

Social and nature connectedness, coping strategies, and mental health symptoms

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Abstract:

Aim of the study: The study evaluates the role of connectedness and coping strategies in mental health model.

Subject or material and methods: The sample included a total of 81 adult participants aged 19-57 years ($M=28.02$), of whom 76,5% were female. More than half of participants live in the biggest cities in Poland, including capital city (61,73%). The online semi-structured questionnaire included sections concerning several areas: sociodemographic data, mental health symptoms (DASS-21), nature connectedness (CNS), social connectedness (SCS-R), coping strategies (Mini-COPE).

Results: The analysis examined how depression, stress, anxiety, and coping mechanisms are related to the nature and social connectedness. Obtained results shown: (1) significant negative relationship of social connectedness with severity of stress ($r = -.41$; BCa 95% CI), anxiety ($r = -.40$; BCa 95% CI) and depression ($r = -.50$; BCa 95% CI); (2) significant negative relationship of nature connectedness with anxiety level ($r = -.22$; BCa 95% CI) and symptoms of depression ($r = -.26$; BCa 95% CI). Furthermore, the results showed a significant relationships of social connectedness/ nature connectedness and adaptive and maladaptive coping strategies.

Discussion: Recent studies have shown the mental health is broad concept and both nature and social connectedness seems to be one of important factors affecting it. The stronger both nature and social connectedness we can observe the clear tendency to using positive, adaptive coping strategies.

Conclusions: As this research seems to indicate that prevention should include strengthening both social and nature connectedness, the implications of these findings may be useful for mental health care planning.

social connectedness; nature connectedness; coping strategies; mental health

INTRODUCTION

Last years, many people worldwide turned to community and nature in many ways, through in particular: neighbours helping and caring, local communities supporting, activities that involve contact with nature, contemplation and

reflection concerning nature. In times of COVID-19 pandemic, the role of social support has been appreciated by entire communities struggling with social isolation and local restrictions. Contact with nature has become one of the most accessible ways to stress relief. Hence, both individual's experience of social connectedness and nature connectedness became more and more in research interests. It is worth noting that both social and nature-related variables have so far been underestimated variables in the mental health

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model, although according to the results of the latest research [1-8] they have a significant impact on the well-being and mental health of an individual.

While connectedness topic is not entirely new, the COVID-19 pandemic has shed new light on our perceptions of both community and nature. Polish as well as worldwide studies concerning mental health changes during pandemic underline mental well-being deterioration and higher need for professional help in particular populations [1-3]. Recent research brought new or in-depth findings concerning human-nature relations highlighting complex relationship between nature dose and health and wellbeing benefits [4-8]. Numerous studies concerned social connectedness and its impact on mental health during pandemic, especially in the elderly [9-14]. Many studies indicated that contact with nature and social connectedness can be protective factors for mental health issues in high – and long-lasting – stress context [13,15-17]. Although the data are relatively scarce, obtained results underline positive and significant relationship between nature connectedness and individual happiness, well-being, and mental health indicators [18-20]. In Poland, the nature and social connectedness have not been studied so far, and they are rather new concepts. As researchers concluded, there is a need for locally relevant evidence, mental prevention strategy or policy concerning social and nature connectedness [4].

The presented research aimed at:

- indication of the existing links between social and natural bonds and the psychological well-being of the respondents, and also
- indication of the links between the social and nature connectedness and the preferred coping strategies.

Therefore, this paper focuses on two main hypotheses:

- (1) strong social and nature connectedness are associated with lower psychopathological symptoms of common mental health issues

- (2) strong social and nature connectedness are associated with a higher level of positive coping strategies.

The practical implications of the presented study come directly from the adopted salutogenic model of mental health, focused on building mental resilience by strengthening health-promoting factors within preventive programs.

METHODS

Study Design and Participants

This cross-sectional, observational study was conducted within adult Poles. Invitations to participate in the survey were disseminated through social media. An online semi-structured questionnaire was developed by using Google forms (due to epidemiological restrictions), with an informed consent form appended to it. The Maria Grzegorzewska University of Ethics Committee approved the study procedures (Approval number: 44/2021). This study was conducted in accordance with the Declaration of Helsinki. The procedures were clearly explained, and participants could interrupt or quit the survey at any point without explaining their reasons for doing so. Confidentiality was maintained by omitting personal identifiers.

