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The impacts of a healthy lifestyle on the physical and mental health status of female stroke survivors in Australia

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ABSTRACT

Introduction: This longitudinal study aimed to explore the impacts of adopting a healthy lifestyle on self-reported physical and mental health outcomes among Australian females who are living with stroke.

Methods: The study utilized data retrieved from the Australian Longitudinal Study on Women's Health's 1946–51 cohort (from survey 5 conducted in 2007 to survey 9 conducted in 2019), focusing on 531 female stroke survivors. The dependent variables for this study were self-reported physical and mental health status, whereas the independent variables were lifestyle behaviors, including physical activity, smoking, alcohol consumption, and supplement use. Generalized Estimating Equation models were employed to assess the longitudinal associations between a dependent variable and the independent and confounding variables.

Results: The average age of the participants was 58.1 (SD = 1.4) years in survey 5 and 70.5 years in survey 9. The longitudinal analyses revealed that stroke survivors who engaged in moderate/high levels of physical activity had significantly better physical and mental health status than their inactive or sedentary counterparts. Besides, current smokers had significantly poorer physical and mental health status than nonsmokers. In addition, risky/high-risk alcohol consumers had significantly poorer mental health status compared to no/low-risk alcohol consumers.

Conclusions: Our findings suggest that post-stroke individuals can improve their physical and mental health by maintaining a healthy lifestyle. Specifically, targeted and appropriate programs and strategies are needed to promote physical activity and reduce smoking and alcohol consumption in female stroke survivors in order to optimize their overall health and quality of life.

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Stroke survivors; healthy lifestyle; well-being; physical health; mental health; longitudinal study


Introduction

As a leading cause of long-term neurological and functional disability as well as adult mortality, stroke has become a significant global public health concern.^{1,2} More than half of stroke survivors are unable to regain their functional independence, and even those who attain functional independence continue to experience considerable physical and emotional difficulties.³ Health status, including both physical and mental health, is significantly lower in stroke survivors compared to the age-matched general people.^{4–7} The number of individuals living with stroke is increasing due to the aging population and advancements in acute stroke treatment.⁸ Currently, the global population of stroke survivors exceeds 101 million, with females comprising approximately 56% of this population.⁹

Previous studies have shown that several factors, including age, body mass index, functional status, stroke severity, comorbidities, degree of dependency, and social support, are associated with the self-reported physical and mental health status of post-stroke individuals.^{10–19} Also, female stroke survivors are found to have substantially lower levels of physical and/or mental health than male stroke survivors.^{12–15,17,18} Compared to their male counterparts, female stroke survivors exhibit poorer functional recovery, a diminished ability to engage in daily activities, and a higher prevalence of mental disorders.^{12,17–21} As such, it is important that future research focus on improving the physical and mental health of female stroke survivors.^{12,13,15,17–19}

A number of international stroke guidelines recommend that post-stroke individuals should

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engage in self-management practices such as adopting a healthy lifestyle.^{22–26} While physical activity, alcohol consumption, and smoking are well-established components of lifestyle behavior, the use of dietary supplements is also often regarded as an important aspect of maintaining health.^{22,27,28} Stroke survivors frequently encounter nutritional deficiencies due to several reasons, such as dysphagia, changes in appetite, and the adverse effects of medications.^{28–31} Dietary supplements can help address these deficiencies by providing essential vitamins and minerals that are crucial for recovery and overall health.^{22,32–34} Maintaining a healthy lifestyle, including engaging in adequate physical activity, refraining from smoking, reducing or abstaining from alcohol consumption, and taking nutritional supplements, can improve post-stroke symptoms management, functional ability, neurological recovery, prevention of secondary strokes, cardiovascular outcome, survival rate, and overall rehabilitation outcome.^{22,32–42}

Given the immense health care burden caused by stroke on females, attention should be given to research exploring the impacts of adopting key healthy lifestyle behaviors on physical and mental health outcomes among women living with stroke. To date, only limited and inconclusive evidence is available, which is primarily based on cross-sectional or randomized controlled trials^{15,35,39,43–47} (with the exception of a single longitudinal study that examined the effects of exercise on self-reported health among stroke survivors with a 2-year follow-up⁴⁶). To directly address this gap, this longitudinal study aimed to explore the impacts of a healthy lifestyle on self-reported physical and mental health in female stroke survivors in Australia.

