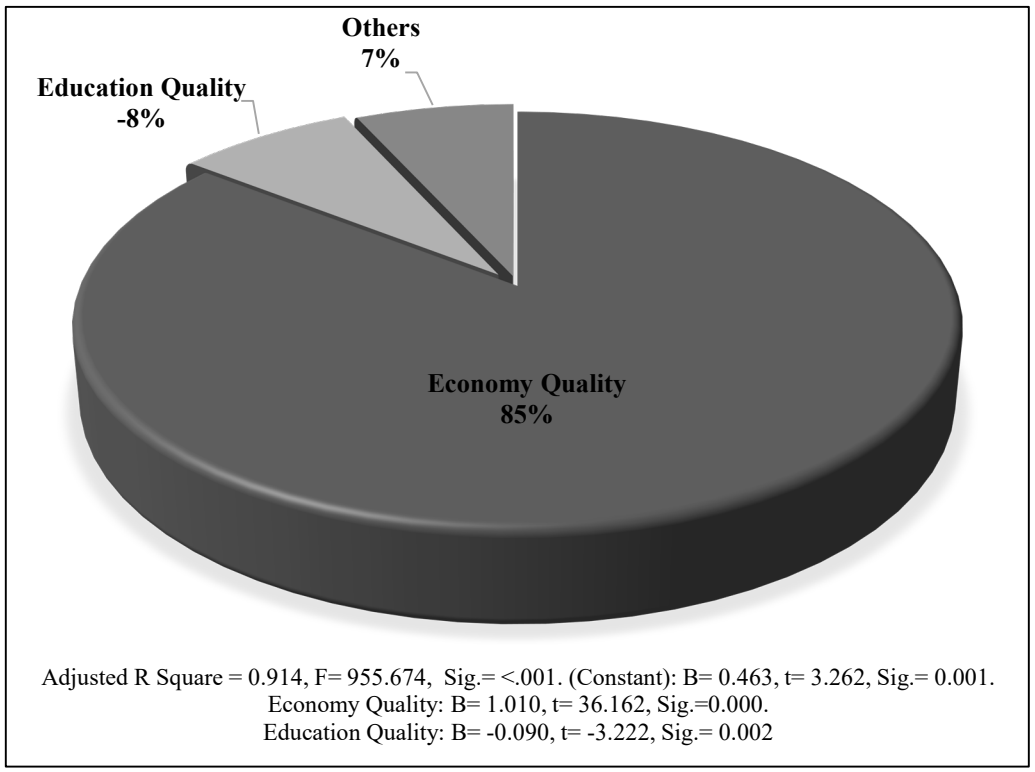

Figure 5. Relative weights of factors in the Gross Domestic Product (GDP) index derived from multiple regression analysis. *Source: Own calculations using IBM SPSS Statistics 26.0 and Excel 2019.*

The results in Figure 6 show that the relative weights of the factors affecting LEX are 48% for health quality, 28% for economic quality, -18% for governance quality, and 6% for other factors. The main advantage of this index compared to the standard model proposed by the study is that LEX gives a high weight to health quality. Its downsides are that it is not affected by education quality, is negatively affected by governance quality (the most important factor according to the standard model), and is heavily biased towards health quality. Nevertheless, it is better than INC and GDP indices as it includes more factors.

