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Relationship between resilience, coping resources, and psychological well-being with stress of leprosy as a predictor. A correlation study through the structural equation models

Abd Nasir [a,*], Ah Yusuf [b], Muhammad Yulianto Listiawan [c], Makhfudli Makhfudli [b], Hafna Ilmy Muhalla [a], Andri Setiya Wahyudi [b], Abdul Muhith [d]

[a] Faculty of Vocational, Airlangga University, Surabaya, Indonesia
[b] Faculty of Nursing, Airlangga University, Surabaya, Indonesia
[c] Faculty of Medicine, Airlangga University, Surabaya, Indonesia
[d] Nursing Science Depertement – University of Nahdlatul Ulama, Surabaya, Indonesia

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ABSTRACT

Introduction: Expanding positive thoughts and narrowing the space for negative thoughts can compensate for mental attacks to reduce leprosy stress because the impact caused by leprosy can destroy the mental strength that has been built. This study aimed to examine the model of the relationship between resilience, coping resources, psychological well-being, and leprosy stress as a predictor.

Methods: The perceived stress scale, coping resources scale, coping strategy scale, and psychological well-being scale were used to collect the data, with 125 participants involved in this study, consisting of women (33.60%) and men 66.40%. The structural equation model was used to test the data using the cross-sectional design.

Results: The SEM test shows that there is a negative relationship between coping resources and leprosy stress, with the coefficient value (−0.294), *t*-test (3.647), p (0.000) <0.05, and there is a positive relationship with psychological well-being, with the coefficient value of (0.330), *t*-test (4.451), p (0.000) <0.05. Besides, there is a negative relationship between resilience and leprosy stress, with the coefficient value (−0.640), *t*-test (8.233), p (0.000) < 0.05, and a positive relationship with psychological well-being, with the coefficient value (0.498), *t*-test (5.987), p (0.000) <0.05. Concerning psychological well-being, stress shows a negative relationship, with the coefficient value (−0.162), *t*-test (2.513), and p (0.012) < 0.05.

Conclusion: In facing mental attacks due to leprosy, individuals should have vigorous self-defense and extensive coping resources so that they can adapt to stress due to leprosy and thus they can maintain better psychological well-being.

1. Introduction

Psychological problems for people with leprosy are a very serious threat because the consequences can go beyond the disease itself.[1] By having very specific characteristics, leprosy causes negative emotional responses, such as the frequency of depression (24.6%), poor mental well-being problems (38%); and the risk of experiencing poorer mental health is up to six times higher (odds ratio 6.02) than the reference group.[2]

Meanwhile, prosperous individuals are identified by feeling free from pressing demands[3] and always being proactive in solving problems.[4] In other words, psychological well-being is a psychological dimension that refers to the release of negative psychology to get happiness in life by strengthening environmental control, increasing personal growth, life goals, and better self-acceptance,[5] Previous research has found that resilience is used as a guarantor of psychological well-being because it always uses emotional intelligence as a useful source of energy in increasing motivation for a better life[6]; this provides

* Corresponding author. Faculty of Vocational, Universitas Airlangga, Surabaya, Indonesia Doctoral candidate of Faculty of Nursing, Airlangga University Airlangga University Campus B, Jl. Dharmawangsa Dalam Selatan No.28 - 30, Airlangga Gubeng, Surabaya city, East Java, 60286, Indonesia.

E-mail addresses: abdoel.nasir@gmail.com, abdoel.nasir@vokasi.unair.ac.id (A. Nasir), ah-yusuf@fkp.unair.ac.id (A. Yusuf), m.yulianto@fk.unair.ac.id (M.Y. Listiawan), makhfudli@fkp.unair.ac.id (M. Makhfudli), hafnailmy@vokasi.unair.ac.id (H.I. Muhalla), andri.setiyawahyudi@fkp.unair.ac.id (A.S. Wahyudi), abdulmuhith@unusa.ac.id (A. Muhith).