Methods

This study conforms to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cohort studies.⁴⁸ The study utilized data retrieved from the Australian Longitudinal Study on Women's Health (ALSWH).⁴⁹ The ALSWH commenced data collection in 1996, focusing on three distinct age groups of women: young (18–23 years/born 1973–1978), mid-age (45–50 years/born 1946–1951) and old (70–75 years/born 1921–1926) to track changes in women's

health over time, identify associated factors that may influence their health outcomes, and evaluate the effects of changes in policy and practice.⁴⁹ From the database of the Health Insurance Commission (currently known as Medicare Australia), the participants of the baseline surveys of the ALSWH study were selected using a random sampling method within each of the age groups (except for women residing in rural and remote areas, who were over-sampled at a double rate than urban women).⁵⁰ The participants are broadly representative of the nationwide female population within the specified age groups.⁵⁰ Details about ALSWH can be found elsewhere.⁵⁰

This present study utilized the dataset of the ALSWH mid-age cohort, of which 13,714 women participated in the baseline survey in 1996.⁴⁹ The data from this cohort of participants was collected through mailed surveys at intervals of approximately three years. If required, proxy respondents – typically family members or close friends – were permitted to complete the survey on their behalf.⁴⁹ Proxy respondents are reliable and valid sources for assessing stroke-related health outcomes, including health-related quality of life.^{51,52} This cohort has undergone a total of nine surveys so far, with participants aged between 45–50 years during survey 1 in 1996 and 68–73 years during survey 9 in 2019.⁵³ Due to the availability and consistency of the variables associated with a healthy lifestyle, the present study employed data from surveys 5 through to 9. The questionnaire item “*In the Past 3 years, have you been diagnosed with or treated for stroke*” was utilized across all surveys to identify stroke patients. Several studies have examined the validity of self-reported stroke, providing support for the utilization of self-administered questionnaires in epidemiological research to determine the prevalence of stroke in population-based studies where hospital-recorded data are unavailable.^{54–56} For instance, a study by Engstad et al.⁵⁴ found that self-reported stroke results closely correspond with medical records, exhibiting a positive predictive value of 79%, sensitivity of 80%, and specificity of 99%.

Attrition is common in longitudinal investigations.⁵⁷ Figure 1 illustrates the longitudinal progression of participant engagement, providing a detailed listing of participant retention rates and reasons for attrition at each follow-up interval over