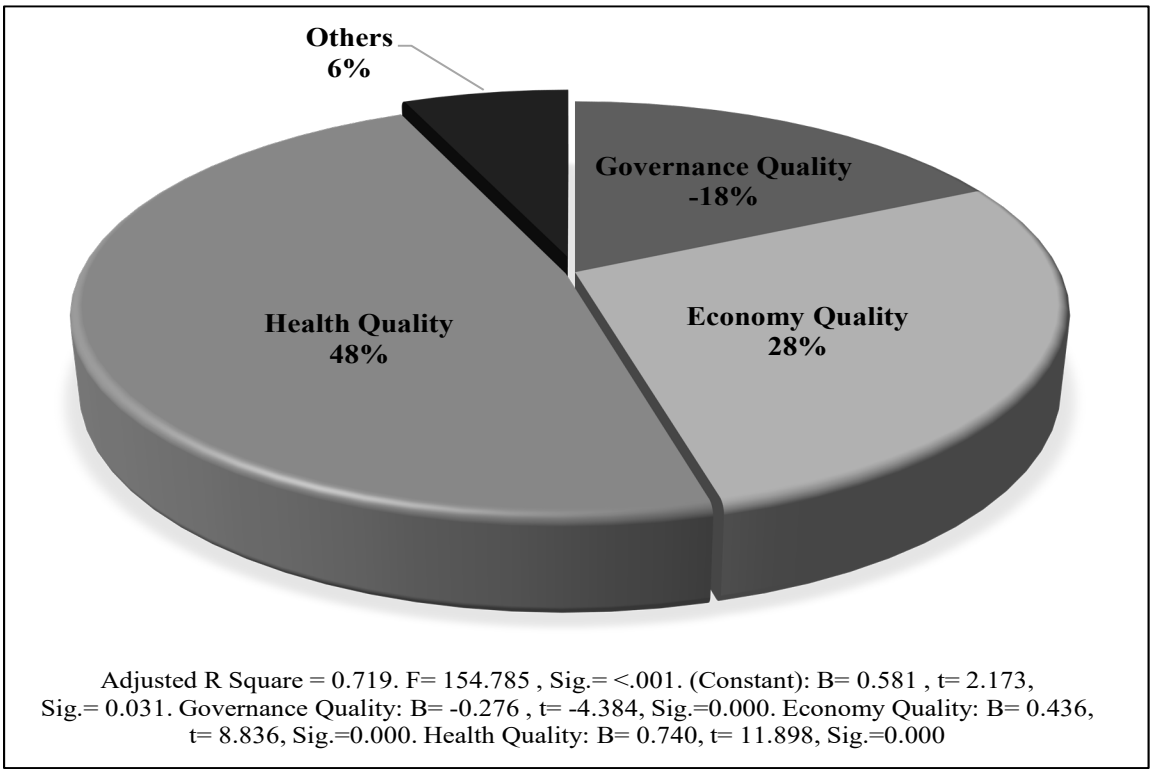

Figure 6. Relative weights of factors in the life expectancy index (LEX) derived from multiple regression analysis. *Source: Own calculations using IBM SPSS Statistics 26.0 and Excel 2019.*

The results in Figure 7 show that the relative weights of the factors influencing HDI are 35% for economic quality, 21% for governance quality, 19% for education quality, 14% for health quality, and 11% for other factors. HDI is influenced by all factors. However, the downside of this index is that it assigns higher relative weights to economic quality and education quality than to health quality and governance quality, and it is also significantly biased towards economic quality. Despite this, it is considered better than INC, GDP, and LEX indicators because it includes all factors and is more balanced. It needs to increase the weights for governance quality and health quality.

