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The effect of place of residence and social capital on depression prevalence in Poland before and after the COVID-19 pandemic

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A – Research concept and design, B – Collection and/or assembly of data, C – Data analysis and interpretation, D – Writing the article, E – Critical revision of the article, F – Final approval of the article

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Abstract

Introduction and Objective. The aim of the study is to verify changes in the association between place of residence and depression prevalence before and after the onset of COVID-19 pandemic, and to identify indicators of social capital as determinants of the prevalence of depression among people aged 50 years or older living in rural and urban areas in Poland.

Materials and Method. The study used pooled data from two cross-sectional studies conducted in Poland: the COURAGE in Europe (2011–2012) and COURAGE-CAD (2024) including 2917 and 1802 participants, respectively, who were randomly selected from the general population aged 50 or older. Both studies applied the same methodology. The structured questionnaire included, among others, a scale measuring social network (COURAGE-SNI), social support (OSLO-3 SSS), formal and informal participation as well as social trust. It also incorporated an assessment of depression prevalence based on the DSM-IV algorithm for Major Depressive Disorder.

Results. The results showed that before the pandemic, there were no significant differences in depression prevalence between urban and rural areas. However, after the pandemic, urban residents had higher odds of experiencing depression than rural residents. Social networks emerged as one of the most consistent protective factors, particularly among urban residents, while other dimensions of social capital showed heterogeneous associations across time and place of residence. Trust was found as an important factor in protecting rural residents from depression.

Conclusions. The findings underscore the necessity to incorporate social capital into the design of public health strategies or interventions targeting the mental well-being of older adults, who are especially vulnerable to the negative effects of the disease.

Key words

depression, social capital, rural and urban areas, pandemic, older population

INTRODUCTION

At the end of 2019, the COVID-19 virus quickly spread throughout China and across the world, prompting governments to implement various measures to limit transmission, including home quarantines, business closures and the suspension of public transportation [1]. The outbreak of the global pandemic affected not only physical health and mortality, but also triggered a surge in mental health problems caused by social distancing measures and difficulties in accessing medical services [1]. In Poland, the first COVID-19 patient was diagnosed on 4 March 2020. A week later, the WHO declared the outbreak of the pandemic and the Polish government declared a state of epidemiological threat. In May 2023, according to WHO data, the public health emergency caused by the virus had ended [2]. However, despite the end of the pandemic, its residual effects, manifesting as social isolation, fear and depression, persisted within society [3]. Longitudinal studies from Ireland showed a marked increase in depressive symptoms among older adults during the pandemic, particularly among individuals living alone and those experiencing prolonged social restrictions [4]. Likewise, studies from The Netherlands demonstrated that loneliness remained strongly associated with anxiety and depression throughout the pandemic [5]. These diverse psychological challenges, such as enforced isolation or prolonged lockdowns, underscore the need for research comparing depression symptoms before and after the pandemic [6], especially in the older adults population. In Poland, even before the pandemic, older people were particularly vulnerable to social isolation due to living alone in their households, with up to one million Poles affected by this phenomenon [7]. Public health measures implemented to curb the pandemic also required significant behavioural adjustments, including changes in social interactions [8]. However, it is important to note that

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due to fear of stigmatization, many individuals avoid seeking professional support, which may further exacerbate their symptoms [9].

Data from the Institute for Health Metrics and Evaluation (IHME) indicate that 3.3% of Poland's population experienced depression in 2023 [10]. Globally, depression currently affects 5.9% people aged 70 years or over [11]. Loneliness and social isolation are recognized as key risk factors for mental health conditions in later life [12]. The place of residence of individuals is also a significant factor in the context of the various challenges related to the pandemic that are being faced by urban and rural residents. Despite the evidence from studies that urban areas have a higher incidence of depression [13], research encompassing the period before and after the pandemic has yet to be conducted in the Polish context.

In view of aging of the global population, there is an increasing interest in understanding the role of social capital in shaping the health of older adults, particularly in terms of mental health and symptom of depression. Empirical evidence suggests that places with higher social capital indices showed fewer confirmed cases of COVID infection [14].

