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Quality of life of Syrian migrants living in Portugal

Dissertação de candidatura ao grau de Mestre em Saúde Pública apresentada à Faculdade de Medicina da Universidade do Porto e ao Instituto de Ciências Biomédicas Abel Salazar**.**

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LIST OF ABBREVIATIONS

QoL - Quality of life

HRQoL - Health related Quality of life

WHO - World Health Organisation

GP4SYS - Global Platform for Syrian Students programme

SEF - O Serviço de Estrangeiros e Fronteiras

UNHCR - The United Nations High Commissioner for Refugees

IOM - The International Organization of Migration

PTSD - Post Traumatic Syndrome Disease

WHOQOL-BREF - World Health Organisation Quality of life instrument Brief

WHOQOL-100 - World Health Organisation Quality of life instrument 100

BAI - Beck Anxiety Inventory

BDI II - Beck Depression Inventory II

OECD - European Organization for Economic Cooperation and Development country

EQ-5D - The European Quality of Life 5-Dimensions

SF-36 - The 36-Item Short-Form Health Survey

EU - European Union

GCC - The countries of Gulf Cooperation Council

NCBI - The National Centre for Biotechnology Information

RESUMO

Introdução: Desde o início da guerra civil na Síria, mais de 6.5 milhões de Sírios fugiram do país à procura de melhores condições de vida em países considerados mais seguros. Desde então, estes foram expostos aos mais variados tipos de stress com impacto na sua qualidade de vida (QdV) e consequências futuras a nível de saúde. Este estudo visa avaliar a perceção da QdV pelos migrantes sírios que vieram para Portugal através do programa GP4SYR, de forma a continuar a sua educação, e determinar os fatores associados à QdV.

Métodos: Este é um estudo observacional transversal baseado num questionário online, em língua árabe, conduzido entre migrantes sírios que residem em Portugal. Os dados foram obtidos com o apoio do programa GP4SYS em 2020, de estudantes atuais e antigos, que residem em Portugal e aos quais foi atribuída uma bolsa pelo GP4SYS para prosseguir a sua educação em universidades portuguesas entre 2014 e 2020. Um total de 105 participantes foram recrutados para o estudo. QdV foi determinada usando a ferramenta World Health Organization Quality of Life BREF (WHOQOL-BREF), os sintomas de ansiedade foram avaliados com recurso ao o Beck Anxiety Inventory (BAI) e os sintomas de depressão com o Beck Depression Inventory-II (BDI-II). A relação entre idade, sexo, grau de escolaridade, estado civil, rendimentos, estatuto profissional, proficiência linguística do país de acolhimento, duração da estadia, local onde a família reside, sintomas de ansiedade e depressão assim como os dados de QdV que incluem os domínios QdV geral, físico, psicológico, social e meio ambiente foram quantificados através de modelos generalizados de regressão linear, recorrendo ao software IBM Statistical Package for the Social Sciences (SPSS).

Resultados: Os migrantes sírios perceberam que a sua pontuação mediana relativa à QdV é maior do que a sua satisfação geral com a saúde. Obtiveram valores mais altos no domínio físico, seguido do psicológico, social e meio ambiente. A QdV geral e os domínios psicológico e meio ambiente foram negativamente associados aos rendimentos insuficientes. O domínio psicológico foi associado de forma positiva a idade mais jovem, enquanto que o social foi associado de forma positiva a ser do sexo feminino. Níveis mais elevados de depressão foram negativamente associados à QdV geral e aos seus domínios, enquanto que níveis mais elevados de ansiedade foram negativamente associados à QdV geral e aos domínios físico e meio ambiente da QdV. Mais de metade dos participantes demonstraram sintomas de ansiedade e depressão. Adicionalmente, a maioria dos participantes que responderam que a pandemia influenciou as suas respostas relativamente à QdV, ansiedade e depressão, registaram uma influência negativa.

Discussão: Os migrantes sírios demonstraram uma QdV inferior ao equivalente da população portuguesa, em todos os domínios. Apesar do apoio que Portugal presta aos migrantes sírios, estes parecem beneficiar de um menor leque de oportunidades conducentes à integração social, em particular condições de vida precárias e baixos subsídios sociais, o que explica níveis de QdV inferiores aos da população portuguesa. Compreender os fatores associados com a QdV dos migrantes sírios em Portugal é um passo fundamental para a promoção do seu estado de saúde e da sua integração no país de acolhimento.

Conclusão: Os nossos resultados indicam que existe uma profunda necessidade de explorar fatores relacionados com as experiências pré-migratórias, a exclusão social, e valores culturais que podem influenciar a QdV dos migrantes sírios em Portugal. O nosso estudo alerta também para a necessidade de políticas que possam levar a intervenções multidimensionais para a promoção da saúde dos migrantes em Portugal.

Palavras-chave: guerra civil, migrantes sírios, qualidade de vida, depressão, ansiedade

ABSTRACT

Background: Since the beginning of the civil war in Syria, more than 6.5 million Syrians have fled the country seeking better living conditions in safer countries. Ever since, Syrians have been exposed to various stressors that impact their quality of life (QoL) and future health outcomes. This study aimed to assess the perception of QoL by Syrian migrants who came to Portugal under the Global Platform for Syrian Students' program (GP4SYS) as a means to continue their education, and to determine the factors associated with it.

Methods: This is an observational cross-sectional study based on an online questionnaire in the Arabic language conducted among Syrian migrants residing in Portugal. Data were obtained with the assistance of the GP4SYS in 2020 from Syrian students and alumni who are residing in Portugal and who were awarded a grant by GP4SYS to pursue their education in Portuguese universities, between 2014 and 2020. A total of 105 participants were recruited for the study. The Quality of life (QoL) was assessed using the World Health Organization Quality of Life BREF instrument (WHOQOL-BREF), symptoms of anxiety were assessed using the Beck Anxiety Inventory (BAI) and symptoms of depression were assessed using Beck Depression Inventory-II (BDI-II). The association between age, sex, educational level, marital status, income adequacy, working status, host language proficiency, length of stay, the place where the family resides, anxiety and depression symptoms, and the QoL, including the overall QoL, physical, psychological, social and the environment domain, was quantified through generalized linear regression models using the software IBM Statistical Package for the Social Sciences (SPSS).

Results: Syrian migrants perceived their overall QoL median score to be higher than their overall satisfaction with health. They scored higher on the physical domain, followed by the psychological and social domains and the environment domain. The overall QoL, psychological domain and environment domain were negatively associated with insufficient income. The psychological domain was positively associated with younger age, while the social domain was positively associated with being a female. Higher levels of depression were negatively associated with the overall QoL and the QoL domains, while higher levels of anxiety were negatively associated with overall QoL, the physical domain and the environment domain of QoL. More than half of the participants expressed anxiety and depressive symptoms. Additionally, most of the participants who responded that the pandemic influenced their responses concerning QoL, anxiety and depression, reported perceiving a negative influence.

Discussion: Syrian migrants had a lower QoL than the matched Portuguese population in all domains. Despite the support Portugal provides to the Syrian migrants, they still seem to suffer from social integration stressors, poor living conditions, and low social support allowance which resulted

in them experiencing low QoL when compared to the Portuguese population. Understanding the factors associated with the QoL of the Syrian migrants in Portugal is a fundamental step to promoting their health and to foster the development of optimal conditions for successful integration in the host country.

Conclusion: Our findings indicate that there is a profound need for further investigation to explore premigration factors, social exclusion and cultural values that may influence the QoL of Syrian migrants in Portugal. Our study also provides empirical data that can be used to inform policy and multidimensional interventions to promote migrants' health in Portugal.

Keywords: civil war, Syrian migrants, quality of life, anxiety, depression

1. INTRODUCTION

Since the civil war started in 2011 Syria has been under a ten-year-long devastating conflict, which has caused more than 6 million people to become internally displaced and over 5.6 million to flee, mostly into neighbouring countries (i.e., Lebanon, Jordan and Turkey), but also to Europe and North America (1, 2). The large volume of this forced migration flow – totalling more than half of the country's pre-war population – has led the United Nations High Commissioner for Refugees (UNHCR) to consider it "the biggest refugee and displacement crisis of our time" (3).

War is an adverse and disruptive life event that impacts people's quality of life and future health outcomes, not least by exposing them to increased risk for mental ill-health and communicable and non-communicable diseases (4, 5). High levels of insecurity, violence, death, dilapidated infrastructure, economic breakdown, insufficient health care, education, and transportation, reduced employment and poverty impede people from exercising their rights and rob them from opportunities to thrive and to aspire to a healthy and prosperous life (6). In Syria's conflict zones deprivation is ripe. Similarly, to other services, access to education has been significantly reduced. Before the war, over 100,000 Syrians were enrolled in university (7). However, the Syrian higher education system has been challenged by sieges, protection concerns, severe underfunding, infrastructure destruction and human resources depletion (8). Syrian universities have also been found to be used for promoting political support and fostering indoctrination (7). As a result, thousands of Syrian university students have been forced to drop out and impeded from fulfilling their fundamental right to education (8). The spillover effect of war on education has been so severe that there is talk of a lost generation of Syrian students.

The Global Platform for Syrian students (9) is a non-profit multi-stakeholder organization founded in 2013 by Jorge Sampaio, former President of Portugal, that offers a systemic solution for Syrian students to pursue their academic studies in safe countries worldwide. Around 400 grants were awarded so far by GP4SYS as a rare lifeline to boost high education opportunities for students affected by the armed conflict worldwide. Its main aims are to save a generation from missing educational opportunities and to support the preparation of forthcoming leaders, as well as to enable the unleashing of innovation and entrepreneurial skills among graduates that are so key for reconstruction and sustainable development in post- conflict societies. Between 2014, when the program started, and 2019, around 160 Syrian students received grants to study in Portugal. The remaining grants have been awarded to Syrians attending university in Canada, Egypt, France, Germany, Iraq, Lebanon, Mexico, Turkey, United Arab Emirates and United States of America (10).

Access to education can help to mitigate the negative psychosocial impacts of armed conflict, namely by providing people in emergency and post-emergency situations with safe spaces, structure and hope (11). However, little is known about the quality of life of post-war Syrian migrants in host countries (12) and less so about Syrians enrolled in foreign universities. Assessing the quality of life of Syrians attending higher education in foreign countries is crucial to identify their needs and to promote the development of optimal conditions for psychosocial integration and academic achievement. This is the goal of this thesis. In the following chapters we will discuss the definitions of QoL followed by a brief historical view of the concept of QoL and assessing QoL. Through the second chapter we will highlight on the trends of Syrian migration pre and post the war, worldwide and in Portugal. The QoL of Syrian migrants will be addressed in the third chapter.

1.1 Quality of life

1.1.1 Defining quality of life

Providing a clear, precise and unified definition of Quality of Life (QoL) is a challenge. There is no consensus over an ideal conceptual model and, as WHO stated, “there is no generally agreed definition of QoL” (13). QoL is interpreted in different and complex ways within and between several disciplines. Furthermore, finding a unitary notion of QoL showed high levels of ambiguity (14). Nevertheless, in1997, the WHO introduced a much-needed working definition of the term QoL, which was defined as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" (15). Thus, QoL can be understood to be a multidimensional concept that encompasses people’s perceptions of their physical health, psychological status, social connections, and standpoints of their close environment. In this thesis, we employ the WHO’s definition of QoL.

1.1.2 Brief historical overview of the quality-of-life concept framing

It is pivotal to trace back the history of the process leading to a conceptual framework of QoL to comprehend the turning point in developing this terminology and to understand the ambiguity that hovers around defining this concept. The use of the QoL construct in the field of medicine started with cancer treatments where it was observed that prolonging patient’s life resulted in poorer QoL (16). In other academic contexts interest in QoL started after World War II, when social inequalities were predominant. It is believed that the first time the term QoL was addressed was in a socio-political context in the 1950s (14).

The value and significance of QoL emerged when advances in medical treatments resulted in extending the length of the lifespan at the expense of QoL and vice versa. Nowadays, QoL can be measured using a variety of assessments and targets different groups within such diverse fields as sociology, psychology, biomedical, economics, politics, philosophy, architecture, environment, etc (14, 17). As a result, an exponential rise in research about QoL has occurred. For example, the number of publications under the topic of QoL in PubMed has raised dramatically between 1972 and 2019. In 1972, there was a null number of QoL publications, while in 2019 the National Centre for Biotechnology Information (NCBI) identified 29,996 articles listing under the QoL keyword (18).

In 1973, Smith proposed to distinguish between the terms of QoL and well-being. Smith believed that wellbeing indicates a mere objective standard of living, while the QoL is an immensely personal concept and self-assessment of living conditions and it refers to the evaluation of individuals' aspects of life. However, there is still considerable ambiguity concerning the definition of both terms and they have been used interchangeably in the literature (18).

