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Resilience and discrimination: unravelling the multifaceted nature of refugee health in Germany

Daria Mendola^{1*}  and Annalisa Busetta²

*Correspondence:
daria.mendola@unipa.it

¹ Department of Psychology,
Educational Science and Human
Movement (SPPEFF), Palermo,
Italy

² Department of Economics,
Business and Statistics (SEAS),
University of Palermo, Palermo,
Italy

Abstract

The complex topic of health involves various determinants that impact refugees differently from the general population. Refugees' experience itself serves as a determinant, interacting with individual and socio-economic factors throughout the migratory cycle, making them particularly vulnerable. The theoretical contribution of this study lies in its focus on resilience as a key protective factor for refugee health. It deepens the understanding of how resilience can be related to health and its relationship with discrimination and loneliness. This study focuses on refugees in Germany and, via a structural equation model with data from the IAB-BAMF-SOEP Survey of Refugees, drives our attention to the many critical dimensions of refugees' reception, not only as material support but also as a positive interrelation between refugees and the host society. Among the main results, it stands out how feeling or being discriminated against, as well as experiencing social isolation and suffering the distance from friends, worsens refugees' health directly. Moreover, discrimination increases the feeling of loneliness, further contributing to poorer health. In this framework, resilience has been proven to play a role in smoothing hard times in refugees' lives.

Keywords: Health, Refugee, Loneliness, Perceived discrimination, IAB-BAMF-SOEP Survey of Refugees in Germany, SEM

Introduction

The field of refugee and migrant health is highly complex. While the same health determinants may influence refugees and migrants as they influence the general population, their migratory status is a health determinant. In particular, the circumstances surrounding migration—before, during, after, and upon return—play a significant role in shaping the health of migrants and refugees, in addition to their characteristics (WHO, 2022). Furthermore, a combination of factors influences health outcomes in different ways. These factors include the migratory process, social determinants of health, and risks and exposures throughout various phases of displacement and migration, resulting in diverse health outcomes (WHO, 2018).

According to well-known theories of migrants' health, individuals who migrate tend to be healthier due to the selection process favouring individuals with robust physical and mental well-being—a phenomenon known as the “healthy immigrant effect”. Moreover, individuals who decide to move generally exhibit higher motivation, ambition, and resilience, known as migration selectivity (Chiswick et al., 2008). However, it is essential to note that these theories may not hold for refugees compelled to flee from situations that put their lives at risk and that, particularly among individuals who suffered trauma and stressful experiences (like refugees), mental and physical health concur in shaping the general health condition of individuals. Refugees often endure strenuous journeys and prolonged stays in camps (Matlin et al., 2018), and their mental and psychological health conditions frequently deteriorate during their journeys (Ellis et al., 2019). The process of fleeing persecution or conflicts may result in severing their social and family networks (Cheung & Phillimore, 2013), with consequences for feelings of loneliness, mental health, and life satisfaction. Indeed, while migrants actively choose their country of destination based also on social networks available at the destination (Gërxhani & Kosyakova, 2020), refugees' choice is linked to a need to survive.

Academic research on refugees in destination countries has traditionally focused on refugee trauma, persecution, displacement, and their profound effects on mental and physical health (Carswell et al., 2011; Nakash et al., 2015; Sinnerbrink et al., 1997; Walther et al., 2020). Some studies have investigated the impact on the health of the socio-economic, living, and working conditions refugees encounter upon arriving at their destination (Mendola & Busetta, 2021), often in terms of housing, employment opportunities, and access to education and healthcare services on the health and well-being of refugees (Bevelander et al., 2019; DeVoretz et al., 2004; Jackson & Bauder, 2014). In contrast, refugees' subjective evaluation of their lives and their determinants has started to draw scholarly attention only in more recent years (Ambrosetti et al., 2021; Fozdar & Torezani, 2008; Haindorfer et al., 2022; Mendola et al., 2024).

This paper focuses on the determinants of refugees' multidimensional self-assessed health in a high-income country, specifically, how these health conditions are connected to the perceived dimensions of discrimination and loneliness and the role of individual resilience. This study involved refugees and asylum seekers who arrived in 2013–2017 in Germany, the fifth-largest host country of refugees in the world ranking, the first European country for the number of hosted refugees and the second-largest humanitarian donor (UNHCR, 2021).

Literature review

Our literature review on refugee health focused on individual subjective dimensions, such as perceptions of discrimination, loneliness, and resilience, while exploring their connection to mental and physical health conditions. The legal status of refugees and migrants, along with the experience of being a foreigner, adds a layer of complexity and intensity to the determinants of health (Mosca et al., 2017), often resulting in poorer health outcomes compared to the host population, particularly when considering the conditions in which they live and work. For example, it is widely documented that foreigners face additional barriers to receiving timely medical diagnosis, treatment, and care, which might increase the prevalence and severity of diseases.