The sample was consisted of 81 people: 62 females and 19 males. The age was ranged from 19 to 57 years ($M = 28.02$; $SD = 8.22$). Thirty seven percent (37%) of them are students and almost 30% have contract of employment. Most participants were single (40,74%), living with a close family (58,02%). More than half of participants live in the biggest cities in Poland, including capital city (61,73%). Forty-two participants (51,85%) declared that they have had a higher education completed (bachelor's or master's degrees). Thirty participants suffer from chronic illness (physical: 16.05%; mental: 11.11%; both: 9.88%). Characteristics of the participants are presented in Table 1.

Table 1. Socio-demographic characteristics of the study sample (N = 81)

Socio-demographics	Category			Frequency	%
Gender	Female			62	76.5%
	Male			19	23.5%
Marital status	Single			33	40.74%
	Informal relationship			26	32.10%
	Married			20	24.69%
	Divorced			2	2.47%
Education	Primary			1	1.23%
	Secondary			27	33.33%
	Post-secondary/vocational			10	12.35%
	Higher vocational/ Bachelor's degree			16	19.75%
	Higher master's degree			26	32.10%
	Doctoral degree			1	1.23%
Place of residence	Village			18	22.22%
	Small town (< 20 thousand inhabitants)			6	7.41%
	Medium city (20-100 thousand inhabitants)			7	8.64%
	Large city (100-350 thousand inhabitants)			20	24.69%
	Very large city (> 350 thousand inhabitants)			13	16.05%
	Capital city			17	20.99%
Residence situation	Alone			8	9.88%
	Dorm			2	2.47%
	With close family			47	58.02%
	With partner			10	12.35%
	With roommate(s)			14	17.28%
Employment status	Unemployed			6	7.41%
	Student			30	37.04%
	Internship/ voluntary work			2	2.47%
	Retired/ pensioner			1	1.23%
	Contract for specific work/mandate			5	6.17%
	Self-employment			13	16.05%
	Contract of employment			24	29.63%
Health status	Healthy			43	53.09%
	Somatic illness			13	16.05%
	Mental disorder			9	11.11%
	Both somatic and mental illness			8	9.88%
	During diagnosis for a somatic or mental illness			8	9.88%
Age	Mean (SD)	Mdn	Q1; Q3	Min-max	
	28.02 (8.22)	24.00	22; 33	19-57	

Research tools

The online questionnaire covered several areas: (1) general sociodemographic data, including general health condition; (2) nature connectedness measured by the Connectedness to Nature Scale (CNS), [21]; (3) social connectedness measured by the Social Connectedness Scale Revised (SCS-R) [22]; (4) mental health – symptoms of depression, anxiety and stress, measured by The Depression, Anxiety, Stress Scale (DASS-21) [23]; (5) coping strategies measured by Mini-COPE (the Coping Orientation to Problems Experienced questionnaire) [24,25].

Social and nature connectedness

The 20-item SCS-R [22] measures the degree to which participants experience a psychological sense of belonging to their social world (friends, family, community). The SCS uses a 6-point rating scale (1 = strongly disagree to 6 = strongly agree). The 14 items Connectedness to Nature Scale (CNS) [21] measures an individuals' experience of connection with nature. The CNS uses a 5-point Likert scale, ranging from "completely disagree" to "completely agree" [21]. The authors of mentioned tools approved the use of scales in present study. For this study purposes both CNS and SCS-R were adapted into Polish context according to translation and adaptation recommendations [26]. In particular, the two-way translation procedure was implemented. In the first step, a native Polish-speaking translator with excellent English language skills made the Polish translation. In the second step, a back translation of the Polish version into English by an independent English-speaking translator with excellent Polish language skills were obtained. Finally, both English versions were revised in terms of linguistic ambiguities. After introducing the professional translator' amendments, the final Polish versions of CNS and SCS-R were obtained.

