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A cross-national analysis of sociodemographic variation in suffering across 22 countries



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Abstract

Background Suffering has been identified as an important public health issue worthy of closer attention. This preregistered study takes an initial step toward developing an epidemiology of suffering by exploring the distribution of suffering in 22 countries and testing for sociodemographic disparities in suffering.

Methods Using nationally representative data from the first wave of the Global Flourishing Study ($N = 202,898$), we estimated the proportion of people who endorsed some/a lot of suffering in each country. Variation in proportions of suffering across the categories of 9 sociodemographic characteristics (age, gender, marital status, employment status, years of education, immigration status, frequency of religious service attendance, religious affiliation, racial/ethnic identity) were estimated separately for each country. We aggregated country-level estimates of suffering for specific sociodemographic categories using random effects meta-analyses.

Results We find that the proportion of country-specific populations experiencing suffering varies considerably, ranging from 0.24 (Poland) to 0.60 (Türkiye). Country-level results provide evidence of cross-national heterogeneity in suffering for all sociodemographic categories, although variation is greater for some categories than others. Meta-analytic results support differences in suffering based on marital status, employment status, and years of education across the countries, with the highest suffering observed among those who have separated from their spouse, are either unemployed and looking for a job or endorse the none of these/other employment status category, and have completed 8 or fewer years of education.

Conclusions Suffering varies across countries and sociodemographic categories. Our findings lay the foundation for population-level monitoring of suffering and a population health agenda to address suffering among vulnerable subpopulations.

Plain Language Summary

We used nationally representative data from 22 countries in the Global Flourishing Study to explore the distribution of suffering in each country and identify subpopulations that may be particularly vulnerable to suffering. There was substantial variation in suffering across the countries (lowest in Poland, highest in Türkiye). Across the countries, subpopulations with the highest suffering were those who had separated from their spouse, were either unemployed and looking for a job or endorsed the none of these/other employment status category, and had 8 or fewer years of education. This study takes an initial step toward developing an epidemiology of suffering, the findings of which lay the foundation for population-level monitoring of suffering and a population health agenda to address suffering among vulnerable subpopulations.

After surviving more than 2 years of cruel and undignified conditions as a Jewish prisoner in several Nazi concentration camps during World War II, Viktor Frankl¹ concluded that “suffering is an ineradicable part of life, even as fate and death” (p. 67). While recognizing that suffering is a universal

human experience (i.e., it is something that all people will experience at one time or another), Eric Cassell also points out that the nature of an individual’s experience of suffering is often deeply personal and particular to them². Suffering may take different (though not necessarily mutually

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exclusive) forms, such as when it pertains principally to the physical, mental, social, or spiritual dimension of a person's existence^{3,4}. With these complexities in view, suffering might be understood as "an undesired experiential state, of considerable duration or intensity, involving the loss or privation of some perceived good" (p. 2)^{5,6}. Although suffering is closely related to a rich nomological network of negatively laden affective states (e.g., pain, loneliness, depression), it can be distinguished from other forms of distress on both conceptual and empirical grounds⁷. For example, a person is thought to be suffering only when a negative affective state is accompanied by "an *occurrent desire* that the state not be occurring" (p. 31)⁸, which is not a necessary condition for establishing other forms of distress (e.g., pain). Empirically, some studies have found that suffering may be experienced independently of other forms of distress, such as physical pain⁹ and depression symptoms¹⁰. These findings suggest that suffering is not merely a marker of the severity of a person's physical or mental health symptoms but is a distinct experience that warrants consideration in research and practice.

The existing empirical research on human suffering has largely focused on understanding and addressing suffering in clinical samples of older adults dealing with physical health problems, medical illness, or terminal conditions¹¹. Perhaps unsurprisingly, evidence from this body of literature suggests that suffering is often related to worse well-being^{12,13}. Recently, a growing number of studies have explored suffering in a wider range of populations, such as nonclinical samples of younger adults⁷ and middle-aged employees engaged in physically demanding work⁵. Evidence from these studies suggests that it is not uncommon for even healthy adults to experience some degree of suffering, and that suffering in nonclinical populations has the potential to degrade different aspects of individual well-being. When the negative implications of suffering for well-being are considered alongside the extent to which *everyday* suffering is experienced in the general population, suffering appears to be an important public health issue worthy of closer attention⁶.

Given the potential public health significance of suffering, further work is needed to develop an epidemiology of suffering⁶. An epidemiology of suffering requires population-level assessment and monitoring efforts that can help inform policy decisions and guide implementation of intervention strategies to support subpopulations that may be especially vulnerable to experiencing suffering and its potential consequences for well-being¹⁴. Although some large-scale research has approached the theme of suffering in nationally representative samples using proxy measures of suffering¹⁵, no prior study has conducted population-level assessments of suffering itself. The Global Flourishing Study (GFS), an intended longitudinal cohort study with nationally representative samples from numerous diverse countries around the world, provides a novel opportunity to measure and track population-level suffering in different geographic and cultural contexts. Leveraging Wave 1 data from the GFS, the present preregistered study takes an initial step toward an epidemiology of suffering by exploring the distribution and potential disparities of suffering in 22 countries and identifying sociodemographic differences in suffering across all countries.

Although suffering is an inner phenomenological experience (i.e., it is subjectively experienced by the person), suffering cannot be separated from the broader environment in which a person lives. According to the central tenets of socioecological systems theory¹⁶, individual experiences of suffering unfold within a network of hierarchically nested sociocultural layers ranging from those that are highly proximal and more directly influential to those that are highly distal and more indirectly influential^{13,17}. For example, it is not uncommon for the causes of a person's suffering to originate from external sources in the immediate settings in which they engage in daily life, as when suffering arises because the individual has been deeply hurt by a coworker or is grieving the loss of a loved one^{6,18}. Along similar lines, people who are suffering may draw on resources that they are able to access directly, such as emotional support from family members or spiritual support from their religious community^{13,19}. More distally, social-structural factors may indirectly influence an individual's experience of suffering through their impact on the person's immediate environment, such as government

policies (e.g., COVID-19 pandemic lockdowns) that constrain a person's capacity to access services that could help mitigate their suffering^{20,21}. Expanding out even further, a person's perception of suffering might be indirectly influenced by the overarching social norms and cultural values that are particular to the societal context in which they live, such as normative beliefs about suffering grounded in a long-standing religious/spiritual tradition that is dominant within a particular country^{13,22}. While the suffering-relevant factors embedded within layers that are most proximal to the individual will often be unique to that individual (e.g., loss of a loved one is particular to the bereaved person), factors within the most distal layers are more likely to be common to many people within a society (e.g., fragile health systems). To the extent that vulnerabilities to suffering exist at more distal layers of a country's sociocultural system, we might expect the population-level prevalence of suffering to be higher.