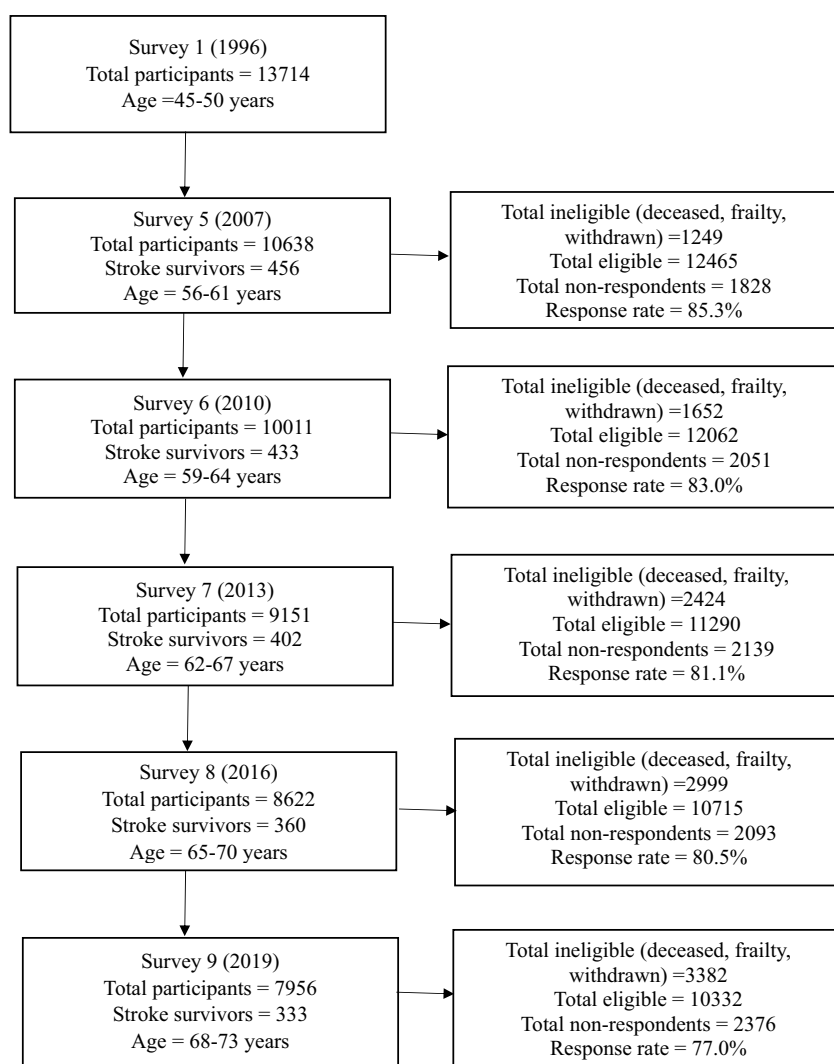


Figure 1. Longitudinal trajectory of participant engagement.

the course of the investigation. A total of 531 stroke survivors were identified in different surveys. Among them, 456 stroke survivors participated in survey 5 (2007); 433 stroke survivors participated in survey 6 (2010); 402 in survey 7 (2013); 360 in survey 8 (2016); and 333 in survey 9 (2019). This study is based on the information of those 531 stroke survivors.

Dependent variables

The dependent variables considered in this study were the self-reported physical and mental health status of the participants. The self-reported physical and mental health status was determined using the Physical Component Summary (PCS) scores and Mental Component Summary (MCS) scores

obtained from the Short Form 36 Health Survey Questionnaire (SF-36).^{58,59} The SF-36 questionnaire comprises eight distinct multi-item scales consisting of a total of 36 items. These scales evaluate various aspects of an individual's health, including physical function (PF), bodily pain (BP), role limitations due to physical health problems (RP), general health (GH), vitality (V), social functioning (SF), role limitations due to emotional problems (RE), and mental health (MH).^{58,59} Two summary measures of health status, namely PCS scores and MCS scores, are calculated using standard scoring algorithms based on the eight scales.^{59,60} The PCS score is comprised of PF, BP, RP, and GH, whereas the MCS score is comprised of V, SF, RE, and MH.^{59,60} PCS and MCS scores range from 0 to 100 (mean = 50, standard deviation = 10), with higher scores indicating

better health.^{59,60} The SF-36 is commonly used to measure self-reported physical and mental health status in various populations. This questionnaire has also been shown to have high reliability and validity for use with stroke survivors.^{61,62}

Independent variables

The independent variables for this study were physical activity, smoking, alcohol consumption, and supplement use. The Active Australia Survey questionnaire was utilized to measure physical activity levels,⁶³ whose validity and reliability have been demonstrated to be acceptable.⁶⁴ Participants reported the frequency and amount of time they spent (that lasted ≥ 10 -minute periods) engaging in brisk walking, moderate physical activities (such as social tennis, moderate exercise classes, dancing, recreational swimming), and vigorous physical activities (that caused them to breathe harder or puff and pant such as aerobics, vigorous cycling, running, competitive sports, swimming) during the preceding week. Physical activity score was measured using metabolic equivalent (MET) minutes per week, which was calculated using the formula: $(3.0 \times \text{walking minutes} + 4.0 \times \text{moderate activities minutes} + 7.5 \times \text{vigorous activities minutes})$.⁶⁴ Based on total MET.minutes per week, physical activity was categorized as inactive/sedentary (< 600) or moderate/high (≥ 600), where moderate/high physical activity is equivalent to the recommended physical activities for Australian adults (≥ 150 min/week of moderate activities).⁶⁴

The participants were asked to report the number of standard alcoholic drinks they usually consumed daily. The risk associated with alcohol consumption was categorized as: no/low-risk (≤ 14 drinks/week) and risky/high-risk (> 14 drinks/week).⁶⁵ The smoking status was determined by asking participants how often they currently smoke cigarettes or any tobacco products. Supplement use was determined by asking participants if they had consumed vitamins/minerals during the 12-month period preceding the survey.

