

Suicidal ideation among older adults in Europe: The role of migration, loneliness, and regional contexts

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ABSTRACT

This article explores suicidal ideation among people aged 50+ in Central European (Czechia, Hungary, Poland, Slovakia), Nordic (Sweden, Finland, Denmark), and Baltic (Estonia, Latvia, Lithuania) countries, using SHARE Wave 9 data (N = 20,996, including 1,356 migrants). Migrants reported higher rates of suicidal thoughts (6.9%) than non-migrants (4.8%). Using logistic regression, factors such as age, education, loneliness, and depression explained most of the variance in suicidal ideation. The overall difference between migrants and non-migrants was small once these factors were controlled. Within the migrant subsample, those residing in Baltic countries had lower odds of suicidal ideation compared to those residing in Nordic countries. These findings underscore the importance of socio-geographical context and psychosocial factors, highlighting the need for targeted support strategies. As aging and migration reshape Europe, emotional well-being must remain central to suicide prevention efforts.

KEYWORDS

late-life suicide; migration; Baltic countries, Nordic countries; Central European countries

Received: 19 April 2025

Accepted: 20 January 2026

Published online: 2 February 2026

1. Introduction

Suicide represents a pressing global public health issue, with over 700,000 deaths annually (WHO 2024). This figure likely underestimates the true scale of the problem due to the hidden and complex nature of suicidal behaviour. While awareness has increased, particularly after the COVID-19 pandemic (Pathirathna et al. 2022; Yan et al. 2023), older adults remain underrepresented in research and prevention strategies, despite their heightened vulnerability.

This study addresses this gap by investigating suicidal ideation among people aged 50 and older, focusing on migrants and regional differences within Europe. Our objective is to assess how individual-level factors and contextual factors interact to influence late-life suicidal ideation, a topic that has received limited cross-national comparative attention. We aim to identify risk patterns across different European contexts to inform targeted mental health strategies.

The motivation for this study stems from concerns about the unique challenges faced by older adults, who are often overlooked in mental health discussions. Unlike younger populations, late-life suicidal behaviour is frequently dismissed or misunderstood as inevitable (Simon 1989). Many older people experience anxiety over losing autonomy, identity, and self-care capacity (Kjølseth et al. 2010; Crocker et al. 2006). For migrants, such struggles are compounded by cultural dissonance, language barriers, social isolation, and limited healthcare access.

Migration has increased significantly due to global mobility and political, economic, and social unrest. In 2024, over 304 million international migrants were recorded, with Europe experiencing the largest increase, where they now comprise 12.6% of the population (UN 2024). Migration is a heterogeneous process, and pre-, during-, and post-migration stressors can elevate the risk of mental health disorders, including suicidal ideation (Norredam et al. 2013).

The Nordic, Baltic, and Central European (also referred to as the Visegrad group) regions offer a valuable comparative framework due to their differing welfare systems, migration histories, and healthcare infrastructures (Fenger 2007; Borevi 2017; Szikra 2014). Although all three face aging populations and rising mental health concerns (OECD 2021), their institutional responses vary. Our analysis deliberately focuses on these regions to maintain conceptual coherence and comparability across institutional, demographic, and historical contexts. Previous research shows clear contrasts in how welfare regimes affect health, with Scandinavian welfare system typically linked to more favourable health outcomes compared to Eastern European region (Eikemo et al. 2008; Widding-Havneraas and Pedersen 2020).

To our knowledge, no prior study has systematically examined the intersection of aging, migration, and suicidal ideation while addressing regional

differences across the Nordic, Baltic, and Central European regions. Using SHARE data for multivariate regression analysis, we analyse both individual and contextual factors to assess the prevalence of suicidal ideation among older migrants and non-migrants while controlling for gender, age, and regional background, and examine how demographic, socioeconomic, regional, and mental health factors shape suicidal ideation in both groups.

2. Suicidal ideation in the context of migration and aging

Suicide is generally defined as self-harm intended to end one's life, encompassing completed suicides, attempts, and suicidal ideation, thoughts or plans of self-harm (Kuntz and Moutier 2021). Terms like "successful" or "failed" suicide are considered misleading (Klonsky et al. 2016).

Loneliness is a key correlate of suicidal ideation (McClelland et al. 2020) and tends to increase with age-related changes such as declining physical health, loss of mobility, retirement, and the reductions in social interactions. Based on the analysis of the Albanian elderly population, Nesturi and Nasufi (2025) concluded that these age-related factors, combined with deterioration of traditional family structures and ongoing migration trends, significantly deepen loneliness. By comparing the Nordic and Baltic regions, Reine et al. (2024) found significant regional differences in loneliness among individuals aged 67 and older, with heightened loneliness among respondents from Baltic countries. The authors highlight the role of both individual and societal factors in influencing late-life social isolation.

According to the International Organization for Migration, a migrant is anyone who moves from their usual residence, domestically or internationally, for various reasons (Sironi et al. 2019). Berry's (1980) acculturation model, though developed for recent migrants, also applies to older adults who continue to navigate cultural identity. Acculturative stress may build over time, especially without social support or inclusion (Cohen et al. 2018), guiding our focus on social integration, discrimination, and loneliness as key predictors of suicidal ideation.

Globally, suicide prevalence among migrants and refugees is about 2%, with suicidal ideation reaching 16% (Amiri 2020). While overall suicide risk is lower than among natives, non-fatal suicidal behaviour is more common, particularly among forcibly displaced individuals (Cogo et al. 2022). Older migrants often report poorer health, greater loneliness, and more stigma than younger migrants (Wu and Penning 2015; Reus-Pons et al. 2018). In Norway, immigrants report mental health issues at twice the rate of the general population (Kan et al. 2019). In Finland, migrants access psychotherapy less often than natives despite

similar needs (Lehti et al. 2025). Norwegian studies show first- and second-generation immigrants are less likely to receive mental health care before or after self-harm with generally lower suicide rates (Qin et al. 2022).