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room for optimal adjustment even in situations of frightening threats. So, resilience is defined as a strong personal ability that continues to grow, develop, and survive in facing situational crises.[7] Besides, those who are tough are always proactive and more persistent in getting comfort amid the difficulties they face because they have many creative ideas in dealing with every attack that tries to disrupt self-integrity.[8] Meanwhile, for individuals who are actively involved in situations of maladaptive behavior such as anxiety and depression, resilience contributes to the guarantee of well-being in stressful situations.[9] Thus, resilience always uses adaptive patterns to overcome difficulties and slowly develops for the better. Therefore, resilience can be seen as an important predictor of psychological distress problems in improving psychological well-being because it is always negatively related to neuroticism when associated with life satisfaction.[10]

Meanwhile, coping resources are always associated with what the individual has, and this is always related to the availability of personal and environmental resources.[11] Based on the conservation resource stress model, the measure of a person's resources to cope with a stressor is the most important factor in predicting the amount of perceived stress.[12] Lazarus & Folkman (1984) make it clear through the view of transactional stress that the instability between the need to deal with stressors and available resources can trigger stress, and this makes excessive demands to cope with stressors so that it can burden personal resources.[13] As long as the perception of the label "people with leprosy" cannot be separated from personal life and the environment, the application of individual coping resources is less effective, while the risk of severity due to leprosy may increase.[14] This is why coping resources can be considered an important component in overcoming fear, anxiety, depression, increasing self-esteem, and stress due to leprosy. Thus the use of coping resources is very helpful in creating effective stress management strategies.[15]

2. Method

2.1. Participants and procedures

Data collection was obtained from a cross-sectional design using a convenience sampling technique. The study was conducted from March 2021 to June 2021. The sample was leprosy patients who were treated at the Leprosy Poly at Dr. Soetomo Regional General Hospital, Surabaya, consisting of 42 (33.60%) women and 83 (66.40%) men. The mean age of participants was >15 years by 122 (97.60%), <15 years by 3 (2.40%), marital status of participants was married 65 (52%), not married 60 (48%), respondents' occupational status was working 65 (52%) and not working 60 (48%), Type of Leprosy MB 47 (37,60%), PB 78 (62,40%), which can be seen in Table 1. The questionnaire included the psychological well-being scale (Ryff & Keyes, 1995), the perceived stress scale (Cohen, Kamarck, and Mermelstein, 2012), a brief resilience scale (Smith et al., 2008), and the coping resources inventory for stress (Matheny et al., 2003) which has been developed into the Indonesian version, is given to people with leprosy and filled in the Leprosy Poly Room, General Hospital "Dr. Sutomo" Surabaya, where they previously received brief information about the research. Informed consent was obtained from the participants. Participants completed four anonymous self-report measures to avoid response biases. Because the questionnaire is anonymous, individual participants cannot be identified. The researchers explained that participants could withdraw from the study at any time they wished. Each participant took about 20–25 min to fill out the research instrument in this questionnaire.

Table 1
Results of the analysis of respondents characteristics.

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	83	66,40
	Female	42	33,60
Age	<15 Years	3	2,40
	>15 Years	122	97,60
Marital status	Married	65	52,00
	Not Household	60	48,00
Employment status	Employed	65	52,00
	Unemployed	60	48,00
Types of Leprosy	MB	47	37,60
	PB	78	62,40

2.2. Data analysis

The relationship between resilience, coping resources, psychological well-being, and the stress scale of leprosy was tested using descriptive statistical analysis (mean and standard deviation) using IBMSPSS Statistics version 20. The role of leprosy stress as a predictor was analyzed using a two-step procedure. Then the structural equation model was tested using the maximum likelihood estimation in the AMOS Graph if the measurement model turned out to be significant. The data fit index from Hu & Bentler (1999) was used to evaluate the overall fit of the model to the data.[16]

Hypothesis testing was carried out to determine the relationship between the variables of coping resources, coping strategies, leprosy stress, and psychological well-being.

3. Results

3.1. Descriptive statistics of variables

Respondents' perceptions of the variables have a good average and standard deviation, and more details can be seen in Table 2.

