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Caregiver adaptation after stroke: The role of adversity quotient and spiritual-religious coping

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Abstract: Stroke is one of the leading causes of long-term disability, often requiring intensive support from family caregivers, whose psychological adaptation to their changing roles is essential not only for the patient's recovery, but also for their own emotional well-being. This study aims to examine the influence of adversity quotient and spiritual-religious coping on caregivers' perceptions and coping strategies, as well as the impact of these strategies on caregivers' adaptation. A cross-sectional, correlational quantitative design was employed. Data were collected from 200 caregivers of post-stroke patients in Tomohon City, North Sulawesi, Indonesia selected through cluster random sampling, and using structured questionnaires. Adversity Quotient (AQ) was measured using the Chinese version of the Adversity Quotient Scale, while Spiritual-Religious Coping (SRC) was assessed by Pargament's RCOPE scale. Caregiver perception was measured by the Appraisal of Caregiving Scale (ACS); coping strategy by the Ways of Coping Questionnaire (WCQ); and Caregiver Adaptation developed from the Coping and Adaptation Processing Scale. Data were analyzed using structural equation modeling (SEM) with SmartPLS. The results demonstrate that adversity quotient significantly influenced caregiver perception ($\beta = .247$, $t = 3.259$, $p = .001$, $R^2 = .154$, SRMR = .055) and coping strategies ($\beta = .205$, $t = 3.092$, $p = .002$, $R^2 = .280$). Similarly, spiritual-religious coping had a significant effect on caregiver perception ($\beta = .230$, $t = 2.700$, $p = .007$) and coping strategies ($\beta = .312$, $t = 4.646$, $p < .001$). Furthermore, caregiver perception positively predicted coping strategies ($\beta = .185$, $t = 2.615$, $p = .009$), and coping strategies significantly enhanced caregiver adaptation ($\beta = .255$, $t = 4.035$, $p < .001$, $R^2 = .065$). The practical implications of this study highlight the need to integrate resilience-building and spiritually informed psychological interventions into caregiver support programs to strengthen adaptive coping and promote sustained adjustment in post-stroke home care.

Keywords: adversity quotient; caregiver adaptation; caregiver perception; coping strategy; post-stroke; spiritual-religious coping

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Introduction

Stroke is one of the leading causes of death and disability worldwide (Chen et al., 2021; Kazemi et al., 2021; Lin et al., 2022; Ugur, 2019). Each year, approximately 15 million people experience a stroke, with more than one-third either dying or living with long-term disabilities (Zawawi et al., 2020). Beyond medical management, stroke survivors often require ongoing support throughout the rehabilitation process, with caregivers playing a pivotal role in this continuing care (Panzeri et al., 2019). In Indonesia, stroke remains the primary cause of death and long-term disability. According to the Ministry of Health, its prevalence has shown a steady increase, with recent national surveys reporting a rise from 7 per 1,000 population in 2013 to 10.9 in 2018 (Badan Penelitian dan Pengembangan Kesehatan - Kemenkes RI, 2018). This trend underscores the heavy burden placed on families, particularly caregivers, who provide day-to-day assistance for stroke survivors in the absence of sufficient formal rehabilitation facilities. At the local level, in Tomohon City, North Sulawesi, stroke (hypertension) ranks among the top causes of hospitalization and mortality (BPS Kota Tomohon, 2019). The increasing number of stroke survivors has exacerbated the demands placed on family caregivers, many of whom are unprepared for the emotional, psychological, and physical challenges associated with long-term care.

To prevent stroke recurrence, caregivers must adopt a biopsychosocial approach that actively engages stroke survivors in their care (Pucciarelli et al., 2019). Therefore, the needs of stroke survivors must be thoroughly assessed and evaluated periodically to ensure that interventions remain targeted and effective. Family caregivers, who are responsible for ensuring treatment adherence, from medication compliance to attending rehabilitation sessions, play an essential role in the recovery process (Zawawi et al., 2020).

However, caregivers often experience emotional, mental, and physical stress, which can lead to burnout (Fauziah et al., 2022; J. Wang et al., 2022). As such, caregivers must adapt to the evolving needs of stroke patients by learning new skills, such as patient mobilization techniques and routine health monitoring (Chen et al., 2021; J. Wang et al., 2022). This adaptation also requires adjustments to personal and family routines to ensure that the caregivers' well-being is not neglected. Effective adaptation is expected to help maintain stroke patients' quality of life while preserving family balance. Furthermore, the shifting dynamics within the family environment demand effective coping strategies. These involve transitioning between different approaches to manage unexpected situations and are generally classified into problem-focused coping (PFC) and emotion-focused coping (EFC) (Dewilde et al., 2019; Dharma et al., 2021; Kazemi et al., 2021; Mukhti et al., 2022; Schwertfeger et al., 2020; Zanini et al., 2022). PFC includes efforts such as problem-solving, confrontational coping, and the seeking of social support, while EFC encompasses distancing, escape/avoidance, self-control, accepting responsibility, and positive reappraisal (Lazarus, 1984).

