

## ROLE OF FAMILY SUPPORT AND ITS SIGNIFICANCE IN REHABILITATIVE CARE AMONG STROKE PATIENTS AND DEPRESSION

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### ABSTRACT

*Stroke incidence increases with age, and the combination of a growing population and aging demographics is expected to lead to a significant rise in global mortality and disability in the future. Stroke survivors experience substantial health, emotional, social, and economic impacts, which are felt not only by individuals but also by families and communities. This study aimed to identify the relationship between depression level and stroke severity with family support in post-stroke patients at Sumedang Regency Hospital. This study used quantitative methods with a cross-sectional design. A total of 123 post-stroke patients participated in this study. Data were collected using the Beck Depression Inventory-II (BDI-II) questionnaire, National Institutes of Health Stroke Scale (NIHSS), and Perceived Social Support-Family (PSS-Fa), and analyzed using the Chi-Square test. Statistical tests showed a significant relationship between stroke severity and family support in post-stroke patients with a p value of 0.017 (p value <0.05), as well as between depression level and family support in post-stroke patients with a p value of 0.001 (p value <0.05). There is a significant relationship between stroke severity and depression level with family support in post-stroke patients. To improve health outcomes, it is important for healthcare providers to develop and implement strategies that strengthen family involvement in post-stroke patients care.*

### ABSTRAK

Kejadian stroke meningkat seiring bertambahnya usia, kombinasi populasi yang berkembang dan demografi yang menua kemungkinan akan menghasilkan peningkatan besar dalam kematian dan kecacatan global di masa depan. Penyintas stroke menghadapi dampak kesehatan, emosional, sosial, dan ekonomi yang sangat besar. Dampak ini dialami pada tingkat pribadi, keluarga, dan komunitas. Penelitian untuk mengidentifikasi hubungan antara tingkat depresi dan keparahan stroke dengan dukungan keluarga pada pasien pasca stroke di RSUD Kabupaten Sumedang. Penelitian ini menggunakan metode kuantitatif dengan desain cross-sectional. Sebanyak 123 pasien pasca stroke berpartisipasi dalam penelitian ini. Data dikumpulkan menggunakan kuesioner *Beck Depression Inventory-II (BDI-II)*, *National Institutes of Health Stroke Scale* dan *Perceived Social Support-Family (PSS-Fa)* yang mengukur tingkat depresi, keparahan stroke, dan dukungan keluarga, serta dianalisis menggunakan uji Chi-Square. Uji statistik menunjukkan bahwa terdapat hubungan yang signifikan antara keparahan stroke dengan dukungan keluarga pada pasien pasca stroke diperoleh p value sebesar 0,017 (p value <0,05) dan hubungan tingkat depresi dengan dukungan keluarga pada pasien pasca stroke diperoleh p value sebesar 0,001 (p value <0,05). Terdapat hubungan yang signifikan antara keparahan stroke dan tingkat depresi dengan dukungan keluarga pada pasien pasca stroke. Untuk meningkatkan hasil kesehatan pasien pasca stroke, penting bagi penyedia layanan kesehatan untuk mengembangkan dan mengimplementasikan strategi yang mendukung keterlibatan keluarga dalam perawatan pasien.

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## INTRODUCTION

Stroke is a neurophysiological disorder caused by impaired blood supply to the brain (Astuti et al., 2020). It can be classified into two types: ischemic stroke, which results from the blockage of blood vessels, and hemorrhagic stroke, which occurs due to the rupture of blood vessels (Diener & Hankey, 2020). Stroke is the second leading cause of death and the third leading cause of disability worldwide (Feigin et al., 2021). Its incidence increases with age, and the combination of a growing population and aging demographics is likely to lead to a substantial rise in global mortality and disability in the future (Owolabi et al., 2022). In Indonesia, stroke is the primary cause of both disability and mortality, contributing to 11.2% of total disability and 18.5% of all deaths. According to data from the 2023 Indonesian Health Survey, the national stroke prevalence reached 8.3 per 1,000 population (Kemenkes, 2024). In West Java, there were 3,988 stroke cases recorded in 2021 (Dinkes, 2022). Based on data collected by the author at Sumedang Regency Hospital, a total of 1,435 stroke cases were recorded over the past year.