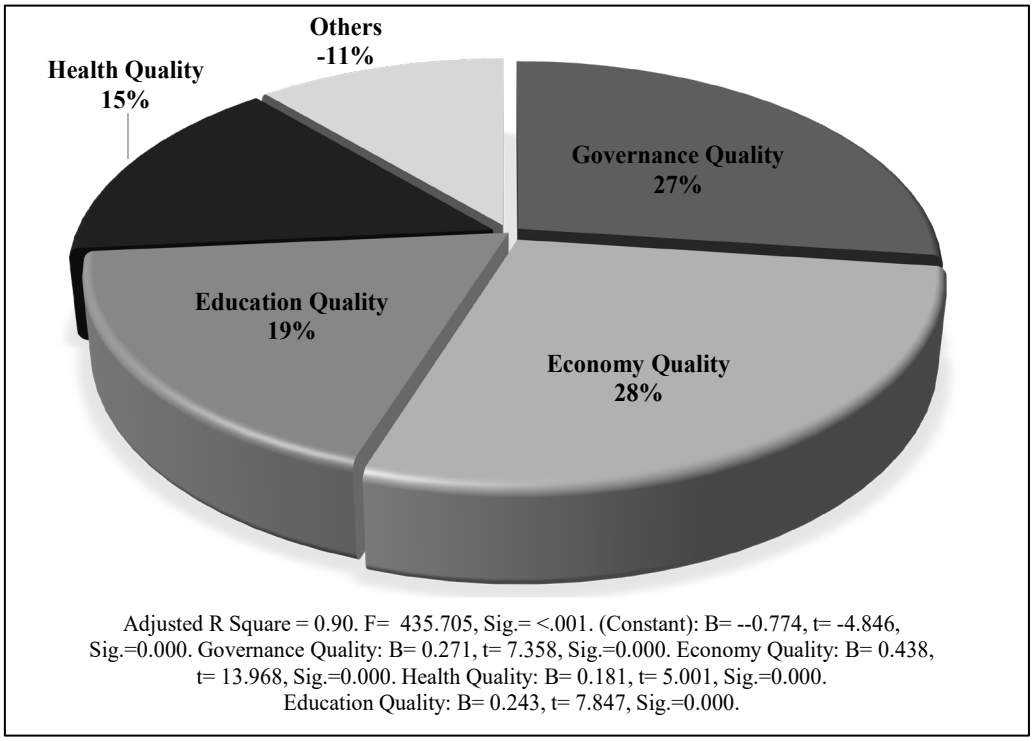

Figure 7. Relative weights of factors in the Human Development index (HDI) derived from multiple regression analysis. *Source: Own calculations using IBM SPSS Statistics 26.0 and Excel 2019.*

The results in Figure 8 show that the relative weights of the factors influencing LEG are 35% for economic quality, 34% for governance quality, 22% for education quality, and 9% for other factors. LEG assigns a high relative weight to governance quality. However, the downside of this index is that it is not influenced by the health quality factor, which is the second most important factor in the standard model, and it also assigns the highest relative weight to economic quality. This is noteworthy because LEG includes in its composition a domain called "Empowering People," which consists of four pillars, one of which is health. Health is represented by six variables: longevity, physical health, mental health, care systems, behavioral risk factors, and preventive interventions. Despite all these health variables, LEG was not influenced by the health quality factor present in the standard model proposed by the study. Nevertheless, LEG remains better than INC and GDP indicators because it covers more factors, and it is also better than LEX, which is negatively influenced by governance quality. LEG needs to reconsider the variables representing health and reduce the weights for governance quality and economic quality.