Several factors have been shown to influence the effectiveness of coping strategies among caregivers, including their perceptions of coping, adversity quotient, and spiritual-religious coping. Previous studies have demonstrated that the adversity quotient is positively associated with resilience and effective coping behaviors in various caregiving contexts (Gou et al., 2024; X. Wang et al., 2021). In addition, spiritual-religious coping has been identified as a protective factor that enhances psychological well-being and facilitates adjustment in stressful caregiving situations (Fauziah et al., 2022; Sen et al., 2022).

However, the specific interplay between these factors in shaping caregiver adaptation remains underexplored, particularly in the context of post-stroke caregiving. While previous studies provide evidence for the independent roles of adversity

quotient and spiritual-religious coping, less is known about how these variables jointly influence caregivers' perceptions, coping strategies, and ultimately their adaptation. Moreover, research in Indonesia is scarce, despite the cultural prominence of spirituality and family-based caregiving in the national culture.

Given these gaps, it is important to investigate further how psychological and spiritual resources contribute to caregiver adaptation in post-stroke families. Such research should provide evidence-based insights to inform culturally sensitive interventions and strengthen caregiver resilience.

Adversity quotient, the perception of coping, and spiritual-religious coping represent key psychological and spiritual resources that enable individuals to manage stress effectively. Those with a high adversity quotient respond more positively to stressful situations and are less likely to be overwhelmed by obstacles or difficulties (Rahmawati et al., 2024). Adversity quotient strengthens resilience and problem-solving strategies (Gou et al., 2024), while spiritual-religious coping provides meaning and hope in difficult situations, contributing to greater well-being (Dolcos et al., 2021). Together, these resources can enhance caregivers' coping strategies, psychological resilience, and overall adaptation when facing the challenges of post-stroke care.

Despite evidence for their individual roles, limited research has examined how these variables interact within a unified framework, particularly in the cultural context of Indonesian family caregiving. Therefore, this study develops and tests a caregiver adaptation model that integrates the adversity quotient and spiritual-religious coping, with caregiver perception and coping strategies as mediators, offering new insights into the adaptation process of post-stroke caregivers. By testing the framework, the study seeks to uncover the mechanisms through which these resources interact, thereby contributing to a more comprehensive understanding of caregiver adaptation in post-stroke contexts.

While previous studies have highlighted the importance of resilience, coping, and social support in caregiving (Y. Liu et al., 2025; Naz et al., 2024), few have integrated psychological and spiritual constructs within a single explanatory model. The combined role of adversity quotient and spiritual-religious coping, along with their indirect effects through caregiver perception and coping strategies, remains underexplored in collectivist contexts such as Indonesia. This study therefore addresses that gap by testing a comprehensive model of caregiver adaptation using a structural equation approach. The following hypotheses proposed:

H_1 Adversity quotient has a positive and significant effect on caregiver perception.
H_2 Spiritual-religious coping has a positive and significant effect on caregiver perception.
H_3 Adversity quotient has a positive and significant effect on coping strategy.
H_4 Spiritual-religious coping has a positive and significant effect on coping strategy.
H_5 Caregiver perception has a positive and significant effect on coping strategy.
H_6 Coping strategy has a positive and significant effect on caregiver adaptation.

Methods

An observational analytical approach was employed with a cross-sectional design. Such a design combines observational methods in which no intervention is made by the researcher with analytical techniques to explore natural relationships between variables. In our study therefore, the researchers did not influence or alter the subjects' conditions, but instead observed the variables as they occurred. The goal was to investigate the relationship between exogenous variables, namely adversity quotient and spiritual-religious coping, and endogenous variables, which comprises caregiver perception, coping strategies and

caregiver adaptation in caring for post-stroke family members.

The study population consisted of family members caring for post-stroke patients or patients who were recently discharged from hospitalization within the previous 6 months to 3 years. The sample included primary caregivers living in the same household as the patient and who were willing to participate. We recruited 200 family caregivers via cluster random sampling across seven health center areas in Tomohon City. Beyond the SEM "rules of thumb" (which N = 200 is commonly considered adequate for stable estimation and fit assessment), the global model fit (SRMR = .055) further supports the sufficiency of the sample. Cluster random sampling was used because the population of stroke caregivers naturally clustered by community health center areas in the city. Each center serves as a distinct geographical cluster, allowing efficient and representative data collection. This technique ensured inclusion of caregivers from diverse socio-economic and caregiving backgrounds, while maintaining randomization within each cluster. It also reduced logistical challenges and sampling bias that might have occurred if the caregivers had been selected individually across dispersed areas.