Stroke survivors face significant health, emotional, social, and economic challenges, experienced not only personally but also at the family and community levels (Devereux & Berns, 2023). Among the major complications, psychological impacts—particularly depression—are commonly developed. Depression is a major contributor to functional disability, as it impairs patients' ability to cope with daily stressors and perform activities independently (Yang et al., 2016). The onset of post-stroke depression is thought to be caused by a multifactorial combination of biological and psychosocial responses to post-stroke functional impairment (Towfighi et al., 2017). Contributing factors include older age, low education, stroke symptom severity, and cognitive impairment (Yang et al., 2016).

Previous studies have estimated that the prevalence of post-stroke depression ranges from 18% to 33%, with a cumulative incidence of 39% to 52% within five years after stroke (Mitchell et al., 2017). Despite its high prevalence, post-stroke depression remains underdiagnosed and under-recognized (Ladwig et al., 2018). Identifying individuals at high risk of developing depression is therefore essential. Risk factors include genetics, age, gender, stroke severity, lesion location, and aphasia (Shi et al., 2017) and some studies have also shown that marital status, years of education, prior history of stroke or myocardial infarction, life stressors, poverty, and lack of social support are associated with a higher incidence of post-stroke depression (Chaudhary et al., 2022).

Depression interferes with the recovery process and significantly affects stroke severity, cognitive impairment, and overall mortality (Ojagbemi et al., 2014). Several studies have shown that stroke severity is positively correlated with depression (Guo et al., 2021). However, a recent review found that stroke severity may not predict post-stroke depression, whereas the degree of physical disability may be a better predictor within the first year after stroke (Ladwig et al., 2023). These two aspects may interact in certain cases, depending on the definitions and assessment tools used in the research sample.

The National Institutes of Health Stroke Scale (NIHSS) is a structured tool used to assess stroke severity. Understanding the comparison of mean NIHSS scores at admission is crucial to determining favorable and unfavorable functional outcomes after stroke (Kazi et al., 2021). A study that used NIHSS scores as a measure of stroke severity found a significant association between stroke severity and post-stroke depression, demonstrating that NIHSS scores were significantly correlated with the occurrence of post-stroke depression (Guo et al., 2021).

Care is a vital aspect for post-stroke patients who suffer from neurological deficits, particularly those in the acute and subacute phases who experience moderate to severe impairment and require assistance with most activities of daily living (Ahn et al., 2015). This care is generally provided by the family. In most cases, post-stroke patients require full support from their families and surrounding environment (Marlina et al., 2023). Such support can stimulate the patient's emotional well-being and foster a stronger will to recover. Empowerment and adaptation among post-stroke patients are known to enhance functional status, improve coping mechanisms, and increase life expectancy (Dharma et al., 2018). Therefore, fostering patient independence is essential in preventing stroke recurrence and improving quality of life (Marlina et al., 2023).

This study explores the relationship between depression level and stroke severity with family support in post-stroke patients at Sumedang Regency Hospital, addressing a research gap as no prior studies have focused on this specific setting. Most previous studies have tended to examine only a single factor, without considering all variables holistically. For example, prior research found that 14% of stroke survivors experienced depression, with disability and loss of functional independence identified as key predictors (Kumar et al., 2020). Hartley et al., (2022) reported that while function and stroke severity improved significantly during rehabilitation, improvements in health-related quality of life did not always follow, emphasizing the importance of psychological support in the rehabilitation process. Specific data regarding the prevalence of stroke in Sumedang is still limited, especially in the context of family support and its influence on depression and stroke severity.

Based on this phenomenon, the researcher aims to examine the relationship between depression level and stroke severity with family support in post-stroke patients at Sumedang Regency Hospital. This study is expected to provide valuable insights for planning effective interventions and developing relevant health policies. Understanding local patient characteristics will allow for the design of more targeted interventions, ultimately improving the quality of life for post-stroke patients through the strengthening of family support.