Moreover, stigma and discrimination—often experienced by refugees and migrants during interactions with the healthcare system—may hamper their access to health services. Discrimination is acknowledged as a major stressor of immigrant health (Szaflarski & Bauldry, 2019); it acts as both an acute and chronic stressor that prompts physiological responses. Adverse outcomes associated with discrimination include not only poor mental health (e.g. anxiety, depression) and unhealthy lifestyle behaviours (e.g. smoking and drinking) but also poor physical health (e.g. cardiovascular and respiratory diseases)—see Clark et al. (1999), Williams (1999), and Williams et al. (2003). Discrimination can manifest at the institutional level—through practices, policies, or processes that perpetuate avoidable inequalities among different groups—and at the interpersonal level, through interactions between individuals who could also have internalised beliefs, or attitudes about the perceived inferiority of one's group. But it is mainly a subjectively experienced situation that induces physiological and psychological responses (Andrighetto et al., 2013; Ziersch et al., 2020). Indeed, recent papers have identified perceived discrimination as a factor that limits opportunities for refugees, especially young refugees (Deuchar, 2011), and impedes their access to health services (Szaflarski & Bauldry, 2019) and successful integration (Takeuchi, 2016; Williams, 2012). Studies have shown that perceived ethnic discrimination is pervasive across different groups of immigrants and ethnic minorities both in the U.S. and in Europe (Straiton et al., 2019). However, the types and incidences of perceived discrimination change by group (e.g. ethnic origin and skin colour are more frequently cited in some groups) and are related to how groups are perceived in society (Andriessen et al., 2014).

Szaflarski and Bauldry (2019) focused on the effects of perceived discrimination on the health of immigrants and refugees in the U.S. It was concluded that “*among first-generation immigrants, discrimination in health care had a negative association with physical health while discrimination, in general, had a negative association with mental health*.” Edge and Newbold's (2013) study in Canada suggested that discrimination impacts health through various pathways (e.g. disproportionate exposure to hazardous environments, psychosocial stressors, inadequate medical care, economic deprivation, social exclusion, etc.). A study by Di Saint Pierre et al. (2015) in the Netherlands showed that perceived discrimination and low host country identification increase the likelihood of refugees wanting to return to their home country. Interestingly, those more educated and proficient in the host country's language are proven to perceive more discrimination. In contrast, frequent contact with natives leads to lower perceived discrimination, greater identification and a lower desire to return. The perception of discrimination is also linked with individual feelings of loneliness (Castaneda et al., 2015).

Perceived loneliness among migrants and refugees represents a pressing issue in contemporary societies. A large part of the literature investigates the role of loneliness among older migrants, finding a significant relationship between being a migrant and feeling lonely and underlining how the intersection of ageing and migration background causes a trap of vulnerabilities with health consequences (see, among many others, Jessen et al., 2018 in Denmark; Victor et al., 2012 in the UK). Fewer studies have investigated the role of loneliness in migrant populations in general (e.g. Cela & Belgiojoso, 2021 in Italy; Visser & El Fakiri, 2016 in the Netherlands). Studies on migrants have shown that in a novel context where individuals must establish new personal relationships, they

often experience higher levels of loneliness than natives (Koelet & de Valk, 2016). Such loneliness is exacerbated by cultural differences and language barriers (de Jong Gierveld et al., 2015). Nevertheless, it gradually decreases with the length of residence in the destination country (Dolberg et al., 2016). The few existing studies on refugees and asylum seekers confirm these results and show that high levels of loneliness and isolation are mainly due to low language skills and being separated from one's family (e.g. Mendola et al., 2024; Strijk et al., 2011; Wicki et al., 2021). A recent study by Löbel et al. (2022) analysed differences in loneliness among migrants, refugees, and the host population in Germany, providing evidence of higher social isolation and loneliness among refugees than among host and migrant populations, with a greater need for social networks and support among refugees. The greater exposure of refugees (compared to migrants) to loneliness was also proven by Ryan et al. (2008). Furthermore, refugees struggle to reach social, cultural, and legal integration in the host country, expressing high potential and actual vulnerability (Busetta et al., 2021).

A recent study on refugees in Germany by Belau et al. (2021) revealed that many respondents felt socially isolated, perceiving a moderate degree of loneliness and social support. Moreover, social integration, social support, and loneliness were correlated with health-related determinants of quality of life. This finding emphasises the need for prolonged attention to loneliness among resettled refugees in Germany, suggesting the importance of addressing loneliness to improve refugees' overall well-being.

Scientific literature widely acknowledges resilience as a crucial protective factor for the psychosocial well-being of forced migrant populations, a subject that has been extensively examined in research (Siriwardhana et al., 2017). The model on Migration Health Vulnerability and Resilience, described in the OIM report by Mosca et al. (2017), clearly shows how migrants' health is shaped not only by vulnerabilities (e.g. poverty, discrimination, limited access to healthcare) but also by protective factors that build resilience (e.g. social networks, better living conditions, community support) suggesting the importance of enhancing resilience through non-medical interventions and community-based strategies to foster better health and well-being for migrant populations. Although facing significant adversity before, during, and after resettlement, many refugees show an enormous ability to cope (i.e. resilience) with conditions of deprivation and survive against adversity (Tiong, 2006). Despite the pervasiveness of the trauma narrative in refugee people's lives, the majority of those who survive do not develop significant mental disorders (Rosner et al., 2003) thanks to their resilience. Hutchinson and Dorsett (2012) identified several factors that either build or impede resilience in refugee people. Internal resources, such as optimism, adaptability, perseverance, and religiosity, were identified in the literature as major contributors to refugee resilience. Several qualitative studies have also emphasised the importance of family (including extended family), friends, and community in bolstering resettled refugees' resilience or reducing it when family is lacking or far and in danger (Hutchinson & Dorsett, 2012). Moreover, Walther et al., 2020 underscored how living in refugee housing facilities further isolates newcomers from the host population and other migrants, affecting refugee mental health. These studies within the refugee community showed the relevance of the reciprocal processes of giving and receiving support and its relationship to resilience (Schweitzer et al., 2007; Sossou et al., 2008).