Social capital can be defined as a resource that operates through social networks, which form its structural core. Values such as trust and reciprocity, which are integral components of social capital and operate at both the individual and collective levels, facilitate the establishment and maintenance of interpersonal relationships in older age. These elements have been shown to have a significant impact on the health of this age group [15]. For the purposes of this study social capital is defined as a multi-dimensional phenomenon including social networks, social support, social participation and trust.

OBJECTIVE

The aim of the study is to verify changes in the association between place of residence and depression prevalence before and after the period of the COVID-19 pandemic, and to identify indicators of social capital as determinants of the depression prevalence before the outbreak of the pandemic and one year after the end of pandemic, among people aged 50 years or older living in urban and rural areas in Poland.

MATERIALS AND METHOD

Study design and sampling. The pooled data from two cross-sectional studies were analysed. The *COURAGE in Europe* and *COURAGE – Poland: Comparison After a Decade (COURAGE-CAD)* were conducted in Poland comprehensively during 2011–2012 and 2024 on two entirely separate study populations. Participants of the *COURAGE* study were randomly selected from the adult population (n=4,071) based on a multi-stage clustered design. In the present study, only people aged 50 years or over were analysed (n=3036). In the *COURAGE-CAD* survey, participants were randomly selected from among the general population aged 50+ years through a stratified three-stage sampling procedure (n=2,006) (Fig. 1). In both studies, face-to-face computer-assisted interviews were conducted at respondent's home by trained interviewers using a structured questionnaire. Details concerning design, sampling procedures and measurements of both surveys are described elsewhere [16, 17].

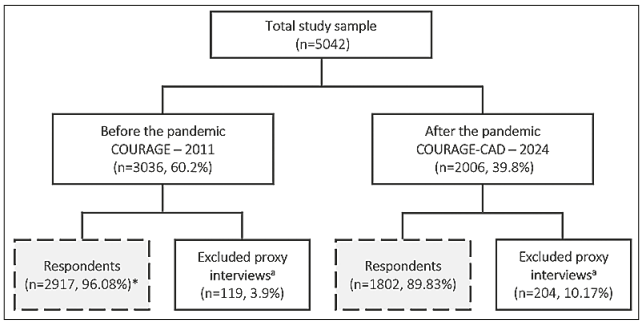


Figure 1. Flow chart of participants.
Note: [a] proxy version of the questionnaire was developed for use when respondents were unable to provide answers independently due to impaired cognitive function; * the sample size used for analysis was determined by age eligibility, defined as the difference between the interview year and the year of birth

MEASUREMENTS

Moderating variable

The **pandemic period** is treated as a dichotomous variable. Respondents from the *COURAGE in Europe* study are categorized as 'before the pandemic', whereas the 'after the pandemic' category involved respondents from the *COURAGE- CAD* survey.

Dependent variable

The **presence of depression** was assessed in a manner analogous to Freeman et al., by confirming a certain number of symptoms occurring in the respondent in the previous 12 months, as defined using the DSM-IV algorithm for Major Depressive Disorder [18].

Independent variables

The **place of residence** indicates whether respondents live in an urban or rural area. Urban area is an administrative region legally defined as urban based on the TERYT register. In the *COURAGE in Europe* and also *COURAGE-CAD* studies this includes small town (up to 50,000 residents), medium town (from 50,000 to 200,000 residents) and city (more than 200,000 residents). All areas not designated as urban were classified as rural, including villages.

Social capital

The level of **social network** was assessed by the COURAGE Social Network Index (COURAGE-SNI). The scale measures both the structural and functional aspects of respondents' of social contacts in terms of frequency of direct contact, ties, and feeling of support involving: family, friends, co-workers and neighbours.

To measure the **social support,** the OSLO-3 Social Support Scale was used [19]. A score was created by adding up the three items and then transformed into a 0–100 scale with higher scores indicating greater social support.

Formal social participation was assessed using a three items factor score based on the IRT -GRM model. This score was derived from questions about involvement in community meetings, contacts with local leaders and participation in organizations or groups. **Informal social participation** was determined as a factor score of four items concerning social interactions with friends, neighbours, relatives and co-workers outside the formal setting. Responses to the items

concerning formal and informal social participation were measured using a five-point Likert scale ranging from *never* to *daily*. The scale of formal and informal social participation ranges from 0 – 100, where 0 indicates the lowest level of social participation while 100 indicates the highest. The same applies to the COURAGE Social Network Index.