Migrants generally report lower subjective well-being than natives, with larger gaps in countries with restrictive family reunion policies (Sand and Gruber 2018). Bersani and Morabito (2020) highlight the “immigrant paradox”, where foreign-born individuals often have better health, but suicidality varies across generations. They found that the effect of migration age on suicidality varies based on gender and nativity, underscoring the need for nuanced analyses.

Although previous research has illuminated the complexity of suicidal behaviour among older adults (Kjølseth et al. 2010), older migrants remain underexamined as a distinct group in suicide research. Much of the existing literature either focuses on younger or newly arrived populations, or it does not explore how migration history intersects with suicidal ideation in late life. While healthcare access, social isolation, and acculturation challenges are well-documented, their interaction with mental health in older age, especially across different European contexts, remains insufficiently understood.

3. Data and methods

Data from the Survey of Health, Ageing and Retirement in Europe (SHARE) were used, specifically wave 9 from 2022, which was the most recent wave available at the start of our research. Additionally, we incorporated demographic variables from participants' first interview (baseline data from waves 1–7).

3.1 Study sample

A sample of individuals aged 50 and above from 10 European countries: Czechia, Denmark, Estonia, Finland, Hungary, Poland, Slovakia, Sweden, Latvia, Lithuania was analysed for the paper. These countries were selected due to their geographical belonging to the Nordic, Central European, Baltic regions and EU. Norway and Iceland, although part of the Nordic region, are not members of the European Union and are therefore not included in the SHARE project, which is why they are not part of our sample.

The initial sample consisted of 69,447 respondents from SHARE Wave 9. As the focus of this study was on individuals residing in Central European, Nordic, and Baltic countries, those living outside these regions were excluded. Additionally, to maintain a focus on older adults, individuals younger than 50 or older than 94 were removed, reducing the sample to 24,902 respondents. Excluding the oldest-old is justified due to their likely mental and physical decline. According to a study by Lee et al. (2016),

there is a sharp increase in the proportion of frail elderly when at the age of 95. The states of physical and mental decline increase the odds of incoherent responses, which, in turn, are likely to add unexplained variability in the dependent variable, thus obscuring the underlying relationships.

Next, respondents with missing migration status were excluded ($n = 1,881$), resulting in a sample of 21,439 non-migrants and 1,582 migrants. Further exclusions were made for respondents with missing data on suicidal thoughts ($n = 390$), leaving 21,081 non-migrants and 1,550 migrants. Finally, individuals with missing data on any predictor variables were removed ($n = 1,635$), yielding a final study population of 20,996 observations, including 19,640 non-migrants and 1,356 migrants. This final sample was used in the subsequent statistical analyses (Fig. 1).

3.1.1 Analysed variables

All “Refusal” and “Don't know” responses in the analysed variables were coded as missing and excluded from the analysis, which was conducted on complete cases only.

Dependent variable. The dependent variable in this study measures suicidal ideation or a wish to be dead, based on the question: “In the last month, have you felt that you would rather be dead?” Responses include refusal (−2), don't know (−1), any mention of suicidal feelings (1), and no such feelings (2). For this analysis, we focus on those who reported suicidal ideation (coded as 1) to examine prevalence and associated factors.

Independent variables

Demographics. Age at the time of the interview (age_int) was recoded into three categories: 50–64, 65–80, and 81–94 years to capture distinct life stages.

Gender was coded as 1 representing female respondents and 0 representing male respondents.

Education is grouped into Low (0–10 years of schooling), Middle (10–14 years of schooling), and High (15–25 years of schooling) based on socioeconomic outcomes. Cross-national findings indicate that both lower and higher levels of educational attainment are linked to higher elderly suicide rates (Shah 2012). At the same time, registry-based Norwegian data show that lower education consistently increases suicide risk, whereas higher education may be protective, particularly among men (Øien-Ødegaard et al. 2021). These categories allow for a clearer analysis of education's role in mental health and suicidal ideation.

Mental health indicators. The Three-Item Loneliness Scale (Hughes et al. 2004) assesses loneliness through three components: lack of companionship, feeling left out, and isolation. Responses range from “hardly ever”