Theoretical framework and research questions

In this paper, the theoretical framework focuses specifically on refugees and asylum seekers encompassing previous literature evidence on their health in an integrated model. The model is grounded on the importance of perceptions and feelings for physical and mental health, and on the understanding that resilience plays a key role in shaping the health outcomes of refugees. Specifically, this study explores the influence of resilience on a self-reported health measure, encompassing various subjective evaluations of both physical and mental well-being,¹ highlighting how it relates to the subjective dimensions of discrimination and loneliness. In this theoretical framework, the resilience of refugees is their capacity to adapt, recover, and maintain their well-being despite exposure to adverse conditions, such as forced displacement, the loss of familiar and social relations, and acculturation stress. The resilience of refugees, who often face socio-economic and emotional difficulties and legal barriers in host countries, is conceived to be a crucial factor that can improve refugees' health and smooth some health determinants.

The theoretical premise posits that resilience can directly improve health outcomes, as well as indirectly influence health through its impact on subjective experiences like perceived discrimination and loneliness (Fadhli et al., 2022; Solà-Sales et al., 2021). Discrimination, conceived as both the subjective perception and experience of being treated unfairly in the host society, is hypothesised to be negatively associated with health outcomes. Furthermore, resilience is expected to buffer these adverse effects by reducing feelings of loneliness which in turn is linked to better health outcomes. Both discrimination and loneliness are defined specifically concerning the refugee's condition, encompassing the feeling of being welcome in the country of destination, the worry about xenophobia and the reported direct experience of discrimination due to ethnic origin, the lack of compatriots and fellow nationals, and the feeling of social isolation. According to this framework, resilience is positively associated with good health conditions, while discrimination and loneliness are negatively associated with good health conditions. Furthermore, we assume that resilience has an interplay with discrimination and loneliness and that these are connected to each other.

The following detailed hypotheses are formulated to empirically test the associations between resilience, discrimination, loneliness, and health, specifically self-assessed health, among refugees.

Hypothesis 1: Refugees exposed to higher levels of discrimination or loneliness are anticipated to report poorer health outcomes. This detrimental association is postulated to be mediated by psychological stress.

Hypothesis 2: Feelings of loneliness mediate the negative link between discrimination and reported health. Discrimination is believed to be linked to increased loneliness, and both loneliness and discrimination are independently associated with poorer reported health outcomes.

Hypothesis 3: More resilient refugees are expected to perceive less discrimination and loneliness.

¹ Along the whole paper, health is measured as a latent construct, grounding on self-assessed measures, as analytically explained in Sect. "Response variable and other related constructs".

Hypothesis 4: More resilient refugees are expected to report better physical and mental health. This positive relation is supposed to be both direct, through psychological coping mechanisms, and indirect, through the relations between resilience, discrimination, and loneliness.

It should be noted that resilience is the only exogenous construct in our theoretical framework, while discrimination and loneliness are endogenous to measuring self-assessed health. Furthermore, due to the cross-sectional nature of the data and the statistical models presented later, all hypotheses should be interpreted as representing associations, with causal relationships being inferred only.

Data and methods

Sample

Our analyses rely on first-time respondents of the first two waves of the IAB-BAMF-SOEP Survey of Refugees (Brücker et al., 2021) conducted in Germany (i.e. samples M3-M4 and M5).² The target population comprises asylum seekers and refugees who entered Germany and applied for asylum or temporary protection in 2013–2017, regardless of the application results. In addition, the respective household members (aged 18 or older) were also interviewed.

The survey was carried out by the Research Centre of the Federal Office for Migration and Refugees (BAMF-FZ) in cooperation with the Institute for Employment Research (IAB) and the Socio-Economic Panel (SOEP) at DIW Berlin. The participants were selected from the Central Register of Foreigners (AZR) using a two-stage, disproportionate stratified sampling design.³

The survey gathers information on individual socio-demographic characteristics and household-level information. This includes education, labour skills, current work situation, language skills, housing and family situation, social participation, feelings, perceptions, attitudes, and various psychometric scales. The initial sample is made of 7,430 individuals. Excluding cases with missing values for the variables involved in this analysis (and introduced in the next section), our “working” sample included 5,900 adults⁴ with a prevalence of men (70%).⁵ The four main nationalities—Afghan, Eritrean, Iraqi, and Syrian—account for approximately 65% of the sample. The mean age ranges from 26 years among Eritreans to 31 years among Syrians, and the percentage of women in the sample ranges from 27% of Eritreans to 31.5% of Syrians.

² The version used is IAB-BAMF-SOEP Survey of Refugees v.38.1eu. From the M3-M5 data of the years 2016–2021 (https://www.diw.de/en/diw_01.c.885460.en/edition/iab-bamf-soep-survey_of_refugees_2021_-_update.html), we excluded those in M5 who were already interviewed in M3 and M4. Despite the longitudinal setting of the survey, it is important to highlight that health information (including the SF-12 scale) is recorded at the first interview and then only in even years. Furthermore, attrition across waves is remarkable, and new interviewees after 2017 are very few. This is why we selected only those with their first interview in 2016 and 2017.