3.2. The structural equation model

a. Outer Model Evaluation

Outer model evaluation has been identified based on Construct Validity Evaluation and Construct Reliability Evaluation. The first stage of evaluating construct validity was done by calculating convergent validity which was represented by the loading factor value and Average Variance Extracted (AVE), and it is known that the coping resources loading factor value is between (0.959–0.981) > 0.5 with the Average Variance Extracted value (AVE) of (0.938) > 0.05, which can be concluded that the indicator of coping resources is valid to measure the variable. The value of loading factor for resilience is between (0,899–0,943) > 0,05 with the Average Variance Extracted (AVE) of (0,859) > 0,05 that can be concluded that the resilience variable is valid

Table 2
Description of research variables.

Variable	Dimension	Mean	Std. Deviation	Information
Resillience		3,1439	1,09691	pretty good value
Coping Resources	Cognitive	2,8053	0,71,246	good value
	Social	2,8128	0,71,335	good value
	Emotional	2,7560	0,73,949	good value
	Spritual	2,7360	0,74,210	good value
	Physical	2,7880	0,74,396	good value
Leprosy stress		2,6664	0,47,951	high value
Psychological Well-Being	The Autonomy	2,9714	0,99,491	good value
	The Environmental Mastery	2,8536	0,77,326	good value
	The Personal Growth	2,8190	0,74,865	good value
	The Positive Relations with Others	2,8366	0,74,832	good value
	The Purpose in Life	2,7754	0,76,619	good value
	The Self-Acceptance	2,8058	0,76,667	good value

to measure the variables. Meanwhile, the loading factor value of stress of leprosy is (1,000) > 0.05 with an Average Variance Extracted (AVE) value of (1,000) > 0.05 which can be concluded that the indicator of leprosy stress is valid to measure the variable. Besides, measurements of the loading factor value of the psychological well-being variable were also carried out, and the result is between 0.941 and 0.977 with an Average Variance Extracted (AVE) value of (0.908) > 0.05 in which it can be concluded that the indicator of psychological well-being is valid to measure the variable. Social Indicator (0.981) gave the biggest contribution in measuring coping resources variable. Then the BRS 1 (0.943) indicator gave the biggest contribution in measuring the resilience variable. The personal growth indicator (0.977) gave the biggest contribution in measuring the psychological well-being variable. This is evidenced by the highest factor loading value among the indicators on each measured variable.

Meanwhile, to strengthen the results of the evaluation of construct validity, discriminant validity has been evaluated. The results show that overall, the indicators of all variables (bold font) produce a loading value that is greater than the loading value on other variables, which indicates that based on the discriminant validity test, each indicator is able to measure the latent variable that corresponds to the indicator. Besides, the evaluation results of the construct validity test show that the Cronbach's Alpha value of coping resources is (0.983), resilience is (0.967), leprosy stress is (1,000), psychological well-being is (0.980) > 0.6. Besides, the value of composite reliability of coping resources is (0.987). resilience is (0.973), leprosy stress is (1,000), psychological well-being is (0.983) > 0.7, and further can be seen in Table 3.

b. Inner Model Evaluation

Evaluation of the value of goodness of fit was used to measure the evaluation of the structural model, including an assessment of the value of the coefficient of determination, predictive relevance, and the value of hypothesis testing. The calculation results show that coping resources and resilience have a significant contribution, either directly or indirectly, through leprosy stress on psychological well-being, which indicates that this model is quite good. The results can be seen in Table 4.

The results of the hypothesis test have shown that coping resources and resilience are negatively correlated with Leprosy Stress which can be seen from the coefficient values of coping resources on leprosy stress (−0.294), with T statistics (3.647) > 1.96, and p-value (0.000) < 0.05. While the result of the calculation of the coefficient value of resilience against stress leprosy is (−0.640), with T statistics (8.233) > 1.96, and p-value 0.000 < 0.05. Furthermore, it has been known that coping resources and resilience have a positive effect on psychological well-being, with the coefficient value (0.330), T statistic (4.451) > 1.96, and p-value (0.000) < 0.05. Meanwhile, the relationship between resilience and psychological well-being also shows a positive relationship, with the coefficient value (0.498), T statistics (5.987) > 1.96, and p-value of 0.000 < 0.05. Moreover, the relationship between stress leprosy and psychological well-being shows a negative relationship, with the coefficient value (−0.162), T statistic (2.513) > 1.96, and p-value (0.012) < 0.05. The detail can be seen in Table 5.