Confounding variables

Age, body mass index (BMI), marital status, the number of comorbidities, and year of survey were included as confounding variables in the regression

models. Marital status was categorized as: married/de facto and widowed/divorced/separated/never married. The BMI was computed using the formula kg/m^2 , utilizing self-reported measurements of height and weight. According to the WHO, the classification of BMI was as follows: underweight/normal ($< 25.0 \text{ kg/m}^2$), overweight ($25.0\text{--}30.0 \text{ kg/m}^2$), and obese ($\geq 30.0 \text{ kg/m}^2$).⁶⁶ The survey questionnaires asked about a range of doctor-diagnosed chronic conditions within the previous three years. The number of comorbidities calculated from the conditions: diabetes, arthritis, hypertension, heart disease, cancer, asthma, depression, anxiety, bronchitis, low iron level, and osteoporosis.

Statistical analysis

This study analyzed the longitudinal association between a dependent variable and the independent and confounding variables using Generalized Estimating Equation (GEE) models, with the Gaussian family and log link function specified. The initial multivariable GEE models incorporated variables whose corresponding crude odds ratio (OR) had a p-value less than 0.25. Subsequently, a backward stepwise regression model approach was employed to identify the most parsimonious model for each dependent variable. Following the completion of the model development procedure, the final models provide the estimates for the adjusted OR (AOR).

GEE can provide robust estimates in the presence of dropouts and missing points, assuming the data are missing completely at random (MCAR) or missing at random (MAR).^{66–68} To address biases caused by non-random missing data (e.g. cases where participants dropped out due to mortality or severe health issues potentially related to poorer lifestyle choices) and ensure reliable estimates, we performed sensitivity analysis utilizing multiple imputation and weighted GEE with inverse probability weighting approaches,^{66–69} and found that our adjusted analyses were robust, with potential attrition bias had no significant impact on the main associations. A p-value of < 0.05 was deemed statistically significant. The statistical software Stata 17.0 was employed throughout the analysis procedures.

Ethical approval

The Human Research Ethics Committees at the University of Newcastle and the University of Queensland, Australia, granted ethics approval for ALSWH. The participants provided clear written consent to participate in the ALSWH. We received approval from the ALSWH Data Access Committee to use the de-identified ALSWH Core dataset for this study.

Results

A total of 531 stroke survivors participated in different surveys over the course of five survey periods (2007–2019). The demographic and health status characteristics of the participants are shown in Table 1. The average age of the participants was 58.1 (SD = 1.4) years in survey 5 (conducted in 2007) and 70.5 (SD = 1.5) years in survey 9 (conducted in 2019). Physical health (PCS) showed a declining trend from 43.1 (SD = 11.5) in 2007 to 39.6 (SD = 11.4) in 2019. Conversely, mental health showed an increasing trend from 48.4 (SD = 12.0) in 2007 to 50.3 (SD = 10.8) in 2016, and 50.0 (SD = 10.5) in 2019.

The prevalence of smoking among the participants was reported as 17.5% in the year 2007, which subsequently decreased to 7.6% in 2016 and 7.9% in 2019. The prevalence of risky/high-risk alcohol consumption showed a gradual decline from 10% in 2007 to 4.3% in 2019. The percentage of participants with moderate to high levels of physical activity was its highest level in 2010 (57.3%), and its level lowest in 2019 (47.4%). There was a consistent prevalence of supplement utilization across the five surveys, with a range of 77.0% to 79.4%. The prevalence of three or more comorbidities increased from 37.3% in 2007 to 47.5% in 2019.

The results of the two GEE models – one adjusted for age, marital status, and year of survey, and the other additionally adjusted for BMI and number of comorbidities – are presented in Table 2. To assess the potential mediating effects of BMI and number of comorbidities on health outcomes, we compared these two models. Using two distinct models, our analyses demonstrated that AORs for the associations between lifestyle factors and health outcomes showed minimal differences, suggesting that BMI and comorbidities

Table 1. Demographic and health status characteristics of study participants across five survey periods (2007–2019).