In the absence of prior research on suffering in national samples, indirect evidence suggests that the sociocultural dynamics of different countries are likely to vary in ways that might be important for understanding experiences of suffering in local populations. We explore this briefly using a non-exhaustive set of national- and individual-level suffering-relevant metrics for the 22 countries included in this study (see Table 1). These metrics roughly intersect with indicators—in either existential, physical, emotional, or social domains of human life—that previous empirical research has shown are related to suffering. For example, prior studies have reported evidence linking indicators of mental and physical health problems, interpersonal adversities, and financial insecurity with higher suffering^{7,11}. As shown in Table 1, rankings for these metrics varied to some extent across the countries. To illustrate, Japan was ranked in the top four (most positive) countries for 5/8 metrics (and it did not rank in the bottom four for any metric), whereas Kenya was ranked among the bottom four countries for 4/8 metrics (and it did not rank in the top four for any metric). Rankings were more mixed for some countries, such as Tanzania which ranked in the top four countries for 3/8 metrics and the bottom four countries for 3/8 metrics. Although these metrics are not direct markers of suffering itself, cross-national differences in potential vulnerabilities to suffering highlight the possibility that experiences of suffering might vary across contexts.

Effective promotion of population health relies on empirical evidence concerning the subpopulations that may be at greater risk of disease and poor health, in part because these insights can inform decisions about how resources should be allocated to support population well-being²³. Similarly, a population health and policy agenda to address suffering needs to be informed by research that aims to identify disparities in suffering among different sociodemographic groups (e.g., age, gender, racial/ethnic identity) and monitors progress toward reducing such disparities. Although there presently is limited evidence concerning sociodemographic differences in suffering at the population level, a few studies have reported some potentially relevant findings.

Abraham et al.²⁴ assessed suffering in a cross-sectional clinical sample of $N = 48$ older United States adults receiving end-of-life care. The moderate-severe suffering group was younger than the no-mild suffering group, but there was little evidence of gender, racial/ethnic status, or marital status differences between the two groups. In a somewhat larger cross-sectional study of $N = 381$ adult Canadian patients with advanced cancer, Wilson et al.²⁵ found that individuals in the moderate-extreme suffering group were younger and more highly educated than those in the none-mild suffering group; there was little evidence of gender, marital status, or religious affiliation differences between the two groups. Davis et al.²⁶ examined correlates of suffering in a cross-sectional sample of $N = 150$ United States adult cancer patients. Suffering was lower among older individuals, but a gender difference was not observed. Extending beyond clinical populations, Shmotkin and Shrira²⁷ explored suffering in two cross-sectional samples of older Israeli adults (sample 1: $N = 815$; sample 2: $N = 213$). Present suffering was higher among older adults, women, and non-native Israelis (sample 1 only), but there was little evidence of an association with education in either sample. In a more recent longitudinal study with a nonclinical community

Table 1 | Selected National-level and Individual-level Indicators of the Sociocultural Context in Each Country

Country	National level				Individual level			
	Percentage of population in extreme poverty ^a (rank)	All-cause disability-adjusted life years per 100,000 population ^b (rank)	Mental disorder cases per 100,000 population ^c (rank)	Percentage of population exposed to conflict ^d (rank)	Percentage without enough money for food in last 12 months ^e (rank)	Percentage experienced physical pain a lot yesterday ^f (rank)	Percentage experienced worry a lot yesterday ^g (rank)	Percentage rarely/never in harmony with those around them ^h (rank)
Argentina	1% (12)	27,898 (9)	13,001 (11)	44% (16)	36.7% (12)	37.1% (18)	50.8% (21)	10.9% (9)
Australia	0.5% (7)	25,599 (3)	17,635 (22)	19% (4)	13.1% (9)	26.8% (12)	33.5% (9)	9.4% (5)
Brazil	5.8% (16)	30,189 (14)	16,806 (20)	45% (17)	32.9% (11)	40.8% (21)	60.8% (22)	17.1% (14)
Egypt	1.5% (13)	26,619 (4)	13,789 (14)	9% (3)	40.9% (14)	50.9% (22)	43.9% (17)	15.2% (13)
Germany	0% (1)	32,162 (15)	14,850 (18)	43% (15)	8.2% (4)	25.1% (9)	28.8% (3)	7.6% (3)
Hong Kong (S.A.R. of China)	0.1% ^a (3)	26,871 ^a (5)	11,260 ^a (8)	8% ^a (2)	10.1% (7)	15.1% (1)	33.3% (7)	9.4% (5)
India	11.9% (18)	33,643 (17)	13,516 (13)	20% (5)	45.4% (16)	38.2% (19)	45.3% (18)	24.7% (19)
Indonesia	2.5% (14)	29,843 (13)	10,613 (4)	23% (8)	43.1% (15)	22.6% (7)	40.8% (14)	33.1% (22)
Israel	0.5% (7)	19,702 (1)	13,322 (12)	65% (22)	6.6% (2)	17.9% (3)	33.4% (8)	14% (12)
Japan	0.7% (10)	28,624 (10)	9915 (2)	29% (11)	8.1% (3)	19.8% (4)	28.3% (2)	8.1% (4)
Kenya	36.1% (21)	35,201 (19)	10,823 (6)	25% (9)	72.5% (21)	32.9% (17)	31.9% (5)	28.2% (20)
Mexico	3.1% (15)	27,197 (7)	11825 (10)	47% (18)	39.7% (13)	29.5% (15)	41.1% (15)	11.9% (10)
Nigeria	30.9% (20)	54,038 (22)	9187 (1)	26% (10)	74.5% (22)	32.7% (16)	39.7% (13)	9.5% (7)
Philippines	6.8% (17)	29,158 (11)	11,182 (7)	21% (6)	70.8% (20)	20% (5)	35.3% (12)	24.1% (18)
Poland	0% (1)	32,930 (16)	10,622 (5)	21% (6)	9.4% (6)	17.3% (2)	32.9% (6)	18.2% (15)
South Africa	20.5% (19)	47,830 (21)	11,716 (9)	37% (13)	57.1% (19)	26.5% (11)	35% (11)	22.6% (16)
Spain	0.9% (11)	27,492 (8)	17,212 (21)	58% (21)	12.7% (8)	27.2% (13)	47.8% (20)	4.6% (1)
Sweden	0.4% (5)	26,888 (6)	14,748 (17)	55% (20)	5% (1)	20.3% (6)	29.9% (4)	7.2% (2)
Tanzania	44.9% (22)	41,047 (20)	10,514 (3)	5% (1)	52% (18)	40.4% (20)	25.6% (1)	23.6% (17)
Türkiye	0.4% (5)	24,127 (2)	14,517 (16)	51% (19)	48.7% (17)	26.1% (10)	46.2% (19)	32.6% (21)
United Kingdom	0.5% (7)	29,325 (12)	14,464 (15)	38% (14)	9.2% (5)	24.9% (8)	34.2% (10)	12.7% (11)
United States	0.2% (4)	33,866 (18)	16,151 (19)	31% (12)	20.6% (10)	28.7% (14)	41.7% (16)	10.2% (8)