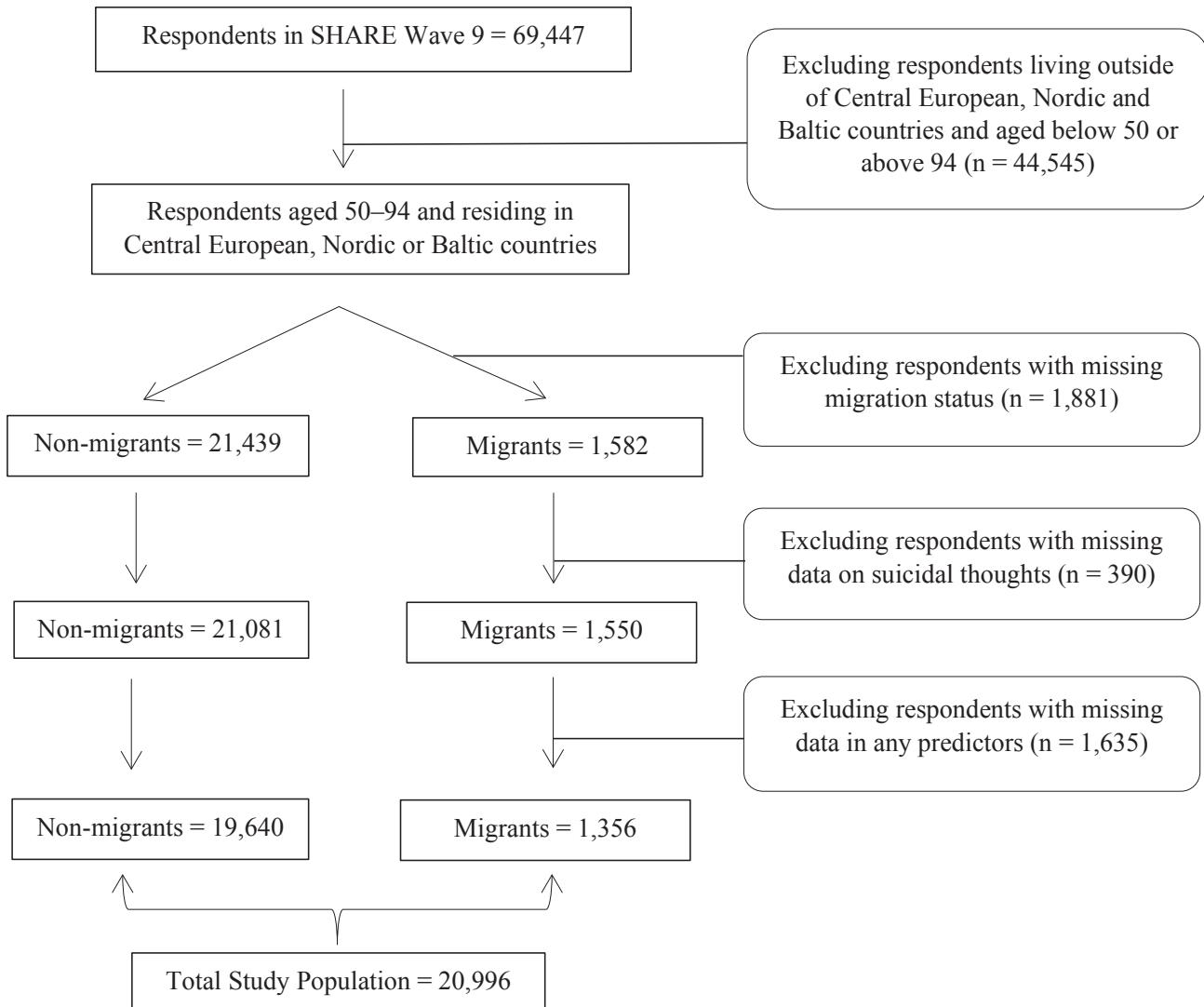


Fig. 1 Steps of the Sample Selection and Refinement Process.

to “often” (score 3–9). We categorize loneliness as Not lonely (3), Somewhat lonely (4–6), and Very lonely (7–9) to provide a nuanced understanding. Recent feelings of sadness were assessed using the original SHARE variable mh002, in which respondents reported whether they had felt sad or depressed in the past month. This variable was recoded into a binary indicator, with 1 for Yes and 0 for No.

Migration. Respondents were identified as migrants if they were not born in the country where the interview took place (dn004 “Born in the country of interview”). This was coded as 1 for migrants and 0 for non-migrants. Finally, for migrants, years in the country were calculated as the difference between the year of the interview (int_year) and the year the respondent arrived in the country (dn006). The variable dn005c (“Foreign Country of Birth”) was recoded into three categories to reflect the region of birth for migrants: European Union (EU), Former Soviet Union (FSU), and Other Countries. EU countries include member states of the EU at the time of the data collection,

regardless of their prior affiliations. Countries that belong to both the EU and the former Soviet Union, were categorized under the EU group. This decision was made to reflect their current institutional context, which shapes migrant integration policies, healthcare access, and overall societal structure more directly than historical affiliations. It also aligns with other literature that classifies countries primarily based on current political-economic alignment (e.g., Eurostat, OECD frameworks).

Geographical. The country of residence variable identified the ten countries included in the analysis. The region of residence was classified based on the country variable. Respondents were categorized into one of three regions: Nordic (Sweden, Denmark, Finland), Central European (Czechia, Poland, Hungary, Slovakia), and Baltic (Estonia, Latvia, Lithuania). The type of residence was recorded based on the “Area of building” variable to indicate whether respondents lived in a rural area. A score of 1 was assigned for rural areas, and a score of 0 for non-rural areas.

3.2 Methods

First, descriptive statistics along with Pearson's Chi-Square test of independence were calculated to examine the relationship between independent variables and suicidal ideation. To gain deeper insight we first assessed the pairwise associations among all analysed variables using the Phi coefficient. Based on the pairwise relationships, we selected informative predictors – focal and controls – to include in the logistic models.

Second, to examine the relationship between suicidal ideation and key predictors, we estimated

a series of logistic regression models in a stepwise manner. We began by including control variables only, to assess their direct associations with suicidal ideation. In the next step, we added key predictors – the indicators of loneliness and depression and regional indicators of Central European, Nordic and Baltic countries. The models were initially calculated for all 20,996 respondents together and then separately for the sub-samples of migrants (1,356 respondents) and non-migrants (19,640 respondents). Finally, for the migrant subsample, we estimated one additional model: that further incorporated migrant-specific characteristics, namely years spent in the host

Tab. 1 Descriptive Statistics of the total study sample, migrants and non-migrants and prevalence of suicidal ideation across the Central European, Baltic, and Nordic regions.