## **METHODS**

### **Types of research**

This study employed a quantitative research design. The analytical research approach used was cross-sectional.

### **Research Location and Time**

This research was conducted at Sumedang Regency Hospital between April and June 2024.

### **Ethical Clearance**

Primary data were collected through respondent questionnaires and secondary data from medical records. The research process began with administrative arrangements, including the submission of ethical clearance (No. 478/UN6.KEP/EC/2024) to the Research Ethics Committee of Padjadjaran University and obtaining research permits from Sumedang Regency Hospital. After explaining the purpose and benefits of the study, informed consent was obtained from all respondents. Each questionnaire was completed within 20–30 minutes with short breaks. The researcher checked for completeness of the responses; if there were any missing data, the respondent was immediately contacted to complete and clarify their answers. Once all data were completed, the questionnaires were securely stored to maintain respondent confidentiality.

### **Population and Sample**

The population in this study consisted of 889 post-stroke patients. Data collection employed a non-probability sampling technique using the consecutive sampling method. The sample size was calculated using the G\*Power version 2.19.4 software, resulting in a minimum required sample of 88 participants. The final sample consisted of 123 post-stroke patients undergoing outpatient rehabilitation who met the inclusion and exclusion criteria. The inclusion criteria were: patients aged  $\geq 18$  years, willing to participate, and currently undergoing post-stroke rehabilitation. The exclusion criteria were: patients with severe communication disorders or paralysis. Sampling was based on specific considerations made by the researcher, grounded in known characteristics and conditions of the target population (Sugiyono, 2022).

### **Instrument**

Data were collected using three validated instruments: the Beck Depression Inventory-II (BDI-II), the National Institutes of Health Stroke Scale (NIHSS), and the Perceived Social Support–Family (PSS-Fa).

### Data Collection

The data collection process involved both primary data through questionnaires and secondary data from medical records. The instruments used in this study consisted of five questionnaires included: (1) a depression questionnaire using the Beck Depression Inventory (BDI-II) which has shown high content validity (I-CVI = 0.97; S-CVI = 0.98) and very good reliability (Cronbach's alpha = 0.89); (2) the National Institutes of Health Stroke Scale (NIHSS) to assess stroke severity based on 15 items; (3) the Perceived Social Support-Family (PSS-Fa) questionnaire with 20 items and a Likert scale that has been validated ( $r > 0.361$ ) and is reliable (Cronbach's alpha = 0.752). All instruments have undergone validity and reliability tests so that they are suitable for use in this study.

### Processing and Analysis Data

Data on depression level, stroke severity, and family support were processed through editing, coding, entry, cleaning, and tabulation. Data analysis included both univariate and bivariate approaches. The Chi-Square test was used to analyze relationships among the variables.

## RESULTS

**Table 1.** Frequency Distribution of Respondents' Demographic Data at Sumedang Regency Hospital (n=123)

Respondent Characteristics	Frequency (f)	Percentage (%)
<b>Age</b>		
Adult	9	7.3
Pre-elderly	50	40.7
Elderly	64	52.0
<b>Gender</b>		
Male	60	48.8
Female	63	51.2
<b>Marriage Status</b>		
Unmarried	2	1.6
Married	100	81.3
Ever Married (Divorced)	21	17.1
<b>Education</b>		
Not in School	2	1.6
Elementary	59	48.0
Junior High	16	13.0
High School	26	21.1
D3/S1/S2	20	16.3
<b>Occupation</b>		
Housewife	42	34.1
Self-employed	23	18.7
Civil Servant/NI/Police	11	8.9
Farmer	14	11.4
Other	33	26.8

Based on Table 1, the majority of post-stroke respondents (52.0%) were aged >60 years. Most were female (51.2%), married (81.3%), had an elementary education background (48.0%), and nearly half (34.1%) were housewives. Table 2 shows that 69.9% of respondents had mild stroke severity. Most experienced severe depression (61.8%), and more than half (55.2%) received low family support.