Trust was measured as a factor score based on the IRT-GPCM model comprising four items. One of these questions, which had two response options, related to general trust in people. The other three items concerned trust in neighbors, co-workers and strangers. The five-point Likert response scale was used for these questions, ranging from *a very small extent* to *a very great extent*. The factor scores were transformed to a 0–100 scale using min-max normalization, with higher scores indicating greater trust.

Confounders

Age, **gender**, **marital status**, **educational level** and **subjective socio-economic status** (SES) measured at country levels by means of visual analogue scale.

The **total number of chronic medical conditions** was determined based on affirmative responses to questions regarding diagnosis or receiving treatment for arthritis, angina, stroke, diabetes, chronic lung disease, asthma and cataract.

Functioning and disability were assessed using the 12-item version of the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0). Scores were calculated on a scale of 0–100 with higher scores indicating greater disability.

Additional variable

Quality of life (QoL) was assessed using a scale ranging from 0–100, based on the World Health Organization Quality of Life Assessment-Age (WHOQOL-AGE), whereby higher values indicate a better quality of life.

Statistical analysis

All data were weighted to account for the sampling design and to generalise the study sample to the reference population for *COURAGE in Europe* and *COURAGE-CAD* survey, respectively.

To compare socio-demographic, health, functional status and social capital characteristics of the participants across the pandemic period as well as by place of residence, Pearson chi-squared test (with Rao-Scott second-order correction), t-test and design-based Wilcoxon-type rank test, were performed as appropriate.

Multiple logistic regression models with interactions were used to assess the moderating effect of the 'pandemic period' on the association between place of residence and depression. Two models were estimated: Model 1 – adjusted for age, Model 2 – additionally adjusted for gender, marital status, educational level, subjective SES, number of chronic diseases, functioning and disability (WHODAS 2.0). If the p-value for the interaction term between place of residence and pandemic period was lower than the assumed significance level, it was expected that a moderation effect would be observed. In order to further investigate this effect, a logistic regression analysis was performed, stratified by assessed time periods: Models 1a–2a were controlled for age and Models 1b-2b were fully adjusted. The results were presented in a forest plot. In the next step, multiple logistic regression models were used to examine any association between social capital (i.e. social network, social support, social participation and trust), and prevalence of depression in four groups: before and after the pandemic by rural and urban areas. In this case, eight models were estimated: Models 1a–4a which were only adjusted for age, while Models 1b–4b, which were additionally adjusted for gender, marital status, educational level, subjective SES, number of chronic diseases, functioning and disability (WHODAS 2.0). Statistical significance level was set at $p<0.05$. For all data analyses the R environment (version 4.4.2) with *survey* packages was used.

RESULTS

Generally, the weighted median age of respondents increased from 62 to 65 years post-pandemic, reflecting the trend of population aging. In both studies, the majority of respondents lived in urban areas; however, the percentage of urban residents decreased to 59% in the period after the pandemic, compared with 69% previously. Married respondents predominated each of the surveys, representing 65% of participants. The most notable differences in marital status were related to a higher proportion of widowed individuals observed in the post-pandemic period (21% vs. 17%). The distribution of the socio-demographic characteristics and health status of respondents differed significantly between the studies. Following the pandemic, respondents' level of education, subjective SES, health and functional status, as well as QoL, significantly improved. Whereas the level of social capital indicators (except social trust) was significantly lower than before the outbreak of the pandemic (Tab. 1).

Table 2 shows the differences in socio-demographic characteristics, health, functional status and social capital between people over the age of 50 living in rural and urban areas in the period before and after the pandemic. Before the pandemic, urban residents were more likely to be divorced, had a significantly higher overall level of education, subjective SES, and reported better functional status and QoL than rural residents. Prior to the pandemic, rural residents had significantly higher level of formal participation in comparison to people living in urban areas. In the post-pandemic period, residents of urban areas were older, more likely to be divorced, and less likely to be married, were better educated but had a poorer functional status. After the pandemic, the prevalence of depression was significantly higher in urban residents (5% vs. 2.5%). However, urban citizens reported a significantly lower level of social network but higher level of informal social participation than rural residents.