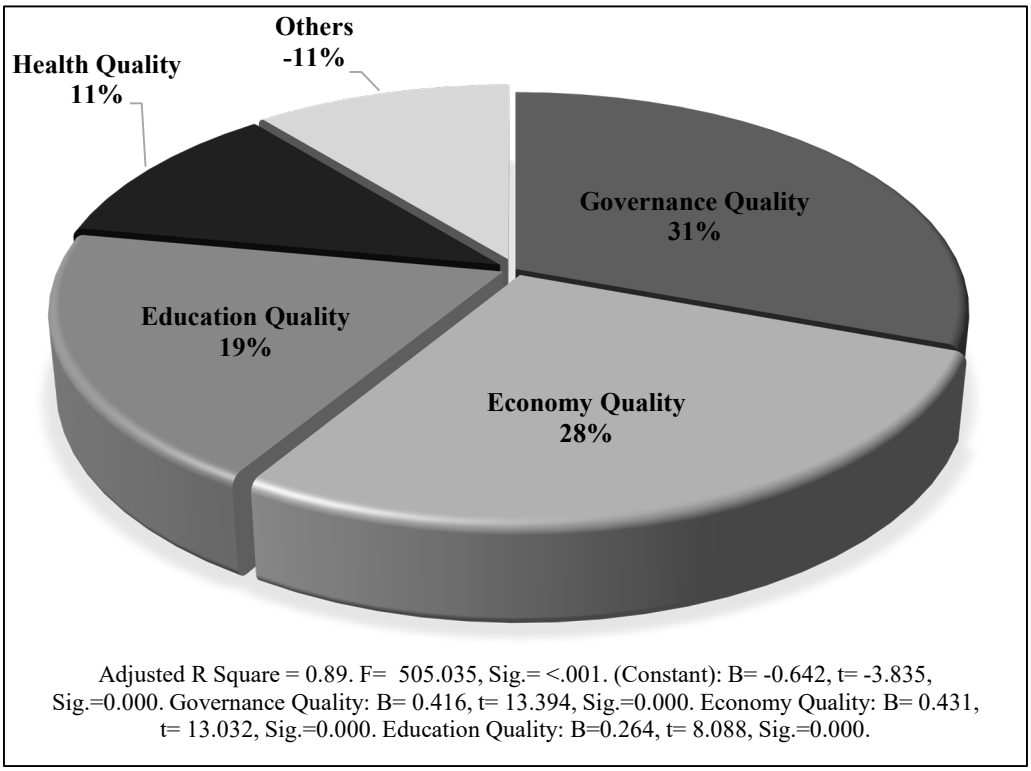

Figure 8. Relative weights of factors in the Legatum Prosperity index (LEG) derived from multiple regression analysis. *Source: Own calculations using IBM SPSS Statistics 26.0 and Excel 2019.*

5. Conclusions and recommendations

This study aimed to evaluate the main indicators used to measure quality of life and determine their determining factors and relative weights. Using data consisting of 181 cases, representing annual observations for 32 European countries over the period from 2012 to 2017, the study employed exploratory factor analysis (EFA) to identify four key factors affecting quality of life in Europe: economic quality, health quality, education quality, and governance quality. These key factors were validated using confirmatory factor analysis (CFA) to develop a standard model for measuring quality of life. The study utilized these foundational factors within the standard model to evaluate five indicators used for measuring quality of life: income, gross domestic product (GDP), life expectancy at birth, the Human Development Index (HDI), and the Legatum Prosperity Index (LEG). Confirmatory factor analysis (CFA) validated these factors as effective components of a standard quality of life model. Analysis of quality of life indicators revealed the following biases and influences:

- Gross Domestic Product (GDP) indicator: Biased towards economic quality, unaffected by governance and health quality.
- Income indicator (INC): Not influenced by governance quality, but more comprehensive than GDP as it considers multiple factors.
- Life expectancy at birth indicator (LEX): Biased towards health quality, negatively impacted by governance quality, and unaffected by educational quality.

- Legatum Prosperity Index (LEG): Emphasizes governance quality but disregards health quality, with significant weight on economic quality.
- Human Development Index (HDI): Influenced by all factors but biased towards economic and educational quality over health and governance quality.

These findings underscore the different biases and strengths of each indicator in measuring quality of life, highlighting the need for balanced consideration of all relevant factors. The study emphasized the importance of considering multiple factors for a comprehensive representation of quality of life, highlighting the effectiveness of EFA and CFA in determining relative weights and constructing integrated measurement models.

The Human Development Index (HDI) emerged as the most balanced and comprehensive indicator compared to others, despite its simplicity. The administrators of the Legatum Prosperity Index (LEG) are advised to reassess factor weights, particularly by enhancing the representation of health variables and reducing emphasis on economic and governance factors. For the HDI, improvements should include increased weighting for governance and health quality to enhance accuracy in measuring quality of life. Researchers and policymakers are encouraged to utilize EFA and CFA to develop more precise indicators. Further research should expand to include diverse countries and regions to validate the proposed model and understand quality of life factors in different contexts.

Finally, the study proposes a definition of quality of life as the extent to which an individual is able to meet their fundamental needs, including physiological needs, safety needs, social needs, esteem needs, and, finally, self-actualization needs. A society with a high quality of life is one that provides individuals with the appropriate environment to achieve self-actualization, where the primary motivation for a healthy person is the development of their full potential and capabilities. From this perspective, any deficiency in meeting these needs can be considered a form of illness, much like deficiencies in vitamins or minerals, which are recognized as health issues.

References

Abu-Alrop, J. H. A. (2025). *European European Panel Data: Quality of Life, Governance, Economy, Education, and Health (2012-2017)* (Version V1) [Data file]. Harvard Dataverse. https://doi.org/10.7910/DVN/MTTFJR

Alarcón, D., & Sánchez, J. (2015). Assessing convergent and discriminant validity in the ADHD-R IV rating scale: User-written commands for Average Variance Extracted (AVE), Composite Reliability (CR), and Heterotrait-Monotrait ratio of correlations (HTMT). *Spanish Stata Users Group Meeting*, 1–39. Madrid. https://www.stata.com/meeting/spain15/abstracts/materials/spain15_alarcon.pdf