**Table 2.** Frequency Distribution of Stroke Severity, Depression Level, and Family Support (n=123)

Variable	Frequency (f)	Percentage (%)
<b>Stroke Severity</b>		
Light	86	69.9
Heavy	37	30.1
<b>Depression Level</b>		
Mild Depression	47	38.2
Severe Depression	76	61.8
<b>Family Support</b>		
Lack of Support	69	55.2
Good Support	54	43.2

**Table 3.** Relationship Between Stroke Severity, Depression Level, and Family Support (n=123)

Independent Variable	Family Support (n=123)						<i>p-value</i>
	Lack of Support		Good Support		Total		
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	
<b>Depression Level</b>							
Mild Depression	20	42.6%	27	57.4%	47	38.2%	0.017
Severe Depression	49	64.5%	27	35.5%	76	61.8%	
<b>Stroke Severity</b>							
Light	40	46.5%	46	53.5%	86	69.9%	0.001
Heavy	29	78.4%	8	21.6%	37	30.1%	

As shown in Table 3, 57.4% of respondents with mild depression received good family support, while 64.5% of those with severe depression received less support ( $p = 0.017$ ), indicating a significant relationship between depression level and family support. Similarly, 53.5% of those with mild stroke severity received good family support, whereas 78.4% of those with severe stroke severity received less support ( $p = 0.001$ ), also indicating a significant relationship between stroke severity and family support..

## DISCUSSION

### Relationship between Depression Level and Family Support in Post-Stroke Patients

This study found a significant relationship between depression levels and family support in post-stroke patients. This finding suggests that strong family support can play a crucial role in alleviating depressive symptoms among individuals recovering from stroke (Bi & Wang, 2022). A study in Taiwan also reported that family support mediates the relationship between activities of daily living and post-stroke depression. Patients who received greater family support demonstrated improved functional ability and reduced levels of depression (BPS, 2013). Similarly, research in the United States found that social support was the strongest predictor of community participation among stroke survivors, helping them to overcome physical limitations and reducing the risk of depression (Erler et al., 2019).

Zhou & Kulick, (2023) emphasized that stroke patients with higher levels of family support generally exhibited lower levels of depression. Their findings reinforced the notion that family support acts as a protective factor by mitigating the prevalence and severity of depressive symptoms. Moreover, a study by Sun et al., (2024) explored the mediating effect of hope in the relationship between social support, self-esteem, and psychological resilience in stroke patients. The study revealed that social support positively influenced psychological resilience and, through the mediating role of hope, contributed to a reduction in depressive symptoms. These studies highlight the critical role of enhancing both family and broader social support systems to improve the mental health outcomes of stroke patients.



Interventions aimed at strengthening family and social support networks may serve as effective strategies for mitigating depression and enhancing overall recovery in post-stroke patients. Programs designed to educate families on caregiving practices not only reduce the emotional and physical burden on caregivers but also improve the quality of life for stroke survivors. Therefore, it is imperative that healthcare providers actively involve family members in the rehabilitation process and offer them adequate training and resources to support patients effectively.

### Relationship between Stroke Severity and Family Support in Post-Stroke Patients

This study found a significant relationship between stroke severity and family support in post-stroke patients. Adequate family support plays a critical role in recovery by influencing emotional well-being and functional ability. This finding aligns with Wang et al., (2024), who reported that patients with strong family support tend to adopt healthier behaviours, contributing to reduced stroke severity and faster recovery. Similarly, Mekky et al., (2023) found that patients with high levels of family support recovered more quickly and experienced milder stroke symptoms than those with minimal support. Emotional and physical assistance from family boosts patient motivation to adhere to rehabilitation programs and treatments, thereby lessening stroke's long-term impact. A study from Germany also noted a decreasing trend in stroke severity, as measured by the NIHSS, particularly among patients who received timely rehabilitation. This supports the importance of early intervention combined with continuous social support (Belau et al., 2024).

Further research underscores the influence of perceived social support especially from family, on patients' health behaviours, including physical activity and rehabilitation adherence (Wang et al., 2023). Involving family in the rehabilitation process not only improves motivation and compliance but also fosters more positive recovery outcomes (Devereux & Berns, 2023).