Data were collected using questionnaires scored on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The instruments measured both exogenous and endogenous variables, including Adversity Quotient (X_1), Spiritual-Religious Coping (X_2), Caregiver Perception (Z_1), Coping Strategy (Y_1), and Caregiver Adaptation (Y_2).

1. Adversity Quotient (AQ) was measured using the Chinese version of the Adversity Quotient Scale, originally developed by Stoltz (2000) and translated into Chinese by Bing (2008). The Indonesian version was translated and back-translated by two bilingual experts to ensure linguistic equivalence.
2. Spiritual-Religious Coping (SRC) consisted of five items adapted from Pargament's RCOPE scale (Pargament et al., 2000), including positive coping and negative coping. Items were culturally adjusted to align with Indonesian religious expressions, while maintaining conceptual validity.
3. Caregiver Perception was assessed using seven items modified from the Appraisal of Caregiving Scale (ACS) of (Bigatti & Steiner, 2014). The Indonesian version was translated and back-translated by two bilingual experts to ensure linguistic equivalence.
4. Coping Strategy comprised six items related to problem-solving from Folkman and Lazarus (2012), Ways of Coping Questionnaire (WCQ). The Indonesian version was translated and back-translated by two bilingual experts to ensure linguistic equivalence.
5. Caregiver Adaptation was measured using six items developed from the Coping and Adaptation Processing Scale (Roy, 2001). The Indonesian version was translated and back-translated by two bilingual experts to ensure linguistic equivalence.

The total number of questionnaire items was adjusted to suit the subjects' and respondents' educational backgrounds. All the adapted instruments underwent expert review by three psychologists specializing in clinical and health psychology to evaluate the content validity. A pilot test involving 30 caregivers in a similar population yielded satisfactory reliability coefficients (Cronbach's α = .78 –.90) and item-total correlations (> .40), confirming internal consistency and preliminary construct validity.

The research was conducted in several stages. First, ethical approval and permission were obtained from Universitas Airlangga, East Java, Indonesia. Caregivers of post-stroke patients were then selected using cluster random sampling based on the health center areas. Participants who met the inclusion criteria were informed about the study and provided with written consent. Data were collected using self-administered Likert-scale questionnaires measuring adversity quotient,

spiritual-religious coping, caregiver perception, coping strategy, and caregiver adaptation. The completed questionnaires were verified and analyzed to examine the relationships between the variables. Data collection took place from October 2020 to April 2021.

The data were analyzed using SEM-PLS (Structural Equation Modelling Partial Least Squares) due to its suitability for handling models with latent variables. The analysis began with an outer model assessment to test convergent and discriminant validity and reliability, ensuring each indicator reflected its latent variable accurately. The inner model was then analyzed to evaluate the predictive strength and relationships between the variables. Finally, hypothesis testing was conducted using bootstrapping to determine the significance of the relationships between the variables.

Ethical approval for the study is shown in the letter of ethics with number 463/HRECC. FODM/X/2020 from the Faculty of Dentistry, Universitas Airlangga, with consideration of ethical aspects that protect the rights and welfare of respondents following applicable guidelines.

It was ensured that participation was voluntary, without pressure or coercion, and with the guarantee that participants had the right to withdraw at any time without negative consequences.

Results

Respondent characteristics, including age and education, are shown in Table 1. Based on the data, the majority of respondents were women, totaling 149 individuals (74.5%), while men accounted for 51 participants (25.5%). The majority of respondents were over 40 years old (43.5%), followed by 31-40 years age group, with 23.0%. In terms of education, the largest proportion number of respondents had a high school level education (47.5%), followed by junior high school (21.5%) and elementary school (20.5%). Regarding adversity quotient, most of the respondents were included in the category of climbers (42.5%), which showed resilience in facing challenges, while campers accounted for 37.0% and quitters 20.5%. Regarding spiritual religious coping, most respondents (84.0%) used positive coping. This aligns with the caregivers' perception, with 86.0% having a positive perception. Regarding coping strategies, most respondents (92.0%) used problem-focused coping, which is more oriented toward problem-solving. Caregiver adaptation also showed positive results, with 95.0% of respondents successfully adapting.