S.A.R. Special Administrative Region. ^aMost recent estimate of the percentage of the population living below the \$2.15 per day poverty line⁶². ^bEstimated all-cause disability-adjusted life years (DALYs) per 100,000 people, the number of years of healthy life lost due to all causes⁶³. ^cEstimated total number of mental disorder cases per 100,000 population⁶⁴. ^dEstimated percentage of the population exposed to conflict in 2022, a metric reflecting the number of people living within a particular distance (i.e., 1 km, 2 km, and 5 km) of all event types⁶⁴. ^ePercentage across the 2020–2022 Gallup World Polls who reported that there were times in the last 12 months when they did not have enough money for food that they or their family needed⁶⁵. ^fPercentage across the 2020–2022 Gallup World Polls who endorsed experiencing physical pain during a lot of the day yesterday⁶⁵. ^gPercentage across the 2020–2022 Gallup World Polls who endorsed experiencing worry during a lot of the day yesterday⁶⁵. ^hPercentage across the 2020–2022 Gallup World Polls who reported rarely/never being in harmony with those around them⁶⁵. ⁱEstimates are for China because data were not available for Hong Kong. Ranks for each indicator were produced after any rounding was performed.

sample of $N = 184$ United States adults living with chronic illness, Cowden et al.²⁰ reported bivariate associations between sociodemographic characteristics and suffering, including age, gender, racial/ethnic identity, sexual orientation, marital status, religious affiliation, and educational attainment. They found little evidence of sociodemographic differences in suffering, except for marital status in that suffering was lower among those who were married or in a domestic partnership compared to those who were unmarried or had separated from their spouse.

Taken together, some of the findings reported in prior work point to the possibility of sociodemographic differences in suffering, but the evidence so far is mixed and inconclusive. Besides methodological differences that can make it challenging to compare findings across previous studies (e.g., sample variation), the external validity of existing research that has reported on sociodemographic differences in suffering remains unclear because the focus has typically been on population segments (e.g., older clinical samples of adults) and representative samples have rarely been used. Relatedly, given that much of the empirical literature on suffering is based on samples from Western, educated, industrialized, rich, and democratic (WEIRD) countries⁷, relatively little is known about sociodemographic differences in suffering among populations living in less WEIRD contexts. To support the development of a global epidemiology of suffering and a population health

agenda focused more explicitly on suffering, research exploring potential sociodemographic disparities in suffering is needed with representative samples from diverse geographic and cultural contexts around the world.

This preregistered descriptive study uses nationally representative data from 22 countries to explore the distribution of suffering in each country and test for potential sociodemographic variation in suffering within and across countries. As a first step, we describe the distribution of the sociodemographic characteristics that were assessed consistently across the countries (i.e., age, gender, marital status, employment status, years of education, immigration status, frequency of religious service attendance). Although not a central part of our purpose for exploring the distribution of suffering in each country, we anticipated that there would be some meaningful cross-national variation in suffering. Drawing on past empirical work, we expected that suffering across all countries would exhibit variations based on sociodemographic characteristics. While our primary focus is on potential sociodemographic differences in suffering across all countries, we also anticipated some cross-national variation in sociodemographic differences because of the unique sociocultural landscape of each country. We find considerable variation in suffering across the included countries, differences in suffering for some sociodemographic characteristics (i.e., marital status, employment status, years of education) when country-specific

estimates are pooled meta-analytically, and cross-national variation in sociodemographic differences in suffering.

Methods

The methodological details described below have been adapted from VanderWeele et al.²⁸, with additional methodological information available elsewhere.^{29–34} The GFS was ruled exempt by the Baylor University Institutional Review Board (IRB) (#1841317-2) because it met the criteria for exemption according to Baylor's IRB guidelines (e.g., minimal risk to participants, adherence to specific federal IRB regulations). Ethical approval for all data collection activities was also obtained from the IRB at Gallup Inc. Data collection activities were performed in accordance with relevant ethical regulations, and informed consent was obtained from all participants. All personally identifiable information was removed from the data used in the present study by Gallup Inc.

Study sample

Wave 1 of the GFS included nationally representative samples from 22 geographically and culturally diverse countries: Argentina, Australia, Brazil, Egypt, Germany, Hong Kong (Special Administrative Region of China), India, Indonesia, Israel, Japan, Kenya, Mexico, Nigeria, the Philippines, Poland, South Africa, Spain, Sweden, Tanzania, Türkiye, the United Kingdom, and the United States ($N = 202,898$). The countries were selected to (1) maximize coverage of the world's population, (2) ensure geographic, cultural, and religious diversity, and (3) prioritize feasibility in line with existing data collection infrastructure. Data collection was conducted by Gallup Inc. Data for Wave 1 was collected primarily during 2023, although some countries began data collection in 2022 and exact dates of data collection varied to some extent by country³⁵. The GFS survey centers on salient aspects of well-being, such as happiness, health, meaning, character, relationships, and financial stability³⁶, along with other sociodemographic, social, economic, political, religious, personality, childhood, community, health, and well-being variables. Gallup translated the GFS survey into multiple languages following the TRAPD (translation, review, adjudication, pretesting, and documentation) model for cross-cultural survey research³². Extensive details about the translation, cognitive interviewing, and piloting testing phases of the GFS can be found elsewhere^{29,31,32,37}.

Sampling design

The precise sampling design that was used to ensure samples were nationally representative varied by country^{32,35}. In most countries, local field partners were guided in implementing a probability-based face-to-face or telephone methodology to recruit panel members. Recruitment involved an intake survey that mainly gathered basic sociodemographics and information for recontacting participants. Shortly following recruitment, participants received invitations to participate in the annual survey via phone or online. Three major sampling frames were used for recruitment in the GFS, namely a probability-based sample, a nonprobability-based sample, or a combination of the two. Post-stratification and nonresponse adjustments were carried out within each country separately using census data or a reliable secondary source. Additional information about the sampling design used in Wave 1 of the GFS is available in Padgett et al.³² and Ritter et al.³⁵.

Measures

Sociodemographic variables. Seven sociodemographic variables were assessed consistently across the 22 countries: age, gender, marital status, employment status, years of education, frequency of religious service attendance, and immigration status. Continuous age was classified into 18–24, 25–29, 30–39, 40–49, 50–59, 60–69, 70–79, and 80 years or older categories. Gender was assessed as male, female, or other. Marital status was assessed as single/never married, married, separated, divorced, widowed, and domestic partner. Employment was assessed as employed, self-employed, retired, student, homemaker, unemployed and looking for a job, and none of these/other. Education was assessed as up to 8 years, 9–15 years, and 16 or more years. Frequency of religious service

attendance was assessed as more than once a week, once a week, one-to-three times a month, a few times a year, and never. Immigration status was dichotomously assessed with an item that asked participants to report whether or not they had been born in the country where data collection was taking place.