Health policies that encourage family participation in stroke care can ease the burden of disease and improve outcomes (Hackett & Pickles, 2014). Overall, strong family support enhances emotional resilience, promotes functional recovery, and should be considered an essential component of comprehensive stroke management strategies.

### CONCLUSIONS AND RECOMMENDATIONS

This study found a significant relationship between stroke severity and depression levels with family support in post-stroke patients. The findings underscore the critical role of family support in enhancing emotional well-being and recovery outcomes among stroke survivors. Therefore, healthcare providers should design and implement interventions that actively involve families in the care and rehabilitation process. To support this, health policies should promote family-centered care models that recognize the family as an essential component in post-stroke recovery. These policies can reduce the overall burden of stroke and improve patient health outcomes. Future research is recommended to adopt longitudinal study designs to assess the long-term effects of family support on stroke severity and depression. It is also suggested to include additional variables such as caregiver burden or support from non-family sources. Mixed-method approaches may provide deeper insight into patients' subjective experiences. Furthermore, multi-center studies with larger sample sizes are needed to increase the generalizability of the findings. These efforts can deepen our understanding and contribute to more effective, inclusive post-stroke care strategies.

### REFERENCES

- Ahn, D. H., Lee, Y. J., Jeong, J. H., Kim, Y. R., & Park, J. B. (2015). The Effect of Post-Stroke Depression on Rehabilitation Outcome and the Impact of Caregiver Type as a Factor of Post-Stroke Depression. *Annals of Rehabilitation Medicine*, 39(1), 74. <https://doi.org/10.5535/ARM.2015.39.1.74>
- Astuti, P., Kusnanto, K., & Novitasari, F. D. (2020). Depression and functional disability in stroke patients. *Journal of Public Health Research*, 9(2), 169–171. <https://doi.org/10.4081/JPHR.2020.1835>
- Belau, M. H., Misselwitz, B., Meyding-Lamadé, U., & Bassa, B. (2024). Trends in stroke severity at hospital admission and rehabilitation discharge before and during the COVID-19 pandemic in Hesse,