| Variable / Category | Total study sample | | | Migrants | | | Non-migrants | | |
|--|--------------------|---------------------------------|-----------|----------|---------------------------------|-----------|--------------|---------------------------------|-----------|
| | N | Preval. of suicide ideation (%) | P values* | N | Preval. of suicide ideation (%) | P values* | N | Preval. of suicide ideation (%) | P values* |
| Age groups (years) | | | | | | | | | |
| 50–64 | 6,357 | 3.4 | <0.001 | 301 | 4.3 | <0.001 | 6,056 | 3.3 | <0.001 |
| 65–80 | 11,727 | 4.5 | | 754 | 5.7 | | 10,973 | 4.4 | |
| 81–94 | 2,912 | 10.5 | | 301 | 12.3 | | 2,611 | 10.3 | |
| Gender | | | | | | | | | |
| Female | 12,336 | 5.8 | <0.001 | 880 | 8.2 | <0.001 | 11,456 | 5.6 | <0.001 |
| Male | 8,660 | 3.8 | | 476 | 4.4 | | 8,184 | 3.8 | |
| Educational groups | | | | | | | | | |
| Low | 3,840 | 8.3 | <0.001 | 244 | 13.1 | <0.001 | 3,596 | 7.9 | <0.001 |
| Middle | 12,201 | 4.7 | | 749 | 5.9 | | 11,452 | 4.7 | |
| High | 4,955 | 3.0 | | 363 | 4.7 | | 4,592 | 2.9 | |
| Region of residence | | | | | | | | | |
| Central European | 9,067 | 5.4 | <0.001 | 193 | 9.3 | 0.058 | 8,874 | 5.3 | <0.001 |
| Baltic | 5,696 | 5.2 | | 937 | 5.8 | | 5,470 | 5.1 | |
| Nordic | 6,233 | 4.1 | | 226 | 9.3 | | 5,296 | 3.9 | |
| Type of residence – rural | | | | | | | | | |
| Yes | 7,292 | 4.9 | 0.638 | 239 | 10.0 | 0.032 | 7,053 | 4.9 | 0.775 |
| No | 13,704 | 5.1 | | 1,117 | 6.2 | | 12,587 | 4.8 | |
| Feelings of loneliness | | | | | | | | | |
| Not lonely | 11,455 | 2.3 | <0.001 | 711 | 3.7 | <0.001 | 10,744 | 2.2 | <0.001 |
| Somewhat lonely | 8,226 | 5.5 | | 526 | 6.7 | | 7,700 | 5.4 | |
| Very lonely | 1,315 | 24.7 | | 119 | 26.9 | | 1,196 | 24.6 | |
| Recently sad or depressed | | | | | | | | | |
| Yes | 8,591 | 9.7 | <0.001 | 673 | 11.0 | <0.001 | 7,908 | 9.6 | <0.001 |
| No | 12,405 | 1.7 | | 683 | 2.7 | | 11,732 | 1.7 | |
| Years in the country (for migrants) | | | | | | | | | |
| 20 years or less | | | | 25 | 8.0 | 0.083 | | | |
| 21 to 50 years | | | | 480 | 4.8 | | | | |
| Over 50 years | | | | 851 | 8.0 | | | | |
| Region of birth (for migrants) | | | | | | | | | |
| Former Soviet Union | | | | 926 | 5.6 | 0.022 | | | |
| European Union | | | | 317 | 10.1 | | | | |
| Other | | | | 113 | 8.0 | | | | |
| Total | 20,996 | 5.0 | | 1,356 | 6.9 | | 19,640 | 4.8 | |

* The p-values come from Pearson's Chi-Square test of independence.

Tab. 2 Pairwise associations (Phi coefficients) for all analysed variables in the total study sample (n = 20,996), Central European, Baltic, and Nordic regions.

| | Age: 50–64 | Age: 65–80 | Age: 81–94 | Female | Education: Low | Education: Middle | Education: High | Migrant | Baltic | Central European | Nordic | Rural Area | Not lonely | Somewhat lonely | Very lonely | Recently sad or depressed | |
|--------------------|------------|------------|------------|---------|----------------|-------------------|-----------------|----------|----------|------------------|----------|------------|------------|-----------------|-------------|---------------------------|----------|
| Suicidal thoughts | -0.049** | -0.025** | 0.101** | 0.045** | 0.071** | -0.013 | -0.050** | 0.023** | 0.006 | 0.017* | -0.025** | 0.003 | -0.133** | 0.020** | 0.235** | 0.180** | |
| Age (years): 50–64 | | -0.741** | -0.264** | -0.010 | -0.177** | 0.112** | 0.030** | -0.046** | 0.044** | 0.021* | -0.069** | 0.051** | 0.121** | -0.095** | -0.057** | -0.057** | |
| Age (years): 65–80 | | | -0.451** | -0.019* | 0.005 | -0.005 | 0.001 | -0.001 | -0.093** | 0.046** | 0.045** | -0.020* | -0.026** | 0.041** | -0.028** | -0.005 | |
| Age (years): 81–94 | | | | 0.040** | 0.227** | -0.142** | -0.042** | 0.063** | 0.076** | -0.094** | 0.027** | -0.039** | -0.124** | 0.069** | 0.116** | 0.083** | |
| Female | | | | | 0.041** | -0.021* | -0.013 | 0.033** | 0.056** | -0.004 | -0.053** | -0.042** | -0.065** | 0.044** | 0.045** | 0.159** | |
| Education: Low | | | | | | -0.557** | -0.263** | -0.002 | -0.036** | 0.020* | 0.014* | 0.137** | -0.080** | 0.045** | 0.072** | 0.045** | |
| Education: Middle | | | | | | | -0.655** | -0.015* | 0.011 | 0.135** | -0.162** | -0.005 | 0.018** | -0.012 | -0.012 | -0.029** | |
| Education: High | | | | | | | | 0.020* | 0.020* | -0.175** | 0.175** | -0.119** | 0.052** | -0.027** | -0.052** | -0.008 | |
| Migrant | | | | | | | | | 0.227** | -0.154** | -0.062** | -0.094** | -0.011 | -0.002 | 0.027** | 0.051** | 0.051** |
| Baltic | | | | | | | | | | -0.566** | -0.396** | -0.046** | -0.09 | 0.001 | 0.016* | 0.085** | 0.085** |
| Central European | | | | | | | | | | | -0.532** | 0.061** | -0.069** | 0.051** | 0.037** | -0.020* | -0.065** |
| Nordic | | | | | | | | | | | | -0.021* | 0.085** | -0.058** | -0.058** | -0.058** | -0.058** |
| Rural Area | | | | | | | | | | | | | -0.007 | 0.012 | -0.011 | -0.005 | |
| Not lonely | | | | | | | | | | | | | | -0.879** | -0.283** | -0.266** | |
| Somewhat lonely | | | | | | | | | | | | | | | -0.207** | 0.169*** | |
| Very lonely | | | | | | | | | | | | | | | | 0.205** | |