³ In the two-stage sampling, the primary sampling units (PSUs) are the regional clusters of immigration offices and the secondary are the individuals selected on a disproportional sampling scheme that ensured minimum sample sizes for subgroups of refugees. Participation in the study is voluntary. For more information on the sampling strategy, see Jacobsen et al. (2019), Kühne et al. (2019), and Kroh et al. (2017).

⁴ We tested for selection bias in age, sex, and country. Only for Syrians, there is evidence of selection with an increased probability of inclusion in the sample used for estimates, while there is no evidence of selection of “fully-respondents” for age, sex, nationality, and their interactions.

⁵ Henceforth, all descriptive statistics refer to our sample and are weighted.

Response variable and other related constructs

Our main interest here is to determine the factors associated with the current health status of refugees living in Germany. Since health is a multidimensional concept that includes physical and mental well-being, it is difficult to have a consistent measure that is valid across populations and subgroups (as underscored by the WHO, 2018). Moreover, social surveys, such as the one we are using here, do not provide medical assessments of health, while grounding health measurements on indirect or self-reported information.

The literature on health measures states that the information people use to assess their health is derived from a combination of assessments of general physical functioning, health behaviours, mental health, and general social experience. Nevertheless, the significance attributed by individuals to these dimensions of health varies considerably across subgroups within population (Ploubidis & Grundy, 2011). In particular, studies on immigrant health in Europe have shown that immigrant groups differ in health status (Saint-Fort et al., 2023), with some studies showing better health status among migrants than among their native counterparts (e.g. Hernández-Quevedo & Jiménez-Rubio, 2009, in Spain) and others showing poorer health status (Chandola, 2001, in the UK).

In this paper, the concept of health is intended as a latent construct, where physical and mental facets represent distinct yet interrelated aspects that collectively define overall health. We believe that, particularly among individuals who suffered trauma and stressful experiences (like refugees), these two facets interact, contributing to the general condition of individual health. Moreover, the primary objective of this study is to investigate the effect of perception-based and subjective variables on several aspects of mental and physical health status. Considering this, the health measurement model consists of 11 manifest variables from the SF-12 scale (Jacobsen et al., 2017; Ware et al., 1996), which makes it possible to reduce the impact of random errors that can come from single measurements or any aggregation. The SF-12 is a short version of SF-36 which consists of the Mental and Physical Component Summary Scales (MCS/PCS). Both scales are well known and have been used repeatedly in the SOEP. Particularly, these variables (labelled as “ple_ _ _”) account for physical and psychological health. We used the version of the SOEP scale tested on refugees (see Jacobsens et al., 2017). In detail, they account for as follows:

difficulties in ascending stairs (ple0004)—a lot, a little, or not at all,
difficulties in doing tiring tasks (ple0005)—a lot, a little, or not at all.

How often in the last four weeks... [scale: 1 (very often), 2 (often), 3 (sometimes), 4 (almost never), 5 (never)]:

had physical pain (ple0030),
accomplished less due to physical problems (ple0031),
had limitations due to physical problems (ple0032),
felt run-down, melancholy (ple0027),
was well balanced (ple0028),

was energetic (ple0029),
 accomplished less due to emotional problems (ple0033),
 was limited socially due to health (ple0035).

How is his/her:

current health (ple008) [scale from 1 (very well) to 5 (poor)].

We excluded the item “was less careful due to emotional problems” (ple0034) due to its high correlation with the item “accomplished less due to emotional problems” (ple0033), which resulted in computational issues. All the variables were ordered in the same direction so that the higher the score, the better the health condition.

To test the complex model of relationships around health, we also included refugees’ perceptions of discrimination and loneliness and their resilience in our analysis, which were defined and measured as follows.⁶

- a) *Perceived discrimination* is defined as the perception and declaration of unfair treatment due to specific characteristics such as gender, age, ethnicity, and sexual orientation. It should be noted that this definition implies that not discriminatory events according to the law can also be perceived as discriminatory. In contrast, events that are discriminatory by law could not be reported because they are not experienced as such by the person in question (Andriessen et al., 2014). Perceived discrimination is here measured through refugees’ evaluations, capturing the individual’s sense of “belonging” or feeling welcome in German society (“Do you feel welcome in Germany now?”—*welcome*—on a 5-point Likert scale from 1 “Totally” to 5 “Not at all”). Additionally, we assess experiences of ethnic discrimination using answers to “How often have you personally experienced being disadvantaged in Germany because of your origin?” (*discrim*) on a scale from 1 “Frequently”, to 3 “Never”. Finally, we include societal ethnic discrimination in response to concerns about anti-foreigner sentiment and xenophobia in Germany (“Do you worry about anti-foreigner sentiment and xenophobia in Germany?”—*xenof*—on a scale ranging from 1 “Yes, I worry a lot” to 3 “No, I don’t worry at all”).
- b) *Loneliness* is defined as the experience of lacking quality of social contact. In this paper, we do not consider the quantity and/or frequency of social relationships but only emotional loneliness, i.e. the lack of social relationships as intimate as desired (de Jong-Gierveld & Van Tilburg, 2006). Following Jacobsen et al. (2017), we measured the concept of loneliness by the three items of the UCLA Loneliness Scale (Russell, 1996). The items are measured on a Likert scale ranging from 1 (very often) to 5 (never). The three items considered are “How often do you... (1) ...miss the company of others?—*misscom*; (2) ...feel socially isolated?—*isolated*; (3) ...miss people from your country of origin?—*missnat*”.
- c) *Resilience* is defined as “the process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional, and behavioral flexibility and adjustment to external and internal demands” (APA, 2023). It regards