Religious affiliation was also assessed in all countries, but there were considerable cross-country differences in the response categories endorsed by participants because some religious affiliations are only applicable in certain countries and not others. Religious affiliation response category options included Christianity, Islam, Hinduism, Buddhism, Judaism, Sikhism, Baha'i, Jainism, Shinto, Taoism, Confucianism, Primal/animist/folk religion, Spiritism, Umbanda, Candomblé, and other African-derived religions, Chinese folk/traditional religion, some other religion, or no religion/atheist/agnostic. Racial/ethnic identity was assessed in most (18/22) countries, and response categories varied across countries. Additional details about measurement of the sociodemographic variables can be found in the GFS Codebook (<https://osf.io/cg76b>).

Outcome variable. A range of suffering measures are available and have been employed in the empirical literature (for reviews, see refs. 6,38–40); they vary in modality (e.g., standardized scales versus pictorial representations) and scope of assessment (e.g., general versus domain-specific). Many existing measures of suffering are not well suited for research outside of clinical contexts (e.g., those that make reference to medical illness). Thus, the Personal Suffering Assessment (PSA) was constructed to provide a generalized measure of suffering intended for broader application beyond the clinical context⁶. In the present study, suffering was assessed with a single *extent of suffering* item that was adapted from the PSA⁶: “To what extent are you suffering? This can be any type of physical or mental suffering” (response options: Not at all; Not very much; Some; A lot). Other variations of this item have been employed in research on suffering over the years dating back at least two decades^{25,41,42}. Slight modifications were made to the phrasing and response categories of the original PSA item in the GFS survey based on the results of cognitive interviews that were performed during the survey development process to strengthen its cross-cultural equivalence^{29,31,32,37}. The original PSA item has been used widely in prior research, including with samples from several countries that are part of the GFS (e.g., Indonesia, the United States)^{5,7,10,20}. Some previous work has reported large to very large correlations between responses to variations of this item and scores on alternative brief measures of suffering that are frequently used, such as versions of the visual-based Pictorial Representation of Illness and Self Measure^{43,44}. Consistent with our preregistered analytic plan, we dichotomized this variable into categories of (0) not at all/not very much and (1) some/a lot.

Statistics and reproducibility

The research questions, variables, and analyses for the current study were preregistered on the Open Science Framework prior to accessing data (<https://osf.io/8rxpg>). All analyses were performed using R 4.2.2⁴⁵.

Descriptive statistics for the full sample, weighted to be nationally representative within each country, were estimated for each of the sociodemographic variables. Nationally representative proportions and accompanying 95% confidence intervals (CIs) for people endorsing some/a lot of suffering were estimated separately for each country and ordered from highest to lowest. As a post-hoc secondary analysis, we replicated this analysis after dichotomizing the outcome variable into categories of (0) not at all/not very much/some and (1) a lot.

Variation in proportions of some/a lot of suffering across sociodemographic categories were estimated, with all analyses initially conducted by country. Primary results consisted of random effects meta-analyses of country-specific proportions for some/a lot of suffering in each specific sociodemographic category^{46,47}, along with 95% CIs, standard errors, lower and upper limits of an approximately 95% prediction interval across countries, heterogeneity (τ), and I^2 for evidence of variation within a

Table 2 | Sociodemographic Characteristics of the Sample (N = 202,898)

Characteristic	n (%)
Age group	
18–24 years	27,007 (13%)
25–29 years	20,700 (10%)
30–39 years	40,256 (20%)
40–49 years	34,464 (17%)
50–59 years	31,793 (16%)
60–69 years	27,763 (14%)
70–79 years	16,776 (8.3%)
80 years or older	4119 (2.0%)
Missing	20 (< 0.1%)
Gender	
Male	98,411 (49%)
Female	103,488 (51%)
Other	602 (0.3%)
Missing	397 (0.2%)
Marital status	
Married	107,354 (53%)
Separated	5195 (2.6%)
Divorced	11,654 (5.7%)
Widowed	9823 (4.8%)
Domestic partner	14,931 (7.4%)
Single, never married	52,115 (26%)
Missing	1826 (0.9%)
Employment status	
Employed for an employer	78,815 (39%)
Self-employed	36,362 (18%)
Retired	29,303 (14%)
Student	10,726 (5.3%)
Homemaker	21,677 (11%)
Unemployed and looking for a job	16,790 (8.3%)
None of these/other	8431 (4.2%)
Missing	793 (0.4%)
Years of education	
Up to 8 years	45,078 (22%)
9–15 years	115,097 (57%)
16+ years	42,578 (21%)
Missing	146 (< 0.1%)
Frequency of religious service attendance	
> 1/week	26,537 (13%)
1/week	39,157 (19%)
1–3/month	19,749 (9.7%)
A few times a year	41,436 (20%)
Never	75,297 (37%)
Missing	722 (0.4%)
Immigration status	
Born in this country	190,998 (94%)
Born in another country	9791 (4.8%)
Missing	2110 (1.0%)

particular sociodemographic variable across countries⁴⁸. Discussion of the rationale underpinning the choice of a meta-analytic approach (over multilevel modeling) can be found in Padgett et al.³³ The *metafor* package was used to conduct all meta-analyses⁴⁹. Within each country, we conducted a global test of variation in suffering across the categories of each particular sociodemographic variable. A pooled *p*-value across countries was used to test whether suffering differs among categories of a particular sociodemographic variable in at least one country⁵⁰. We provide Bonferroni corrected *p*-value thresholds based on the 7 sociodemographic variables (i.e., age, gender, marital status, employment status, years of education, frequency of religious service attendance, and immigration status) that were included in the meta-analyses: $p = 0.05/7 = 0.007^{51}$. Religious affiliation and racial/ethnic identity were not included in the meta-analyses because these variables were not measured consistently across all 22 countries. As a supplementary analysis, we conducted population weighted meta-analyses for the same sociodemographic variables included in the random effects meta-analyses.

Missing data. Missing data on all sociodemographic and outcome variables were imputed using multivariate imputation by chained equations, with 5 imputed datasets produced^{52,53}. The imputation model incorporated the outcome variable, all sociodemographic characteristics (including religious affiliation and racial/ethnic identity when available), and sampling weights. Including the sampling weight in the multiple imputation procedure allowed missingness to be related to the probability of inclusion in the study. To account for variation in the assessment of certain variables across countries (e.g., religious affiliation, racial/ethnic identity), the imputation process was conducted separately in each country. This within-country imputation approach ensured that the imputation models accurately reflected country-specific contexts and assessment methods. Further details about missingness and the imputation procedure can be found in Padgett et al.³³.