In 1991, Levine proposed a model of socio-psychological QoL that reflects individuals' observations and estimations of their positions in life in accordance with their culture, values, experiences expectations, and environmental conditions (19). Subsequently, in 1997, and based on the previous conceptualization, Saxen and Orley identified the fundamental factors that shape the QoL entailing physical health, psychological wellbeing, social relationships environmental activities, and the independence level. QoL thus encompasses dimensions external to the health domain such as economic status, housing, education, and political, cultural, and spiritual aspects of an individual's existence. Therefore, QoL is a broad-ranging concept where health shapes merely one part (20). As Feinstein (1987) pinpointed "QoL often seems to be an umbrella term, covering a variety of concepts, such as functioning, health status, perceptions, life conditions, behavior, happiness, lifestyle, symptoms, etc." (21).

In the medical sciences, the concept of QoL has been divided into two categories. The first one refers to the general quality of life which examines general factors, whereas the second category is the health-related quality of life which investigates the influence of different diseases on the mental, physical and social aspects of life (22). In their investigation of the QoL Schipper et al. (1990s) were the first to coin a new term called Health-related Quality of Life (HRQOL) by incorporating health and quality of life. They realized that health status greatly influences people's lives and that it impacts their assessment of the QoL. They pinpointed HRQOL as "the functional effect of disease and its treatment, as perceived (experienced) by the patient" (23). HRQOL is also conceptualized as an assessment of patient's perspectives of their position in life at the time when they have a particular disease and are being treated (22). Therefore, HRQOL measurement gives voice to the patient's perspectives in the therapeutic process (22), and it reflects the impact of diseases and treatment on

individuals' perspectives of their health and position in life (17). However, it has a narrower focus when compared to the concept of QoL.

Over time, some misconceptions have been detected between the terms QoL and satisfaction. These terms are interlinked but are not identical terms. Satisfaction can influence QoL as it describes the fulfillment of desires and contentment with life circumstances. In principle, satisfaction has a significant impact on QoL and it is considered in its subjective assessment (16, 23). To avoid misinterpretations and to illustrate the difference between both constructs, Moons et al (2006) noted that "overall satisfaction with life can be considered to be an indicator of the quality of life because one indicates how satisfied one is with one's life as a whole" (21). Therefore, QoL is a wide concept that comprises satisfaction with life aspects, pain, perspectives of health status, psychological wellbeing, physical functions, daily activities, and socio-environment activities (16).

In their seminal work Malkina-Pykh and Pykh (2008) characterized QoL as a positive or negative subjective concept assessed through individuals' perspectives and determined by their values, core principals, and cultural beliefs. Their conceptualization of QoL comprises three main domains: built environment, social environment, and economic environment. The built environment entails accommodation, infrastructure and attainable utilities, while the social environment involves family, friends, partners, education, and health. On the other hand, the economic environment covers employment status and money matters. It has been believed that culture shapes individuals' personalities and behaviours. Eventually, behaviours that shape our QoL result from the consolidation between our personal experiences, living conditions and the differences that shape our values and believes such as gender, age, marital status, etc (24).

Despite the difficulty in identifying a universal definition of QoL and the absence of a "golden standard", there is general agreement that QoL is subjective in the sense that it can only be understood from an individual's perspective (25). The concept of QoL is subjective and influenced by individuals' interpretations of their health and wellbeing. Therefore, diverse challenges have been encountered when seeking to measure QoL and to reach a meaningful grasp of the construct (18). In the next section we look into the assessment of QoL.

1.1.3 Assessing quality of life.

QoL has been assessed using multiple instruments in the form of questionnaires. At present, there are more than one thousand instruments to measure it. Instruments to assess QoL can be categorized by the type of report (self-report or proxy report), the targeted population (generic or condition-specific), or the scores (single indicator, profile, or battery approach). Generic QoL

instruments refer to assessments that have not been designed for any particular population or disease. On the other hand, the condition specific QoL instruments are designed to measure specific pathologies and, as such, they are clinically relevant since they assess the impact of the disease on patients and evaluate the effectiveness of the interventions (17).

Most studies aimed at assessing QoL have failed to provide a clear-cut operational definition of the construct measured. Only a few assessments have put forward a definition of QoL including, the Patient-generated Index, the Repertory Grid, the World Health Organization Quality of Life 100 (WHOQOL-100), and the World Health Organization Quality of Life BREF (WHOQOLBREF) (26). As previous research shows a “best scale” for QoL measurement does not exist in an absolute sense, as there is no unified concept of QoL. Instead, there is one optimal instrument that is convenient for a particular purpose (27, 28). Thus, the frequency with which a particular questionnaire is used does not imply the appropriateness of that instrument across settings. Alternatively, the suitability of the instrument is shaped by the research question, the coverage of items of interests, the aim of the study, and stating good psychometric properties such as validity and reliability (18).

The European Quality of Life 5-Dimensions EQ-5D, the 36-Item Short-Form Health Survey (SF-36), the WHOQOL 100 and the WHOQOL-BREF for adults are some examples of generic instruments that are widely used and are validated across cultures (26). QoL assessments should take into account different considerations if the targeted population are migrants. Despite the various scales available to assess QoL, most researchers favour SF-36 and WHOQOL BREF in research measuring QOL among migrants because they are amongst the most accepted instruments suitable for various groups (28). For the purpose of this thesis, we will use the WHOQOL BREF.

The European Quality of Life (EUROQOL) or (EQ-5D) is a self-perception and generic scale used in policy research to measure the health status (18). It has been also used in the evaluative studies that analyze the costs and benefits of the interventions to determine the length of life gained along with the quality of life (29).

SF-36 is a set of generic and coherent QoL measurements that is translated into approximately 50 languages. It comprises 36 items that assess eight health concepts: physical function, social function, bodily pain, role function, general mental health, emotional related questions, energy and fatigue and general health (30). The concepts measured by SF-36 are labelled in two categories: the physical dimension, represented by the Physical Component Summary (PCS); and the mental dimension, represented by the Mental Component Summary (MCS) (31). SPF 36 is particularly beneficial for service planning, comparing burdens of disease and distinguishing treatment outcomes (32).

The WHOQOL instruments entail a precise conceptual model of QoL as a multidimensional concept based on subjective criteria that provide a broad perspective and understanding of the QoL. In addition, the WHOQOL instruments target diverse population groups in several situations, results can be converted to numerical values, and the instruments present good psychometric properties, namely good discriminant validity, content validity, and test-retest reliability. They have been designed for various purposes within diverse domains such as for assessing changes in QoL throughout treatment interventions, clinical trials, getting better insights about the disease, assisting in making treatment decisions, and promoting health policy research (33).

The WHOQOL 100 comprises 100 questions entailing 25 facets of QOL labelled in 6 domains: (1) physical health, (2) psychological, (3) level of independence, (9) social relations, (5) environment, and (6) spirituality/religion/personal beliefs. Although the WHOQOL 100 allows a detailed assessment of each facet related to QoL, it is lengthy and time-consuming with an estimated completion time between 40 to 90 minutes (34). A requisite for optimizing WHOQOL 100 was performed by minimizing the number of questions to make the questionnaire more practical and to save time. The abbreviated assessment version of the WHOQOL 100 was named WHOQOL BREF. The WHOQOL BREF instrument merged the domains 1 and 3 together, and domains 2 and 6 together, from the original instrument (35).

The WHOQOL-BREF is a generic subjective self-administrated questionnaire to assess QoL, which is broadly used for adults. It is validated for various cultures and nationalities as it provides a QoL profile representing 4 distinct domains (physical, psychological, social, and environmental health) within relatively small items where the completion time is a premium (it requires between 10 to 15 minutes to be completed) (34). The physical health domain pertains to items on mobility, daily activities, functional capacity, energy, pain, and sleep. The psychological domain incorporates self-image perceived, negative and positive thoughts, self-esteem, mentality, personal beliefs learning ability, memory concentration, religion, and mental status. The social relationships domain covers topics related to personal relationships, social support, and sexual activities. While, the environmental health domain entails questions concerning financial resources, safety, security, freedom, health, and social services, home and physical environment, opportunities to acquire new skills and knowledge, recreation, general environment (noise, air pollution, etc.), and transportation (33).

The WHOQOL BREF is a self-report instrument emphasizing subjective QOL and *entailing 24 items. Each* item represents *one facet* of the original format with two ‘benchmark’ items from the overall QOL that should be examined separately: question 1 asks about an individual’s overall perception of the quality of life and question 2 asks about an individual’s overall perception of their health but they are not included in the scoring (33, 34). It was developed cross-culturally in over 20

different languages using data from the field trial version of the WHOQOL-100. Results are comparable across different countries and cultures and among diverse populations. It produces and interprets domain scores without any particular individual facet scores contrary of the WHOQOL-100 that represents both scores (35). However, the calculation of a single/total/overall score of quality of life is not recommended (31).

The WHOQOL BREF is based on a 5-point Likert scale through a set of 26 items; it is scored from one to five on a response scale which is considered as 5-point Likert scale or 5 points ordinal scale (Very dissatisfied) to (Very satisfied) or (Very poor) to (Very good), except for question 26 where the anchor statement has different meanings; (1: Never), (2: Seldom), (3: Quite often), (4: Very often), and (5: Always) (33). Picking a 5-point Likert scale as an approach to scale responses in WHOQOL BREF represents multiple strengths. This approach makes the responses simple, comprehensive and it enables a degree of agreement and freedom of choice (36). Furthermore, it has been suggested that the 5-point Likert scale increases the quality of the response rates (37). Different standards should be taken into consideration when using a measurement namely, the cultural and sensitivity of the tool used, cultural differences in perceiving health and quality of life (38).

The psychometric properties of the WHOQOL-BREF have made the instrument a valid assessment tool that could be used for various cultures and across socioeconomic statuses (33). After analysing the internal consistency, the item-total correlations, the discriminant validity, and the construct validity, WHOQOL-BREF has achieved good to excellent psychometric properties of reliability and validity, and it performed well in preliminary tests of validity. Despite the fact that WHOQOL-BREF length is not the most favourable comparing to other shorter instruments, it covers a broad range of QoL related domains and the inclusion of the social and environmental facets is remarkable (34).

The WHOQOL BREF is a multilingual assessment instrument based on a cross-culturally sensitive concept (items are framed in culture neutral terminology). It is widely considered by the academic community as the best leading generic measurement of QoL due to its conceptual and methodological strengths, its strong cross-cultural applicability and the wide contextual factors of life it includes and that are generally not considered as health-related items (34, 39). The Arabic translation of the WHOQOL-BREF displays high reliability and validity indices combined with highly significant structural integrity characteristics and it represents the same constructs across cultures (39). In conclusion, WHOQOL BREF is a valid instrument to assess QoL in this thesis' target population given its psychometric properties, cross-cultural and multi-language nature and the time needed to complete the questionnaire, as a well as for the robustness of the conceptual framework supporting it.

1.2 Syrian migration: pre- and post-war trends

Migration is a complex phenomenon that is growing in scope and impact with an estimated 1 billion migrants worldwide (40). The International Organization of Migration (IOM) has defined migration as the individuals' relocation process from one place to another within the same state or crossing borders, temporarily or permanently, and for a variety of reasons (41). Migration occurs for different reasons that can be labelled generally as pull and push factors. The pull factors include job opportunities, education, better medical care, security, better living standards, and family reunion. Push factors include low wages, famine, violence, religious discrimination, deforestation, persecution, and any other life-threatening events (42).

Migration is categorized based on various considerations such as the political boundaries (internal and external migrants), movement patterns (step migration, circular migration, seasonal migration, and chain migration), or the decision-making approach (voluntary and involuntary migration). Voluntary migrants are individuals who have the autonomy and the free will to make life-altering decisions regarding migration and who may migrate to seek better living conditions. On the other hand, involuntary migration occurs when the migration process is compulsory due to adverse environmental, social or political situations. Involuntary migration can be further sub-classified in forced migration and reluctant/impelled/imposed migration. Both forced and imposed migrants are individuals who are driven to leave their homeland. Imposed migration happens when circumstances and situations *encourage* individuals to relocate or move outside their place of residence (e.g. this classification can be attributed to most of the Syrian Students residing in Portugal), while forced migration encompasses those who are *compelled* to leave their place of residence under circumstances that make them incapable of returning home (refugees), whose international protection request is yet to be processed (asylum seekers), and who are relocated within the country borders (internally displaced people) (43).

According to Valenta et al. (2020), Syrian migration has become a widely diverse phenomenon as a result of the outbreak of civil war in 2011. At present, there are many different categories of Syrian migrants, including refugees, asylum seekers, forced migrants, transit migrants, stranded migrants, unaccompanied minors, irregular migrants, mixed migrants, naturalised migrants, labour migrants, entrepreneurs, investors, and students. The authors further note that this list is only partial and that these categories are not mutually exclusive or static (44).

1.2.1 Syrian migration worldwide

Due to the absence of data published by the Syrian government about the immigrant population, no accurate statistical information on Syria's migration rates prior to the civil war has been found. However, the total stock of Syrians residing abroad was estimated at around 7.3 million as of November 2015, of whom 5.6 million had left Syria since the civil war conflict started in 2011 (45). The countries of the Gulf Cooperation council (GCC) attracted mainly Syrian labour migrants before the war broke estimated at 500.000 in Saudi Arabia with a further 70.000 spread across the other GCC states (44). Table 1 lists data on Syrian immigrants in different continents and countries worldwide prior to the civil war. The vast majority of pre-war Syrian immigrants was living in Arab countries such as Qatar, Saudi Arabia, Kuwait and United Arab Emirates.