Characteristics	Survey 5 (2007) (n = 456)	Survey 6 (2010) (n = 433)	Survey 7 (2013) (n = 402)	Survey 8 (2016) (n = 360)	Survey 9 (2019) (n = 333)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Age	58.1 (1.4)	61.2 (1.4)	64.4 (1.5)	67.1 (1.4)	70.5 (1.5)
Physical health summary scores	43.1 (11.5)	42.2 (11.7)	40.9 (11.4)	39.9 (11.8)	39.6 (11.4)
Mental health summary scores	48.4 (12.0)	48.7 (11.7)	49.8 (11.3)	50.3 (10.8)	50.0 (10.5)
	n (%)	n (%)	n (%)	n (%)	n (%)
Marital Status					
Married/De facto	334 (73.7)	307 (71.2)	275 (68.9)	230 (65.0)	205 (63.7)
Widowed/Divorced/Separated/Never married	119 (26.3)	124 (28.8)	124 (31.1)	124 (35.0)	117 (36.3)
Current smoking					
No	372 (82.5)	367 (85.2)	357 (88.8)	327 (92.4)	302 (92.1)
Yes	79 (17.5)	64 (14.8)	45 (11.2)	27 (7.6)	26 (7.9)
Alcohol consumption risk					
None/Low risk	405 (90.0)	394 (91.6)	364 (92.4)	326 (93.4)	291 (95.7)
Risky/High risk	45 (10.0)	36 (8.4)	30 (7.6)	23 (6.6)	13 (4.3)
BMI (kg/m ²)					
Underweight or Normal (<25.0)	162 (36.6)	139 (33.3)	127 (32.7)	111 (32.8)	96 (35.0)
Overweight (25.0–29.9)	151 (34.1)	138 (33.0)	134 (34.5)	106 (31.4)	84 (30.7)
Obese (≥30.0)	130 (29.3)	141 (33.7)	127 (32.7)	121 (35.8)	94 (34.3)
Physical activity					
Inactive/Sedentary (<150 min)	196 (45.7)	167 (42.7)	184 (47.7)	152 (44.6)	162 (52.6)
Moderate/High (≥150 min)	233 (54.3)	224 (57.3)	202 (52.3)	189 (55.4)	146 (47.4)
Number of comorbidities					
0	98 (21.5)	76 (17.6)	68 (16.9)	39 (10.8)	39 (11.7)
1	97 (21.3)	101 (23.3)	85 (21.1)	80 (22.2)	74 (22.2)
2	91 (20.0)	83 (19.2)	77 (19.1)	73 (20.3)	62 (18.6)
≥3	170 (37.3)	173 (40.0)	172 (42.8)	168 (46.7)	158 (47.5)
Supplements use					
No	103 (23.0)	99 (23.2)	89 (22.3)	73 (20.6)	74 (22.8)
Yes	344 (77.0)	328 (76.8)	310 (77.7)	282 (79.4)	251 (77.2)

Table 2. GEE model for determining the significant longitudinal predictors of physical and mental wellbeing.

Characteristics	Physical wellbeing		Mental wellbeing	
	AOR* (95% C.I.); p-value	AOR** (95% C.I.); p-value	AOR* (95% C.I.); p-value	AOR** (95% C.I.); p-value
Current Smoking				
No	1.00	1.00	1.00	1.00
Yes	0.93 (0.89, 0.97); <0.001	0.93 (0.89, 0.96); <0.001	0.92 (0.89, 0.96); <0.001	0.93 (0.90, 0.96); <0.001
Alcohol consumption risk				
None/Low risk	–	–	1.00	1.00
Risky/High risk	–	–	0.93 (0.89, 0.97); 0.001	0.93 (0.89, 0.97); < 0.001
Physical activity				
Inactive/Sedentary	1.00	1.00	1.00	1.00
Moderate/High	1.21 (1.18, 1.24); <0.001	1.17 (1.14, 1.20); <0.001	1.07 (1.05, 1.09); <0.001	1.05 (1.02, 1.08); <0.001
Supplements use				
No	–	–	–	–
Yes	–	–	–	–

AOR: Adjusted Odds Ratio.

*Adjusted for age, marital status, and year of survey.