⁶ In choosing the questions for each dimension, we took into account only those who were formulated in the same way in the two waves considered.

the individual's capacity to rebound from adversity and challenges, signifying attributes such as inner strength, competence, optimism, flexibility, and the ability to cope effectively in the face of adversity. Here, scores are given by the BRCS-Brief Resilient Coping Scale⁷ proposed by Sinclair and Wallston (2004) and implemented in the IAB-BAM-SOEP. In particular, it is a 7-point scale ranging from “totally disagree” to “totally agree”. We selected:

- I try to think of how I can change difficult situations (*resil1*);
- No matter what happens to me, I think I have my reactions under control (*resil2*);
- I think I can develop further if I deal with difficult situations (*resil3*);
- I actively seek ways to balance out the losses that have affected my life (*resil4*).

Description of observed indicators

The analysis of SF-12 items on health provides a first portrait of refugees' health conditions in our sample: 14% reported severe pain in the last 4 four weeks, 7.3% had difficulties with tiring tasks, and approximately 29% reported run-down melancholy in the last four weeks. Furthermore, 12% have limitations in daily life or work due to emotional problems (accomplishing less or being less careful because of emotional problems); about 9% are often or very often socially limited due to health problems.

The presence of anxiety and depression in the four weeks before the interview was consistent with the frequent feelings of social isolation among refugees (25.6%). Additionally, 61% often or very often reported missing company of compatriots, while 40.3% reported a general lack of company of others. Regarding perceived discrimination, 7.4% of refugees expressed concern about hostility towards foreigners, 5% felt barely or not at all welcome, and 10.1% reported experiencing disadvantage due to their origin.

Finally, the analysis of resilience items (assessed on a scale from 0 to 7) revealed a generally high level of resilience in all the items considered, with the lowest mean value (6.09) under the sentence “No matter what happens to me, I think I have my reactions under control”, and approximately 6.25 on all the others.

The structural equation model

Health (HE), Resilience (RE), Perceived Discrimination (DI), and Loneliness (LO) are complex, abstract, and multidimensional constructs that can be affected by deviations or inaccuracies in observed variables due to random or systematic factors. To consider the potential measurement errors, we decided to conceptualise them as latent variables. Since the indicators presented above may not fully capture the underlying construct, with consequences in terms of the validity and reliability of our model, we decided to rely on structural equation modelling (SEM). This statistical technique is widely used to explore complex phenomena (Kline, 2023). SEMs formalise relationships among latent variables and statistically test for the validity of the theoretical model; furthermore, they allow for quantifying direct and indirect associations among latent variables. An SEM comprises, the “measurement model” and the “structural model”. The main interest usually resides in the last one. In particular, the measurement model consists of equations

⁷ For an overview, on the use of this scale in the SOEP, see Richter et al. (2013).

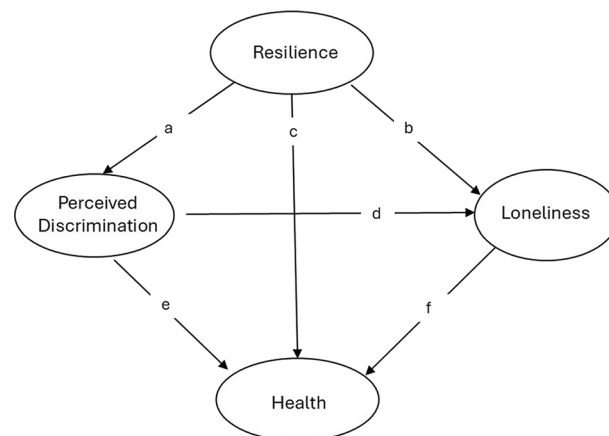


Fig. 1 Theoretical framework: Structural equation model for the health of refugees

that measure latent variables through observed variables and define how observed variables are related to their latent variables and how much measurement error is associated with each observed variable. The structural model sets associations among latent variables and, under certain conditions, also causal relationships. Indeed, despite often mistakenly stated in some literature, an SEM does not aim to establish causal relations from associations alone (Bollen & Pearl, 2013) and in the following analyses, we will never imply causal relations among our latent constructs.

Hence, our main interest is evaluating the interplay among resilience, loneliness, and perception of discrimination with the health of refugees directly and/or indirectly. Figure 1 shows the structural model we hypothesised. In particular, we aimed to test the direct effects of RE, DI, and LO on health, and, at the same time, a) the indirect effects of DI on health through the mediator LO and b) the indirect effects of RE on health through the mediator constructs DI and LO.⁸

Control variables (namely, age and sex) are considered to have a direct effect on health and discrimination, while nationality (five categories: Syrian, Afghan, Eritrean, Iraqi, and all other nationalities) are supposed to have a direct effect on all the endogenous latent variables. To control for differences by nationality, we modelled these effects, following McNeish and Kelley's (2019) approach. We accounted for nationalities dummies in all endogenous latent variables, hence controlling for the variability due to different ethnic origins and accounting for participants' clustering in nations. This method controls cross-nationality variability in the model and is particularly suited for analysing clustered data with a small number of clusters (see McNeish & Kelley, 2019). The structural model remained unchanged also controlling for nationality.