Table 1. Syrian immigrants worldwide in 2011.

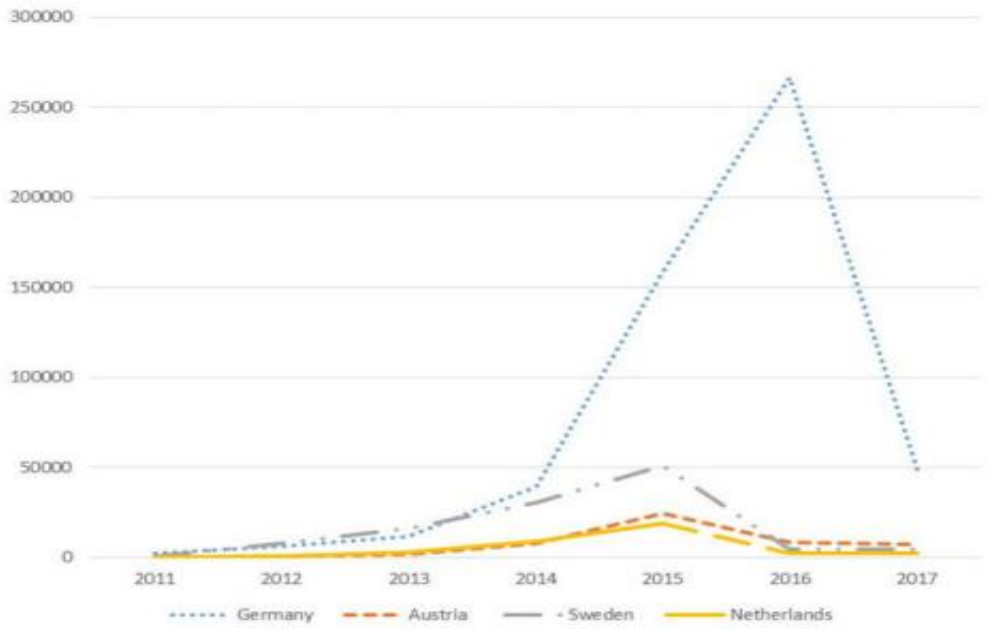
Australia and Iceland	Europe	Americas	Turkey	Arab countries	Total
9,092	59,576	82,625 *	1,169	637,966	790,428

*Among them there are more than 60,000 in the USA only.

Source: Zakaria (2018)

Syria has been under a ten-year-long conflict resulting in the exodus of large numbers of displaced individuals. Syrian asylum applications peaked in 2015 at the height of forced migration into Europe. Between 2015 and 2017, asylum applications decreased substantially as measures to curtail the arrival of forced migrants through the Mediterranean Sea were undertaken by the European Commission (46). The number of Syrians requesting asylum worldwide has since stabilised at about 100,000 applications per year. Figure 1 provides data on trend of Syrian asylum seekers in the largest receiving countries in the EU between 2011 and 2017.

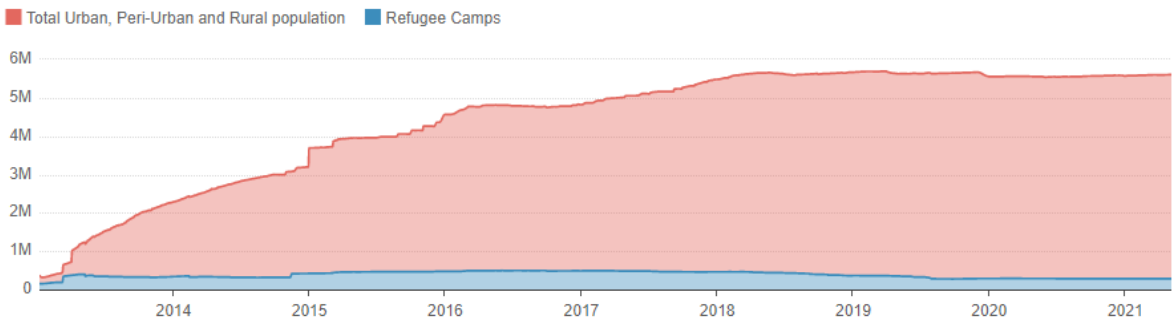
Figure 1. Syrian asylum seekers in the largest receiving countries in EU, 2011–2017.



Source: Valenta (2020)

Syria has a long history of emigration by virtue of its high population growth, the socio-political events, and the economic factors. However, the ongoing armed conflict is responsible for the massive displacement of people, both internally and internationally (45). As pointed out by the UNHCR statistics in Figure 2, 6.6 million Syrians are displaced and over 5.6 million have fled the country, mostly into neighbouring countries (i.e. Lebanon, Jordan, and Turkey) but also to Europe and North America (47). The large volume of this forced migration flow – totalling more than half of the country's pre-war population, has led the UNHCR to consider it "the biggest refugee and displacement crisis of our time" (3).

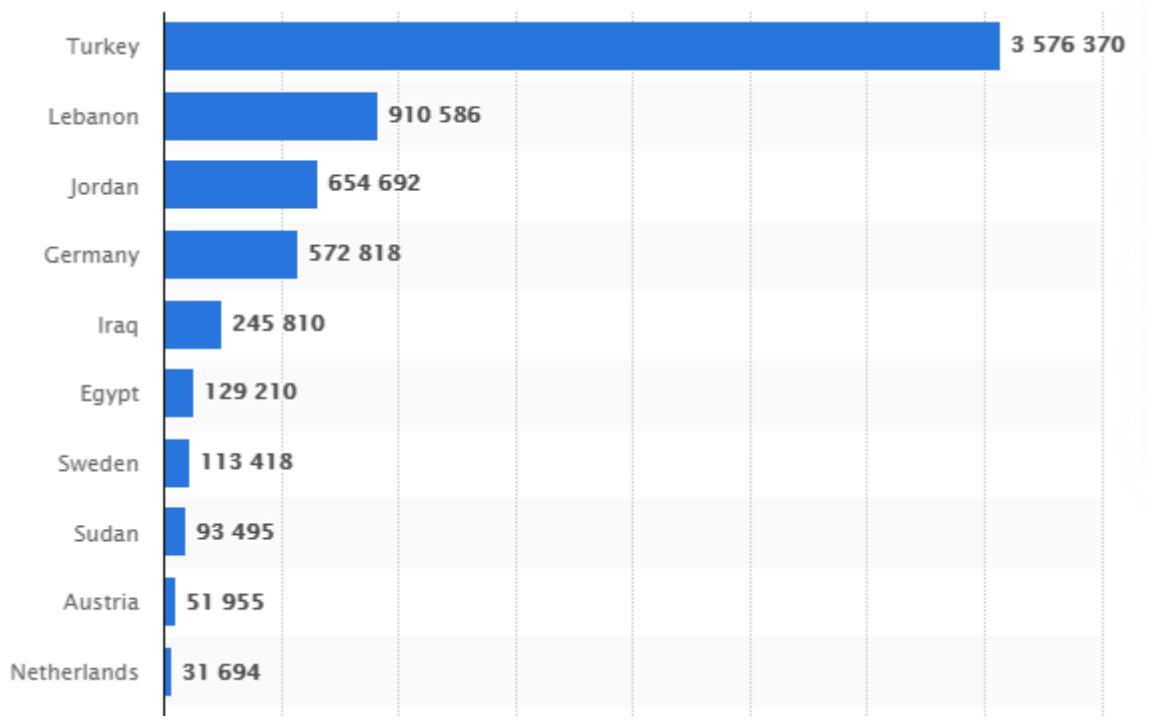
Figure 2. Trend of registered Syrian refugees worldwide between 2014 and 2021.



Source: UNHCR (2021)

The vast majority of Syrian refugees live in countries that have a physical border with Syria. In 2021, Turkey was hosting 3.67 million Syrian refugees. Syrians have also fled to Egypt, Iraq, Jordan and Lebanon reaching 1.9 million totals (48). Between 2011 and 2017, around one million Syrian refugees and asylum seekers arrived to Europe, entering mostly through Greece and Italy (49). In 2019, approximately 572.000 Syrians settled to Germany, 113.000 to Sweden, and 51.000 to Austria**.** A smaller number of Syrian refugees have been hosted and relocated to other countries namely the United States of America (50) and United Kingdome accounting for 8.449 and around 10.389 refugees, respectively (51). However, Figure 3 provides data on the top 10 destination countries hosting Syrian refugees in 2019.

Figure 3. The top 10 destination countries for Syrian refugees in 2019.



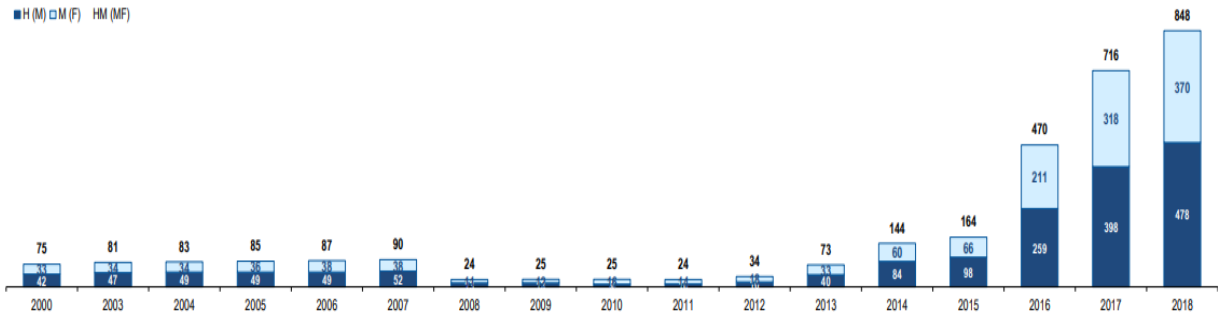
Source: STATISTA (2020)

1.2.2 Syrian migration to Portugal

Portugal's migrant population has increased 75% since 2015 totalling 660,000 in 2020 (50), up from 590,348 in 2019 (52). The largest migrant groups per nationality in 2020 were Brazilian (183.993), British (46.238) and Cape Verdeans (36.609) (53). The most recent data available on the Syrian migrant population in Portugal concerns the year of 2019 showing a total of 1,105 residents of whom 170 were resettled in 2019 (52). Data from the government's Strategy and Studies Office (GEE) shows a steep increase from 75 residents in 2000 up to 848 residents in 2018 (54) (see Figure 4). Starting in 2016, the Syrian population has been growing incrementally, mostly as a result of

programmes focused on the relocation of asylum seekers from other Member States to Portugal and the UNHCR refugee resettlement programme (54).

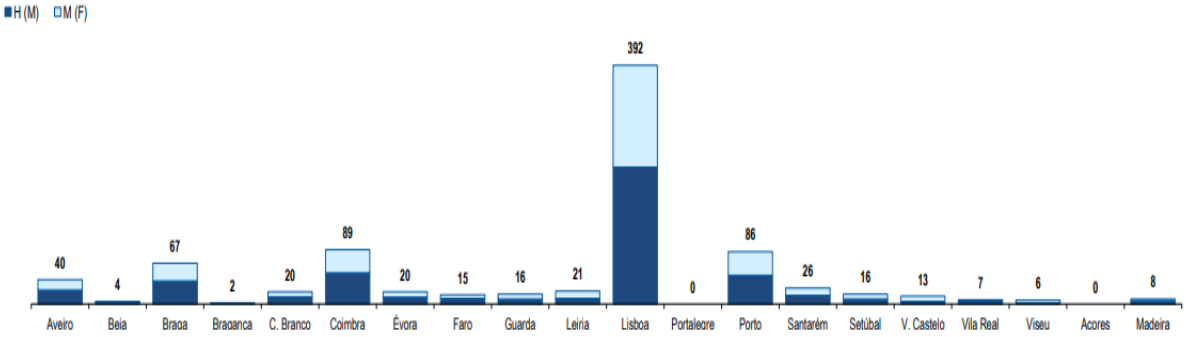
Figure 4. Syrian residents in Portugal, by gender, 2000-2018.



Source: Gabinete de Estratégia e Estudos (GEE, 2020)

Syrians amount to a mere 0,18% of the whole migrant population in Portugal. They are a very young population with 73% being below the age of 34, among whom 32% are younger than 14 years of age, and only 2% are 65 years or older (54). Most Syrian migrants reside in Lisbon (392) (54), although an increasing number is settling in cities across the country as a result of the geographical dispersal policy undertaken by government to host relocated asylum seekers and refugees (37).