** Pairwise relationship is significant at the 0.01 level (2-tailed), * Pairwise relationship is significant at the 0.05 level (2-tailed).

country and the region of birth. This modelling sequence allows for a clearer understanding of how psychosocial, geographical, and migration-related factors independently and jointly shape suicidal ideation in later life. Analyses were conducted using IBM SPSS Statistics 28.0.

4. Results

4.1 Descriptive statistics and matrix of pairwise relationships

Tab. 1 presents descriptive statistics for the study samples, which include 20,996 older adults, with 1,356 migrants and 19,640 non-migrants. Suicidal ideation is more prevalent among migrants (6.9%) than non-migrants (4.8%) and is higher among older age groups, those with lower education, loneliness, and recent sadness or depression. Women report higher suicidal ideation (5.8%) than men (3.8%), particularly among migrant women (8.2%). For the total study sample, regional differences show higher prevalence in the Central European (5.4%) and Baltic (5.2%) regions, while the Nordic countries have the lowest (4.1%). Among migrants, those from the European Union (10.1%) report more suicidal ideation than those from the Former Soviet Union (5.6%) or other regions (8.0%).

As suggested by the descriptive statistics and pairwise relationship matrix, having a migration background is associated with a higher probability of experiencing suicidal thoughts compared to the native population. Migrant status is also linked to greater reported loneliness and a higher likelihood of recent sadness or a depressive episode. Moreover, migration background shows significant associations with nearly all predictor variables, suggesting systematic differences between migrants and non-migrants. These preliminary differences suggest that the relationships between the independent variables and suicidal ideation may vary systematically between the two groups. Therefore, in the subsequent analysis, we estimate models separately for migrants and non-migrants.

The pairwise association table suggests that the relationship between middle education and suicidal ideation was very weak. However, the remaining two education categories showed somewhat stronger associations. Given the conceptual importance, education was retained in the further analysis.

The pairwise relationship matrix showed no relationship between residing in a rural area and reporting suicidal thoughts. Thus, this predictor was dropped from further analysis (Tab. 2).

Similarly, the pairwise association between residing in a Baltic country and suicidal ideation was minimal. Nevertheless, this variable is retained in the

Tab. 3 The sensitivity analysis comparing model estimates with and without Slovakia.

| | | Slovakia included | | Slovakia excluded | |
|--|---------|-------------------|---------|-------------------|--|
| Sample size | | n = 20,996 | | n = 20,064 | |
| -2 Log Likelihood | | 7044.696 | | 6850.379 | |
| Nagelkerke R-square | | 0.179 | | 0.180 | |
| Cox & Snell R ² | | 0.058 | | 0.060 | |
| Variable / category | Adj. OR | 95% CI | Adj. OR | 95% CI | |
| Migrant (Reference: No) | | | | | |
| | 1.13 | 0.90–1.44 | 1.11 | 0.87–1.41 | |
| Rural area (Reference: No) | | | | | |
| Yes | 1.02 | 0.88–1.18 | 1.04 | 0.90–1.20 | |
| Feelings of loneliness (Reference: Not lonely) | | | | | |
| Somewhat lonely | 1.67 | 1.43–1.94 | 1.68 | 1.43–1.98 | |
| Very lonely | 6.43 | 5.35–7.76 | 6.60 | 5.46–7.98 | |
| Recently sad or depressed (Reference: No) | | | | | |
| Yes | 4.01 | 3.40–4.73 | 3.95 | 3.35–4.65 | |
| Age groups (Reference: 50–64) | | | | | |
| 65–80 | 1.12 | 0.95–1.33 | 1.12 | 0.94–1.33 | |
| 81–94 | 1.87 | 1.53–2.30 | 1.88 | 1.53–2.30 | |
| Gender (Reference: Male) | | | | | |
| Female | 1.11 | 0.97–1.28 | 1.13 | 0.98–1.31 | |
| Educational groups (Reference: Low) | | | | | |
| Middle | 0.77 | 0.66–0.91 | 0.79 | 0.67–0.93 | |
| High | 0.51 | 0.42–0.63 | 0.52 | 0.42–0.65 | |

analysis to assess whether the relationship between residing in the Baltic region – one of our studied predictors – and suicidal ideation also appears insignificant after adjusting for other covariates (Tab. 2).

According to Tab. 2, all pairwise relationships between analysed variables were low to moderate at most. Therefore, multicollinearity was not identified as a concern in the data. The highest absolute associations occur between mutually exclusive categorical dummies (e.g. Education: Low, Middle, High), where such strong negative relationships are expected due to coding.