In Table 2, can be seen that 42.5% of the respondents belonged to the Climbers category, which means they show the ability to survive and keep moving forward in the face of difficulties. 37.0% were in the Campers category, therefore tending to be satisfied with certain conditions with little encouragement to develop further. The remaining 20.5% of respondents were classified as Quitters, those who easily give up when facing obstacles. Most participants used a positive spiritual religious coping strategy (84.0%), indicating an adaptive approach through spiritual beliefs or practices to deal with pressure. Only 16.0% used negative strategies involving anger, disappointment or loss of meaning in religious practices. In addition, 86.0% of respondents had a positive perception of being a caregiver, indicating an optimistic view of their role in providing care. The remaining 14.0% had a negative perception, reflecting a less adaptive view of their caregiver responsibilities. The dominant coping strategy among respondents was problem-based coping (92.0%), indicating an active approach to problem-solving. Meanwhile, only 8.0% used emotion-based coping, which is a strategy that focuses more on managing emotions rather than solving problems. Most respondents (95.0%) showed positive adaptation in performing their role of caregiver, reflecting their ability to adjust to demands and pressures. Only 5.0% showed negative adaptation, indicating difficulties meeting the demands of the role.

Table 1

Demographic Characteristics of Family Caregiver Respondents of Post-Stroke Patients (N = 200)

Characteristic	Frequency	(%)
Gender		
Woman	149	74.5
Man	51	25.5
Age		
< 19	30	15.0
20-30	37	18.5
31-40	46	23.0
> 40	87	43.5
Education		
Elementary school	41	20.5
Junior high school	43	21.5
Senior high school	95	47.5
College	21	10.5

Table 2

Description of the Research Variables related to the Family Caregiver Respondents of Post-Stroke Hypertension Patients in Tomohon, Sulawesi, Indonesia, October 2020 – April 2021, N = 200

Variable	Frequency	(%)
Adversity Quotient		
Quitters	41	20.5
Campers	74	37.0
Climbers	85	42.5
Spiritual Religious Coping		
Negative	32	16.0
Positive	168	84.0
Caregiver Perception		
Negative	28	14.0
Positive	172	86.0
Coping Strategy		
Emotion-Based	16	8.0
Problem-Based	184	92.0
Caregiver Adaptation		
Negative	10	5.0
Positive	190	95.0

Furthermore, a model of the influence of the adversity quotient and spiritual religious coping on caregiver adaptation, through caregiver perception and coping strategy, was developed using structural equation modeling with the Smart PLS (partial least squares) program, version 4.1.0.6. The first step in this approach is to use the measurement model to assess the construct's

validity and reliability. The first step outer model is with the validity of convergence evaluated through the loading factor, which is considered valid if its value is greater than .5. Table 3 shows the details of the convergence validity test results.

The results of the outer model test with the loading factor value indicate that they do not meet the requirements to pass the convergence validity test. Meanwhile, the dimensions in the other variables met the requirement, that is, an outer loading value of more than .5.

The validity of the discrimination can be measured using the cross-loading value. With a high cross-loading value (.5) on a certain variable's dimension compared to another's dimension value, the construct validity of the variable and the latent dimension is deemed to be good. Table 4 shows the full cross-loading values.

The results of the discrimination test using the Fornell-Larcker criterion showed that all the study variables met discrimination validity. The AVE square root value for each variable is greater than the correlation value between other variables. Specifically, the Adversity Quotient variable has an AVE root value of .846, that of Spiritual Religious Coping .809, of Coping Strategy .911, of Caregiver Adaptation .812, and of Caregiver Perception of .831. These results suggest a clear conceptual difference for each variable, meaning the model can be declared to have valid discrimination.

The next step is the AVE, which means the magnitude of the variance of the indicator contained in the latent variable. An AVE value greater than .5 indicates good validity adequacy for the research variable. In addition, the reliability of the construct is measured by a composite reliability value with a value above .7, so the indicator is considered consistent in measuring latent variables.

Table 3

Results of Convergent Validity Testing

Code	Adversity Quotient	Code	Spiritual Religious Coping	Code	Coping Strategy	Code	Caregiver Adaptation	Code	Caregiver Perception
X_1.01	.871	X_2.01	.667	Y_1.01	.926	Y_2.01	.817	Z_1.01	.829
X_1.02	.866	X_2.02	.860	Y_1.02	.861	Y_2.02	.901	Z_1.02	.824
X_1.03	.824	X_2.03	.854	Y_1.03	.931	Y_2.03	.752	Z_1.03	.840
X_1.04	.844	X_2.04	.853	Y_1.04	.943	Y_2.04	.788	Z_1.04	.856
X_1.05	.863	X_2.05	.796	Y_1.05	.849	Y_2.05	.850	Z_1.05	.819
X_1.06	.834			Y_1.06	.950	Y_2.06	.755	Z_1.06	.834
X_1.07	.827							Z_1.07	.817
X_1.08	.801								
X_1.09	.789								
X_1.10	.795								
X_1.11	.864								
X_1.12	.894								
X_1.13	.867								
X_1.14	.848								
X_1.15	.865								
X_1.16	.836								
X_1.17	.869								
X_1.18	.837								
X_1.19	.842								
X_1.20	.877								

The results of the variable construct test show that all variables have values of more than .7. Based on this result, they all have reasonable construct validity sufficiency. The test results also show that the reliability of all variables had a composite reliability value of rho c greater than .7. Therefore, all the variables were declared to be reliable.