Baker, D., Leon, J., Smith Greenaway, E., Collins, J., & Movit, M. (2011). The education effect on population health: A reassessment. *Population and Development Review, 37*(2), 307–332. https://doi.org/10.1111/j.1728-4457.2011.00412.x

Beslerová, S., & Dzuričková, J. (2014). Quality of life measurements in EU countries. *Procedia Economics and Finance, 12*, 37–47. https://doi.org/10.1016/S2212-5671(14)00318-9

Bigelow, D., McFarland, B., & Olson, M. (1991). Quality of life of community mental health program clients: Validating a measure. *Community Mental Health Journal, 27*(1), 43–55. https://doi.org/10.1007/BF00752714

Brown, J., Bowling, A., & Flynn, T. (2004). *Models of quality of life: A taxonomy, overview and systematic review of the literature*. European Forum on Population Ageing Research.

Campbell, A. (1981). *Sense of well-being in America: Recent patterns and trends*. New York: McGraw-Hill.

Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). *The quality of American life*. New York: Russell Sage Foundation.

Christensen, K., & Levinson, D. (Eds.). (2003). *Encyclopedia of community: From the village to the virtual world*. London: SAGE Publications. https://doi.org/10.4135/9781412952583

Clarke, P., Marshall, V., Ryff, C., & Rosenthal, C. (2000). Well-being in Canadian seniors: Findings from the Canadian Study of Health and Aging. *Canadian Journal on Aging, 19*(2), 139–159. https://doi.org/10.1017/S0714980800013982

Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., ... Snapp, R. (2007). Quality of life: An approach integrating opportunities, human needs, and subjective well-being. *Ecological Economics, 61*(2–3), 267–276. https://doi.org/10.1016/j.ecolecon.2006.02.023

Cutler, D., & Lleras-Muney, A. (2010). Understanding differences in health behaviors by education. *Journal of Health Economics, 29*(1), 1–28. https://doi.org/10.1016/j.jhealeco.2009.10.003

Deseran, A. F. (1978). Community satisfaction as definition of the situation: Some conceptual issues. *Rural Sociology, 43*(2), 235–249.

Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? A literature review and guide to needed research. *Social Indicators Research, 57*(2), 119–169. http://www.jstor.org/stable/27526987

Diener, E., & Seligman, M. (2004). Beyond money: Toward an economy of well-being. *Psychological Science in the Public Interest, 5*(1), 1–31. https://doi.org/10.1111/j.0963-7214.2004.00501001.x

Diener, E., Oishi, S., & Tay, L. (2018). Advances in subjective well-being research. *Nature Human Behaviour, 2*(4), 253–260. https://doi.org/10.1038/s41562-018-0307-6

Dunn, E., Aknin, L., & Norton, M. (2008). Spending money on others promotes happiness. *Science, 319*(5870), 1687–1688. https://doi.org/10.1126/science.1150952

Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. En P. A. David & M. W. Reder (Eds.), *Nations and households in economic growth: Essays in honor of Moses Abramovitz* (pp. 89–125). New York, NY: Academic Press. https://doi.org/10.1016/B978-0-12-205050-3.50008-7

Elizabeth, S. (2007). *The Human Development Index: A history* (Working Paper No. 127). Political Economy Research Institute, University of Massachusetts at Amherst.

Eurostat. (2015). *Quality of life: Facts and views (2015 edition)*. Luxembourg: Publications Office of the European Union. https://ec.europa.eu/eurostat/documents/3217494/6856423/KS-05-14-073-EN-N.pdf/742aee45-4085-4dac-9e2e-9ed7e9501f23?t=1433141890000

Eurostat. (2024). *Quality of life indicators – Measuring quality of life*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Quality_of_life_indicators_-_measuring_quality_of_life

Gabriel, Z., & Bowling, A. (2004). Quality of life from the perspectives of older people. *Ageing and Society, 24*(5), 675–691. https://doi.org/10.1017/S0144686X03001582

Gaskin, J., & Lim, J. (2016). *Master validity tool* [AMOS plugin]. En *Gaskination's StatWiki*. https://statwiki.gaskination.com