Accounting for complex sampling design. Wave 1 of the GFS used different sampling schemes across countries based on availability of existing panels and recruitment needs³⁵. All analyses accounted for the complex survey design components by including weights, primary sampling units, and strata. Additional methodological details, including the approach that was used to account for the complex sampling design, can be found elsewhere^{32,33}.

Reporting summary

Further information on research design is available in the Nature Portfolio Reporting Summary linked to this article.

Results

Sociodemographic characteristics of the total sample are reported in Table 2. The largest age group consisted of 30–39-year-olds (20%), with slightly fewer 40–49-year-olds (17%) and 50–59-year-olds (16%). The gender distribution was approximately equal across males (49%) and females (51%). A majority of individuals were married (53%), were either employed by an employer (39%) or self-employed (18%), had completed 9–15 years of education (57%), and were born in the country where data was collected (94%). The distribution of religious service attendance included people who attended once a week (19%) or more often (13%), as well as those who never attended (37%).

The countries with the largest samples were the United States (19%), Japan (10%), and Sweden (7.4%), whereas the countries with the smallest samples were Türkiye (0.7%), South Africa (1.3%), and Hong Kong (1.5%). Nationally representative sociodemographic characteristics of each country are reported in Supplementary Tables 1–22, with some variability observed across the countries. For example, the percentage of the population aged 60 years or older in Australia and the United Kingdom (Supplementary Tables 2 and 21) was considerably higher than in Argentina and Nigeria

Table 3 | Proportion Endorsing Some/A lot of Suffering by Country

Country	Proportion (95% CI)
Türkiye (<i>n</i> = 1473)	0.60 (0.57, 0.64)
Philippines (<i>n</i> = 5292)	0.59 (0.57, 0.61)
Brazil (<i>n</i> = 13,204)	0.56 (0.55, 0.57)
Tanzania (<i>n</i> = 9075)	0.54 (0.52, 0.57)
India (<i>n</i> = 12,765)	0.51 (0.50, 0.53)
United Kingdom (<i>n</i> = 5368)	0.51 (0.49, 0.53)
Australia (<i>n</i> = 3844)	0.50 (0.48, 0.52)
Egypt (<i>n</i> = 4729)	0.50 (0.48, 0.52)
Germany (<i>n</i> = 9506)	0.49 (0.48, 0.50)
Hong Kong (S.A.R. of China; <i>n</i> = 3012)	0.48 (0.46, 0.51)
Spain (<i>n</i> = 6290)	0.48 (0.47, 0.50)
Kenya (<i>n</i> = 11,389)	0.46 (0.45, 0.47)
Argentina (<i>n</i> = 6724)	0.44 (0.43, 0.46)
United States (<i>n</i> = 38,312)	0.43 (0.42, 0.44)
Nigeria (<i>n</i> = 6827)	0.41 (0.39, 0.43)
Mexico (<i>n</i> = 5776)	0.39 (0.37, 0.41)
Japan (<i>n</i> = 20,543)	0.37 (0.36, 0.38)
Sweden (<i>n</i> = 15,068)	0.34 (0.33, 0.35)
South Africa (<i>n</i> = 2651)	0.30 (0.28, 0.32)
Israel (<i>n</i> = 3669)	0.27 (0.25, 0.30)
Indonesia (<i>n</i> = 6992)	0.26 (0.24, 0.27)
Poland (<i>n</i> = 10,389)	0.24 (0.22, 0.27)

S.A.R. Special Administrative Region, CI confidence interval. A random effects meta-analysis for the overall proportion endorsing some/a lot of suffering across the countries was 0.44 (0.40, 0.48).

(Supplementary Tables 1 and 13), suggesting that the sociodemographic compositions of the countries are at least somewhat idiosyncratic.

Distribution of suffering

Table 3 orders the countries based on the proportion of people experiencing some/a lot of suffering. The countries with the highest proportion of individuals suffering were Türkiye (0.60, 95% CI: 0.57, 0.64), the Philippines (0.59, 95% CI: 0.57, 0.61), and Brazil (0.56, 95% CI: 0.55, 0.57), whereas the countries with the lowest proportion were Poland (0.24, 95% CI: 0.22, 0.27), Indonesia (0.26, 95% CI: 0.24, 0.27), and Israel (0.27, 95% CI: 0.25, 0.30). When we estimated the proportion of individuals experiencing a lot of suffering in each country (see Supplementary Table 23), relative rankings for most countries were similar to Table 3 (11/22 countries shifted two or fewer positions). However, relative rankings for some countries differed more substantially; the countries that evidenced the largest upward (more negative) shift in relative ranking were Nigeria (15th to 4th), Argentina (13th to 5th), and South Africa (19th to 11th), whereas the countries with the largest downward (more positive) shift in relative ranking were Tanzania (4th to 13th), Brazil (3rd to 9th), and Germany (9th to 15th).

Sociodemographic differences in suffering

Results of the random effects meta-analyses are reported in Table 4. Pooling across countries, examination of the 95% CIs for the meta-analyzed proportions provided evidence of differences in suffering between two or more categories of marital status, employment status, and years of education. In particular, the proportion that endorsed some/a lot of suffering was lower among those who were married (0.41, 95% CI: 0.36, 0.46), those who had a domestic partner (0.42, 95% CI: 0.36, 0.48), and those who were single and had never been married (0.44, 95% CI: 0.39, 0.50) compared to those who had separated from their spouse (0.56, 95% CI: 0.51, 0.61); those who were employed for an employer (0.41, 95% CI: 0.36, 0.45) compared to those who

were unemployed and looking for a job (0.54, 95% CI: 0.48, 0.60) and those in the none of these/other employment status category (0.55, 95% CI: 0.47, 0.63); and those with 16 or more years of education (0.38, 95% CI: 0.35, 0.42) compared to those with 8 years or less (0.47, 95% CI: 0.43, 0.52). There was little evidence of average differences in suffering as a function of gender, frequency of religious service attendance, immigration status, and age group across countries (though we note the potential influence of cohort effects on age-related patterns).

Tau (τ) values in Table 4 provide an indication of cross-country variation in suffering for each of the sociodemographic categories. There was some evidence of cross-national heterogeneity in suffering for all sociodemographic categories, although variation was greater for some categories than others. For example, tau was larger for the 80 or older age category (0.43) compared to the other age categories (0.11–0.15), suggesting considerably greater cross-national variability in suffering for this age category relative to the others.