The interaction term between place of residence and presence of depression was statistically significant after controlling for age (OR=2.41; p=0.021) (Tab. 3). No significant association was found between place of residence and the prevalence of depression in the pre-pandemic period, whereas after the pandemic, people living in urban areas had almost twice the odds of experiencing depression in the age-adjusted model (OR=1.93; p=0.037) (Fig. 2).

Table 1. Descriptive characteristics of participants in studies before and after the pandemic, weighted data

		Before the pandemic (n=2,917)	After the pandemic (n=1,802)	p value
Age Median [Q1;Q3]		62.00 [56.00;71.00]	65.00 [57.00;72.00]	0.022
Gender %	men	43.6	43.5	0.952
	women	56.4	56.5	
Place of residence %	rural area	31.1	41.0	0.003
	urban area	68.9	59.0	
Marital status %	single	8.0	6.4	0.036
	married	66.3	64.6	
	separated/divorced	8.3	7.7	
	widowed	17.4	21.3	
Level of education %	primary or lower	25.0	13.1	<0.001
	vocational	28.0	36.0	
	high school	35.1	34.6	
	university	11.9	16.3	
Subjective SES Mean (SD)*		4.90 (1.69)	6.04 (1.64)	<0.001
Total number of chronic conditions Median [Q1;Q3]		1.00 [0.00;1.00]	0.00 [0.00;1.00]	<0.001
Functioning and disability (WHODAS 2.0) Median [Q1;Q3]		11.11 [2.78;30.56]	8.33 [0.28;27.78]	0.016
Quality of life (WHOQOL-AGE) Mean (SD)		62.68 (13.75)	65.90 (15.14)	<0.001
Depression %	no	94.8	96.0	0.154
	yes	5.2	4.0	
Level of social networks (COURAGE-SNI) Mean (SD)		64.97 (12.68)	59.05 (12.96)	<0.001
Social support Mean (SD)		65.58 (16.19)	64.27 (16.33)	0.100
Formal social participation Median [Q1;Q3]		0.00 [0.00;36.72]	0.00 [0.00;14.02]	<0.001
Informal social participation Median [Q1;Q3]		27.47 [25.20;47.55]	26.98 [22.94;46.62]	0.002
Social trust Mean (SD)		38.88 (19.24)	43.29 (19.06)	<0.001

Note: SD – Standard Deviation; Q1 – 25th Percentile; Q3 – 75th Percentile, p value for the Pearson chi-squared test (Rao-Scott second-order correction); independent-samples t-test; design-based Wilcoxon-type rank test, as applicable;*missing values were recorded for this variable (n=175)

Table 2. Descriptive characteristics of participants in studies before (n=2,917) and after the pandemic COVID-19 (n=1,802) by rural and urban areas, weighted data

		Before the pandemic			After the pandemic		
		Rural area (n=1,250)	Urban area (n=1,667)	p value	Rural area (n=701)	Urban area (n=1,101)	p value
Age Median [Q1;Q3]		63.00 [56.00;72.00]	62.00 [56.00;71.00]	0.381	63.00 [57.00;70.00]	66.00 [58.00;74.00]	0.014
Gender %	men	44.4	43.2	0.588	45.4	42.2	0.203
	women	55.6	56.8		54.6	57.8	
Marital status %	single	10.9	6.6	<0.001	5.3	7.1	0.003
	married	65.9	66.5		69.8	60.9	
	separated/divorced	5.2	9.8		5.1	9.5	
	widowed	18.0	17.1		19.8	22.4	
Level of education %	primary or lower	38.6	18.8	<0.001	20.3	8.1	<0.001
	vocational	29.1	27.5		40.6	32.9	
	high school	24.6	39.9		27.1	39.8	
	university	7.6	13.8		12.0	19.3	
Subjective SES Mean (SD)*		4.57 (1.65)	5.05 (1.68)	<0.001	5.96 (1.64)	6.10 (1.63)	0.317
Total number of chronic conditions Median [Q1;Q3]		1.00 [0.00;1.00]	1.00 [0.00;1.00]	0.684	0.00 [0.00;1.00]	0.00 [0.00;1.00]	0.002
Functioning and disability (WHODAS 2.0) Median [Q1;Q3]		13.89 [2.78;33.33]	11.11 [2.78;27.78]	0.001	6.11 [0.28;21.94]	11.11 [0.83;30.56]	0.001
Quality of life (WHOQOL-AGE) Mean (SD)		60.89 (13.85)	63.49 (13.63)	0.002	66.64 (14.23)	65.39 (15.72)	0.214
Depression %	no	94.2	95.1	0.370	97.5	95.0	0.020
	yes	5.8	4.9		2.5	5.0	
Level of social networks (COURAGE-SNI) Median [Q1;Q3]		65.90 (12.88)	64.55 (12.57)	0.067	59.92 (11.93)	58.45 (13.60)	0.088
Social support Mean (SD)		66.37 (16.16)	65.22 (16.20)	0.199	64.52 (14.79)	64.10 (17.32)	0.744
Formal social participation Median [Q1;Q3]		0.00 [0.00;40.29]	0.00 [0.00;36.72]	0.015	0.00 [0.00;14.02]	0.00 [0.00;14.02]	0.241
Informal social participation Median [Q1;Q3]		27.47 [24.24;47.55]	27.47 [25.20;47.74]	0.651	26.18 [22.94;45.73]	27.94 [23.73;46.92]	0.009
Social trust Mean (SD)		39.25 (18.02)	38.71 (19.77)	0.643	43.70 (17.52)	43.01 (20.07)	0.660