Figure 5. Distribution of the Syrian resident population in Portugal in 2018, by gender

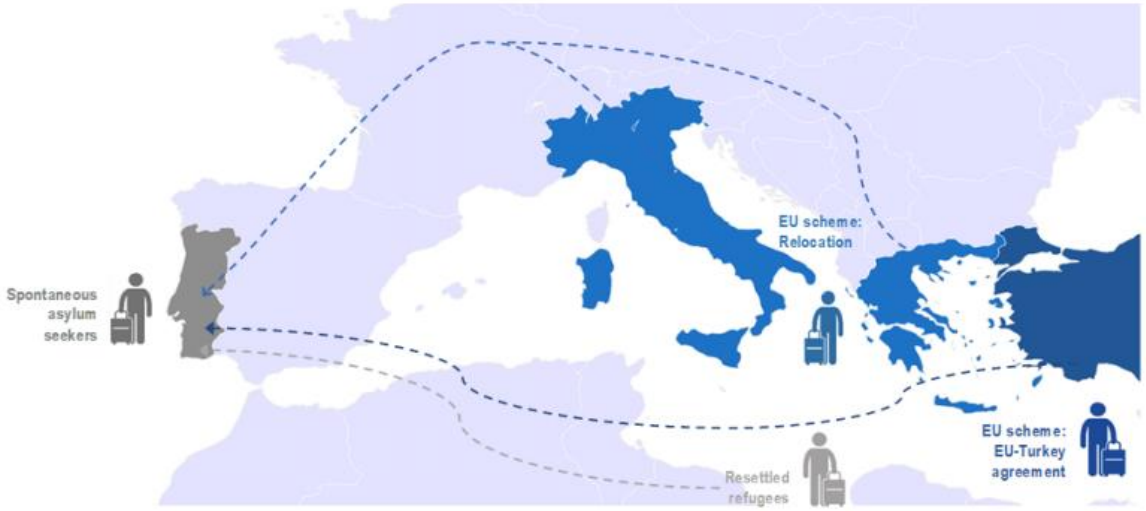


Source: Gabinete de Estratégia e Estudos (GEE, 2020)

Portugal appears as a unique case study in the context of hosting refugees and asylum seekers (55). Despite the rise of far-right politics and an anti-immigration tide in some European countries in recent years (56), Portugal has bucked the migration trend by pledging to receive several thousand refugees and asylum seekers. As stated in a speech by the prime minister António Costa “we need more immigration and we won’t tolerate any xenophobic rhetoric” (55). This “welcoming refugees policy” has been driven, among other things, by the country’s shrinking population (55) and contrast with the stringent policy of the late 1990s and early 2000s when a mere 3% of the asylum applications made were accepted (57). Portugal ranked third worldwide as the most welcoming country for refugees resettled from Egypt (58) as it relocated the sixth highest share of asylum seekers under the European Agenda for Migration Emergency Relocation Programme (46).

Figure 6 shows the channels undertaken by people seeking international protection in Portugal. The first channel concerns spontaneous arrivals of asylum seekers who reach Portuguese territory by their own means. The second channel entails the EU relocation programs in which Portugal has participated in within different conventions (59). The third channel concerns the agreement for the resettlement of refugees from Turkey to Europe under the EU-Turkey 1:1 resettlement program. The fourth channel refers to the UNHCR resettlement programme under which refugees living in a first country that offered them asylum move to a third country that will grant them permanent settlement (60).

Figure 6. The four humanitarian migration channels to Portugal.



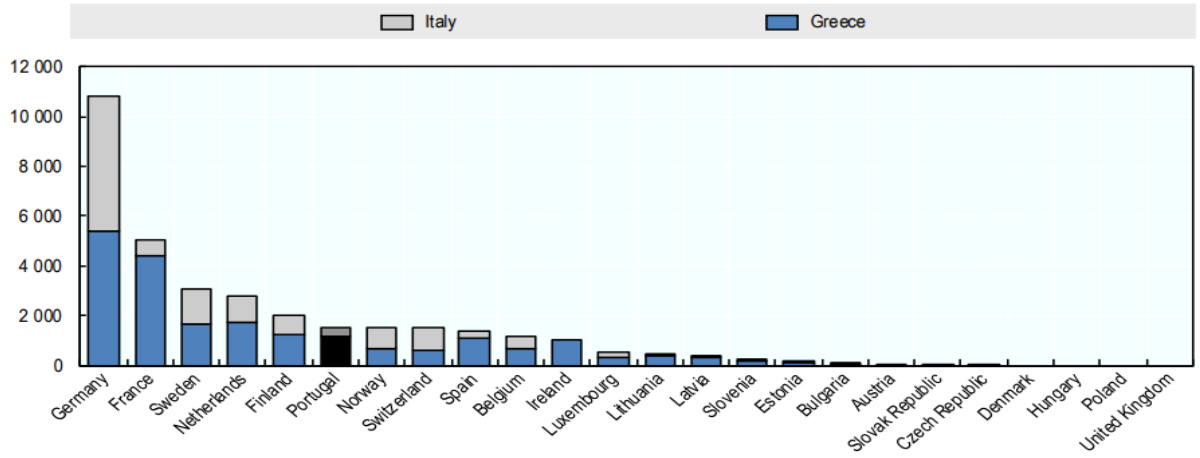
Source: OECD (2019)

Most Syrian migrants residing in Portugal are relocated asylum seekers, resettled refugees or international students who came to study in Portugal under the Global Platform for Syrian Students (61). Next, we describe each of this type of arrival in greater detail.

Relocated Syrian asylum seekers

Under this relocation scheme, asylum seekers with a high probability of being granted international protection in Italy and Greece would be relocated to other EU member states. Portugal sough to relocate 356 asylum seekers from Italy and 1192 from Greece from the period of 2015 until 2018 (see figure 7) (59). Most of the applicants for international protection are from Greece were families of Syrian nationality (62).

Figure 7. Number of asylum seekers relocated from Italy and Greece to other Member States, 2015-18.



Source: European Commission (2018)

Resettled Syrian refugees

Resettlement is transfer process of refugees from an asylum country to another state that will grant them permanent residence. In 2020, UNHCR submitted 39,500 refugees' files for consideration by resettlement countries, of whom 18,200 were Syrians (60). The Portuguese government committed to resettle 1010 refugees who live in Turkey and Egypt as part of the Portuguese National Resettlement Program in 2018 and 2019 under UNHCR protection (62). The selection of resettlement candidates in both Egypt and Turkey has started later on. As a result, 286 refugees in Egypt and 171 refugees in Turkey have been identified and pre-selected to resettle in Portugal of whom Egyptian, south Sudanese, and Syrian (62). In 2015-18, Portugal also hosted 142 Syrians under the 1:1 EU Turkey resettlement scheme, according to which for every individual returned to Turkey from the Greek islands another one is resettled in the EU (59).

Students sponsored by the GP4SYS

The Global Platform for Syrian students (10) is a non-profit multi-stakeholder international organization, founded in 2013 by Jorge Sampaio - Former President of Portugal - with an active network of partners, namely, the Council of Europe, the League of Arab States, the International Organization of Migration, the Institute of International Education and a consortium of institutions and individuals (donors and hosting families). GP4YS promotes a hosting program for Syrian students by offering them a systemic and sustainable solution to pursue their higher academic studies in safe countries worldwide in the context of Academic emergency aid. GP4SYS aims to save youth lives, to prevent a generation from missing education opportunities, to support the preparation of forthcoming leaders, and to enable the unleashing of innovation and entrepreneurial skills among graduates that are so key for reconstruction, resilience, and sustainable development

in post-conflict societies. As it is stated in their motto "Education not only saves lives in emergencies, but it also sustains life by giving a sense of hope for the future". GP4SYS's objectives are to acquire professional qualifications and refine experiences and innovation skills for those affected by emergencies and in fragile settings and help to mitigate the sociological impact of crisis (9).

The student grant is assigned to cover a holistic package of comprehensive services including, Student's health insurance, academic fees, accommodation, Portuguese language acquisition courses, some essential items, and a stipulated monthly salary for the expenditures (63). It endeavours to invest in the summer holiday by providing summer school opportunities including, internships, training, workshops, and intensive Portuguese courses (9).

The program was launched in 2013 but the first phase was operated in March 2014 with the support of the Portuguese government when 45 Syrian students got awarded the grant. Since the launching operation, GP4YSY has awarded more than 550 annual scholarships in several countries – a rare lifeline for students affected by the armed conflict worldwide. Between 2014, when the program started, and 2019, around 160 Syrian students received grants to study in Portugal. The remaining grants have been awarded to Syrians attending university in Canada, Egypt, France, Germany, Iraq, Lebanon, Mexico, Turkey, the United Arab Emirates, and the United States of America (9). However, our study sample was collected from this group of Syrians residing in Portugal.

1.3 Quality of life of Syrian migrants

An estimated of 1 million Syrians have migrated to Europe, eloping from the brutal ongoing conflict that has sat back the standards of living and deprived Syrians from having a decent living for the past decades (64). Syrian migrants, including youth, encountered various obstacles either during their pre- or post-migration trajectory. These hurdles could be categorized into pre-migration experiences such as violence, human trafficking, war adverse events, political disputes, and post-resettlement challenges namely foreign language acquisition, sociocultural adjustment, unemployment, finding a proper dwelling, stigmatization, being able to get good quality education and assessing proper health care. Being exposed to these hardships can increase the likelihood of psychological disturbance, anxiety, post-traumatic stress disorder and depression, which will result in poorer physical status and difficult social integration process (38, 65-67).

Although the quality of life of Syrian migrants is attracting widespread interest in public health research, most existing studies focus on the quality of life of Syrian refugees and asylum seekers and there is little research about the quality of life of Syrian international students who were forced

to migrate in order to be able to pursue their university education. To the best of our knowledge, the quality of life of Syrian students residing in Portugal has not been researched. Our study findings might help to promote migrant's well-being, foster the development of optimal conditions for academic achievement and integration in the host country and discern dimensions of concern for Syrian students in Portugal (38).

A substantial proportion of literature has examined the quality of life of involuntary migrants obtaining contradictory outcomes due to the heterogeneity of the concepts measured and the variance of groups' nature sample (68). It has been found in a Norwegian study conducted to explore the health-related quality of life of recent resettled Syrian children and youth refugees, that their level of HRQOL was moderately good but lower than the European population norms. Concerns were concentrated mainly around the physical, friends, wellbeing, and psychological dimensions. The study showed that Syrian refugees reported significantly lower scores in the friends' dimension comparing to the European norms and also low levels of psychological wellbeing (38). These findings are in consonance with other studies indicating the high prevalence of psychological problems among the forcibly displaced individuals which to some extent links to poorer HRQOL (68). However, the effect of the duration of the residence in the host country was found to be associated with reducing mental illness but not with the HRQOL scores which could be explained due to the fact that changes in HRQOL require time (38).

In their review of the quality of life of Syrian refugees residing outside camps in Jordan, Nour Abdo et al. (2019) stated a positive association between higher monthly income and jobs with physical health. On the other hand, the variables that were associated with negative physical health included aging, having a disease, being married, and increasing family size. Syrian refugees scored average or less in all domains except for the environmental domain. It has been noted that Syrian refugees had significantly lower physical pain and need for treatment than Jordanians with average socioeconomic status (ASES), but the same overall physical health score was around average. On the other hand, their study raised concerns about access to mental health care services in Jordan by Syrian refugees. As expected, Syrian refugees scored below the average in the phycological domain, and the value was the lowest comparing to average and low socioeconomic status Jordanian participants (ASES and LSES). However, in the social relationship domain, Syrian refugees tend to have lower scores than the ASES and LSES Jordanians, yet they scored significantly higher than LSES Jordanians in the environmental domain (12).

In a study conducted in the Kurdistan region of Iraq among 270 Syrian refugees living in camps, and using the WHOQOL-BREF questionnaire, the authors found that QOL of Syrian refugees was statistically higher in all QOL domains than the QoL of West African refugees but lower than the

general population norms in three domains (physical, psychological and environment). Syrian refugees' QoL was also lower in two domains (physical, psychological) when comparing to Gaza strip refugees. It is noteworthy that the social domain of QoL among Syrian refugees was higher than that of the general population norms which could be explained by the social network and the fostered personal relationships they have (69). That being said, forced separation from family members, social isolation and loneliness worsens the quality of life of individuals (66). Furthermore, social support influences positively the wellbeing of migrants since it promotes a sense of belonging, togetherness, and solidarity and it fosters the exchange of mutual support which in turn will affect the integration process (70).

The association between socioeconomic status and social factors and health outcomes has been well documented in the literature. The social determinants of health are defined by the WHO as the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life (71). These factors include income, educational attainment, neighbourhood condition, and access to health care. Refugees' health outcomes are highly divergent by gender. Women migrant are more prone to sexual violence and exploitation in the migration process, which worsens their health status (72). A study conducted among 1215 Syrian refugees resettled in Sweden between the years 2011 and 2013 that assessed HRQOL using the EuroQoL-5D-5L instrument found that being a female has a negative impact on the HRQOL scores (73). This is consistent with previous studies that showed that female migrants have negative HRQOL scores and worse psychological wellbeing than men (38). Therefore, gender is an important variable to consider when assessing QoL of involuntary migrants (73).