⁸ Data analysis: We used R (Version 4.2.0) and the library lavaan (Version 0.6–11). Regarding structural equation modelling, robust estimation methods were applied to avoid the disadvantages of the violation of multivariate normality assumptions (e.g. lack of statistical power and biased parameter estimation). We set the option to define all observed variables as ordered categorical. All models were tested using the diagonal weighted least-squares means and variance-adjusted estimation (DWLS).

Table 1 Loadings of the measurement model

Latent variables	Measurement variables	Loadings	Standardised estimates* (st. lv)	p-value	R ²
Discrimination (DI)	Welcome	1	0.702	0.000	0.476
	Xenof	0.917	0.643	0.000	0.403
	Discrim	0.939	0.542	0.000	0.422
Loneliness (LO)	Isolated	1	0.892	0.000	0.794
	Missnat	0.358	0.319	0.000	0.102
	Misscom	0.674	0.602	0.000	0.362
Resilience (RE)	Resil1	1	0.750	0.000	0.562
	Resil2	0.788	0.591	0.000	0.349
	Resil3	1.128	0.846	0.000	0.715
	Resil4	1.033	0.775	0.000	0.600
Health (HE)	Difficulties in ascending stairs (ple0004)	1	0.844	0.000	0.638
	Difficulties in tiring tasks (ple0005)	0.996	0.841	0.000	0.634
	Physical pain last four weeks (ple0030)	0.998	0.842	0.000	0.636
	Accomplished less due to physical problems (ple0031)	1.198	1.011	0.000	0.876
	Limitations due to physical problems (ple0032)	1.212	1.024	0.000	0.894
	Run-down, melancholy last 4 weeks (ple0027)	0.731	0.617	0.000	0.358
	Well-balanced last 4 weeks (ple0028)	0.546	0.461	0.000	0.205
	Energetic last four weeks (ple0029)	0.534	0.451	0.000	0.196
	Accomplished less due to emotional problems (ple0033)	1.016	0.858	0.000	0.656
	Limited socially due to health (ple0025)	0.977	0.825	0.000	0.612
	Current health (ple0008)	0.888	0.750	0.000	0.515

*Standardised coefficients allow comparison of indirect or compound effects among different sets of paths in the same model: for example, comparing direct vs indirect pathways in a partial mediation model. They are useful for comparing the relative magnitude of change associated with different paths in the same model (i.e. using data drawn from the same population (Lefcheck, 2021))

Results

Let us now analyse the results from the SEM introduced in the previous section, starting from the appropriateness of the *measurement model*, that is, on how well the observed indicators reflect the latent constructs. All the coefficients for the observed indicators are highly significant ($p < 0.001$), see Table 1. In measuring Discrimination (DI), feeling welcome in Germany contributes the most to shaping the latent construct. Furthermore, women are less discriminated against than men and older people less than youngsters. Loneliness is measured mainly by the feeling of social isolation, while the main contribution to the variation in resilience is given by “*resil3*” (I think I can develop further if I deal with difficult situations). Finally, the estimated health measurement model got the highest contributions coming from physical health indicators (see ple0031 and ple0032 in Table 1) and, in analogy with what was observed for discrimination, women (-0.058^{**}) and older people (-0.005^{***}) are slightly in better health.⁹

⁹ p-value symbols: *** < 0.01; ** < 0.05 * < 0.10.

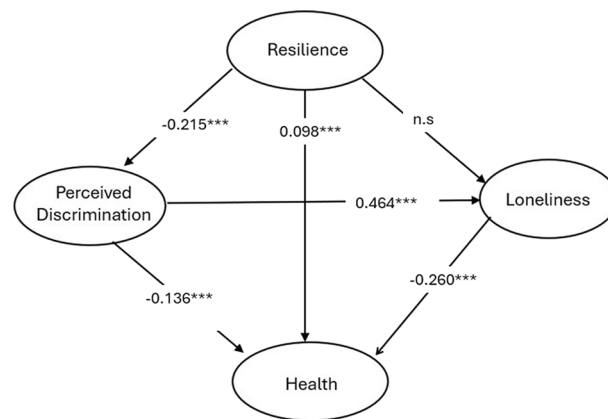


Fig. 2 The estimated structural model for the health conditions of refugees (standardised coefficients).

Note: p-value symbols: *** < 0.01; ** < 0.05 * < 0.10

Table 2 Differences among refugees by their nationality in health, discrimination, and loneliness

Nationality	Health	Discrimination	Loneliness
Afghanistan	− 0.054***	− 0.039**	− 0.016
Eritrea	0.086***	− 0.088***	0.040**
Iraq	− 0.018	− 0.240***	0.060***
Syria	0.032*	− 0.260***	0.097***

All other countries are the reference group

p-value symbols: *** < 0.01; ** < 0.05 * < 0.10

Regarding the structural model, all the relationships among the latent variables are highly significant and have the expected signs. Loneliness and discrimination have, as expected, a negative direct relation with the health of refugees, while resilience contributes to improving health. In particular, health is positively associated with RE (0.111***) and negatively associated with LO (−0.246***) and DI (−0.163***). Figure 2 shows schematically the strength of the estimated relationships in the structural model and Table 2 reports the estimated direct relationships among the four latent variables (in terms of both standardised and unstandardised coefficients) and the *total effects* of discrimination, loneliness, and resilience (as latent variables) on health (including direct and indirect effects).