The structural model stage aims to establish whether there is an influence between variables. The test was performed using the p-value of the t-test. The variable is said to have an influence if the significance value t is less than .05. The calculation results can be seen in Figure 1.

Table 4

Results of Discriminant Validity Testing with the Fornell-Larcker Criterion, Construct Validity, and Reliability

Variable	Adversity Quotient	Spiritual Religious Coping	Coping Strategy	Caregiver Adaptation	Caregiver Perception	Average Variance Extracted (AVE)	Composite Reliability (rho-c)
Adversity Quotient	.846					.716	.981
Spiritual-Religious Coping	.351	.809				.655	.904
Coping Strategy	.376	.443	.911			.830	.967
Caregiver Adaptation	.122	.214	.255	.812		.660	.921
Caregiver Perception	.328	.317	.351	.066	.831	.691	.940

Figure 1

Inner Model Caregiver Adaptation for Stroke Patient Families

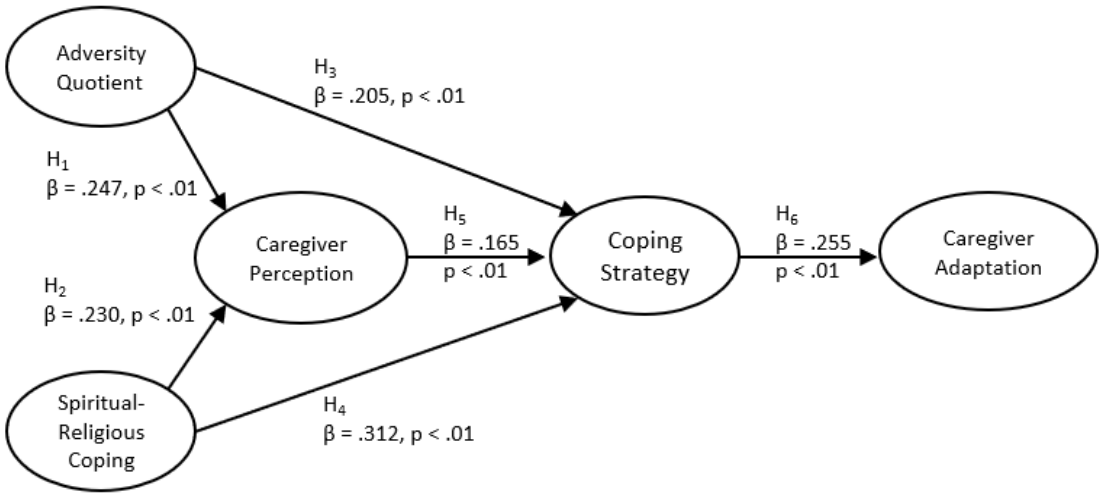

Table 5

SEM-PLS Test Results

Relationship between variables	Coef.	t-test	p-value	VIF	R Square	Model Fit SRMR
Adversity Quotient (X_1) -> Caregiver Perception (Z_1)	.247	3.259	.001	1.213	.154	.055
Spiritual-Religious Coping (X_2) -> Caregiver Perception (Z_1)	.230	2.700	.007	1.141		
Adversity Quotient (X_1) -> Coping Strategy (Y_1)	.205	3.092	.002	1.203	.280	
Spiritual-Religious Coping (X_2) -> Coping Strategy (Y_1)	.312	4.646	.000	1.141		
Caregiver Perception (Z_1) -> Coping Strategy (Y_1)	.185	2.615	.009	1.000		
Coping Strategy (Y_1) -> Caregiver Adaptation (Y_2)	.255	4.035	.000	1.182	.065	

Table 5, the results of the SEM test show that adversity quotient (X_1) had a positive and significant relationship with caregiver perception (Z_1), with a pathway coefficient of .247 and a significance value of .001 ($p < .05$). This indicates that a higher adversity quotient is associated with a more positive perception of the caregiver. Spiritual-religious coping (X_2) also showed a significant influence on the caregiver perception (Z_1), with a coefficient of .230 and a significance value of .007 ($p < .05$). A coping approach involving religious spirituality can improve caregiver perceptions. Adversity quotient (X_1) also had a positive effect on coping strategy (Y_1), with a coefficient of .205 and a significance value of .002 ($p < .05$). This shows that the higher the adversity quotient (X_1), the more effectively the coping strategy is applied. Coping based on religious spirituality (X_2) had a greater influence on coping strategies, with a coefficient of .312 and a significance value of .000 ($p < .05$). The analysis showed that the perception of the caregiver (Z_1) influenced the coping strategy adopted (Y_1), with a coefficient of .185 and a significance value of .009 ($p < .05$). Finally, coping strategy (Y_1) significantly contributed to caregiver adaptation (Y_2), with a coefficient of .25 and a significance value of .000 ($p < .05$). Implementing a good coping strategy helps caregivers view or perceive stress and facilitates their adaptation, thereby improving the quality of support for stroke survivors.