In addition to gender, age also plays a fundamental role in forced migrants' health because older refugees tend to have worse mental (74) and physical health (75). In a study conducted in Sweden to assess QoL of Iranian refugees, it was noted that elderly refugees expressed higher HRQOL than their counterparts in Iran but lower HRQOL than Swedes (76). *Social support* including social resources and help provided by authorities is perceived to positively influence the physical and mental health of refugees because supportive social networks mitigate stress levels and boost the quality of life (73). Educational attainment has downstream benefits on the health status. People feel secure and protected which will to some extent influence the health status (77). However, no association was detected between educational attainment and HRQOL in the prementioned study (73).

Being exposed to the conflict and adverse events makes populations susceptible to health risks, in particular physical dysfunction and psychological distress. The common consequence of exposure to trauma and war-related events is to develop mental disorders particularly depression, anxiety, and PTSD, which seem to be common among war refugees such as Syrians (74). There is a considerable

amount of literature on the prevalence of mental health problems among Syrian refugees where depression, generalized stress, and post-traumatic stress disorders are among the most prominent psychological illnesses diagnosed, which in turn will influence the perceived quality of life (69, 78). An estimation of 22.1% of prevalence of psychological illness involving depression, anxiety, PTSD, bipolar disorder and schizophrenia among Syrians living in conflict affected settings has been reported by the WHO (79). Another study shows that the prevalence rates of psychological illness among Syrian refugees were 40.2%, 31.8% and 29.9% % for depression, anxiety and PTSD respectively (74).

However, in a study conducted to estimate the prevalence of mental disorders among Syrian refugees in Germany, they found lower rates of approximately 11.4%, 14.5%, 13.5% of the participants met the criteria for PTSD, moderate depression, and moderate anxiety, respectively. In the latter study, it has been revealed that depression and anxiety are significantly higher among refugee women than men (65). These outcomes align with findings from an American study conducted to estimate the prevalence of mental disorders among Syrian refugees where being a woman was associated with depression and anxiety (67). Matanoy et al. (2013) highlighted that lower QoL among the refugee population is associated with the conflict related events in the Balkan countries but also with experiencing more stressful events caused by the migration process in Western Europe. The authors concluded that the effects of war related events on refugees and asylum seekers that worsen their quality of life could last for years after resettlement (80).

Only a few studies have been published on the prevalence of physical illness among forced migrants, although there is a growing research on chronic and infectious diseases due to health care facilities devastation in the homeland, low health literacy, and challenges to access health care facilities in the host country (12, 78). Furthermore, non-communicable diseases (81), anemia (82), and nutritional deficiencies (83), are amongst the most prevalent diseases identified among Syrian refugees in the literature.

2. OBJECTIVES

This is an observational cross-sectional study that aims to assess the quality of life of Syrian migrants living in Portugal who enrolled in the national high education system under the GP4SYR's program. It has two specific goals:

1. To examine the perception of the quality of life of Syrian migrants in Portugal who were awarded a GP4SYR grant;
2. To determine the factors associated with the quality of life of Syrian migrants in Portugal who were awarded a GP4SYR grant, including sociodemographic characteristics and anxiety and depressive symptoms.

3. METHODS

3.1 Study design

This is an observational cross-sectional study based on an online questionnaire conducted among Syrian migrants residing in Portugal.

3.2 Participants

All Syrian students and alumni who were awarded a grant by GP4SYS to pursue their education in Portuguese universities between 2014 and 2020 were invited to participate in the study. Those who were still residing in Portugal were considered eligible. An invitation to participate (Appendix 1) was sent by email by the GP4SYR's international relations coordinator on October 2, 2020. The email contained an explanation of the study's purposes, benefits and risks of taking part in the research and a link to the website where the online questionnaire was hosted. Of the 136 people who opened the questionnaire, 107 participants completed the questionnaire and submitted their responses. However, one participant refused to consent to participate, and another participant was excluded for not residing in Portugal. In total, 105 participated in the study.

3.3 Online questionnaire

The questionnaire was created using the Lime Survey tool. It was available online in Arabic for one month, between October 2 and November 2, 2020. The first page of the questionnaire contained clear and detailed information about the following issues: 1) research purposes; 2) the study potential benefits and risks; 3) name and institution of the researcher; 4) voluntary nature of participation in the study (no incentives were given to participating in the research project); 5) expected duration of the questionnaire; 6) confidentiality and anonymity of all the information provided by participants; 7) privacy and data protection procedures. Consent to participate in the online questionnaire was asked and access to the questionnaire's remaining pages was unblocked only for those consenting to participation.

Those who decided to participate completed an online questionnaire (Appendix 2), which comprised three different scales validated for the Arabic Speaking population, as well as questions covering sociodemographic characteristics. The questionnaire covered the following areas:

- Quality of life-related items, which were assessed using the World Health Organisation Quality of Life – BREF Inventory (WHOQOL-BREF) that is organized into a facet of overall QoL (general perception of QoL and health) and four domains: physical health (seven items), psychological health (six items), social relations (three items) and environment (eight items). The physical health domain pertains to questions on mobility, daily activities, functional capacity, energy, pain and sleep. The psychological domain incorporates

questions related to self-image perceived, negative and positive thoughts, self-esteem, concentration ability, perceiving a meaningful life and having pleasure in life. The social relationships domain covers topics related to personal relationships, social support and sexual satisfaction. And the environmental health domain entails questions concerning financial resources, safety, security, freedom, health and social services, home and physical environment, opportunities to acquire new skills and knowledge, recreational opportunities, general environment (noise, air pollution, etc.) and transportation (84).

- Symptoms of anxiety, which were assessed using the Beck Anxiety Inventory covering the following anxiety symptoms: numbness, feeling hot, wobbliness in legs, inability to relax, fear of worst happening, dizziness, heart-pounding, unsteadiness, terrified, nervousness, feeling of choking, hands trembling, fear of losing control, shakiness, breathing difficulties, fear of dying, scaring, indigestion, fainting, face flushed and hot/cold sweats (85).
- Symptoms of depression, which were assessed using the Beck Depression Inventory-II covering the following depressive symptoms: grief, pessimism, previous failure, remorse feelings, loss of pleasure in life, feeling of being subject to punishment, lack of self-love, self-criticalness, suicidal thoughts, or wishes, crying, agitation, loss of interest, indecisiveness, worthlessness, lack of energy, changes in sleeping patterns, irritability, changes in appetite, concentration difficulties, tiredness or fatigue and loss of interest in sex (86).
- Sociodemographic characteristics including age, sex, country of origin, current place of residence for the participants and their families, length of stay in Portugal, time of arrival to Portugal, marital status, level of education, working status, income adequacy and Portuguese language proficiency.

Age was calculated based on the date of birth. Syrian students are admitted to the GP4SYS starting at the age of 18 and most of them finished their bachelor's degree at the age of 23. Therefore, age was labelled into three categories with 6 years equal intervals as follows: 1) ≤23 years; 2) 24-30 years; and 3) >30 years.

Marital status answer categories consisted of: 1) single; 2) living with a partner; 3) married; 4) separated; 5) divorced; and 6) widowed. None of the participants chose response number 6 while only one participant chose response number 5. Therefore, the responses were dichotomised and harmonized into the following categories: 1) married/living with a partner; and 2) single/divorced/separated.

Level of education response categories comprised: 1) secondary education; 2) bachelor; 3) master; and, 4) PhD. Only 3 participants chose the latter response. Therefore, some of the responses were aggregated into the following categories: 1) secondary education; 2) bachelor; and 3) master/PhD.

Working status response categories consisted of: 1) student/in professional training; 2) full-time employee; 3) part-time employee; 4) unemployed; 5) household work and, 6) retired/pre-retired and, 7) others. None of the participants chose responses 5, 6, or 7. Therefore, responses were aggregated and reported as the following 1) student; 2) employed; and 3) unemployed.

Length of stay information was imputed from the questions: “when did you arrive in Portugal?” and “in total how much time have you lived in Portugal?”. Data were categorized into three labels and reported as: 1) ≤ 2 years; 2) 3-5 years; and, 3) >5 years.

Perceived income adequacy was assessed through the question: “thinking of your household income, would you say that your household can make ends meet?” and the responses were: 1) insufficient; 2) caution with expenses; and, 3) enough to make ends meet and, 4) comfortable. For this study, the answers were aggregated into three categories and reported as follows: 1) insufficient; 2) caution with expenses; and, 3) sufficient, which includes respondents who reported considering their household income enough to make ends meet or comfortable.

The Beck Anxiety Inventory is based on a 4-points Likert scale, with response categories ranging from “not at all” to “severely, it bothered me a lot”. It consists of 21 items each with 4 statements and each statement has an associated value (0-3 values). A single score is calculated by adding up the values of the 21 items (ranging from 0-63). The respondents evaluate their state where higher values indicate higher levels of anxiety symptoms. The items values were recoded for scoring (1=0, 2=1, 3=2, 4=3). With regards to missing items, if one or two items are missing, their scores were imputed with the mean of the items before summing. Anxiety scores are labelled in four categories: minimal level of anxiety (ranging from 0-7), mild level of anxiety (ranging from 8-15), moderate level of anxiety (ranging from 16-25) and severe level of anxiety (scores above 26) (87, 88). Furthermore, anxiety scores were dichotomised into an absence of anxiety symptoms (ranging from 0-7) and presence of anxiety symptoms (ranging from 8-63).

The Beck Depression Inventory-II is composed of 21 items each with 4 or 6 statements and each answer being scored on a scale value of 0 to 3. A single score is calculated by summing the values of the 21 items (ranging from 0-63) where higher total scores indicate more severe depressive symptoms. In the case of missing items, if one or two items are missing, their score was imputed with the mean of the items before summing. The items’ values with 4 statements were recoded for scoring (1=0, 2=1, 3=2, 4=3), while those that represent 6 statements (16 and 18) were recoded differently (1=0, 2=1, 3=1, 4=2, 5=2, 6=3, 7=3). Depression scores were interpreted as depression levels and categorized as minimal levels of depression (ranging from 0-13), mild levels of depression (ranging from 14-19), moderate levels of depression (ranging from 20-28), and severe levels of depression (ranging from 29-63) (89, 90). Furthermore, depression scores were dichotomised into

an absence of depressive symptoms (ranging from 0-13) and presence of depressive symptoms (ranging from 14-63).

WHOQOL-BREF comprises 26 items on a 5-points Likert scale ranging from “very dissatisfied” to “very satisfied” or “very poor” to “very good”, or “not at all” to “an extreme amount” except for question 26 where the anchor statement has different meanings: 1) Never; 2) Seldom; 3) Quite often; 4) Very often; and, 5) Always. All 26 items have a range of (1-5); (1=1, 2=2, 3=3, 4=4, 5=5). Three negatively phrased items (3, 4, and 26) were recoded as (1=5, 2=4, 3=3, 4=2, 5=1). Missing items were substituted by the mean of the other items in the same domain when ≤ 2 items were missing from the physical, psychological and environment domains and 1 missing item in the social domain. Domain scores and the overall QOL on scales of (4-20) and (0-100) were computed. One assessment with more than 20% missing items was discarded since its total score was 19 and the assessments with ≥ 80% of the total number of items were included (1,7) (33). Therefore, a total of 104 participants were eligible for data analysis of QoL while 105 were eligible for the rest of data analysis.

The questions 21 in WHOQOL BREF scale “how satisfied are you with your sex life?” and BDI II scale’s “loss of interest in sex” item were missed in four questionnaires, perhaps due to their sensitive context in the Arabic culture (12). Furthermore, the ninth question in the BDI II scale concerned with “suicidal thoughts or wishes” was missed in three assessments, perhaps because suicide is a strong religious-cultural taboo in predominantly Muslim countries (91). Nevertheless, the vast majority of participants answered these questions.

COVID-19 pandemic-related questions consisted of dichotomous questions that were asked after each scale as follows “my responses would have been different if we were not living in the COVID 19 era” and “my responses have been changed to”. These two questions were based on a 4-point Likert scale with response categories ranging from “strongly agree” to “strongly disagree” and from “much better “to “much worse” respectively. The response scales for these two questions were dichotomised and reported as: 1) agree including “strongly agree” and “agree” categories; and, 2) disagree including “strongly disagree” and “disagree” categories for the first question; and, reported as: 1) better including “much better” and “better” categories; and, 2) worse including “much worse” and “worse” categories for the second question. However, the second question was unlocked only if the participant agreed to the first one.

3.4 Data analysis

Data analysis was performed using the software IBM Statistical Package for the Social Sciences (SPSS) Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA, 2019). From the 107 participants recruited, two did not meet eligible criteria: one participant resided in the Netherlands and the other participant refused to consent to participate. Sociodemographic characteristics and anxiety and depression levels were presented as counts and proportions, while the domains of QoL and the overall QoL were reported as median and percentiles (25-75) in tables since our QoL data did not follow a normal distribution. The association between the independent variables including age, sex, educational level, marital status, income adequacy, working status, host language proficiency, length of stay, the place where the family resides, anxiety and depression symptoms and the dependent variables of QoL data including the overall QoL, physical, psychological, social and the environment domain was quantified through generalised linear regression models. Data are presented as crude Beta, adjusted Beta and 95% Confidence interval (95%CI).