Note: SD – Standard Deviation; Q1 – 25th Percentile; Q3 – 75th Percentile, p value for the Pearson chi-squared test (Rao-Scott second-order correction); independent-samples t-test; design-based Wilcoxon-type rank test, as applicable; *missing values were recorded for this variable (n=175)

Table 3. Logistic regression models examining the moderating role of 'pandemic period'

Dependent variable: Depression	Model 1		Model 2	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Place of residence (ref. rural area)	0.83 (0.54;1.27)	0.384	0.93 (0.58;1.49)	0.769
Pandemic period (ref. before the pandemic)	0.42 (0.23;0.76)	0.004	0.86 (0.46;1.60)	0.637
Place of residence *Pandemic period	2.41 (1.14;5.10)	0.021	1.51 (0.68;3.38)	0.314

Note: models examining the moderator's role in the association between place of residence and depression (dichotomized); CI – Confidence Interval, OR – Odds Ratio; Model 1 adjusted for age (as continuous); Model 2 – additionally adjusted for gender, marital status, educational level, subjective SES, number of chronic diseases, functioning and disability (WHODAS 2.0)

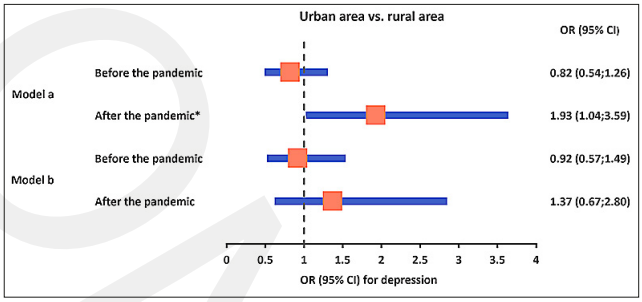


Figure 2. Forest plot showing the association between place of residence and occurrence of depression by time periods: before the pandemic (n=2,917) and after the pandemic (n=1,802).
Note: *p-value<0.05; CI – Confidence Intervals; OR – Odds Ratio; Model a adjusted for age (as continuous), Model b additionally adjusted for gender, marital status, educational level, subjective SES, number of chronic diseases, functioning and disability (WHODAS 2.0)

Table 4. Logistic regression models examining association between social capital and depression over time before and after the pandemic in rural and urban areas