The R-squared shows the contribution of exogenous variables to endogenous ones in the model. The relationship between adversity quotient (X_1) and spiritual/religious coping (X_2) to caregiver perception (Z_1) has an R-squared of .154, which means that these two variables can explain 15.4% of the variability of caregiver perception. At the same time, other factors have not been adequately addressed. The combination of adversity quotient and spiritual/religious coping on coping strategy (Y_1) recorded an R-squared of .280, indicating that these two variables could explain 28% of the variability of the coping strategy. The relationship between coping strategy (Y_1) and caregiver adaptation (Y_2) has an R-squared of .065, which shows that only 6.5% of the variability of caregiver adaptation is described, so other aspects need to be considered in relation to it.

The results of the fit model test show that the standardized root mean square residual (SRMR) value is .055. This value is below the threshold of .08, indicating that in the research model there is good

agreement between the data and the proposed model. Therefore, the model used can be considered to meet the overall goodness-of-fit criteria.

Discussion

The study was conducted in Tomohon City, North Sulawesi, Indonesia, with the participation of 200 caregivers of post-stroke patients who were also family members. From the data collected, the caregivers were dominated by those over the age of 40, with the majority educated to high school level. This is in line with statistical data from the United States, where the average age of caregivers is 49.2 (Family Caregiver Alliance, 2016). The average level of caregiver education for stroke patients is dominated by high school graduates, with a total percentage of more than 40% (Ariska et al., 2020).

The financial burden on low-income caregivers greatly affects their ability to access health information and adequate health facilities close to home (Zahra & Sutejo, 2019). The caregivers in this study were dominated by those with incomes below the UMR (Regional Minimum Wage), which can result in a heavy financial burden in caring for post-stroke patients who are family members. Income below the UMR is also related to a lack of access to higher education. This study identified a clear association indicating that caregivers with lower income levels tended to have more limited knowledge regarding the appropriate care model for their family members living with post-stroke conditions.

Abilities, skills and in-depth knowledge of post-stroke patient care are needed to help provide better and more appropriate care (Zahra & Sutejo, 2019). A good level of knowledge will help caregivers understand and utilize health service facilities to reduce the additional burden on them (Ariska et al., 2020). Therefore, a family's below-average economic status will affect their knowledge of good care models and the extent to which they can care for post-stroke patients.

The study results show that the adversity quotient (AQ) affected the caregiver perception (CP). This is because it reflects an individual's ability to overcome difficulties and challenges, which are often an integral part of caregivers' roles. Those with high AQ results have a positive CP tendency when facing challenges and difficulties, considering that they are not inevitable obstacles. This perception also affects caregivers' response to difficult situations, allowing them to be more optimistic and proactive in finding right solutions during treatment. Positive perceptions will also impact people's tendency to have a stronger outlook on life and their ability to cope with the pressures of daily life.

The study results also show that caregivers use coping strategies are more effective in handling their roles (Mukhti et al., 2022; Zanini et al., 2022). It is demonstrated that the results concerning spiritual religious coping (SRC) affect CP. SRC has a significant influence on CP due to the associated spiritual beliefs and religious practices, thus providing a scheme of meaning that helps caregivers interpret their experiences while caring for others (Fauziah et al., 2022). SRC in caregivers helps them interpret their role as a larger mission and a form of service to God. SRC gives them confidence that the role of caregiver has a deeper purpose and meaning. Directly, this affects their perception of the challenges in caregiving, leading them to consider difficulties faced as spiritual tests given by God to strengthen their faith (Krok et al., 2021; Sen et al., 2022). In a sense, SRC is a mechanism to reduce the psychological burden that causes an increase in CP related to the caregiver's ability to face the burden of care (Zheng et al., 2021). In addition, social support from the religious community also plays an important role in building the positive perception that caregivers are not alone in dealing with situations, but that strong social support is available (Zheng et al., 2021). Therefore, SRC significantly affects CP through meaning, emotional support, and stress reduction in caregivers performing their nursing roles.

The results of the analysis show that AQ influences problem-focused coping strategies; caregivers with high AQ tend to use such strategies (Mukhti et al., 2022; Zanini et al., 2022). They are able to focus on overcoming their problems while continuing their role as caregivers for post-stroke patients. AQ plays an important role in caregivers' coping strategy, especially when they are facing the challenges and burdens of daily life related to their role in caring for others. Caregivers with high AQ can take advantage of the effectiveness of problem-focused and emotion-focused coping strategies. Problem-focused strategies are used by caregivers when resolving immediate problems, such as finding additional resources or rearranging care routines. Caregivers consider the difficulties they face as issues that can be managed and resolved. Individuals with high AQ tend to be resilient and proactive in facing challenges, making this approach beneficial for caregivers (M. Liu & Wang, 2023).