Participants' perceptions of the influence of the COVID-19 pandemic on their responses were reported as absolute counts and proportions. Missing values were substituted by the mean in the three scales when appropriate (12, 92) .Statistical significance was set at a value of $P < 0.05$.

3.5 Ethical considerations

The study protocol followed the World Medical Association Declaration of Helsinki. Ethical approval was granted by the Ethics Committee of the Institute of Public Health of the University of Porto on February 5, 2020 (nº CE20137). Data handling and data protection was conducted according to the usual confidentiality rules and only those involved in the research team had access to data. All the research data collected, stored, processed and analyzed was anonymous. Data storage and data processing were secured to impede its accessibility to unwanted third parties or untimely destruction. Names of participants were not collected. Instead, each participant received a numerical code. Data will be destroyed after the end of the study and according to the legally established deadlines.

4. RESULTS

4.1 Characteristics of the study participants

The characteristics of the study participants are summarized in Table 2. All participants were from Syria and resided in Portugal. The study included a slightly higher proportion of male (52.4%) participants. Most participants were aged between 24 and 30 years (65,7%) and were students (76.2%). The majority of them resided in Portugal for two or less years (63.1%) and spoke Portuguese enough to manage daily activities (64.1%). Most participants were single, separated or divorced (76.2%) and had all their family members residing in Syria (56.2%). Almost half of the participants had a master's or PhD degree (48.6%) and the more than half stated that they need to be cautious with expenses (53.3%).

Table 2. Characterization of study participants

	TOTAL (N=105) n (%)
Sex	
Female	50 (47.6)
Male	55 (52.4)
Age (years)	
≤ 23	7 (6.7)
24-30	69 (65.7)
> 30	29 (27.6)
Educational level	
Secondary education	12 (11.4)
Bachelor	42 (40)
Master/ PhD	51 (48.6)
Marital status	
Married/Living with partner	25 (23.8)
Single/separated /divorced	80 (76.2)
Working status	
Student	77 (76.2)
Employed	17 (16.8)
Unemployed	7 (6.9)
Host language proficiency	
Speak Portuguese fluently	24 (23.3)
Enough to manage daily life activities	66 (64.1)
Do not speak Portuguese	13 (12.6)
Length of stay (years)	
≤ 2	65 (63.1)
3-5	25 (24.3)
>5	13 (12.6)
The family resides in Syria	
All reside in Syria	59 (56.2)
Some reside in Syria	26 (24.8)
None reside in Syria	20 (19)
Income adequacy	
Insufficient	26 (24.8)
Caution with expenses	56 (53.3)
Sufficient [a]	23 (21.9)

[a] Includes those who answered that their income is enough to make ends meet or that their income is comfortable.

Notes: In each variable, the total may not add 105 participants due to missing values. The proportions may not add 100 due to rounding.

4.2 Quality of life scores

The median and percentiles (25-75) of the overall QoL, overall perception of QoL, overall satisfaction with health and the four domain scores are listed in Table 3. The study participants scored above average in all the QoL outcomes. The highest median score among the QoL domains was observed for the physical health domain with a score of 66.07, followed by the psychological domain (58.33), the social relationships domain (58.33) and the environment domain (54.68). Participants' median scores were 75 for the overall perception of QoL, 50 for the overall satisfaction with health and 62.5 for the overall QoL.

Table 3. Overall median scores and percentiles for overall QOL (0-100), each domain of QOL (0-100 scale) and the two global items (N=104)

	Median	Percentiles (25-75)
Overall quality of life	62.5	50-75
Domains of quality of life		
Physical health domain	66.07	53.57-78.57
Psychological health domain	58.33	42.7-66.66
Social health domain	58.33	41.66-66.66
Environmental domain	54.68	43.75-68.75
Global items		
Item 1: Overall perception of quality of life	75	50-75
Item 2: Overall satisfaction with health	50	50-75

4.3 Levels of anxiety and depression

Levels, presence and absence of anxiety and depressive symptoms among study participants are presented in Table 4. More than half of the participants reported experiencing anxiety symptoms (55.2%), with 31,4% of the participants reporting moderate (14.3%) to severe (17.1%) levels of anxiety. Depressive symptoms were experienced by 52.4% of the participants, with a 32,4% of them reporting moderate (20%) to severe (12.4%) levels of anxiety.

Table 4. Levels, presence and absence of anxiety and depressive symptoms

	TOTAL (N=105)
	n (%)
Levels of anxiety	
Minimal level of anxiety	47 (44.8)
Mild level of anxiety	25 (23.8)
Moderate level of anxiety	15 (14.3)
Severe level of anxiety	18 (17.1)
Anxiety symptoms	
Absence of anxiety symptoms	47 (44.8)
Presence of anxiety symptoms	58 (55.2)
Levels of depression	
Minimal level of depression	50 (47.6)
Mild level of depression	21 (20)
Moderate level of depression	21 (20)
Severe level of depression	13 (12.4)
Depression symptoms	
Absence of depressive symptoms	50 (47.6)
Presence of depressive symptoms	55 (52.4)

4.4 Participants' perceptions of the influence of the COVID 19 pandemic on their responses

Table 5 shows participants' perceptions of the influence of the COVID 19 pandemic on their responses: 40.4% of the participants responded that the pandemic influenced their responses concerning QoL, with almost 60% reporting it had a negative influence. The pandemic was perceived to influence responses concerning anxiety and depressive symptoms among 25.7% and 28,6% of the participants, respectively. Most participants reported it had a negative influence on anxiety (51.9%) and depression (62.1%).

Table 5. Participant's perceptions of the influence of the COVID 19 pandemic on their responses after each scale

	N (%)
WHOQOL-BREF scale N=104	
My responses would have been different if we were not living in the COVID 19 era	
Agree	42 (40.4)
Disagree	62 (59.6)
My responses changed:	
To the better	17 (40.5)
To the worse	25 (59.5)
Beck Anxiety Inventory N=105	
My responses would have been different if we were not living in the COVID 19 era	
Agree	27 (25.7)
Disagree	78 (74.3)
My responses changed:	
To the better	13 (48.1)
To the worse	14 (51.9)
Beck Depression Inventory N=105	
My responses would have been different if we were not living in the COVID 19 era	
Agree	30 (28.6)
Disagree	75 (71.4)
My responses changed:	
To the better	11 (37.9)
To the worse	18 (62.1)

4.5 Factors associated with quality of life.

Table 6 presents the factors associated with quality of life. It is noteworthy that insufficient income was a predictor of overall QoL and of the four domains' scores. After adjustment, insufficient income was negatively and significantly associated with overall QoL (adjusted b= -15.1; 95%CI: -23.73 to -6.47), the psychological domain (adjusted b= -6.25; 95%CI: -12.37 to -0.13) and the environment domain (adjusted b=-8.65; 95%CI: -15.57 to -1.73).

Being aged 24-30 years was positively associated with higher scores on the psychological domain of QoL (adjusted b= 5.6; 95%CI: 1.1 to 10.09). Female participants presented higher scores in QoL for the social domain (adjusted b= 10.52; 95%CI: 3.76 to 17.28).

Higher levels of depression symptoms were negatively associated with the participants' perception of overall QoL (adjusted b= -0.67; 95%CI: -0.99 to -0.35), the physical domain (adjusted b=-0.83; 95%CI: -1.09 to -0.57), the psychological domain (adjusted b=-0.93; 95%CI: -1.17 to -0.69), the social domain (adjusted b=-0.51; 95%CI: -0.91 to -0.12) and the environment domain (adjusted b=-0.64; 95%CI: -0.91 to -0.37) of QoL. Higher levels of anxiety were also negatively and significantly associated with participants' perceptions of overall QoL (adjusted b= -0.54; 95%CI: -0.83 to -0.26), the physical health domain (adjusted b=-0.35; 95%CI: -0.57 to -0.12) and the environment domain (adjusted b=-0.33; 95%CI: -0.56 to -0.09).

Table 6. Crude and adjusted associations between participants' sociodemographic characteristics, anxiety and depression symptoms and quality of life / TOTAL (N=104)

	Crude b (95%CI)					Adjusted b (95%CI)				
	Overall QOL	**Physical**	**Psychological**	**Social relationships**	**Environment**	**Overall QOL**	**Physical**	**Psychological**	**Social relationships**	**Environment**
Sex										
(Female vs. Male)	5.34 (-2.77; 13.45)	1.08 (-5.4;7.59)	2.46 (-3.94; 8.86)	**10.72 (3.42; 18.01)**	-0.63 (-6.89; 5.61)	—	—	—	**10.52 (3.76; 17.28)** [d]	—
Age, years										
(≤ 23 vs. >30)	7.58 (-9.8; 25)	-6.63 (-20.57; 7.3)	3.27 (-10.25; 16.8)	3.57 (-12.63; 19.78)	-1.67 (-14.95; 11.61)	—	—	-0.19 (-8.6; 8.25) [c]	—	—
(24-30 vs. >30)	6.86 (-2.37; 16.1)	1.13 (-6.26; 8.52)	**7.64 (0.47; 14.82)**	5.31 (-3.28; 13.9)	5.33 (-1.71; 12.37)			**5.6 (1.1; 10.09)**		
Educational level, years										
(Secondary education vs. Master/ PhD)	-0.3 (-13.53; 12.92)	4.6 (-6; 15.21)	-0.16 (-10.6; 10.32)	5.22 (-6.97; 17.43)	2.28 (-7.92; 12.49)	—	—	—	—	—
(Bachelor vs. Master/ PhD)	6.12 (-2.52; 14.77)	1.5 (-5.43; 8.44)	-1.28 (-8.13; 5.57)	7.19 (-0.78; 15.17)	1.92 (-4.75; 8.59)					
Marital status										
(Married/ living with partner vs. Single/ separated/ divorced)	**14.11 (4.8; 23.42)**	**9.16 (1.64; 16.69)**	7.24 (-0.24; 14.72)	1.87 (-7.1; 10.85)	6.54 (-0.76; 13.86)	4.48 (-2.31; 11.28) [a]	2.78 (-2.61; 8.18) [b]	—	—	—
Working status										
(Student vs. Unemployed)	2.56 (-13.3; 18.42)	-5.85 (-18.85; 7.14)	-7.37 (-20.17; 5.41)	1.01 (-14.28; 16.32)	-2.5 (-14.94; 9.93)	—	—	—	—	—
(Employed vs. Unemployed)	6.82 (-11.2; 24.86)	-6.15 (-20.93; 8.62)	-5.95 (-20.49; 8.59)	-0.42 (-17.82; 16.98)	-4.22 (-18.37; 9.91)					
Host language proficiency										
(Speak Portuguese fluently vs. Do not speak Portuguese)	0.96 (-13.34;15.27)	-1.16 (-12.61; 10.28)	2 (-9.29; 13.3)	3.23 (-10; 16.5)	-1.37 (-12.33; 9.59)	—	—	—	—	—
(Enough to manage daily activities vs. Do not speak Portuguese)	-3.26 (-15.89; 9.35)	-0.71 (-10.81; 9.38)	-0.06 (-10.03; 9.9)	3.07 (-8.63; 14.78)	1.01 (-8.66; 10.68)					
Length of stay, years										
(≤ 2 vs. >5)	-6.15 (-18.87; 6.56)	-8.35 (-18.39; 1.69)	-2.82 (-12.8; 7.16)	5 (-6.58; 16.58)	-3.12 (-12.8; 6.55)	—	—	—	—	—
(3-5 vs. >5)	-6.53 (-20.94; 7.88)	-5.99 (-17.38; 5.38)	-1.74 (-13; 9.57)	-1.97 (-15.1; 11.15)	1.54 (-9.42; 12.5)					
Family members reside in Syria										
(All reside in Syria vs. None reside in Syria)	0.71 (-8.97; 10.39)	-6.14 (-13.55; 1.26)	-5.34 (-12.44; 1.74)	5.34 (-3.7; 14.4)	-5.17 (-12.38; 2.03)	—	—	-3.16 (--8; 1.68) [c]	—	—
(Some reside in Syria vs. None reside in Syria)	9.8 (-2.39; 22.01)	8.17 (-1.16; 17.5)	**11.97 (3.02; 20.91)**	5.73 (-5.66; 17.14)	6.88 (-2.19; 15.97)			1.62 (-4.59; 7.83)		
Income adequacy										
(Insufficient vs. Sufficient)	**-26.23 (-36.72; -15.73)**	**-12.65 (-21.72; -3.58)**	**-15.94 (-24.43; -7.44)**	**-11.32 (-22.03; -0.62)**	**-16.93 (-25.32; -8.54)**	**-15.1 (-23.73; -6.47)** [a]	-1.47 (-8.33; 5.372) [b]	**-6.25 (-12.37; -0.13)** [c]	-5.22 (-15.48; 5.03) [d]	**-8.65 (-15.57; -1.73)** [e]
(Caution with expenses vs. Sufficient)	-4.7 (-13.8; 4.4)	-1.45 (-9.32; 6.41)	0.34 (-7.02; 7.71)	0.14 (-9.14; 9.43)	-3.56 (-10.84; 3.71)	-3.89 (-10.96; 3.18)	-0.22 (-5.84; 5.39)	1.52 (-3.47; 6.52)	-1.02 (-9.61; 7.56)	-3.07 (-8.81; 2.67)
Anxiety	**-1.03 (-1.31; -0.76)**	**-0.82 (-1.04; -0.61)**	**-0.67 (-0.9; -0.44)**	**-0.45 (-0.76; -0.15)**	**-0.72 (-0.94; -0.5)**	**-0.54 (-0.83; -0.26)** [a]	**-0.35 (-0.57; -0.12)** [b]	-0.05 (-0.26; 0.14) [c]	-0.14 (-0.49; 2) [d]	**-0.33 (-0.56; -0.09)** [e]
Depression	**-1.24 (-1.53; -0.95)**	**-1.1 (-1.31; -0.89)**	**-1.14 (-1.33; -0.94)**	**-0.67 (-0.99; -0.35)**	**-0.95 (-1.17; -0.74)**	**-0.67 (-0.99; -0.35)** [a]	**-0.83 (-1.09; -0.57)** [b]	**-0.93 (-1.17; -0.69)** [c]	**-0.51 (-0.91; -0.12)** [d]	**-0.64 (-0.91; -0.37)** [e]

Statistically significant results are highlighted in bold (P-value <0.05).
[a] adjusted for each other. [b] adjusted for each other. [c] adjusted for each other. [d] adjusted for each other. [e] adjusted for each other.