4. Discussion

Leprosy stress causes a psychological burden because of its impact on physical, psychological, and social conditions so that it affects all life processes.[17] This is because all stimuli that are considered stressors always involve cognitive and behavioral components,[18] so they have a role as a liaison with welfare and worse psychological problems that lead to psychosocial problems. In this case, this study aimed to identify the role of stress mediators in the relationship between resilience and coping resources, and psychological well-being.

Stress has a very significant role as a predictor in the relationship between resilience and psychological well-being based on this correlation design, which means that the results of this study are what someone feels that having a high level of resilience can reduce stress conditions so that it can help report more positive evaluations about psychological well-being which has an affective dimension in life. This is because resilience is a pattern for defending oneself from various mental attacks and is used as a buffer for people with psychological stress,[19] which automatically activates positive emotions to overcome the stress.[20]

Although there have been studies linking resilience and psychological well-being in other disciplines,[21] there are still no studies related to leprosy that have identified a predictor role of stress in this relationship. This finding may be consistent with findings that reported that stress due to physical illness as a result of cognitive assessment reflects a negative orientation to the response to the stimulus received,[22] and is always associated with post-traumatic stress syndrome,[23] so the construct has a significant negative relationship with happiness. Thus stress is identified as a psychological component that can play an important role in the occurrence of positive and negative mental health in everyday life, and this is always associated with resilience as a result of the psychopathological process of post-traumatic stress syndrome[24]

Similarly, the results of this study may be consistent with findings

Table 3
Results of Testing Discriminant Validity Cross Loading, Convergent Validity and construct Validity.

	Validitas Diskriminan *Cross Laoding*				Convergen Validity		Construct Validity	
	Coping Resources	Resillience	Leprosy Stress	Psychological Well-being	Loading Faktor	AVE	*Cronbach's Alpha*	*Composite Reliability*
Cognitive	**0,964**	0866	−0,840	0885	0,964	0938	0,983	0987
Social	**0,981**	0875	−0,860	0906	0,981			
Emotional	**0,972**	0870	−0,842	0897	0,972			
Spritual	**0,959**	0825	−0,793	0849	0,959			
Physical	**0,966**	0830	−0,817	0859	0,966			
BRS 1	0,836	**0943**	−0,839	0900	0,943	0.859	0,967	0973
BRS 2	0,844	**0938**	−0,834	0888	0,938			
BRS 3	0,837	**0920**	−0,842	0869	0,920			
BRS 4	0,831	**0935**	−0,827	0877	0,935			
BRS 5	0,786	**0924**	−0,856	0855	0,924			
BRS 6	0,762	**0899**	−0,799	0805	0,899			
leprosy_stress	−0,858	−0,899	**1000**	−0,893	1000		1000	1000
The Autonomy	0,888	0935	−0,898	**0942**	0,942	0908	0,980	0983
The Environmental Mastery	0,876	0907	−0,856	**0949**	0,949			
The Personal Growth	0,877	0896	−0,853	**0977**	0,977			
The Positive Relations with Others	0,852	0875	−0,852	**0949**	0,949			
The Purpose in Life	0,853	0881	−0,851	**0959**	0,960			
The Self-Acceptance	0,844	0848	−0,794	**0941**	0,941			

Table 4
Predictive relevance and coefficient of determination results (R^2).

Variabel Dependen	Predictive Relevance (Q^2)			Coefficient of Determination (R^2)		
	SSO	**SSE**	**Q^2 (= 1-SSE/SSO)**	**R Square**	**1 - R Square**	**R Square Total**
Leprosy Stress	125,000	23,909	0,809	0827	0,173	0984
Psychological Well-being	750,000	173,749	0,768	0910	0,090	

Tabel 5
hypothesis testing results.