Dependent variable: Depression	Rural area (n=1951)				Urban area (n=2768)			
	Before the pandemic (n=1,250)		After the pandemic (n=701)		Before the pandemic (n=1,667)		After the pandemic (n=1,101)	
	Model 1a		Model 2a		Model 3a		Model 4a	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Level of social networks (COURAGE-SNI)	0.97 (0.95;<1.00)	0.031	1.01 (0.94;1.08)	0.877	0.95 (0.93;0.97)	<0.001	0.97 (0.95;0.99)	0.012
Social support	1.00 (0.98;1.03)	0.723	0.99 (0.95;1.03)	0.636	1.01 (0.99;1.03)	0.253	1.00 (0.98;1.02)	0.806
Formal social participation	1.00 (0.99;1.02)	0.683	0.97 (0.93;1.02)	0.244	0.98 (0.97;<1.00)	0.023	0.99 (0.97;1.01)	0.512
Informal social participation	0.99 (0.98;1.01)	0.512	1.01 (0.98;1.04)	0.632	1.00 (0.99;1.02)	0.537	0.99 (0.97;1.01)	0.268
Social trust	0.96 (0.94;0.99)	0.002	0.98 (0.94;1.01)	0.236	0.99 (0.97;1.01)	0.219	1.01 (<1.00;1.03)	0.118
	Model 1b		Model 2b		Model 3b		Model 4b	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Level of social networks (COURAGE-SNI)	0.98 (0.95;1.01)	0.162	1.02 (0.96;1.09)	0.469	0.97 (0.95;<1.00)	0.039	0.98 (0.94;1.01)	0.121
Social support	1.01 (0.98;1.04)	0.423	0.99 (0.95;1.02)	0.460	1.01 (0.99;1.03)	0.241	1.00 (0.98;1.02)	0.801
Formal social participation	1.01 (0.99;1.03)	0.251	0.97 (0.93;1.01)	0.161	0.99 (0.97;>1.00)	0.084	1.00 (0.97;1.02)	0.756
Informal social participation	1.00 (0.98;1.02)	0.936	1.01 (0.97;1.04)	0.740	1.00 (0.99;1.01)	0.702	0.99 (0.98;1.01)	0.453
Social trust	0.97 (0.94;0.99)	0.013	1.00 (0.96;1.04)	0.845	0.99 (0.98;1.01)	0.481	1.02 (>1.00;1.04)	0.013

Note: CI – Confidence Interval; OR – Odds Ratio; Models 1a-4a adjusted for age (as continuous); Models 1b-4b additionally adjusted for gender, marital status, educational level, subjective SES, number of chronic diseases, functioning and disability (WHODAS 2.0)

Regression model for rural areas. In the pre-pandemic period, the model adjusted for age showed that an increased level of social network was significantly associated with a decreased odds of depression (OR=0.97; p=0.031). A higher level of social trust was associated with lower odds of experiencing depression both after controlling for age and in the fully adjusted model (respectively OR=0.96; p=0.002; OR=0.97; p=0.013) (Tab. 4). There were no significant associations after the pandemic.

Regression model for urban areas. Across all models, higher levels of social network were significantly linked to lower odds of depression, except for the fully adjusted post-pandemic model. Before the pandemic, an increased level of formal social participation was significantly associated with a reduced odds of depression after age adjustment (OR=0.98; p=0.023). For the post-pandemic subgroup, a higher level of social trust was significantly linked to higher odds of experiencing depression in a fully adjusted model (OR=1.02; p=0.013) (Tab. 4).

DISCUSSION

The study aimed to analyse urban–rural differences in the prevalence of depression and to examine social capital indicators as determinants of depression across place of residence before and after the pandemic period. The results showed no significant differences in the prevalence of depression between urban and rural areas in the pre-pandemic period. After one year of the COVID-19 pandemic period, living in an urban area was associated with a greater prevalence of major depressive disorder than living in rural area [13, 20, 21]. These findings are consistent with international evidence suggesting that urban environments may amplify the adverse mental health effects of the pandemic, while social isolation, reduced social engagement, and loneliness have been identified as key mechanisms linking pandemic restrictions to depression among older adults [8, 20, 22].

The current state of knowledge suggests that urban residents are more vulnerable to depression [23], a condition that

can be triggered by various factors as disruption of routine social activities, primarily due to the implementation of strict mobility restrictions, high population density and earlier implementation of social distancing measures. Urban areas adopted more rigorous forms of isolation with the closing of public spaces, etc., which disproportionately affected older people living in these areas [24].