5. DISCUSSION

To the best of our knowledge, this is the first study to assess the quality of life of Syrian migrants residing in Portugal. Although the body of evidence addressing the quality of life of migrants in host countries is growing, research on Syrian migrants continues to be scarce and has largely been focused on mental health (65, 93, 94). We aimed, thus, to assess the perception of quality of life by Syrian migrants who came to Portugal under the GP4SYR's program as a means to continue their education and to determine the factors associated with it using the WHOQOL-BREF scale, the Beck Anxiety Inventory and the Beck Depression Inventory II.

Our findings suggest that Syrian migrants perceived their overall QoL median score to be higher than their overall satisfaction with health. Looking at each of the QoL domains, they scored higher on the physical domain, followed by the psychological and social domains and the environment domain. It is noteworthy that overall QoL, psychological domain and the environment domain were negatively associated with insufficient income. The psychological domain was positively associated with younger age, while the social domain varied according to gender in favour of females. Our results revealed that more than half of the participants expressed anxiety and depressive symptoms. Higher levels of depression were negatively associated with the overall QoL and the QoL domains, while higher levels of anxiety were negatively associated with overall QoL, the physical domain and the environment domain of QoL. Additionally, most of the participants who responded that the pandemic influenced their responses concerning QoL, anxiety and depression, reported perceiving a negative influence.

Participants' perception of QoL can be compared with the scores observed in the normative data of the Portuguese general population (95, 96), given the use of a highly standardized measure of QoL (i.e., WHOQOL-BREF scale) that provides the possibility to compare data from populations with distinct sociocultural backgrounds (97). A key finding from this comparison is that Syrian migrants had a lower QoL than the matched Portuguese population in all domains. This is consistent with the findings of previous studies carried out in Finland and Sweden that showed that refugees tend to perceive their QoL to be lower when compared to the host population (73, 98). Refugees encounter stressful events related to the pre-migratory trajectory and resettlement difficulties including exposure to traumatic events, social integration stressors, poor living conditions, family separation, discrimination, acculturation process (99) and financial strains (100), that were found to be determinants of refugees' mental health (99, 100), in which, these determinants may act as key drivers of the adverse QoL profile of our sample.

Low-income appears to be a salient factor that is associated negatively with the psychological domain, environment domain of QoL and the overall QoL. Several studies have reported that income disparities impede physical, psychological, social and environmental health through various pathways (101, 102). Financial burdens appeared to be negatively associated with worsen living conditions and poorer environmental qualities and assets, that resulted in adverse environmental health (103). Additionally, limited money resources cause social exclusion (104) and deprivation of medical necessities (105), which result in adverse psychological consequences and higher rates of mental disorders such as depression and stress (102, 106, 107). However, given the significant and well-documented relationship between economic hardships and mental disorders among Syrian refugees (99, 108-110), in the light of our findings, we could argue that income is an important predictor of mental health among Syrian migrants in Portugal and, more broadly, of their QoL.

Age is a well-known determinant of health where younger individuals tend to be healthier (73, 74). A similar association was found in the psychological domain where scores slightly declined by age, which concurs with previous studies (73, 74, 111). This might be ascribed to the greater resilience among younger refugees (109) and due to the higher risk of adverse health outcomes among older age groups (73, 74). Other studies also have reported that younger refugees were found to be physically healthier (75), whereas our study did not find such association. Most of our sample are young students who came in pursuit of their studies and to escape the conflict. Hence, they may have been less likely to engage in health-risk behaviours (112). This, however, needs to be closely investigated since the majority of participants (65%) were in a relatively narrow age range (24-30 years).

It is worth highlighting that women scored higher than men in the social domain of QoL. Although women tend to report worse health outcomes than men (111, 113), they seem to benefit more from social support (114). Women are more likely to seek help and to receive emotional and informational support (115). On the other hand, men have smaller social networks since they are less likely to build supportive relationships with others compared to women (116). This difference could also be explained by male participants having experienced massive trauma before migrating due to being involved in combats as soldiers in the Syrian war. If this is the case, which is not entirely unlikely taking into consideration that men in Syria are conscripted into the army upon the age of 18 (117), it would imply that premigration trauma has significantly influenced social exclusion (118) of men in our sample. Furthermore, our sample comprises of almost equal participants of females and males and any statistically significant difference could be attributed to a small sample size. However, other factors that might modify the association between sex and QoL such as individual factors, pre-migration facets, community factors, social exclusion and cultural values (119) were not analyzed in this study. Therefore, further research is necessary for any conclusions to be drawn.

Depressive and anxiety symptoms were detected among almost half of our sample. Major depressive disorder, anxiety disorders and Post Traumatic Stress Disorder (PTSD) have been reported as the most common mental illnesses among Syrian refugees (65, 120). Previous research revealed that refugees' QoL and mental health problems are negatively associated (121-124). It has been widely documented that mental disorders have a significant impact on QoL and, as a result, QoL has been implicated in the mental health status (66). Similar results were found in our study showing that depression and anxiety are negatively associated with QoL.

Another important finding is that educational attainment was not associated with QoL. These findings are congruent with those of previous studies showing no association between education level and QoL among forced migrants (73, 111, 125). Education functions as a good predictor for health outcomes as it is usually associated with greater financial security and a higher social position (77). Other evidence showed that, despite having high level of qualifications, migrants could perceive their social status negatively since they might experience employment difficulties due to language barriers or potential rigorous job requirements such as recognition of foreign certificates that resulted in poor mental illness (126, 127). The lack of importance of educational level can be partially ascribed to recruiting highly educated migrants who received equal stipends under the GP4SYS program regardless of their educational attainment. Hence, we assume that perhaps in our study income and social status are not mediating factors of education on a person's quality of life perception.

We found that length of stay in Portugal did not affect the QoL scores in this study. Although the duration of resettlement has been associated with QoL in previous studies (111, 119), the results of the current study were in correspondence with earlier findings (38). The inverse relationship between mental health and length of stay was widely documented in the literature (126), which might be due to the acculturation process, adaptation to new cultural values and integration stressors that are being encountered mainly in the early period after resettlement (126). Other scholars argue that the effects of traumatic war events may persist for years after resettlement (123). However, the absence of such association in our study might be due to the skewed distribution of our sample since most of them are recent settlers with less than two years of residency in Portugal. In addition, changes in the quality of life might require a longer time interval (38). Another possible explanation is that WHOQOL-BREF might be less sensitive than other instruments, such as the Harvard Trauma Questionnaire, to the effects of the length of stay as it might be the case with the duration of detention in detention centers (128).

No associations were found in our study between working status and QoL unlike what was reported by previous studies (12). This might be due to our study recruiting mostly students and only a few migrants were employees (16%), which may have prevented us the detection of such associations. Other studies have reported an association between poor host country language proficiency and

mental disorders among refugees (129, 130). This association was not identified in our study, perhaps because self-assessment may not be a valid indicator of a language proficiency (131). However, it remains open whether, perhaps, other socioeconomic factors and living conditions overrode the impact of significant associations for these variables.

Our results showed no positive or negative patterns of associations between marital status and QoL, unlike earlier findings (66, 73). Marriage reinforces intimate emotional backups (132, 133), enhances the feeling of belongings, fosters social network linkages and provides financial stability, which are found to be protective factors from mental illnesses (134). However, our findings might be attributed to the high levels of educational attainments of our sample or, perhaps, their good command of the Portuguese language, regardless of the participants' marital status. Pursuing a higher education degree provides a sense of purpose and higher social status (135), while mastering the language of the host country increases migrants' ability to navigate the health care system and their health literacy (136). Another explanation could be that the supportive resources and the integrated service package offered equally, and regardless of the marital status of our participants, under the GP4SYS program seem to be favourable and it might have contributed to outweigh the effect of such association.

The covid 19 pandemic had a negative impact on the participants' perception of QoL, anxiety and depression, of whom responded that the pandemic influenced their responses. Similar results were found in the literature (137, 138). During the time of outbreaks, individuals experience psychiatric symptoms such as feeling of anger, loneliness (139), anxiety, depression, stress disorders (140), necrophobia and stigmatization (141). In addition, social isolation, higher frequency of diseases, uncertainty of the outbreak (137) and income instability (142) that are associated with the health crisis could undermine the QoL of individuals.

To the best of our knowledge, this is the first study to assess the quality of life of Syrians residing in Portugal. An additional strength of our study is using the Arabic version of WHOQOL-BREF, that is a reliable instrument and applicable cross-culturally (39). Despite these strengths, the findings should be viewed in light of some methodological limitations. Most notably, participants were recruited with the assistance of one educational institutional entity (GP4SYS), which resulted in a potential selection bias. This could increase the margin of error and limit the detection of some differences. Also, these findings should be interpreted with caution, bearing in mind that it was based on a cross-sectional study, which did not allow to draw a causal relationship between variables (143). Our estimates of the prevalence of anxiety or depression were not based on clinical interviews but instead on screening tools, which makes it hard to reach a definitive diagnosis and increases the risk of false positives. Therefore, the generalizability of our findings may be limited and results should be treated with caution. Future studies with larger samples and more diverse ethnic groups that

recruit asylum seekers and refugees in asylum reception centers, are needed to examine further individual and social predictors of QoL, such as premigration factors. An additional limitation is that, although data are anonymous and kept confidential, the possibility of social desirability bias cannot be excluded.

6. CONCLUSION

To conclude, our study showed that the QoL of Syrian migrants is associated with age, gender, income, anxiety and depression. It also showed the existence of disparities in the QoL between Syrian migrants and the general Portuguese population. To provide optimal health care for refugees and asylum seekers and to foster the development of optimal conditions for successful integration in the host country, it is necessary to address their unmet needs and poor living conditions. Migrants impose demands on the host country to achieve a successful integration which, in the long run, contribute to fostering their health status (144,145, 146). Such demands include securing access to the labour market and Portuguese language courses (46). Additionally, many migrants are affected by social marginalization with negative consequences to their health and social exclusion during the acculturation process is a significant acculturative stressor (147). As a result, facilitating the social inclusion of this population is essential. Based on our study, a recommendation for future studies in Portugal on forced and imposed Syrian migrants is to prioritize the aspects of psychological wellbeing. Our study provides evidence that can be used to inform policies to provide a stabilized social support allowance and adequate monthly stipends for refugees and asylum seekers to meet their basic needs, since their wages tend to be very low in Portugal (46). As such, these findings seem to invite special attention for guiding psychological interventions including the development of culturally appropriate mental health services to help refugees manage their symptoms.

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APPENDIX

APPENDIX 1- Invitation email to participate in the study

Subject: Invitation by Walaa Kinaan to participate in study about quality of life

I would like to invite you to participate in a research study entitled “Quality of life of Syrian migrants living in Portugal”. I am a student enrolled in the Master in Public Health of the Institute of Public Health of the University of Porto (ISPUP). This study aims to assess the quality of life of Syrian migrants who received a grant from the Global Platform for Syrian Students and who are still living in Portugal.

I would like to invite you to participate!
Please click on this link to fill in the online questionnaire:

https://inqueritos.up.pt/index.php?r=survey/index&sid=657474&lang=ar

The results of this study can help to promote students’ well-being and to foster the development of optimal conditions for academic achievement and integration in the host country. Your participation entails answering an online questionnaire in Arabic about quality of life and related factors. This will take 15 minutes of your time. Your participation is anonymous and data confidentiality and protection are fully guaranteed. Some questions may cause discomfort.

Should you have any questions or comments, you may contact me

Walaa Kinaan
Institute of Public Health, University of Porto
E-mail: walaa.1993.k@gmail.com
Thank you for your time and participation!

APPENDIX 2- The Questionnaire

QUESTIONNAIRE

Quality of life of Syrian migrants residing in Portugal

This study aims to assess the quality of life of Syrian migrants living in Portugal who enrolled in the national high education system under the program of the Global Platform for Syrian Students.
Quality of life is defined by the WHO as 'an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns'.