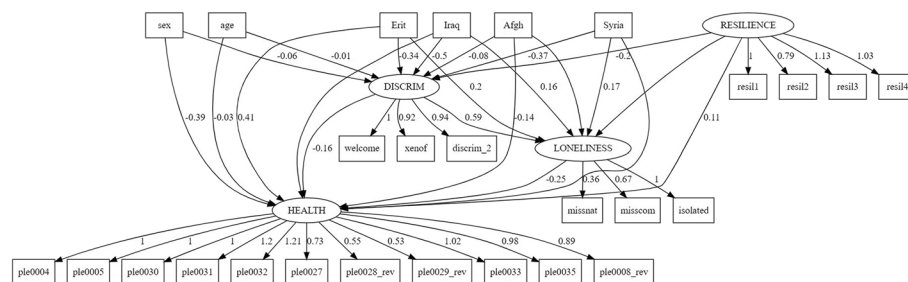
Some differences among nationalities were observed for latent variables even without a clear pattern (see Table 2). Refugees from different countries experience different levels of discrimination, loneliness, and health. Particularly, when compared to the residual group (intended as people from any country but Afghanistan, Eritrea, Iraq, and Syria), Afghans show lower levels of health and discrimination. Eritreans and Syrians show lower discrimination, higher loneliness, and better health. Iraqis are less discriminated against while lonelier, but at the same time, they enjoy the same health as other refugees.

Considering also the indirect effect of discrimination on health through loneliness, the total effect is still negative and significant at 1% (−0.308**).

Table 3 Path coefficients and total effects of other latent variables on health

Latent Variables	Links' labels, as in Fig. 1	Path coefficients	Standardised estimates (std.lv)
<i>Health</i>			
HE-LO	f	− 0.246***	− 0.260
HE-RE	c	0.111***	0.098
HE-DI	e	− 0.163***	− 0.136
<i>Loneliness</i>			
LO-DI	d	0.590***	0.464
LO-RE	b	0.023	0.019
<i>Discrimination</i>			
DI-RE	a	− 0.201***	− 0.215
Total effect DI on HE: (DI,HE) + (DI,LO,HE)	e + df	− 0.308***	− 0.256
Total effect RE on HE: (RE, HE) + (RE,DI,HE) + + (RE,DI,L O,HE)	c + ae + adf + bf	0.167***	0.148
Total effect LO on HE: (LO, HE)	f	− 0.246***	− 0.260

p-value symbols: *** < 0.01; ** < 0.05 * < 0.10

**Fig. 3** Path diagram for testing the health conditions of refugees. Note: The label “_rev” is added to those variables that were reversed to have the same direction as the others in the model

Similarly, considering the indirect effect of resilience on health through discrimination and loneliness (considered one by one or in combination; see Table 3), the total effect is still positive and highly significant (0.167***).

Finally, the direct relationship between loneliness and health is negative and significant at 1% (−0.246***). This is something to bear in mind, considering that the feeling of loneliness is more diffuse among refugees than among other migrants and natives (e.g. Löbel et al., 2022).

The next path diagram (Fig. 3) describes the entire estimated SEM. The goodness-of-fit statistics¹⁰ support the theoretical framework introduced in Sect. "The structural

¹⁰ The models' fit was evaluated using indexes (Hu & Bentler, 1999): the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker–Lewis index (TLI). RMSEA is an absolute fit index, in that it assesses how far a hypothesised model is from a perfect model. An absolute measure of fit presumes that the best-fitting model has a fit of zero. The measure of fit then determines how far the model is from perfect fit. Hence, RMSEA is a “badness measure of fit” in that the bigger the index, the worse the fit is. It ranges between 0 and 1. Based on Gunzler et al. (2021), we considered RMSEA values acceptable if below .08 and as satisfactory if close to or below .06. CFI and TLI are incremental fit indices that compare the fit of a hypothesised model with that of a baseline model (i.e., a model with the worst fit). Hence, the higher is the value the better is it. Both TLI and CFI range between 0 and 1 with values acceptable if above .90 and as excellent if close to or above .95.

equation model". In particular, the CFI and TLI are equal to 0.961 and 0.972, respectively; the RMSEA is equal to 0.077 (confidence interval 90%: 0.076–0.079), chi-square(293) = 10,655.621, p -value = 0.000, and SRMR = 0.075).

Discussion

The debate on the relationship between refugees' health and life experiences is ongoing. Refugees and migrants living in countries with less favourable integration policies report poorer health outcomes (WHO, 2018). Even when refugees and asylum seekers live in safe, highly developed countries, their health is still a concern. With this paper, we aim to assess what factors are associated with the current health status of refugees and asylum seekers living in Germany, the leading host country for refugees in Europe.

This study deepens the understanding of how resilience can play a role in health, in the presence of adverse experiences (like discrimination and loneliness). By incorporating an in-depth analysis of these relationships, this study offers new insights into how, in vulnerable populations, resilience contributes to theoretical knowledge and suggests practical implications for refugee health and well-being interventions. This new framework aligns with recent literature on marginalised populations, with a growing focus on resilience and health determinants. It suggests that interventions aimed at improving refugee health should focus not only on reducing discrimination but also on fostering resilience, which can mitigate the negative effects of adverse experiences on both mental and physical health.

Consistently with the literature, discrimination, loneliness, and resilience had a direct and statistically significant relation with health. Moreover, using structural equation modelling allowed us to investigate more complex interrelations among them, revealing a broader landscape.