- Germany: a register-based study. *Neurological Research and Practice*, 6(1), 1–10. <https://doi.org/10.1186/S42466-024-00308-5/TABLES/2>
- Bi, H., & Wang, M. (2022). Role of social support in poststroke depression: A meta-analysis. *Frontiers in Psychiatry*, 13, 924277. <https://doi.org/10.3389/FPSYT.2022.924277/BIBTEX>
- BPS. (2013). *Social Support Following Stroke*. British Psychological Society. <https://www.bps.org.uk/psychologist/social-support-following-stroke>
- Chaudhary, D., Friedenber, I., Sharma, V., Sharma, P., Abedi, V., Zand, R., & Li, J. (2022). Predictors of Post-Stroke Depression: A Retrospective Cohort Study. *Brain Sciences*, 12(8). <https://doi.org/10.3390/BRAINS12080993>
- Devereux, N., & Berns, A. M. (2023). Evaluation & Treatment of Psychological Effects of Stroke. *Delaware Journal of Public Health*, 9(3), 62. <https://doi.org/10.32481/DJPH.2023.08.011>
- Dharma, K. K., Damhudi, D., Yarden, N., & Haeriyanto, S. (2018). Increase in the functional capacity and quality of life among stroke patients by family caregiver empowerment program based on adaptation model. *International Journal of Nursing Sciences*, 5(4), 357. <https://doi.org/10.1016/J.IJNSS.2018.09.002>
- Diener, H. C., & Hankey, G. J. (2020). Primary and Secondary Prevention of Ischemic Stroke and Cerebral Hemorrhage: JACC Focus Seminar. *Journal of the American College of Cardiology*, 75(15), 1804–1818. <https://doi.org/10.1016/J.JACC.2019.12.072>
- Dinkes. (2022). *Profil Dinas Kesehatan Kabupaten Sumedang*. Dinas Kesehatan Provinsi Jawa Barat. <https://diskes.jabarprov.go.id/assets/unduh/743ed67d9392011b54baee048ef56e05.pdf>
- Erler, K. S., Sullivan, V., Mckinnon, S., & Inzana, R. (2019). Social Support as a Predictor of Community Participation After Stroke. *Frontiers in Neurology*, 10, 480090. <https://doi.org/10.3389/FNEUR.2019.01013/BIBTEX>
- Feigin, V. L., Stark, B. A., Johnson, C. O., Roth, G. A., Bisignano, C., Abady, G. G., Abbasifard, M., Abbasi-Kangevari, M., Abd-Allah, F., Abedi, V., Abualhasan, A., Abu-Rmeileh, N. M. E., Abushouk, A. I., Adebayo, O. M., Agarwal, G., Agasthi, P., Ahinkorah, B. O., Ahmad, S., Ahmadi, S., ... Murray, C. J. L. (2021). Global, regional, and national burden of stroke and its risk factors, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet. Neurology*, 20(10), 795. [https://doi.org/10.1016/S1474-4422\(21\)00252-0](https://doi.org/10.1016/S1474-4422(21)00252-0)
- Guo, J., Wang, J., Sun, W., & Liu, X. (2021). The advances of post-stroke depression: 2021 update. *Journal of Neurology* 2021 269:3, 269(3), 1236–1249. <https://doi.org/10.1007/S00415-021-10597-4>
- Hackett, M. L., & Pickles, K. (2014). Part I: frequency of depression after stroke: an updated systematic review and meta-analysis of observational studies. *International Journal of Stroke : Official Journal of the International Stroke Society*, 9(8), 1017–1025. <https://doi.org/10.1111/IJS.12357>
- Hartley, T., Burger, M., & Inglis-Jassiem, G. (2022). Post stroke health-related quality of life, stroke severity and function: A longitudinal cohort study. *African Journal of Disability*, 11. <https://doi.org/10.4102/AJOD.V11I0.947>
- Kazi, S. A., Siddiqui, M., & Majid, S. (2021). Stroke Outcome Prediction Using Admission Nihss In Anterior And Posterior Circulation Stroke. *Journal of Ayub Medical College, Abbottabad : JAMC*, 33(2), 274–278. <https://pubmed.ncbi.nlm.nih.gov/34137544/>
- Kemenkes. (2024, October 25). *Cegah Stroke dengan Aktivitas Fisik*. <https://kemkes.go.id/id/rilis-kesehatan/cegah-stroke-dengan-aktivitas-fisik>
- Kumar, R., Kataria, N., Kumar, N., Kumar, M., & Bahurupi, Y. (2020). Poststroke depression among stroke survivors in Sub-Himalayan region. *Journal of Family Medicine and Primary Care*, 9(7), 3508. [https://doi.org/10.4103/JFMPC.JFMPC\\_444\\_20](https://doi.org/10.4103/JFMPC.JFMPC_444_20)
- Ladwig, S., Werheid, K., Südmeyer, M., & Volz, M. (2023). Predictors of post-stroke depression: Validation of established risk factors and introduction of a dynamic perspective in two longitudinal studies. *Frontiers in Psychiatry*, 14. <https://doi.org/10.3389/FPSYT.2023.1093918/FULL>
- Ladwig, S., Zhou, Z., Xu, Y., Wang, X., Chow, C. K., Werheid, K., & Hackett, M. L. (2018). Comparison of Treatment Rates of Depression After Stroke Versus Myocardial Infarction: A Systematic Review