Due to the small sample of migrants present within data for Slovakia, Slovakia was excluded from further analysis to account for this issue. To understand whether excluding Slovakia is justified, sensitivity analysis was performed by comparing parameter estimates and their confidence intervals with and without Slovakia. The sensitivity analysis was carried out for the key logistic models in this study, and the results suggest that excluding Slovakia did not significantly alter model parameters. The results of the sensitivity analysis can be found in Tab. 3.

4.2 Logistic regressions of suicidal ideation

We analysed associations between suicidal ideation and key predictors using a stepwise set of logistic regression models. First, the controls were included in the model to assess their direct associations with suicidal ideation (Tab. 4). Second, the models were expanded by adding the core predictors of interest: the region of residence, feelings of loneliness and depression (Tab. 5). This approach allowed an evaluation of whether the effects of the main predictors were independent of demographic composition. Finally, Tab. 6 shows the results of a model for the migrant subsample only. This model included the variables of

interest and demographic controls and additionally controlled for migrant-specific variables (years spent in the host country and region of birth) to examine whether these factors further explained variation in suicidal ideation among older migrants.

Tab. 4 presents the results of logistic regressions examining the association between suicidal ideation and the control variables: age groups, gender, and education, providing an initial overview of how basic demographic factors are related to the likelihood of reporting suicidal thoughts before introducing additional covariates in later models.

Across all models, older age was associated with higher odds of experiencing suicidal thoughts. Compared with individuals aged 50–64, those aged 65–80 had higher odds of suicidal ideation in the total sample and among non-migrants. Among migrants, a similar pattern was observed, with further increase in odds among the oldest age group suggesting that the increase in risk with age may manifest later in life for this group.

For the oldest age group (81–94), the odds of suicidal ideation were markedly higher across all samples. Individuals aged 81–94 had almost three times higher odds of reporting suicidal thoughts in the total population and among non-migrants, and more than twice as high among migrants. These results indicate that the risk of suicidal thoughts escalates sharply in advanced old age, particularly beyond 80 years.

Gender was associated with suicidal ideation across all groups. Women were about 1.5 times more likely than men to report suicidal thoughts in the total population and among non-migrants. Among migrants, this gender difference was also evident, indicating that women more frequently experience such thoughts regardless of migration background.

Education showed a clear protective pattern in all three samples. Compared with individuals with

Tab. 4 Results of logistic regression models for suicidal ideation with control variables.

| | | Total study population | | Migrants | | Non-migrants |
|--|---------|------------------------|---------|-----------|---------|--------------|
| –2 Log Likelihood | | 7795.320 | | 646.962 | | 7142.209 |
| Nagelkerke R-square | | 0.014 | | 0.022 | | 0.013 |
| Cox & Snell R ² | | 0.043 | | 0.056 | | 0.041 |
| Variable / category | Adj. OR | 95% CI | Adj. OR | 95% CI | Adj. OR | 95% CI |
| Age groups (Reference: 50–64) | | | | | | |
| 65–80 | 1.28** | 1.08–1.52 | 1.22 | 0.65–2.32 | 1.28** | 1.08–1.52 |
| 81–94 | 2.84** | 2.34–3.44 | 2.27* | 1.15–4.50 | 2.85** | 2.33–3.49 |
| Gender (Reference: Male) | | | | | | |
| Female | 1.51** | 1.32–1.73 | 1.73* | 1.04–2.87 | 1.49** | 1.29–1.71 |
| Educational groups (Reference: Low education) | | | | | | |
| Middle education | 0.73** | 0.63–0.85 | 0.536* | 0.32–0.89 | 0.75** | 0.64–0.88 |
| High education | 0.45** | 0.37–0.55 | 0.416** | 0.22–0.78 | 0.45** | 0.36–0.56 |
| Intercept | 0.04** | | 0.06** | | 0.04** | |

** Odds ratio is significant at the 0.01 level (2-tailed), * Odds ratio is significant at the 0.05 level (2-tailed).

low education, both middle and high education were associated with significantly lower odds of suicidal ideation across all groups. In the total population and among non-migrants, higher education reduced the odds of suicidal ideation by more than 50%. Among migrants, the protective effect was also significant. These results suggest that higher educational attainment reduces vulnerability to suicidal thoughts for both migrants and non-migrants.

The extended models including loneliness, recent sadness or depression, and regional context substantially improved the explanatory power of the model compared to controls-only. These results highlight the strong psychological correlates of suicidal ideation, while demographic and contextual effects remain more modest.

Loneliness emerged as one of the strongest and most consistent predictors of suicidal thoughts. Compared to those who reported not feeling lonely, individuals who described themselves as somewhat lonely had roughly 1.7 times higher odds of suicidal ideation in both the total population and among non-migrants. The effect was particularly pronounced for those who felt very lonely: the odds of suicidal thoughts were over six times higher in the total sample and among non-migrants. Among migrants, the association was also strong, confirming that intense loneliness is a powerful risk factor regardless of migration background.

Experiencing recent sadness or depression was another key determinant of suicidal ideation. Those who reported feeling sad or depressed had roughly four times higher odds of suicidal thoughts in the total sample and among non-migrants, and more than three times higher odds among migrants. This indicates that even after adjusting for loneliness and other factors, depressive feelings independently and strongly increase vulnerability to suicidal thinking.

Older age continued to be associated with higher odds of suicidal ideation, even after accounting for loneliness and sadness. Individuals aged 81–94 had approximately twice the odds of suicidal thoughts relative to those aged 50–64 in all groups. The persistence of this effect suggests that old age remains a structural risk factor for suicidal ideation, not fully explained by concurrent emotional distress. In the migrant sample, the effect was similar in size but not statistically significant, which can be explained by the smaller size of migrant sample.