All global *p*-values in Table 4 were *p* < 0.0001 (below the Bonferroni-corrected significance threshold of *p* = 0.007), indicating that there were differences between the proportions of individuals suffering for each sociodemographic variable in at least one of the countries. The country-specific results for sociodemographic differences in suffering are presented in Supplementary Tables 24–45, with accompanying forest plots displaying country-specific suffering for each sociodemographic category (see Supplementary Figs. 1–34). We did not find support for a universal pattern of sociodemographic differences in suffering that applied across all countries, including the sociodemographic characteristics for which there was evidence of group differences in the random effects meta-analyses (i.e., marital status, employment status, years of education). For example, meta-analytic results in Table 4 indicated that the proportion endorsing some/a lot of suffering was lowest among people who were married, employed for an employer, and had completed 16 or more years of education, but some country-specific results for marital status (e.g., Egypt, India), employment status (e.g., Hong Kong, Japan), and years of education (e.g., Nigeria, South Africa) did not conform to this pattern.

There were country-specific instances in which evidence of a difference in the proportion of individuals suffering emerged between sociodemographic categories that were not observed in the pooled random effects meta-analyses. To illustrate, results in Table 4 showed overlapping 95% CIs for the average proportion of individuals reporting some/a lot of suffering among 18–24-year-olds and those aged 80 years or older, but there was evidence supporting higher suffering among those aged 80 years or older compared to 18–24-year-olds in countries like Kenya (see Supplementary Table 34). Similarly, 95% CIs for the proportions of males and females endorsing some/a lot of suffering were overlapping in Table 4, but 95% CIs in several countries (e.g., Spain, the United States) provided evidence of higher suffering among females (see Supplementary Tables 40 and 45). There was also some cross-country variation in the differences observed between some of the sociodemographic categories. For instance, 95% CIs for proportions reporting some/a lot of suffering indicated that suffering was lower among those who attended religious services more than once a week compared to those who never attended in Israel and the United States (see Supplementary Tables 32 and 45), but this pattern was reversed in Hong Kong and Sweden where suffering was highest among those who attended religious services more than once a week (see Supplementary Tables 29 and 41).

We also estimated country-specific variation in suffering as a function of religious affiliation and racial/ethnic identity (when available), which were not part of the meta-analysis because these variables were assessed inconsistently across countries (see Supplementary Tables 24–45). These results provide some evidence of differences in proportions of suffering across categories of these variables in certain countries, such as a lower suffering among adherents of Christianity compared to the no religion/atheist/agnostic category in Brazil (see Supplementary Table 26); as well as among those who self-identify racially/ethnically as Maasai compared to those who identify as Luhya in Kenya (see Supplementary Table 34).

Table 4 | Random Effects Meta-Analyses for the Proportion Endorsing Some/A lot of Suffering by Sociodemographic Category

Variable	Proportion (95% CI)	SE	Prediction interval		τ	I^2	Global p -value
			Lower	Upper			
Age group							< 0.0001
18–24 years	0.44 (0.38, 0.50)	0.03	0.13	0.64	0.15	93.8	
25–29 years	0.43 (0.37, 0.49)	0.03	0.16	0.64	0.13	92.9	
30–39 years	0.43 (0.38, 0.49)	0.03	0.18	0.60	0.12	91.6	
40–49 years	0.44 (0.39, 0.50)	0.03	0.19	0.63	0.13	92.3	
50–59 years	0.45 (0.41, 0.50)	0.02	0.24	0.61	0.11	89.8	
60–69 years	0.45 (0.40, 0.50)	0.03	0.20	0.62	0.12	90.6	
70–79 years	0.45 (0.40, 0.51)	0.03	0.24	0.74	0.13	91.6	
80 years or older	0.44 (0.27, 0.62)	0.09	0.00	0.80	0.43	99.2	
Gender							< 0.0001
Male	0.41 (0.37, 0.46)	0.02	0.23	0.58	0.11	89.0	
Female	0.46 (0.41, 0.51)	0.02	0.28	0.61	0.11	88.6	
Other	0.44 (0.19, 0.72)	0.13	0.00	0.90	0.61	99.6	
Marital status							< 0.0001
Married	0.41 (0.36, 0.46)	0.02	0.23	0.58	0.11	89.7	
Separated	0.56 (0.51, 0.61)	0.02	0.35	0.71	0.11	89.3	
Divorced	0.50 (0.44, 0.56)	0.03	0.26	0.76	0.14	92.9	
Widowed	0.51 (0.46, 0.56)	0.02	0.25	0.68	0.11	89.9	
Domestic partner	0.42 (0.36, 0.48)	0.03	0.18	0.60	0.13	92.3	
Single, never married	0.44 (0.39, 0.50)	0.03	0.19	0.60	0.12	91.3	
Employment status							< 0.0001
Employed for an employer	0.41 (0.36, 0.45)	0.02	0.19	0.58	0.10	88.6	
Self-employed	0.42 (0.36, 0.48)	0.03	0.17	0.64	0.13	92.8	
Retired	0.45 (0.40, 0.50)	0.02	0.20	0.62	0.10	88.6	
Student	0.42 (0.36, 0.49)	0.03	0.10	0.67	0.16	94.6	
Homemaker	0.47 (0.42, 0.53)	0.03	0.21	0.65	0.12	91.4	
Unemployed and looking for a job	0.54 (0.48, 0.60)	0.03	0.31	0.69	0.13	92.0	
None of these/other	0.55 (0.47, 0.63)	0.04	0.25	0.87	0.18	95.8	
Years of education							< 0.0001
Up to 8 years	0.47 (0.43, 0.52)	0.02	0.25	0.64	0.10	87.5	
9–15 years	0.44 (0.39, 0.49)	0.02	0.25	0.59	0.10	88.4	
16+ years	0.38 (0.35, 0.42)	0.02	0.23	0.52	0.08	83.7	
Frequency of religious service attendance							< 0.0001
> 1/week	0.45 (0.40, 0.51)	0.03	0.18	0.68	0.12	91.3	
1/week	0.45 (0.40, 0.49)	0.02	0.26	0.59	0.11	88.9	
1–3/month	0.44 (0.40, 0.49)	0.02	0.27	0.58	0.10	87.2	
A few times a year	0.43 (0.38, 0.48)	0.02	0.22	0.62	0.11	89.5	
Never	0.44 (0.39, 0.49)	0.03	0.23	0.63	0.12	90.9	
Immigration status							< 0.0001
Born in this country	0.44 (0.39, 0.49)	0.02	0.25	0.59	0.11	89.1	
Born in another country	0.45 (0.40, 0.49)	0.02	0.23	0.64	0.10	87.3	

$N = 202,898$. CI confidence interval, SE standard error, τ tau, I^2 = I-squared statistic.

Proportion: Estimated overall proportion of some/a lot of suffering for the sociodemographic category.

95% CI of proportion: The 95% CI for the estimated overall proportion of some/a lot of suffering for the sociodemographic category.