Graham, B., & Kenealy, P. (2004). Quality of life perceptions and social comparisons in healthy old age. *Ageing and Society, 24*(5), 755–769. https://doi.org/10.1017/S0144686X04002399

Green, C. D. (2000). A theory of human motivation by A. H. Maslow. En *Classics in the History of Psychology*. http://psychclassics.yorku.ca/Maslow/motivation.htm

Grundy, E., & Bowling, A. (1999). Enhancing the quality of extended life years: Identification of the oldest old with a very good and very poor quality of life. *Aging & Mental Health, 3*(3), 199–212. https://doi.org/10.1080/13607869956154

Gulick, J., Bowerman, C., & Back, K. (1962). Newcomer enculturation in the city: Attitudes and participation. En F. S. Chapin Jr. & S. Weiss (Eds.), *Urban growth dynamics in a regional cluster of cities* (pp. 315–358). New York, NY: John Wiley & Sons.

Hajdúová, Z., Andrejovský, P., Gajdoš, J., & Andrejkovič, M. (2011). The quality of life and the environment. *Journal of Innovations and Applied Statistics, 1*, 37–42. https://jias.euke.sk/wp-content/uploads/2012/06/1-2011.pdf

Hollingshead, A., & Rogler, L. (1963). Attitudes toward slums and public housing in Puerto Rico. En L. J. Duhl et al. (Eds.), *The urban condition*. New York: Basic Books.

Hsieh, C.-M. (2013). Issues in evaluating importance weighting in quality of life measures. *Social Indicators Research, 110*(2), 681–693. https://doi.org/10.1007/s11205-011-9951-1

Hu, L.-T., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Hughes, B. (1990). Quality of life. En S. M. Peace (Ed.), *Researching social gerontology: Concepts, methods and issues* (pp. 46–58). London: Sage.

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences, 107*(38), 16489–16493. https://doi.org/10.1073/pnas.1011492107

Kaiser, H. (1974). An index of factorial simplicity. *Psychometrika, 39*(1), 31–36. https://doi.org/10.1007/BF02291575

Knipscheer, C., de Jong-Gierveld, J., van Tilburg, T., & Dykstra, P. (1995). *Living arrangements and social networks of older adults*. Amsterdam: VU University Press.

Lawton, P. M. (1991). A multidimensional view of quality of life in frail elders. En J. E. Birren, J. Lubben, J. Rowe, & D. Deutchman (Eds.), *The concept and measurement of quality of life in the frail elderly* (pp. 3–27). New York, NY: Academic Press. https://doi.org/10.1016/B978-0-12-101275-5.50005-3

Malkina-Pykh, I., & Pykh, Y. (2008). Quality-of-life indicators at different scales: Theoretical background. *Ecological Indicators, 8*(6), 854–862. https://doi.org/10.1016/j.ecolind.2007.01.008

Marans, W. R., & Rodgers, W. (1975). Toward an understanding of community satisfaction. En A. Hawley & V. Rock (Eds.), *Metropolitan America in contemporary perspective* (pp. 299–352). New York, NY: John Wiley & Sons.

Maričić, M. (2019). Assessing the quality of life in the European Union: The European Index of Life Satisfaction (EILS). *Statistical Journal of the IAOS, 35*(2), 261–267. https://doi.org/10.3233/SJI-180481

Marmot, M., Friel, S., Bell, R., Houweling, T. A., & Taylor, S. (2008). Closing the gap in a generation: Health equity through action on the social determinants of health. *The Lancet, 372*(9650), 1661–1669. https://doi.org/10.1016/S0140-6736(08)61690-6

Maslow, A. (1954). *Motivation and personality*. New York: Harper & Row Publishers.

Matarrita-Cascante, D. (2010). Changing communities, community satisfaction, and quality of life: A view of multiple perceived indicators. *Social Indicators Research, 98*(1), 105–127. https://doi.org/10.1007/s11205-009-9520-z

Morris, E. W., & Winter, M. (1978). *Housing, family, and society*. New York: John Wiley and Sons.