Studies conducted in the United States and Europe documented substantial reductions in social contacts and increased loneliness among older adults during the COVID-19 pandemic, accompanied by poorer mental health outcomes. Strong social networks may protect mental health by maintaining social connectedness and facilitating access to emotional and practical support. These resources may strengthen resilience to pandemic-related stress and reduce vulnerability to depressive symptoms among older adults. Importantly, the finding in the current study that social networks were associated with lower odds of depression in both the pre- and post-pandemic periods, is broadly consistent with international evidence on their protective role in mental health [3, 8].

Trust, as an element of cognitive social capital, is frequently linked to social networks, which are considered a component that facilitates the establishment and maintenance of social relationships [14, 15, 19, 24, 25].

Prior to the emergence of the pandemic, elevated levels of trust were consistently shown to exert a protective effect against depression. However, evidence emerging in the post-pandemic period suggests that, particularly in urban areas, higher levels of trust may be associated with an increased risk of depressive symptoms. This finding underscores the multifaceted nature of the relationship between trust and depression. In high-trust societies, individuals who exhibit low levels of trust may experience a sense of misalignment with dominant social norms, which can intensify feelings of social exclusion and, consequently, exacerbate depressive symptoms. Moreover, elevated levels of social trust are often accompanied by increased expectations of social participation. Such expectations may not be attainable for all individuals and may be especially burdensome for those experiencing social anxiety or limited social resources. Consequently, while high societal trust can function as a protective factor against depression, it may simultaneously contribute to the alienation of individuals who do not conform to prevailing social patterns [26]. Stronger social ties and higher levels of trust have generally been identified as protective factors buffering the adverse psychological consequences of social isolation. Our findings are only partly consistent with this evidence, as the protective association between social trust and depression was observed only among rural residents before the pandemic, suggesting that the role of trust may vary across social contexts and over time [3, 8].

In Poland, changes in social capital indicate a decline following the pandemic, despite improvements in education, subjective socioeconomic status, and functional capability. The decline in social capital indicators (with the exception of trust) suggests a disruption in the long-term patterns of social activity that may have resulted from forced isolation, which was particularly severe for older people [25].

At the beginning of the first wave, the 'stay at home' social movement gained popularity, encouraging self-isolation out of concern for the safety and health of others. However, the rising number of cases (including those requiring hospitalization or resulting in death), the ambiguous symptoms of the virus, and the growing level of anxiety in society, led to the implementation of social distancing measures. It has been demonstrated that older people, who are more vulnerable to the negative effects of isolation, experienced these effects to a greater extent than other age groups [26].

The present study is notable for a number of strengths. First, the implementation of a standardized instrument for the evaluation of depressive symptoms. The results of the analysis based on its use may constitute valuable material for subsequent meta-analyses. Secondly, the study was conducted on a relatively large and representative sample of Polish respondents over the age of 50. By employing the same instrument and methodology in COURAGE and COURAGE-CAD studies, it was possible to compare changes in social capital factors and their association with depression in these time periods. Another significant advantage of the study is undoubtedly the analysis of social capital factors and the frequency of depression in the post-pandemic period. The majority of research on this aspect has focused on the period during the pandemic and were mostly conducted until 2023 [1, 3, 6, 8, 20, 22, 24, 27]. In contrast, due to the surveys conducted in the second half of 2024, the current study allowed for a comparison of these variables in the pre- and post-pandemic periods.

Limitations of the study. The study also has several limitations. Both studies were cross-sectional, which limited the ability to establish causal relationships. The study relied on self-reported measures, which may have been subject to reporting bias, including recall bias and social desirability bias. The probability of non-response may have been higher among individuals experiencing depression, which could have led to an under-representation of this group in the sample and, as a result, to an underestimation of the prevalence of depression.

CONCLUSIONS

After the pandemic, the patterns of the association between place of residence and prevalence of depression changed in favour of rural areas. Social capital factors declined in both urban and rural areas. The results confirmed a significant positive effect of some social capital indicators on depression before the pandemic; however, during the post-pandemic period the association was ambiguous. The findings underscore the necessity to incorporate social capital into the design of public health strategies or interventions targeting the mental well-being of older adults, who are especially vulnerable to the negative effects of the COVID pandemic. However, the protective function of trust against depression in rural areas necessitates further analysis of the specific factors responsible for this difference in the urban-rural relationship, as well as with regard to women and men.

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