Influence	Coefficient	T Statistics (|O/STDEV|)	P Values
Coping Resources → Leprosy Stress	−0,294	3647	0,000
Resillience → Leprosy Stress	−0,640	8233	0,000
Coping Resources → Psychological Well-being	0,330	4451	0,000
Resillience → Psychological Well-being	0,498	5987	0,000
Leprosy Stress → Psychological Well-being	−0,162	2513	0,012
Coping Resources → Leprosy Stress → Psychological Well-being	0,048	1987	0,037
Resillience → Leprosy Stress → Psychological Well-being	0,104	2457	0,014

reporting that stress is identified as a source of negative psychology and a barrier to coping resources to achieve psychological well-being.[25] Individuals who experience stress are more likely to experience strong mental stress that impacts the use of maladaptive coping strategies because of an inability to identify coping resources (14), and this is always associated with negative psychological well-being.[26]

However, not all stressed individuals experience mental decline because some individuals are also able to adapt to threatening situations, have high motivation to get up immediately and make important decisions regarding protective actions against stressful situations,[27] and thus, are a buffer to obtain better mental health.[28]

Finally, the resilience and coping resources possessed by people living with leprosy, with low levels of stress as a mediator, contribute to a better level of psychological well-being. Therefore, high resilience and adequate coping resources can prevent stress due to leprosy that interferes with daily functions, and the assumption that they are protectors for better mental health seems to be accepted. A positive psychological approach that involves elements of resilience and coping resources, can be used to plan interventions and treat some psychological disorders due to suffering from leprosy, and this is one of the most effective psychological strengths, and the use of other psychological strengths is an alternative solution to support mental health better, and the use of other psychological strengths is a solution alternative to support better mental health.[29] It has been shown that intervention programs that focus on positive psychology are an urgent need for recovery from stress-induced well-being.[3]

Thus, it can be said that the results of this study are in line with previous studies. The results based on cross-sectional data indicate that leprosy stress acts as a partial mediator of the relationship between resilience, coping resources, and psychological well-being. In other words, this finding is consistent with individuals who have higher levels of resilience and have adequate coping resources that tend to adapt to psychological stress, which in turn contributes to better psychological well-being.

5. Limitations

The first limitation of this study is that data were collected only through self-report measures, which might reduce internal validity. Using multiple methods to collect data can help reduce the effects of subjectivity. Besides, using different methods (e.g., observation and in-depth interviews) may be important to measure the level of resilience and ability to identify coping resources. The second limitation is that the participants of this study were people with leprosy, so it was limited to the generalization of the findings of the current study. A third limitation is that this study had a cross-sectional design which made interpretation of cause and effect difficult. The relationship between resilience, coping resources, and stress leprosy may be inversely related to stress and coping resources that lead to resilience. Similarly, some kind of reciprocal relationship may be found between stress and coping resources. To overcome the limitations of this study and to clarify the causal sequence, future research should use a longitudinal design that allows stronger conclusions regarding the causal direction of the variables. In addition, the number of participants deemed insufficient to meet the sample size, may reduce the representative sample size. For further research, there needs to be an effort to increase the participation of participants to be more active in participating. A final limitation is that the mediating role of stress has been tested in this study, but other possible mediators need to be identified.

6. Conclusion

The consequences of leprosy threaten emotional and mental health protection is an important need that must be considered. The findings of this study clearly show that resilience and coping resources as protective factors are always associated with a decrease in leprosy stress and an increase in psychological well-being. In other words, individuals who have strong resilience to overcome the fear of leprosy disability and have extensive coping resources are better able to cope with stressful life events (stress due to leprosy). Their stressful experience of leprosy can be handled adaptively on a practical and functional level so that greater psychological well-being can be felt.

Ethical approval and consent to participate

The study procedure was in accordance with the Declaration of Helsinki and was approved by the Dr. Soetomo Regional General Hospital Health Research Ethics Committee with the number: 0168/KEPK/III/2021 (March 30, 2021). Besides, verbal and written informed consent was obtained before collecting the data.

Availability of data and material

The data sets collected and analyzed for the current study are available from the corresponding author and can be obtained on a reasonable request.

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Author contributions

Conception and design of study: AN; AM; AY. Aacquisition of data: MKF; HIM; MYL. Analysis and/or interpretation of data: AN; HIM. Drafting the manuscript: AN; AY; MKF. Revising the manuscript critically for important intellectual content: AY; MYL; ASW. Approval of the

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Declaration of conflicting interest

All authors critically revise the article, give final approval for the submission of the article, and agree to be responsible for all aspects of the work in ensuring that questions related to the accuracy or integrity of each part of the work are properly researched and resolved, and there are **NO** conflicts of interest.

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