**Adjusted for age, marital status, BMI, number of comorbidities and year of survey.

are not mediators. However, after adjusting for age, marital status, BMI, number of comorbidities and year of survey, the findings illustrate that current smokers exhibited 7% poorer physical health (AOR: 0.93; 95% CI: 0.89, 0.96) and mental health (AOR: 0.93; 95% CI: 0.90, 0.96) than nonsmokers. Likewise, stroke survivors who were risky/high-risk alcohol consumers had 7% lower mental health (AOR: 0.93; 95% CI: 0.89, 0.97) status than stroke survivors who abstained from or had low-risk alcohol use. In contrast, stroke survivors who engaged in moderate or high levels of physical activity had 1.17 times (AOR: 1.17; 95% CI: 1.14, 1.20) and 1.05 times (AOR: 1.05; 95% CI: 1.02, 1.08) better physical and mental health, respectively compared to their inactive or sedentary counterparts. Supplement use was not significantly associated with either physical health or mental health.

Discussion

This is the first longitudinal study that provides in-depth analyses of the impacts of a healthy lifestyle on self-reported physical and mental health status in female stroke survivors in Australia. Our analyses of a nationally representative dataset of Australian women (aged 45–50 years at baseline) reveal some important findings. The study found that stroke survivors who engage in moderate/high levels of physical activity have better physical and mental health. Moreover, stroke survivors who smoke have poorer physical and mental health. Likewise, stroke survivors who consume alcohol at a risky/high-risk level have poorer mental health.

The findings of our study may be important for policymakers, healthcare professionals, and researchers to make evidence-based decisions, develop public health initiatives, and conduct further research in this area.

Our results show that stroke survivors who adhere to the recommended level of physical activity (>150 minutes per week) have significantly better physical and mental health compared to those who do not meet the recommended threshold. A meta-analysis based on randomized controlled trials⁴⁵ found beneficial effects of physical activity/exercise on physical and mental health among stroke survivors. There are numerous plausible health benefits associated with physical activity for post-stroke individuals.^{35,36,38,39,44–46,70} For example, adequate physical activity can improve functional recovery, muscle strength, motor movement, brain recovery, cardiovascular health, mood, and social participation, as well as reduce the risk of stroke-related complications, stroke recurrence, hospitalization, and cognitive impairments among those living post-stroke.^{35,36,38,39,44–46,70} These benefits may explain why stroke survivors in our study who maintain the recommended level of the physical activity report better physical and mental health. Nevertheless, we observed that nearly half of the stroke survivors report physical inactivity/sedentary behavior throughout surveys 5–9, indicating that urgent attention is required to help introduce appropriate initiatives promoting the recommended amounts of physical activity in female stroke survivors.

The negative association between smoking and both physical and mental health among stroke survivors in our study may be explained as follows. First, stroke survivors who smoke may have had a higher prevalence of several conditions due to their smoking behavior, including fatigue, cardiovascular and respiratory issues, and mental/cognitive disorders.^{70–74} In general, post-stroke individuals with a greater number of comorbidities report decreased levels of self-reported health and well-being.^{75,76} Second, as smoking is a significant predictor for stroke recurrence,⁷⁷ the prevalence of stroke recurrence may have been higher among stroke survivors who smoked than those stroke survivors who were nonsmokers. Recurrent stroke is associated with an increased risk of disability, which may adversely affect both physical and mental health.⁷⁸ In order to enhance the physical and mental health of female stroke survivors, our findings suggest that appropriate and effective strategies need to be implemented to reduce smoking rates in this population. Specifically, self-management educational programs have the potential to act as useful interventions in reducing smoking prevalence and improving well-being in post-stroke females.⁷⁹

Our study also demonstrates a significant association between risky/high-risk alcohol consumption and a diminished state of mental health among those living post-stroke. While there is a lack of comparable research specifically focused on stroke survivors, this finding aligns with studies conducted on the general population,^{79–81} which show poor self-reported mental health among high-risk alcohol consumers. One possible explanation for the negative impact of alcohol consumption on self-reported mental health is that alcohol can disrupt neurotransmitter systems, resulting in mood changes, cognitive deficits, a greater tendency for suicidal thoughts, an increased risk of mental health disorders, and a worsening of pre-existing mental health conditions.^{81–85} Alcohol consumption can exacerbate stroke symptoms and interfere with stroke medication;²² these effects may also contribute to a lower state of mental health among risky/high-risk alcohol consumers in our study sample. Our findings further support the need for the implementation of targeted interventions to reduce

risky alcohol consumption among female stroke survivors in an effort to improve their mental health.