Mental health and coping

The Depression, Anxiety, Stress Scale (DASS-21) is 21-item clinical assessment with three self-report scales designed to measure the emotional states of depression, anxiety, and stress. The de-

pression subscale examined the loss of motivation and self-esteem. The anxiety subscale addresses symptoms of persistent anxiety and fear. The stress subscale measures symptoms of persistent arousal and irritability. Each of the three subscales contains seven items. All of them are rated on a 4-point rating scale [23].

The Coping Orientation to Problems Experienced questionnaire (Mini-COPE) is used to measure dispositional coping. It consists of 28 statements included in 14 strategies (2 statements in each strategy). Coping strategies measured by MINI-COPE are following: active coping, planning, seeking instrumental support, seeking emotional support, positive reframing, acceptance, a sense of humour, the return to religion, self-distraction, denial, venting, substance use, behavioral disengagement, blaming oneself. The half-time reliability of the Polish version of Mini-COPE was 0.86 and consistency is satisfactory for most scales [27].

STATISTICAL ANALYSIS

The analysis proceeded in three stages. First, the sample with regards to sociodemographic characteristics were described. Second, we used the correlation analysis to investigate the relations between nature/ social connectedness and psychopathological symptoms. In the third stages, correlations between social/ nature connectedness and coping strategies were explored.

Qualitative data was presented in the form of numbers (*n*) and percentages (%). The age variable was presented in the form of mean (*M*) and standard deviation (*SD*), median (*Mdn*), lower (*Q1*) and upper quartiles (*Q3*) and extreme values (Min-Max) (see Table 1). The normality of the distribution of continuous variables was assessed using the Shapiro-Wilk (*W*) test.

The objective of this study was to examine the relationships of social and nature connectedness with mental state assessed by DASS-21 (severity of stress, anxiety, and depression) and particular coping strategies measured by MINI-COPE.

To verify these relationships, the Pearson product-moment correlation coefficients were calculated. To handle with non-normality of the data bootstrapping method was applied [28]. To obtain sufficiently accurate 95-percent confidence intervals, the number of samples 5,000

was declared [28-30]. The bias-corrected and accelerated (BCa) method was employed that it corrects for bias and skewness in the distribution of bootstrap estimates [31].

The statistical analyses were carried out using SPSS version 27 for Windows. Statistical significance for all conducted analysis was established at $p < 0.05$.

RESULTS

Sample characteristics

Socio-demographic characteristics of the study-sample is presented in Method section (Table 1).

Correlational analysis

First, the relationships between social and nature connectedness and mental health state were verified using Pearson correlation analyses with the BCa bootstrapping method. The results showed a significant negative and moderate relationships of social connectedness with severity of stress ($r = -.41$; BCa 95% CI [-.57, -.22]), anxiety ($r = -.40$; BCa 95% CI [-.57, -.20]) and depression ($r = -.50$; BCa 95% CI [-.65, -.31]) measured by DASS. The nature connectedness was negatively and weakly associated with anxiety ($r = -.22$; BCa 95% CI [-.41, -.03]) and depression ($r = -.26$; BCa 95% CI [-.45, -.07]). See Table 2.

Table 2. The results of correlation analysis with confidence intervals using the bootstrap method between social and nature connectedness and mental health symptoms (DASS) (N = 81)

Variable	M	SD	Social connectedness	Nature connectedness	DASS stress	DASS anxiety
Social connectedness	78.43	17.67				
Nature connectedness	69.56	15.06	.28* [.05, .50]			
DASS stress	8.38	4.91	-.41*** [-.57, -.22]	-.13 [-.35, .09]		
DASS anxiety	4.99	4.31	-.40*** [-.57, -.20]	-.22* [-.41, -.03]	.71*** [.57, .81]	
DASS depression	5.44	4.67	-.50*** [-.65, -.31]	-.26* [-.45, -.07]	.73*** [.63, .81]	.73*** [.57, .83]

Note: Values in square brackets indicate the 95% bias-corrected and accelerated confidence intervals for each correlation.

* - $p < .05$; ** - $p < .01$; *** - $p < .001$

In the following step, the correlational analysis of social and nature connectedness with coping strategies (Mini-COPE) was performed estimating Pearson correlation coefficients with the BCa bootstrapping method.