In contrast, the involvement of emotion-focused coping strategies to manage emotions arises due to stresses in the care process, such as feelings of anxiety or fatigue. High AQ indicates that caregivers have adjusted to situations that cannot be changed, so they focus on emotional regulation, such as seeking social support or changing their perspectives. This ability helps them avoid the emotional exhaustion often experienced when facing difficult situations endlessly. Therefore, caregivers with high AQ are more flexible in utilizing these two coping strategies, depending on the problem at hand, to maintain mental health and the effectiveness of care. The study results help define the effect of SRC on problem-emotion focus (Bakas et al., 2022; Lin et al., 2022). Religious and spiritual activities are a form of coping that is often chosen in dealing with problems as it involves an internal locus of control in stressful situations. Religious activities can be a source of spiritual and religious fertilization, and be one form of spiritual expression (Zheng et al., 2021).

Spirituality can be a powerful source of motivation for caregivers to deal with stressful situations more effectively. Through a problem- and emotion-focused coping approach, spirituality helps individuals manage the stress they are experiencing directly. It is important in increasing mental resilience and building an optimistic attitude in challenging situations. By feeling safe in God's protection, individuals can be more confident in dealing with stressors, choose constructive problem-solving steps, and keep trying rather than giving in to circumstances.

For caregivers who rely on spirituality and religious beliefs, coping strategies are often based on their spiritual values. It shows that religion is a source of strength and supports the use of solution-oriented coping strategies. Therefore, spirituality becomes an important foundation that helps caregivers optimize their internal resources to better manage stress, ideally in a more thoughtful way.

SRC is an approach individuals use when experiencing difficulties involving religious beliefs and spirituality. The use of SRC affects coping strategies that focus on problems and emotions (problem-emotion-focused). The problem-focused coping strategies address issues directly through the making of concrete plan or seeking of support. Individuals who engage with SRC use the strategy because they believe God will provide a solution or guidance to overcome their difficulties. They tend to see problems as challenges or tests that can be overcome with hard work and help from God (Sen et al., 2022; Zheng et al., 2021).

In addition, SRC plays an important role in emotion-focused coping strategy; that is, individuals utilize religious practices such as prayer, meditation, and attendance at acts of worship to manage the negative emotions that arise due to stress (Dolcos et al., 2021; Graça & Brandão, 2024; Krok et al., 2021). For Desiningrum et al. (2025), religiosity and spirituality are important resources for coping with stress. They can help individuals achieve inner peace of mind by accepting absolute

circumstances, and increase confidence in the greater meaning behind difficult circumstances. SRC also increases social support through religious communities and the sharing of emotional burdens with people of the same faith (Dolcos et al., 2021; Graça & Brandão, 2024; Krok et al., 2021). Consequently, SRC provides emotional support through religious beliefs and practices and motivates individuals to proactively address problems, making it a flexible and effective coping strategy across various stressful situations.

The study results show that caregivers' perceptions of stress influence their choice of coping strategies. Coping is an individual's way of dealing with stressful problems and is the result of their ability to think and analyze. Problem-focused coping is a strategy used to overcome stress by directly addressing the source of the problem that causes it the strategy addresses and eliminates the causes of stress, enabling caregivers to live normal lives. On the other hand, emotion-focused coping encompasses all the efforts to reduce emotional responses to stressful incidents (Dewilde et al., 2019; Mukhti et al., 2022; Schwertfeger et al., 2020; Zanini et al., 2022). The problem-emotion-focused coping strategy discussed in this study is a caregiver method for dealing with direct stress situations when caring for post-stroke patients. The coping strategy caregivers use focuses on how they deal with problems and on the future strategies taken to support the care of post-stroke patients.

If the caregiver's perception of stress is positive, they can use the right coping strategy. A problem-based strategy will make them see the care situation as something that can be managed and solved appropriately, meaning they look for practical solutions and concrete steps to solve problems. Examples of such coping strategies are when the caregiver seeks additional information, plans a care strategy, or seeks external support resources to reduce the burden of care. Caregivers can also use emotion-based coping if they feel emotionally distressed, allowing them to view the situation from a more emotional perspective. For example, they may consider the challenge as something exhausting or threatening to their emotional stability, so tend to prefer coping strategies that focus on managing emotions (emotion-focused coping) (Chen et al., 2021; Ugur, 2019). Such a strategy will encourage caregivers to seek emotional support from nearby environments such as friends or family; pray or draw closer to God; or change their perspective on problems to reduce their burden of emotional stress (Graça & Brandão, 2024). This positive perception of family situations can motivate caregivers to seek concrete solutions, whereas a negative or stressful perception will motivate an emotional management strategy.