Murray, C., Aravkin, A., Zheng, P., Abbafati, C., Abbas, K., Abbasi-Kangevari, M., ... Acharya, D. (2020). Global burden of 87 risk factors in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. *The Lancet, 396*(10258), 1223–1249. https://doi.org/10.1016/S0140-6736(20)30752-2

Noll, H.-H. (2002). Towards a European system of social indicators: Theoretical framework and system architecture. *Social Indicators Research, 58*, 47–87. https://doi.org/10.1023/A:1015775631413

Otoiu, A., Titan, E., & Dumitrescu, R. (2014). Are the variables used in building composite indicators of well-being relevant? Validating composite indexes of well-being. *Ecological Indicators, 46*, 575–585. https://doi.org/10.1016/j.ecolind.2014.07.019

Oxford University. (2011). *Oxford dictionary*. Oxford: Oxford University Press.

Potter, J., & Cantarero, R. (2014). Community satisfaction. En A. C. Michalos (Ed.), *Encyclopedia of quality of life and well-being research* (pp. 1094–1099). Dordrecht: Springer. https://doi.org/10.1007/978-94-007-0753-5_480

Raleigh, V. S. (2019). *Trends in life expectancy in EU and other OECD countries: Why are improvements slowing?* OECD Health Working Papers, No. 108. Paris: OECD Publishing. https://doi.org/10.1787/223159ab-en

Ryff, C., & Singer, B. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies, 9*(1), 13–39. https://doi.org/10.1007/s10902-006-9019-0

Scharf, T., Phillipson, C., & Smith, A. (2004). Poverty and social exclusion: Growing older in deprived urban neighbourhoods. En C. Walker (Ed.), *Growing older: Quality of life in old age* (pp. 81–106). Maidenhead: Open University Press.

Stiglitz, J., Sen, A., & Fitoussi, J. (2009). *Report by the commission on the measurement of economic performance and social progress*. https://ec.europa.eu/eurostat/documents/8131721/8131772/Stiglitz-Sen-Fitoussi-Commission-report.pdf

Tang, T. L.-P. (2007). Income and quality of life: Does the love of money make a difference? *Journal of Business Ethics, 72*(4), 375–393. https://doi.org/10.1007/s10551-006-9176-4

Tesch-Römer, C., & Motel-Klingebiel, A. (2001). Quality of life in the context of intergenerational solidarity. En S. O. Daatland & K. Herlofson (Eds.), *Ageing, intergenerational relations, care systems and quality of life* (pp. 63–73). Oslo: NOVA.

Theodori, G. L. (2001). Examining the effects of community satisfaction and attachment on individual well-being. *Rural Sociology, 66*(4), 618–628. https://doi.org/10.1111/j.1549-0831.2001.tb00087.x

United Nations Development Programme. (2010). *Human development report 2010: The real wealth of nations – Pathways to human development*. New York: UNDP. https://hdr.undp.org/content/human-development-report-2010

Walker, A. (2005). A European perspective on quality of life in old age. *European Journal of Ageing, 2*(1), 2–12. https://doi.org/10.1007/s10433-005-0500-0

Walker, A., & Van der Maesen, L. J. G. (2004). Social quality and quality of life. En W. Glatzer, S. von Below, & M. Stoffregen (Eds.), *Challenges for quality of life in the contemporary world* (Social Indicators Research Series, Vol. 24). Dordrecht: Springer. https://doi.org/10.1007/978-1-4020-2903-5_2

Wang, J.-H., Hopke, P., Hancewicz, T., & Zhang, S. (2003). Application of modified alternating least squares regression to spectroscopic image analysis. *Analytica Chimica Acta, 476*(1), 93–109. https://doi.org/10.1016/S0003-2670(02)01369-7

World Bank Group. (2018). *World Bank annual report 2018*. Washington, DC: World Bank Publications. https://documents1.worldbank.org/curated/en/630671538158537244/pdf/The-World-Bank-Annual-Report-2018.pdf

World Health Organization. (2012). *The World Health Organization Quality of Life (WHOQOL)*. Geneva: World Health Organization. https://www.who.int/publications/i/item/WHO-HIS-HSI-Rev.2012.03

World Health Organization. (2019). *Primary health care on the road to universal health coverage: 2019 monitoring report*. World Health Organization. https://www.who.int/publications/i/item/9789240029040