The results showed a significant positive relationships of social connectedness with tendency to using of active coping ($r = .40$; BCa 95% CI [.17, .59]), planning ($r = .31$; BCa 95% CI [.08, .49]), seeking instrumental ($r = .38$; BCa 95% CI [.14, .58]) and emotional support ($r = .51$; BCa 95% CI [.32, .67]), positive reframing ($r = .44$; BCa 95% CI [.26, .60]) and return to religion ($r = .27$; BCa 95% CI [.06, .46]). It was also turned out that social connectedness was negative associ-

ated with tendency to behavioral disengagement ($r = -.48$; BCa 95% CI [-.63, -.28]) and self-blaming ($r = -.38$; BCa 95% CI [-.57, -.15]).

Furthermore, we showed the positive correlations between nature connectedness and active coping ($r = .25$; BCa 95% CI [.01, .47]), planning ($r = .33$; BCa 95% CI [.10, .54]), seeking instrumental ($r = .28$; BCa 95% CI [.08, .46]) and emotional support ($r = .32$; BCa 95% CI [.11, .50]), positive reframing ($r = .37$; BCa 95% CI [.16, .54]) and return to religion ($r = .27$; BCa 95% CI [.04, .48]). The nature connectedness was negative associated with tendency to behavioral disengagement ($r = -.22$; BCa 95% CI [-.41, -.04]). See Table 3.

Table 3. The results of correlation analysis with confidence intervals using the bootstrap method between social and nature connectedness and coping strategies (Mini-COPE) (N = 81)

Variable	M	SD	Social connectedness	Nature connectedness
Social connectedness	78.43	17.67		
Nature connectedness	69.56	15.06	.28* [.05, .50]	
Coping strategy				
Active coping	2.08	0.67	.40*** [.17, .59]	.25* [.01, .47]
Planning	2.07	0.72	.31** [.08, .49]	.33** [.10, .54]
Seeking instrumental support	1.75	0.80	.38*** [.14, .58]	.28* [.08, .46]
Seeking emotional support	1.80	0.83	.51*** [.32, .67]	.32** [.11, .50]
Positive re-evaluation	1.68	0.79	.44*** [.26, .60]	.37*** [.16, .54]
Acceptance	2.06	0.68	.19 [-.03, .40]	.10 [-.11, .32]
A sense of humour	1.10	0.61	.11 [-.10, .31]	.03 [-.17, .22]
The return to religion	0.93	0.93	.27* [.06, .46]	.27* [.04, .48]
Substitute activities	1.74	0.69	.08 [-.14, .30]	-.002 [-.21, .21]
Denial	0.66	0.66	-.15 [-.37, .08]	.10 [-.11, .30]
Discharge	1.61	0.68	.07 [-.14, .27]	.06 [-.17, .28]
Substance use	0.52	0.79	-.13 [-.42, .16]	.08 [-.14, .29]
Cessation of operations	0.81	0.69	-.48*** [-.63, -.28]	-.22* [-.41, -.04]
Blaming oneself	1.71	0.82	-.38*** [-.57, -.15]	-.15 [-.36, .07]

Note: Values in square brackets indicate the 95% bias-corrected and accelerated confidence intervals for each correlation.

* – $p < .05$; ** – $p < .01$; *** – $p < .001$

DISCUSSION

This study aimed to understand relations between mental health, coping and both, social and nature connectedness. The psychological relatedness to nature and community turned out to be correlated to mental health outcomes and particular coping strategies.

So far, no studies linking the social connectedness, the nature connectedness and coping strategies have been conducted. Two main hypotheses were put forward when starting the research: (1) strong social and nature connectedness are associated with lower psychopathological symptoms of common mental health issues, and (2) strong social and nature connectedness are associated with a higher level of positive coping strategies. Presented results supports previously formulated both hypotheses.

On the one hand, we proved that in Polish population social connectedness has negative,

moderate relationships with severity of stress, anxiety, and depression. At the same time nature connectedness is negatively and weakly associated with anxiety and depression. Mental health of people with stronger nature and social connectedness is protected by these factors.