The study data show that 92% of the respondents used problem-solving and 8% used problem-based strategies. This shows that fewer respondents experienced emotional problems, even if a family member had suffered a stroke. It was found that coping strategies influenced caregivers' adaptability. Selecting the right strategy affects caregiver adaptation, because both strategies help caregivers overcome emotional stress and practical challenges during the care process. Strategic coping is problem-focused. It empowers caregivers to focus on the problem-solving process, such as scheduling care, seeking medical information, or devising strategies to ease the burden of care. Caregivers who take advantage of this strategy adapt faster because they are proactive in taking concrete steps to address care challenges. This improves their perception of situations and increases the effectiveness of treatment for the family of stroke survivors (Dolcos et al., 2021; Krok et al., 2021). Emotional coping strategies help caregivers manage negative emotions such as stress, anxiety and emotional fatigue, which often appear for a long time when caring for stroke patients. The use of these strategies allows caregivers to find social support, pray, or employ

relaxation techniques to calm themselves down, helping them to accept the stroke patient's circumstances, which may not be reversible. The ability to manage emotions effectively helps caregivers adapt to routine emotional challenges, prevent burnout, and maintain mental well-being during treatment (Dharma et al., 2021; Kazemi et al., 2021). A combination of problem-focused and emotion-focused approaches helps caregivers become more flexible in dealing with various situations. They will not only be able to solve existing problems, but also maintain emotional balance when facing pressure. This makes their adaptation process smoother, increases resilience, and reduces the risk of mental health disorders due to prolonged treatment burdens.

Although the relationship between coping strategy (Y_1) and caregiver adaptation (Y_2) was significant, the coefficient of determination (R^2 = .065) indicates that only 6.5% of the variance in caregiver adaptation is explained by coping strategies. This relatively low value suggests that additional factors beyond coping mechanisms influence caregiver adaptation. Consistent with previous findings, adaptation among family caregivers is a multidimensional process shaped not only by individual coping efforts, but also by emotional regulation, social support, family functioning, and the severity of the patient's illness (Maggio et al., 2024; Nooreddini et al., 2025; Ye et al., 2024).

From a psychological standpoint, coping strategies generally target situational stress responses, while adaptation involves long-term transformation of attitudes and emotions, including meaning-making and role acceptance (Lazarus & Folkman, 1984)

The findings have several practical implications. First, health professionals and clinical psychologists should integrate resilience-building interventions into caregiver education programs, such as stress-management workshops or psychoeducation modules that focus on enhancing the core dimensions of the adversity quotient—control, ownership, and endurance. Second, incorporating spiritually informed counseling or mindfulness-based religious reflection sessions may strengthen caregivers' meaning-making processes, emotional stability, and hope during the rehabilitation phase. These approaches can promote psychological adaptation and improve the overall quality of caregiving in long-term patient care contexts.

The study does have several limitations. The cross-sectional design limits the ability to establish causal relationships among the adversity quotient, resilience, and coping strategies. In addition, data collection relied on self-reported questionnaires, which may introduce response bias. Moreover, the sample was limited to a specific caregiver group, reducing the generalizability of the findings. Contextual variables such as social support, financial burden and patient condition were not fully controlled, which may have influenced the outcomes. Future research employing longitudinal or mixed-method designs is recommended to capture caregivers' adaptive processes more comprehensively.

Conclusion

The findings show that adversity quotient and spiritual–religious coping influence caregiver perceptions, with adversity quotient playing a more dominant role in shaping positive perceptions. Furthermore, adversity quotient, spiritual–religious coping, and caregiver perception contribute to the development of coping strategies. Among these factors, spiritual–religious coping plays a particularly important role in enhancing coping behavior, as it helps caregivers manage emotional and situational demands more effectively. Finally, coping strategies have a significant impact on caregiver adaptation, indicating that the ability to regulate thoughts and emotions through constructive coping contributes to better adjustment in fulfilling caregiving responsibilities.[]

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Author Contribution Statement

Vione Deisi Oktavina Sumakul: Conceptualization; Data Curation; Formal Analysis; Investigation; Methodology; Project Administration; Resources; Validation; Visualization; Writing Original Draft; Writing, Review & Editing. **Fransiskus Xaverius Dotulong:** Conceptualization; Data Curation; Project Administration; Resources; Visualization; Writing, Review & Editing. **Meylani Dewi Wowor:** Conceptualization; Data Curation; Funding Acquisition; Validation; Writing, Review & Editing. **Brigita Maria Karouw:** Conceptualization; Data Curation; Funding Acquisition; Validation; Writing, Review & Editing. **Fatin Lailatul Badriyah:** Data Curation; Validation; Writing, Review & Editing.

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