Regional context generally did not play a major role, except for a notable protective effect among migrants residing in the Baltic countries, whose odds of suicidal thoughts were roughly two-thirds lower than their Nordic counterparts. This finding may point to contextual or cultural factors in Baltic societies that buffer against suicidal ideation among older migrants, though the pattern was not observed in the non-migrant population.

Tab. 5 Results of logistic regression models for suicidal ideation with key predictors and control variables.

| | | Total study population | | Migrants | | Non-migrants | |
|---|--------|------------------------|--------|-----------|--------|--------------|--------|
| | | Adj. OR | 95% CI | Adj. OR | 95% CI | Adj. OR | 95% CI |
| Region of residence (Reference: Nordics) | | | | | | | |
| Baltic | 0.92 | 0.76–1.10 | 0.37** | 0.21–0.66 | 0.98 | 0.81–1.19 | |
| Central European | 1.10 | 0.93–1.31 | 0.56 | 0.27–1.16 | 1.15 | 0.97–1.38 | |
| Feelings of loneliness (Reference: Not lonely) | | | | | | | |
| Somewhat lonely | 1.67** | 1.42–1.96 | 1.41 | 0.82–2.43 | 1.70** | 1.43–2.01 | |
| Very lonely | 6.55** | 5.41–7.92 | 5.29** | 2.86–9.75 | 6.66** | 5.45–8.15 | |
| Recently sad or depressed (Reference: No) | | | | | | | |
| Yes | 3.99** | 3.38–4.70 | 3.27** | 1.86–5.76 | 4.05** | 3.41–4.81 | |
| Age groups (Reference: 50–64) | | | | | | | |
| 65–80 | 1.11 | 0.94–1.33 | 1.17 | 0.60–2.26 | 1.11 | 0.93–1.33 | |
| 81–94 | 1.92** | 1.57–2.35 | 1.86 | 0.90–3.84 | 1.93** | 1.56–2.40 | |
| Gender (Reference: Male) | | | | | | | |
| Female | 1.15 | 0.99–1.32 | 1.33 | 0.78–2.27 | 1.13 | 0.97–1.31 | |
| Educational groups (Reference: Low education) | | | | | | | |
| Middle education | 0.80** | 0.68–0.94 | 0.63 | 0.36–1.09 | 0.82* | 0.70–0.97 | |
| High education | 0.54** | 0.43–0.66 | 0.44* | 0.22–0.85 | 0.54** | 0.43–0.68 | |
| Intercept | 0.01 | | 0.04 | | 0.01** | | |

** Odds ratio is significant at the 0.01 level (2-tailed), * Odds ratio is significant at the 0.05 level (2-tailed).

Tab. 6 Results of a logistic regression model for migrants estimating suicidal ideation with key predictors, control variables, and migrant specific variables.

| | | |
|---|---------|-----------|
| -2 Log Likelihood | 572.646 | |
| Nagelkerke R-square | 0.074 | |
| Cox & Snell R ² | 0.189 | |
| Variable / category | Adj. OR | 95% CI |
| Region of residence (Reference: Nordics) | | |
| Baltic | 0.61 | 0.24–1.56 |
| Central European | 0.62 | 0.28–1.36 |
| Feelings of loneliness (Reference: Not lonely) | | |
| Somewhat lonely | 1.37 | 0.79–2.36 |
| Very lonely | 5.25** | 2.83–9.72 |
| Recently sad or depressed (Reference: No) | | |
| Yes | 3.31** | 1.88–5.84 |
| Age groups (Reference: 50–64) | | |
| 65–80 | 1.14 | 0.56–2.30 |
| 81–94 | 1.81 | 0.81–4.07 |
| Gender (Reference: Male) | | |
| Female | 1.33 | 0.78–2.29 |
| Educational groups (Reference: Low education) | | |
| Middle education | 0.65 | 0.37–1.12 |
| High education | 0.45* | 0.23–0.89 |
| Years in the country (Reference: More than 50 years) | | |
| 20 years or less | 1.32 | 0.27–6.42 |
| 21 to 50 years | 0.87 | 0.48–1.57 |
| Region of birth (Reference: EU) | | |
| Former Soviet Union | 0.54 | 0.25–1.18 |
| Other | 0.90 | 0.37–2.18 |
| Intercept | 0.05** | |

** Odds ratio is significant at the 0.01 level (2-tailed), * Odds ratio is significant at the 0.05 level (2-tailed).

Once psychological predictors were included, gender differences in suicidal ideation largely disappeared. Education showed a protective effect, especially at higher levels, a trend that can be observed across all study samples. This suggests that the relationship between gender, education, and suicidal ideation may operate indirectly through psychological pathways such as loneliness and depressive symptoms. These factors may mediate or moderate the influence of sociodemographic variables, although confirming this would require additional analyses.

Adding migrant-specific variables (years in the country and region of birth) did not substantially improve the model fit or change the main conclusions. Neither years spent in the destination country nor region of birth showed significant associations with suicidal ideation.

The previously observed protective effect of residing in the Baltic countries disappeared once these variables were included, suggesting that the earlier pattern was partly compositional. Overall, emotional distress rather than migration background remains

the key driver of suicidal ideation among older migrants.

5. Discussion

This study focuses on suicidal ideation among older adults in the Central European, Baltic, and Nordic (EU-member only) countries. Drawing comparisons between migrants and non-migrants, this study explores the prevalence and predictors of suicidal ideation while controlling for individual and contextual factors. Suicidal ideation was slightly more prevalent among migrants (6.9%) compared to non-migrants (4.8%), with separate models indicating subtle variations in the associations between risk factors and suicidal ideation across the two subgroups.

Feelings of loneliness, sadness, and depression were important predictors of suicidal ideation in all study samples. Suicidal ideation is often linked with mental health disorders, but it can also arise in response to situational stressors (Rizvi et al. 2024).