- and Meta-Analysis of Observational Data. *Psychosomatic Medicine*, 80(8), 754–763. <https://doi.org/10.1097/PSY.0000000000000632>
- Marlina, M., Imran, I., Kurniawan, I., & Surbakti, E. (2023). Home rehabilitation using android-based system as booster on the independences of stroke patients in local government hospital in Aceh, Indonesia. *Acta Bio Medica: Atenei Parmensis*, 94(2), 2023083. <https://doi.org/10.23750/ABM.V94I2.13605>
- Mekky, J., Hafez, N., Kholy, O. El, Elsalamawy, D., & Gaber, D. (2023). Impact of site, size and severity of ischemic cerebrovascular stroke on sleep in a sample of Egyptian patients a polysomnographic study. *BMC Neurology*, 23(1), 1–9. <https://doi.org/10.1186/S12883-023-03438-6/TABLES/9>
- Mitchell, A. J., Sheth, B., Gill, J., Yadegarfar, M., Stubbs, B., Yadegarfar, M., & Meader, N. (2017). Prevalence and predictors of post-stroke mood disorders: A meta-analysis and meta-regression of depression, anxiety and adjustment disorder. *General Hospital Psychiatry*, 47, 48–60. <https://doi.org/10.1016/J.GENHOSPPSYCH.2017.04.001>
- Ojagbemi, A., Akinyemi, R., & Baiyewu, O. (2014). Cognitive dysfunction and functional limitations are associated with major depression in stroke survivors attending rehabilitation in Nigeria. *NeuroRehabilitation*, 34(3), 455–461. <https://doi.org/10.3233/NRE-141061>
- Pan, A., Sun, Q., Okereke, O. I., Rexrode, K. M., & Hu, F. B. (2011). Depression and risk of stroke morbidity and mortality: a meta-analysis and systematic review. *JAMA*, 306(11), 1241–1249. <https://doi.org/10.1001/JAMA.2011.1282>
- Shi, Y., Yang, D., Zeng, Y., & Wu, W. (2017). Risk factors for post-stroke depression: A meta-analysis. *Frontiers in Aging Neuroscience*, 9(JUL). <https://doi.org/10.3389/FNAGI.2017.00218/ABSTRACT>
- Sugiyono. (2022). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. In *Alfabeta* (2nd ed., Vol. 29). <https://cvalfabeta.com/product/metode-penelitian-kuantitatif-kualitatif-dan-rd-mpkk/>
- Sun, B., Wang, N., Li, K., Yang, Y., & Zhang, F. (2024). The mediating effects of hope on the relationships of social support and self-esteem with psychological resilience in patients with stroke. *BMC Psychiatry*, 24(1), 1–12. <https://doi.org/10.1186/S12888-024-05744-W/FIGURES/2>
- Towfighi, A., Ovbiagele, B., El Hussein, N., Hackett, M. L., Jorge, R. E., Kissela, B. M., Mitchell, P. H., Skolarus, L. E., Whooley, M. A., & Williams, L. S. (2017). Poststroke Depression: A Scientific Statement for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*, 48(2), e30–e43. <https://doi.org/10.1161/STR.0000000000000113>
- Wang, X., Zhang, Z., Lin, B., Mei, Y., Wang, W., Zhang, C., Zhang, Q., & Chen, S. (2023). *Relationship between Perceived Social Support and Health Behavior in Stroke Patients: the Mediating Role of Recurrence Risk Perception*. <https://doi.org/10.21203/RS.3.RS-2788873/V1>
- Wang, X., Zhang, Z. X., Lin, B. L., Jiang, H., Wang, W., Mei, Y. X., Zhang, C., Zhang, Q., & Chen, S. Y. (2024). Mediation role of perceived social support between recurrence risk perception and health behaviour among patients with stroke in China: a cross-sectional study. *BMJ Open*, 14(2), e079812. <https://doi.org/10.1136/BMJOPEN-2023-079812>
- Yang, Y., Shi, Y. Z., Zhang, N., Wang, S., Ungvari, G. S., Ng, C. H., Wang, Y. L., Zhao, X. Q., Wang, Y. J., Wang, C. X., & Xiang, Y. T. (2016). The Disability Rate of 5-Year Post-Stroke and Its Correlation Factors: A National Survey in China. *PLoS ONE*, 11(11). <https://doi.org/10.1371/JOURNAL.PONE.0165341>
- Zhou, H., & Kulick, E. R. (2023). Social Support and Depression among Stroke Patients: A Topical Review. *International Journal of Environmental Research and Public Health* 2023, Vol. 20, Page 7157, 20(24), 7157. <https://doi.org/10.3390/IJERPH20247157>