SE: Standard error analogue (confidence interval width divided by four), which is the standard error for the estimated overall proportion of some/a lot of suffering for the sociodemographic category.

Prediction interval: Variation in country-specific proportions of some/a lot of suffering for the sociodemographic category.

Lower: Lower limit of the prediction interval.

Upper: Upper limit of the prediction interval.

τ : The standard deviation of the distribution of the proportions of some/a lot of suffering across countries, an indicator of cross-national heterogeneity, and is back transformed from the logit scale which can lead to large estimates for small groups (e.g., other gender category).

I^2 : An estimate of the variability in proportions of some/a lot of suffering due to heterogeneity across countries versus sampling variability. Given that the sample sizes for each country are large, the I^2 is high.

Global p -value: A test of the null hypothesis that there are no differences in the proportions of some/a lot of suffering between the categories for the sociodemographic characteristic in any of the 22 countries.

All p -values were below the Bonferroni-corrected threshold of $p = 0.007$ ($p = 0.05/7$).

When we repeated the meta-analyses using a population weighted approach in which each country's results were weighted by population size in 2023 (see Supplementary Table 46), the pattern of results was mostly comparable to the findings observed for the random effects meta-analyses. However, some differences were observed. For example, whereas we found little evidence of average differences in the proportion of individuals suffering across the age groups when applying the random effects meta-analytic approach, results of the population weighted meta-analyses indicated that the proportion of people suffering was lower on average among those in the 80 years or older category than all other age categories except for 18–24-year-olds (driven largely by India because it received substantial weight in the population weighted meta-analyses).

Discussion

In this study, we used multinational data from Wave 1 of the GFS to explore the distribution of suffering in 22 geographically and culturally diverse countries and test for potential sociodemographic differences in the proportion of people experiencing some/a lot of suffering. Three main findings were observed, including some evidence of (1) cross-national variation in suffering, (2) sociodemographic differences in suffering across countries, and (3) cross-national variation in sociodemographic differences in suffering.

Our descriptive analysis of suffering provided useful nationally representative benchmarks of suffering in 22 countries. As subsequent waves of data collection for the GFS are completed, these findings are likely to be helpful in evaluating population-level changes in suffering that can be used by policymakers and practitioners to support local populations. While our principal focus was on documenting evidence of suffering in each country, we found substantial cross-country variation in suffering. For example, suffering in the country with the highest proportion of individuals who endorsed some/a lot of suffering (Türkiye) was more than two-fold greater than in the country with the lowest suffering (Poland).

When contrasted with Bradshaw et al.'s⁵⁴ findings from their analogous cross-national Wave 1 GFS analysis for depression symptoms using the Patient Health Questionnaire-2, there were some similarities and differences in the pattern of results observed for the two constructs. Relative rankings for suffering and depression symptoms were similar (within two or fewer positions of one another) in 9/22 countries (e.g., Egypt, Japan, Spain, Tanzania), with estimates for both constructs lowest in Poland. In other countries, the relative rankings for suffering and depression symptoms differed more substantially. The countries which showed the largest difference in relative ranking (a lower ranking is more negative) for suffering compared to depression symptoms were Germany (9th vs. 21st), Nigeria (15th vs. 5th), South Africa (19th vs. 11th), and Australia (7th vs. 15th), providing additional empirical evidence supporting a distinction between suffering and depression¹⁰.

There may be several reasons for the heterogeneity in suffering that we observed across countries, including differences in population demographics (e.g., some countries have older populations than others) and sociocultural factors that might be salient to suffering. As one illustration, consider the suffering reported in Türkiye and Poland in light of the 8 existential, physical, emotional, or social suffering-related metrics reported in Table 1. Poland had better rankings than Türkiye on all but one of the metrics (and considerably better on 6/8 of them), which might (at least partially) explain why suffering is lower in Poland than Türkiye. However, not all countries conformed to this pattern, such as South Africa where endorsement of suffering was comparatively low despite relatively poor rankings on many of the suffering-relevant metrics, suggesting there may be other salient factors beyond those listed in Table 1 that affect suffering (or a lack thereof) in specific contexts (e.g., historical events, political systems).

Insights from socioecological systems theory also suggest that socio-cultural factors might interact differently in different countries to influence suffering¹⁶. For example, in principally collectivistic societies (like South Africa) where the needs of the group are often prioritized over individual needs, suffering may be repressed to avoid causing disruption to social

cohesion and preserve social harmony^{55,56}. This may be one potential reason why suffering was comparatively low in South Africa despite apparent contextual vulnerabilities to suffering reflected in several suffering-relevant metrics shown in Table 1. Consideration should also be given to potential cross-cultural differences in how people may have interpreted or responded to the GFS survey items (including the suffering item), along with possible temporal effects (e.g., seasonal variation, current events) based on the timing of data collection in certain countries^{37,57}, highlighting some of the complexities associated with conducting cross-national studies and the importance of applying some caution when attempting to compare these descriptive findings about suffering across countries.

Results from the random effects meta-analyses provided evidence (through examination of 95% CIs for average proportions) of differences in suffering across the 22 countries as a function of marital status, employment status, and years of education. Specifically, we found that suffering was higher among those who had separated from their spouse, were either unemployed and looking for a job or endorsed the none of these/other employment status category, and had completed 8 years or less of education. Although our descriptive findings should not be interpreted causally and further work is needed to understand cause-and-effect relations, conservation of resources theory⁵⁸ would suggest that each of these sociodemographic categories involves some form of loss or privation of a valued resource (e.g., relationship, employment). Based on previous research that has linked different forms of resource loss (e.g., economic, interpersonal) to an increase in suffering¹¹, it is possible that these sociodemographic categories might be constituted by forms of resource loss or privation that are especially consequential to suffering. Thus, these groups may merit special attention from policymakers involved in developing strategies to address suffering in the general population. For example, policies that leverage multisector partnerships to provide tuition-supported adult education or vocational training with job placement services might help mitigate some financial or material sources of suffering in certain contexts. Given the scarcity of existing evidence concerning sociodemographic differences in suffering and the mixed findings that have been reported to date, our findings represent an important step forward in identifying potential cross-national disparities in suffering. As the GFS cohort is established through subsequent years of data collection, the panel data will provide a useful opportunity to track changes in suffering among vulnerable subpopulations and identify potential targets for interventionists and policymakers to prioritize in their efforts to address suffering.

A closer examination of the country-specific results for sociodemographic variation in suffering reveals some similarities and differences across countries. For each sociodemographic characteristic, the category with the highest proportion of individuals suffering across the greatest number of countries (regardless of whether 95% CIs for proportions in the categories overlapped) included the 80 years or older age group (6 countries); females vis-à-vis males (17 countries); those who had separated from their spouse (13 countries); those who endorsed the none of these/other employment status category (8 countries); those who attended religious services more than once a week (7 countries); those with 8 years or less of education (13 countries); and those who were born in the country where data collection took place (13 countries).