Interestingly, our study did not observe a significant association between risky/high-risk alcohol consumption and physical health. A recent cross-sectional study conducted in Sri Lanka also found an insignificant association between alcohol use and physical health among stroke survivors.⁴³ It is important to interpret this finding cautiously and consider potential factors that may explain this result. One possible explanation is that the participants who continue risky/high-risk alcohol consumption over time may have a lower incidence of stroke-related physical disability and/or fewer medical conditions. However, risky/high-risk alcohol consumption can still have negative effects on physical health status over time. To gain a deeper understanding of the association between alcohol consumption and physical health, additional longitudinal research with extended follow-up is required.

Regarding the physical and mental health of female stroke survivors, our findings underscore the critical importance of maintaining a healthy lifestyle. However, it is important to consider these findings within the existing framework of secondary prevention support in Australia. The Australian Stroke Clinical Registry (AuSCR) identifies notable gaps in the provision of secondary prevention services, such as inadequate post-treatment support and limited access to rehabilitation programs, which may impede the achievement of optimal recovery, long-term health maintenance, and overall quality of life.^{86,87} Current clinical guidelines for stroke management, as outlined by the Stroke Foundation, recommend comprehensive lifestyle modifications, including engagement in physical activity, smoking cessation, abstinence from alcohol, and adherence to a proper nutrition.²² Despite these recommendations, our study indicates that a considerable percentage of stroke survivors do not comply with the guidelines, emphasizing the necessity for additional support and resources to ensure that stroke survivors maintain a healthy lifestyle throughout their survivorship. Addressing these gaps through targeted secondary prevention initiatives and strict adherence to clinical guidelines could significantly

enhance the quality of life and health status of stroke survivors.

There are several limitations that should be taken into consideration when drawing conclusions from our research outcomes. Firstly, it is important to note that the study relies on self-reported data provided by the participants, which could potentially be influenced by recall bias. Second, due to a lack of data, we were unable to control for some potential confounders like stroke severity,¹⁷ functional status,^{10,12} and carer roles⁸⁸ which may have some effects on the physical and mental health outcomes. Third, the participants of our study were middle-aged and older; therefore, the findings may not be generalizable to young female stroke survivors. Nevertheless, our study possesses several strengths, including the utilization of a nationally representative dataset collected over a 12-year period from a large sample of women in Australia. Another strength of this study lies in its ability to control for various demographic and health-related characteristics within the model, thereby strengthening the specific analysis. Additionally, the measures included in this study have been widely used and validated in comparable large population samples.

Conclusions

The present longitudinal study provides first specific insights into the impacts of maintaining a healthy lifestyle on the physical and mental health of female stroke survivors in Australia. The longitudinal analyses suggest that engaging in moderate-to-high amounts of physical activity and/or abstaining from smoking can positively affect self-reported physical and mental health and well-being among female stroke survivors. Similarly, none/low-risk alcohol consumption has been found to have a beneficial impact on the mental health of female stroke survivors. Our findings suggest that women living post-stroke could improve their physical and mental health by maintaining a healthy lifestyle. Targeted and appropriate programs and strategies may be needed to promote physical activity and reduce smoking and alcohol consumption in female stroke survivors in order to optimize their overall health and health-related quality of life.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

ALSWH survey data are owned by the Australian Government Department of Health and due to the personal nature of the data collected, release by ALSWH is subject to strict contractual and ethical restrictions. Ethical review of ALSWH is by the Human Research Ethics Committees at The University of Queensland and The University of Newcastle. De-identified data are available to collaborating researchers where a formal request to make use of the material has been approved by the ALSWH Data Access Committee. The committee is receptive of requests for datasets required to replicate results. Information on applying for ALSWH data is available from <https://alswh.org.au/for-data-users/applying-for-data/>.

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