All the hypotheses provided in Sect. "Theoretical framework and research questions" were confirmed, but partly two. Particularly, in this study, we proved that resilience is associated with many other dimensions affecting refugees' health: it is associated with a reduced perception of being discriminated against (the higher the resilience is, the lower the perception of discrimination) and it is positively associated with refugees' reported health. Moreover, the indirect effect of resilience on health through discrimination is significant and positive. Instead, there was no evidence of the association between resilience and loneliness (part of hypothesis 3) nor between resilience and reported health mediated by loneliness (part of hypothesis 4).

Indeed, individuals' capacity to rebound from adversity and challenges became very important for refugees, giving them more ability to cope effectively with challenges in the new host country. In addition to certain unmodifiable internal factors that shape individual resilience, external factors, which policies can address, play a significant role in hindering the resilience of refugees. In particular, research has shown that better language competencies, the support of an extended social network, active participation in community life, and having control of one's own life increase individual resilience (Hutchinson & Dorsett, 2012; Schweitzer et al., 2007). Therefore, policies should help refugees achieve better integration (e.g. by improving their language skills and involving them in community projects), projecting policies in which refugees have agency, fostering family reunification, and improving the feeling of belonging to the new country.

As proved in this study, discrimination plays a relevant role in shaping refugees' health. Preventing and combating discrimination, xenophobia, and discrimination-based inequalities is one of the key goals of current European policies (see, for instance, Article 21 of the EU Charter). What is less known is that discrimination is related to health and how this process proceeds. We proved that the intensity of the perception of discrimination is negatively related to refugees' reported health directly and via the perception of loneliness, which, similarly, worsens health. The significant relation of discrimination with all the latent variables considered here strengthens the belief in the importance of culturally sensitive health systems, among the goals of many European States (McGarry et al., 2018) and pushes to foster intercultural competencies and cultural sensitivity in the healthcare sector. Furthermore, social policies should aim to reduce the xenophobia, discrimination, and stigma often experienced by refugees through actions improving their advocacy and promoting evidence-informed communication with both refugee and migrant communities and host populations, as also highlighted by the WHO (2018).

When studying refugee health, it is also important to recognise that the different treatments reserved for different refugee populations ("deserving" and "not deserving" refugees) and the social determinants of health in the host country have noticeable impacts. In this study, we controlled for the effect of nationality on discrimination, loneliness, and health. Notably, people from countries at the centre of the last decade's geopolitical debate (namely, Afghanistan, Eritrea, Iraq, and Syria) are less discriminated against than refugees from other countries. This evidence supports the notion that societies perceive some refugees as more deserving to be welcomed in Europe than others. However, at the same time, these refugees experience greater feelings of loneliness, longing for their relationships with friends and compatriots left behind.

We are aware that evaluating the factors influencing refugees' health is highly complex, with risks strongly linked with the context of displacement, and that, more than in studies on individual health, health outcomes are often also a result of risks that may have occurred before, during, or after displacement. So, a longitudinal setting would have been more appropriate for identifying causes and effects. This does not solve the fact that the direction of causality among latent constructs can be, in some cases, debatable, and different structures of the model can be assumed. In this study, due to the attrition and the biannual administration of health questions, it was not feasible to use the longitudinal data. Hence, the approach used in this study was cross-sectional, and we can only assume causality while not allowed to prove it.

In a context where studies on refugee health face the difficulty of generalising research findings to a general refugee population that comes from different contexts, at different times, and regions, our study has the advantage of being supported by a very large probability sample, collected in a limited period on the main refugee populations living in Germany. This is a clear advantage as most refugee surveys are based on highly targeted, or convenience samples that pose problems of generalizability. Moreover, using structural equation models had the dual advantage of allowing us to investigate the complex interrelations among many different aspects and to consider that both health and the other three factors are latent constructs. This study sheds light on the impact of individual perceptions and resilience on self-assessed physical and mental health in one of the most important countries for refugees. This study also enriches the recent strand

of literature that quantitatively explores refugees' health conditions in high-income countries.

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Author contributions

DM contributed to conceptualisation and design of the study, first drafting of Sects. "The structural equation model" and "Results", manuscript review, model specification, data preparation, and data analysis and interpretation. AB contributed to conceptualisation and design of the study, literature review, first drafting of Sects. "Introduction", "Theoretical framework and research questions", "Data and methods" (except "The structural equation model"), "Discussion", manuscript review, data preparation, and data analysis and interpretation.

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Availability of data and materials

This study uses the anonymous data of waves 2016–21 of the IAB-BAMF-SOEP Survey of Refugees (https://www.diw.de/en/diw_01.c.885460.en/edition/iab-bamf-soep-survey_of_refugees_2021_-_update.html). The survey is carried on jointly by the Institute for Employment Research (IAB), the research data centre of the Federal German Office for Migration and Refugees (BAMF), and the German Socio-Economic Panel (SOEP) at the German Institute for Economic Research (DIW). Still, restrictions apply to the availability of these data, which were used under licence for the current study, and are available under request by https://www.diw.de/en/diw_01.c.742903.en/edition/data_access_iab-bamf-soep-mig.html.

Declarations

Ethics approval and consent to participate

Ethical approval is not required for this study. Indeed, the data come from the IAB-BAMF-SOEP survey.

Competing interests

The authors declare that they do not have competing interests.

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