There was considerable cross-country variation in the magnitude of the differences that were observed for each sociodemographic characteristic. For example, in the 17 countries where the proportion of females who endorsed some/a lot of suffering was higher than for males, the difference between these two groups ranged from somewhat negligible (95% CIs for proportions in each group were overlapping) in some countries (e.g., Indonesia, Mexico) to quite substantial in others (e.g., Brazil, Egypt). Such heterogeneity could reflect cross-country variation in how social-structural factors (e.g., income inequality among females, gendered norms about expressing suffering) interact with biological, affective, and/or cognitive processes that might be related to suffering in different ways for females compared to males. Although this theorizing requires further empirical evaluation, policies and interventions may be especially effective in

addressing male-female disparities in suffering if a multipronged approach is applied to address psychosocial, behavioral, and social-structural factors in combination.

There were also instances in which the sociodemographic categories with the highest suffering in some countries had the lowest suffering in other countries. As one illustration, suffering was lowest among those who attended religious services more than once a week in 6 countries (e.g., Israel, the United States), and in most of these cases the largest group difference was between those who never attended and those who attended more than once a week. While more in-depth analyses are required to determine the potential reasons for the cross-national variation in sociodemographic differences that were observed, our findings resonate with prior work that suggests personal experiences of suffering are influenced by the contextual particularities of the sociocultural environment in which people live^{2,18}.

A major strength of this study is the use of a large sample of nationally representative data to document the distribution of suffering in multiple countries and identify subpopulations (both within and across countries) that may be especially vulnerable to experiencing suffering. By estimating the prevalence of suffering in different countries around the world, both at national and subpopulation levels, the findings of this study set the stage for developing a more focused population health and policy agenda to address suffering. Despite its strengths, there are methodological limitations of this study that ought to be considered as well.

First, suffering was assessed with a single item. Although this approach is not uncommon in large-scale epidemiologic studies (such as the GFS) and the use of single-item measures should not be automatically dismissed as inferior to multi-item measures⁵⁹, it is important to consider the potential drawbacks of single items. For example, a single item may capture the essence of the construct while potentially overlooking its conceptual breadth, or it may lack cultural sensitivity that could bias results. Our findings could be complemented by additional evidence drawing on measures that might provide more fine-grained conceptual coverage of suffering (e.g., PSA⁶), as well as measures that are more sensitive to forms of suffering (e.g., social, spiritual) which were likely underemphasized in this study because of the clause included in the suffering item (i.e., “This can be any type of physical or mental suffering”). Qualitative or mixed methods approaches may also enrich our depth of understanding about how suffering is experienced in different segments of the population across cultures⁶⁰. Future waves of the GFS could explore whether some of these considerations might be feasible to implement, such as incorporating a qualitative data collection component with a subsample of individuals from each country.

Second, although Wave 1 of the GFS has geographic and cultural diversity represented by the 22 participating countries, other cultures and contexts may not be represented in the GFS. Therefore, some caution should be applied when generalizing the findings beyond the countries that were included in our analytic sample.

Third, differences across sociodemographic characteristics might be due to a number of factors, such as contextual differences across countries (e.g., access to healthcare, macroeconomic conditions), cultural differences in the interpretation of the suffering question and responses categories, and possible seasonal effects. Future studies could build on our findings by examining country-level predictors of suffering (e.g., economic indicators, healthcare quality), along with potential country-level moderators of the associations between sociodemographic characteristics and suffering (e.g., extent of social welfare programming, national religiosity). Although Wave 1 of the GFS did not contain substantial missing data³³, we also bring attention to the possibility that observed sociodemographic disparities in suffering might be biased if there are systematic reasons (e.g., survey fatigue) that explain differences in missingness across sociodemographic categories.

Fourth, the scope of the present study was limited to probing the cross-national heterogeneity of differences in suffering across sociodemographic characteristics. Exploring interactions between sociodemographic characteristics in future work could provide insight into whether there are counter-balancing distributions of suffering across categories of different

sociodemographic characteristics and the consistency in these interactions across countries.

Fifth, we applied a descriptive analytic approach using cross-sectional data, and our findings do not indicate any causal relationships between variables. For example, results of the random effects meta-analyses showed that suffering was among the highest for those who were unemployed and looking for a job, but this may be because unemployment leads to suffering or because experiencing suffering increases the likelihood of job loss. Rather than attempting to identify determinants of suffering, this study contributes to identifying subpopulations at higher risk of suffering that may need to be prioritized in policy and practice.

Sixth, the results reported herein represent a snapshot of suffering assessed at a particular point in time. However, experiences of suffering can fluctuate over time, even within relatively short timeframes⁶¹. Temporal fluctuations in suffering may be attributed to a variety of influences, ranging from those that are highly proximal (e.g., changes in the circumstances that gave rise to suffering, shifts in a person’s coping response) to those that are more distal (e.g., acute changes to a nation’s public health risk or extent of civil unrest)^{11,13,20}. Longitudinal data from subsequent waves of the GFS could provide useful opportunities to explore potential factors that precipitate changes in suffering, as well as how temporal fluctuations in suffering might vary across countries and sociodemographic groups.

In summary, this multinational study provided initial evidence concerning the distribution of suffering in 22 countries and documented sociodemographic differences in suffering both within and across countries. While our findings help to lay the foundation for an epidemiology of suffering, further work is needed to better understand both the determinants and outcomes of suffering in different populations around the world. This will be possible as future waves of the GFS panel data become available. We hope that the findings of this study serve as a useful resource for policy-makers, practitioners, and scientists as they grapple with the challenge that suffering poses to human flourishing.

Data availability

The data that support the findings of this study are openly available on the Open Science Framework³⁰. The specific dataset used was Wave 1 non-sensitive Global data (<https://osf.io/sm4cd/>), which is available from February 2024 to March 2026 via preregistration and publicly from then onwards.

Code availability

All code to reproduce analyses is openly available in an online repository³⁴.

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Author contributions

R.G.C. conducted the analyses and wrote the manuscript. K.S. and R.N.P. provided the code for data analysis. B.R.J. and T.J.V. acquired funding, coordinated data collection, participated in survey design, and supervised the development of the analytic code. Z.J.C., R.W., D.W., T.B., C.G., K.S., R.N.P., B.R.J., and T.J.V. contributed to the review and editing of the manuscript.

Competing interests

The authors declare the following competing interests: Tyler J. VanderWeele reports consulting fees from Gloom Inc., along with shared revenue received by Harvard University in its license agreement with Gloom Inc. according to the University IP policy. All other authors declare no competing interests.

Additional information

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