Our findings align with evidence identifying feelings of loneliness as a risk factor for suicidal ideation in both migrant and non-migrant population (Antonelli-Salgado et al. 2021; Gomboc et al. 2022; Shoib et al. 2023; McClelland et al. 2020). To fully understand suicidality in late life, physical health as well as social factors need to be considered. Loneliness has been shown to mediate the association between physical pain and suicidal ideation (Wiktorsson et al. 2010; Lutzman et al. 2021).

Among older immigrants, loneliness is associated with both social and personal factors, including absence of a spouse, lower financial status, and poor health. Additionally, poor psychological well-being, limited social connections, language difficulties, and weak sense of belonging further contribute to feelings of loneliness (Ruan and Cheung 2024; Alvi and Zaidi 2017). Social disconnection was found to be an important determinant of mental health and suicidal ideation among immigrants in anglosphere countries (Aran et al. 2023).

Depression is another potential risk factor for suicidal ideation among older adults (Jang and Kim 2005). In the context of migration, Bhatia et al. (2024) highlighted key social determinants of mental health in older adults aged 50 years and older. Among protective factors of mental health, warm family relationship, employment, and social support were included. Conversely, risk factors consist of high age, lack of partner, no support from children, language barriers, and limited access to healthcare services. These findings, along with our results, underscore the importance of psychosocial support for older adults, regardless of migration status.

Age is a key factor in this research, as it is related to many barriers that emerge later in life. Older immigrants are a vulnerable group, as increasing age often leads to deterioration in physical health, loss of social networks and loss of independence. All of these can be compounded by the stress of migration, language difficulties, cultural differences, feelings of isolation and other related challenges (Caidi et al. 2020; Anantapong et al. 2024). In this study, individuals aged 81–94 years exhibited the highest odds of suicidal thoughts.

Protective role of higher education was evident across all three samples. These results are consistent with previous research that identified lower socioeconomic status of older adults as a risk factor for suicidal behaviour (Ju et al. 2016; Kim et al. 2016).

In migrant sample, lower odds of suicidal ideation were found in respondents residing in the Baltic region as compared to those living in the Nordic countries, although this association was only statistically significant before including migrant-specific variables. One possible explanation is the socioeconomic background and migration patterns of these migrant populations. According to Włodarska-Frykowska (2017), Baltic societies are strongly influenced by historical ties to the post-Soviet space, which also affect the number of

older immigrants from Soviet countries. Even though the research by Galstyan et al. (2021) focuses on emigration and identifying its main causes, the authors emphasize that since joining EU, the Baltic states have been making efforts to prevent emigration and to encourage return migration. Vorotnikov and Habarta (2021) highlight the efforts of Lithuania and, to somewhat more conservative extent, Latvia and Estonia to support long-term skilled and unskilled labour migrants and their integration into society. Furthermore, it is also worth highlighting the situation in Lithuania, where in 2024 more than half of the new long-term immigrants were family members who come to the country based on family ties (OECD 2025). On the other hand, the Nordic countries, which share similar welfare systems with active labour market policies and universal access to the provision of social benefits, differ in the structure of migrants and the reasons for migration (Greve 2016; Dahl et al. 2021). According to Dahl et al. (2021), the largest migrant structure in Denmark and Norway is represented by immigrants from other European countries, while in Sweden and Finland, the largest groups are immigrants from Syria and Iraq, with residence permits granted for family reasons, work, study, or asylum. In the context of Central European countries, the work-related motivations are often emphasized as predominant factor influencing migration (Drbohlav 2011; Bite et al. 2020; Papp et al. 2019; Schneider 2022).

Migrants in the Baltic region may have different migration trajectories and socioeconomic profiles, which could contribute to their lower risk of suicidal ideation. To confirm this relationship, further research with a larger sample would be needed.

Limitations. This study has several limitations. It is important to acknowledge that migrants are a heterogeneous group, with their health outcomes and suicidal ideation shaped by numerous interacting factors. The data were collected based on self-report measures, which may introduce bias. For example, mental health-related measures may be influenced by cultural factors, including the willingness to disclose suicidal ideation. Categorising continuous variables, while aiding interpretability, may involve some information loss and introduces a degree of subjectivity in how categories are defined. In particular, the small size of the reference group for "Years in the country" warrants cautious interpretation. Additionally, the cross-sectional design of the study does not allow for the confirmation of causal relationships. A longitudinal approach would provide valuable insights into the long-term effects and their potential impact on suicidal behaviour. Although many potential determinants were included in the analysis, the list was not exhaustive, and there may still be confounding variables that could influence suicidal ideation. Finally, the exclusive use of quantitative methods limits exploration of individual experiences.

6. Conclusion

This study examines the prevalence and predictors of suicidal ideation among older adults, with a particular focus on migration status and socio-geographical factors. Our findings indicate that individual factors such as age, loneliness, and mental health conditions, particularly depression, were the most important predictors of suicidal ideation among both migrants and non-migrants.

This research aligns with the UNs' Sustainable Development Goals (SDGs), particularly target 3.4, which prioritizes mental health improvement and suicide prevention. With the global population is aging rapidly, projecting to reach 16% aged 65 or older by 2050 (UN 2019), the need to address late-life mental health challenges has become increasingly urgent. As the proportion of older adults grows, so does their suicide risk. By incorporating a sociological perspective, this study aims to contribute to evidence-based strategies for mitigating suicidal ideation among older adults, with a particular focus on migration, gender, and socio-geographical disparities.

Acknowledgments

This work was supported by the NPO "Systemic Risk Institute" number LX22NPO5101, funded by the European Union – Next Generation EU (Ministry of Education, Youth and Sports, NPO: EXCELES). This work was also supported by GA UK project No 469025.

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