There are no right or wrong answers. We are interested in your sincere opinion.

This questionnaire does not record any identification information and it is completely anonymous.

Recording your answers to the questionnaire does not require any information about your identity, unless the questionnaire contains an item that requires that.
If you use a token to access this survey, please note that this token will not be stored with your responses. Your token is administered in a separate database and will only be updated to indicate whether you have completed (or not completed) this survey. There is no way to match identification codes with survey codes.

Thank you for your time and collaboration.

Completion date: |__|__|/|__|__|/|__|__|_____|_____|
(day) (month) (year)

Sociodemographic characteristics

1. Year of birth: |__|_____|__|__|

2. Gender:

- Female ☐1
- Male ☐2

3. Country of Origin:

- Syria ☐1
- Another country ☐2

4. Where do you currently reside?
Country:_____
City:_____
5. When did you first arrive to Portugal?
Month:_____Year: _____

6. In total, for how have you been living in Portugal?
Days: |__|__| Months: |__|__| Years: |__|__|

7. What is your marital status?

- Single	☐1	- Separated (married but not living with partner)	☐4
- Consensual union (living with a partner)	☐2	- Divorced	☐5
- Married	☐3	- Widow	☐6

8. Does your family still reside in Syria?

- Yes, all my family resides in Syria. ☐1
- No, my family does not reside in Syria. ☐2
- Some of my family members reside in Syria ☐3
  Which family members?

9. Do you speak the Portuguese language?

Yes, I speak Portuguese fluently. ☐1
I speak Portuguese enough to manage daily life activities. ☐2
No, I do not speak Portuguese. ☐3

10. What is your highest education degree?

- Secondary Education ☐1
- Bachelor ☐2
- Master ☐3
- PhD ☐4

11. At this moment, what is your main occupation? (Please choose only one option)

- Student/In Professional training	☐1	- Household work	☐5
- Full-time employee	☐2	- Retired/Pre-retired	☐6
- Part-time employee	☐3	- Other. Which?	☐7
- Unemployed	☐4		

12. You consider your household income to be:

- Insufficient ☐1
- I need to be cautious with expenses ☐2
- It is enough to make ends meet ☐3
- Comfortable ☐4

This assessment asks how you feel about your quality of life, health, or other areas of your life. If you are unsure about which response to give to a question, please choose the one that appears most appropriate. This can often be your first response.

We ask that you think about your life in the last two weeks. Please read each question, assess your feelings, and select the number on the scale for each question that gives the best answer for you.

		Very poor	Poor	Neither poor nor good	Good	Very good
1(G1)	How would you rate your quality of life?	☐1	☒2	☐3	☐4	☐5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2 (G4)	How satisfied are you with your health?	☐1	☐2	☐3	☐4	☐5

The following questions ask about **how much** you have experienced certain things **in the last two weeks**.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3 (F1.4)	To what extent do you feel that physical pain prevents you from doing what you need to do?	☐1	☐2	☐3	☐4	☐5
4(F11.3)	How much do you need any medical treatment to function in your daily life?	☐1	☐2	☐3	☐4	☐5
5(F4.1)	How much do you enjoy life?	☐1	☐2	☐3	☐4	☐5
6(F24.2)	To what extent do you feel your life to be meaningful?	☐1	☐2	☐3	☐4	☐5

		Not at all	A little	A moderate amount	Very much	Extremely
7(F5.3)	How well are you able to concentrate?	☐1	☐2	☐3	☐4	☐5
8 (F16.1)	How safe do you feel in your daily life?	☐1	☐2	☐3	☐4	☐5
9 (F22.1)	How healthy is your physical environment?	☐1	☐2	☐3	☐4	☐5

The following questions ask about how completely you experience or were able to do certain things in the last two weeks.

		Not at all	A little	Moderately	Mostly	Completely
10 (F2.1)	Do you have enough energy for everyday life?	☐1	☐2	☐3	☐4	☐5
11 (F7.1)	Are you able to accept your bodily appearance?	☐1	☐2	☐3	☐4	☐5
12 (F18.1)	Have you enough money to meet your needs?	☐1	☐2	☐3	☐4	☐5
13 (F20.1)	How available to you is the information that you need in your day-to-day life?	☐1	☐2	☐3	☐4	☐5
14 (F21.1)	To what extent do you have the opportunity for leisure activities?	☐1	☐2	☐3	☐4	☐5

		Very Poor	Poor	Neither Poor nor good	Good	Very Good
15 (F9.1)	How well are you able to get around?	☐1	☐2	☐3	☐4	☐5

The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks**.**

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16 (F3.3)	How satisfied are you with your sleep?	☐1	☐2	☐3	☐4	☐5
17 (F10.3)	How satisfied are you with your ability to perform your daily living activities?	☐1	☐2	☐3	☐4	☐5
18(F12.4)	How satisfied are you with your capacity for work?	☐1	☐2	☐3	☐4	☐5
19 (F6.3)	How satisfied are you with yourself?	☐1	☐2	☐3	☐4	☐5
20(F13.3)	How satisfied are you with your personal relationships?	☐1	☐2	☐3	☐4	☐5
21(F15.3)	How satisfied are you with your sex life?	☐1	☐2	☐3	☐4	☐5
22(F14.4)	How satisfied are you with the support you get from your friends?	☐1	☐2	☐3	☐4	☐5

23 (F17.3)	How satisfied are you with the conditions of your living place?	☐1	☐2	☐3	☐4	☐ 5
24 (F19.3)	How satisfied are you with your access to health services?	☐1	☐2	☐3	☐4	☐ 5
25 (F23.3)	How satisfied are you with your transport?	☐1	☐2	☐3	☐4	☐ 5

The following question refers to how often you have felt or experienced certain things in the last two weeks.

		Never	Seldom	Quite often	Very often	Always
26(F8.1)	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	☐1	☐2	☐3	☐4	☐5

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past week, including today, by selecting the number in the corresponding space in the column next to each symptom

	Not at all	Mildly, but it didn't bother me much	Moderately – it wasn't pleasant at times	Severely – it bothered me a lot
1. Numbness or tingling	☐0	☐1	☐2	☐3
2. Feeling hot	☐0	☐1	☐2	☐3
3. Wobbliness in legs	☐0	☐1	☐2	☐3
4. Unable to relax	☐0	☐1	☐2	☐3
5. Fear of worst happening	☐0	☐1	☐2	☐3
6. Dizzy or lightheaded	☐0	☐1	☐2	☐3
7. Heart pounding / racing	☐0	☐1	☐2	☐3
8. Unsteady	☐0	☐1	☐2	☐3
9. Terrified or afraid	☐0	☐1	☐2	☐3
10. Nervous	☐0	☐1	☐2	☐3
11. Feeling of choking	☐0	☐1	☐2	☐3
12. Hands trembling	☐0	☐1	☐2	☐3
13. Shaky / unsteady	☐0	☐1	☐2	☐3
14. Fear of losing control	☐0	☐1	☐2	☐3
15. Difficulty in breathing	☐0	☐1	☐2	☐3
16. Fear of dying	☐0	☐1	☐2	☐3
17. Scared	☐0	☐1	☐2	☐3
18. Indigestion	☐0	☐1	☐2	☐3
19. Faint / lightheaded	☐0	☐1	☐2	☐3
20. Face flushed	☐0	☐1	☐2	☐3
21. Hot / cold sweats	☐0	☐1	☐2	☐3

Below are 21 groups of statements. Please read each group of statements carefully. And then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Select the number beside the statement you have picked. If several statements in the group seem to apply equally well, select the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness	0. I do not feel sad.	☐0
	1. I feel sad much of the time.	☐1
	2. I am sad all the time.	☐2
	3. I am so sad or unhappy that I can't stand it.	☐3
2. Pessimism	0. I am not discouraged about my future.	☐0
	1. I feel more discouraged about my future than I used to be.	☐1
	2. I do not expect things to work out for me.	☐2
	3. I feel my future is hopeless and will only get worse.	☐3
3. Past Failure	0. I do not feel like a failure.	☐0
	1. I have failed more than I should have.	☐1
	2. As I look back, I see a lot of failures.	☐2
	3. I feel I am a total failure as a person.	☐3
4. Loss of Pleasure	0. I get as much pleasure as I ever did from the things I enjoy.	☐0
	1. I don't enjoy things as much as I used to.	☐1
	2. I get very little pleasure from the things I used to enjoy.	☐2
	3. I can't get any pleasure from the things I used to enjoy.	☐3
5. Guilty Feelings	0. I don't feel particularly guilty.	☐0
	1. I feel guilty over many things I have done or should have done.	☐1
	2. I feel quite guilty most of the time.	☐2
	3. I feel guilty all of the time.	☐3
6. Punishment Feelings	0. I don't feel I am being punished.	☐0
	1. I feel I may be punished.	☐1
	2. I expect to be punished.	☐2
	3. I feel I am being punished.	☐3
7. Self-Dislike	0. I feel the same about myself as ever.	☐0
	1. I have lost confidence in myself.	☐1
	2. I am disappointed in myself.	☐2
	3. I dislike myself.	☐3
8. Self-Criticalness	0. I don't criticize or blame myself more than usual.	☐0
	1. I am more critical of myself than I used to be.	☐1
	2. I criticize myself for all of my faults.	☐2
	3. I blame myself for everything bad that happens.	☐3
9. Suicidal Thoughts or Wishes	0. I don't have any thoughts of killing myself.	☐0
	1. I have thoughts of killing myself, but I would not carry them out.	☐1
	2. I would like to kill myself.	☐2
	3. I would kill myself if I had the chance.	☐3
10. Crying	0. I don't cry any more than I used to.	☐0
	1. I cry more than I used to.	☐1
	2. I cry over every little thing.	☐2
	3. I feel like crying, but I can't.	☐3
11. Agitation	0. I am no more restless or wound up than usual.	☐0
	1. I feel more restless or wound up than usual.	☐1

	2. I am so restless or agitated, it's hard to stay still.	☐2
	3. I am so restless or agitated that I have to keep moving or doing something.	☐3
12. Loss of Interest	0. I have not lost interest in other people or activities.	☐0
	1. I am less interested in other people or things than before.	☐1
	2. I have lost most of my interest in other people or things.	☐2
	3. It's hard to get interested in anything.	☐3
13. Indecisiveness	0. I make decisions about as well as ever.	☐0
	1. I find it more difficult to make decisions than usual.	☐1
	2. I have much greater difficulty in making decisions than I used to.	☐2
	3. I have trouble making any decisions.	☐3
14. Worthlessness	0. I do not feel I am worthless.	☐0
	1. I don't consider myself as worthwhile and useful as I used to.	☐1
	2. I feel more worthless as compared to other people.	☐2
	3. I feel utterly worthless.	☐3
15. Loss of Energy	0. I have as much energy as ever.	☐0
	1. I have less energy than I used to have.	☐1
	2. I don't have enough energy to do very much.	☐2
	3. I don't have enough energy to do anything.	☐3
16. Changes in Sleeping Pattern	0. I have not experienced any change in my sleeping.	☐0
	1. A I sleep somewhat more than usual.	☐1
	1. B I sleep somewhat less than usual.	☐2
	2. A I sleep a lot more than usual.	☐3
	2. B I sleep a lot less than usual.	☐4
	2. A I sleep most of the day.	☐5
	3. B I wake up 1-2 hours early and can't get back to sleep.	☐6
17. Irritability	0. I am not more irritable than usual.	☐0
	1. I am more irritable than usual.	☐1
	2. I am much more irritable than usual.	☐2
	3. I am irritable all the time.	☐3
18. Changes in Appetite	0. I have not experienced any change in my appetite.	☐0
	1. A My appetite is somewhat less than usual.	☐1
	1. B My appetite is somewhat greater than usual.	☐2
	2. A MY appetite is much less than before.	☐3
	2. B My appetite is much greater than usual.	☐4
	3. A I have no appetite at all.	☐5
	3. B I crave food all the time.	☐6
19. Concentration Difficulty	0. I can concentrate as well as ever.	☐0
	1. I can't concentrate as well as usual.	☐1
	2. It's hard to keep my mind on anything for very long.	☐2
	3. I find I can't concentrate on anything.	☐3
20. Tiredness or Fatigue	0. I am no more tired or fatigued than usual.	☐0
	1. I get more tired or fatigued more easily than usual.	☐1
	2. I am too tired or fatigued to do a lot of the things I used to do.	☐2
	3. I am too tired or fatigued to do most of the things I used to do.	☐3
21. Loss of Interest in Sex	0. I have not noticed any recent change in my interest in sex.	☐0
	1. I am less interested in sex than I used to be.	☐1
	2. I am much less interested in sex now.	☐2
	3. I have lost interest in sex completely.	☐3

Life has changed since the COVID 19 pandemic started. Therefore, we have more final two questions to ask:

1. My responses (answers) would be different if we were not living in the COVID 19 era:
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree.

2. My responses have been changed to:
1. Much better
2. Better
3. Worse
4. Much worse.

Thank you for your time