On the other hand, we showed not only relationship of the social and nature connectedness with a broader repertoire of coping strategies, but also the higher tendency to using positive, adaptive strategies. Such strategies as: positive reframing, planning, active coping, seeking emotional and instrumental support, acceptance, religion, and humor are found as adaptive strategies. Whereas maladaptive strategies are as follows: self-blame, behavioral disengagement, venting, substance use, self-distraction, denial [32]. The stronger both nature and social connectedness we can observe the clear tendency to using positive, adaptive coping strategies (active coping, planning, seeking instrumental and

emotional support, positive reframing and return to religion). Simultaneously, both nature and social connectedness are negatively associated with maladaptive strategies (tendency to: (1) behavioral disengagement and (2) behavioral disengagement and blaming oneself, respectively).

In their in-depth research White et al. [33] proved that nature connectedness is positively associated with positive well-being, negatively associated with mental distress and depression medication use. From the other hand, the research proved that social connectedness is a significant moderator between poor mental health and suicidal thoughts and behaviours, making it a factor which should be incorporated into suicide prevention programs, particularly in adolescents' group [34,35]. With regard to coping strategies, it is proved, the use of non-adaptive strategies is associated with worsening mental health and symptoms of depression [32].

The current study results highlight the vital role of nature and social connectedness on mental health. As follows from broad systematic review of Preston & Rew [36], social connectedness is one of the most common protective factors to social isolation and its implications. Many surveys concerned the role of nature and social connectedness in maintaining well-being during COVID-19 pandemic [37 – 40]. Simultaneously, in some regions, the recommendations concerning incorporating nature and community perspective in public mental health have been prepared [41].

Many earlier studies assessed coping strategies and its importance for mental health in different groups in many contexts [e.g. 42 – 44]. Their results, indicating the importance of coping strategies for psychological well-being, were convergent.

Until now, very few studies have analyzed the psychological relationships between studied variables and its impact on mental health, and that is the main strength of this study [43]. The results of other worldwide studies are convergent to ours [18-20]. This pilot study makes contributions to the literature by proving interactions between variables.

Very few studies consider the reason of the associations/ links between nature connectedness and social connectedness. There are conceptual similarities between social connectedness and

connectedness to nature which imply the possibility of a positive relationship [45]. On the one hand, the authors suppose that need to belong can be satisfied by both the feeling connected to nature or to other persons (community/ humanity as a whole). On the other, some findings indicate that both variables involve both the inclusion of the other (i.e. nature or people) [46, 47] and commitment [48]. Moreover, some studies have found significant positive correlations between measures of social connectedness and connectedness to nature – similar to present study [i.e. 49].

Although we do not have enough research, we can assume then that development of positive adaptive coping strategy may lead by improving both connectedness with nature and social connectedness. The strategies concerning on social connectedness may cover support group, social skills training as well as psychotherapy in most paradigms. The nature-based interventions may include classical psychological interventions delivered in natural environment setting, wilderness therapy, adventure therapy, horticultural therapy, nature art therapy, or green exercises. The presented study may contribute to a broader recognition and inclusion of novel, nature – based, non-verbal methods of improving adaptive coping strategies.

Nevertheless, the two main methodological limitations are following: the consequences of cross-sectional study design and non-probability sampling technique. Furthermore, as correlation does not equal causation, in-depth analyses should be taken.

According to author knowledge, until now, no studies have analyzed the relation between mental health, coping and connectedness, and that is the main strength of this study.

Summarizing, further research onto mental health, coping strategies and connectedness are recommended. Presented findings can be a starting point for designing further research, developing models that incorporate social/ nature connectedness into mental health model and improving mental health prevention. There is a need to study the range of impact of develop different strategies to empower the social connectedness and nature connectedness in particular populations. Furthermore, there is a need to focus on relations between social and

nature connectedness. We should know mechanisms between connectedness and individual coping strategies. Therefore, future research should focus not only on exploratory aspects of studied phenomena, but on both explanation the links between variables and mechanisms leading to the mental health improvement as well. As some authors underline, nowadays some social determinants and geopolitical factors such as climate change, pandemics, conflict, natural and manmade disasters, displacement can play a major role in the mental health and wellbeing [50,51]. Social connectedness and nature connectedness can play a crucial role in understanding the actions which can be considered in developing the resilience and adaptation strategies worldwide. Broader, the new challenges in public mental health worldwide need to in-depth understanding of social and ecological determinants [52].

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