

Research Article

MEASUREMENT OF COPING STRATEGIES OF PERSON WITH DISABILITIES (PwD) AND ITS ASSOCIATION WITH DEPRESSION AND ANXIETY

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Abstract

Introduction: Coping is defined as response aimed at diminishing physical, emotional and psychological burden that is linked to stressful life events. Adult PwD is reportedly prone to depression and anxiety, and health-related risk behaviours. This study aims to provide sociodemographic profiles of adults PwD in local setting, and prevalence of depression and anxiety in them. Also to examine type of coping strategies being used specific to each PwD group, and how the usage is associated with development of depression and anxiety.

Methods: A cross-sectional study from October 2023-October 2024. Study population involves patient with established diagnosis (>1 year) of stroke, Acquired Brain Injury (ABI) and Spinal Cord Injury (SCI) patients who receives outpatient treatment in our centre. Questionnaires involved are Brief-Coping Orientation to Problems Experience (COPE), PHQ-9 and GAD-7.

Results: A total of 137 patients included, with 42 ABI patients, 48 SCI patients and 47 stroke patients. The mean age of patients was 47.64 years old. Majority of patients were married (57.7%), Malay (51.8%), male (65.0%) who studied up to secondary level (44.5%) and were professionals (18.2%). The ABI group observed to have the lowest level of anxiety and depression, and highest were among the stroke patients.

Among ABI patients, significant coping strategies related to anxiety and depression include emotion coping, self-blaming and avoidance coping. In spine patients, increase self-blame and avoidance coping significantly increases the GAD-7 scores, while increase in self-distraction decreases it. As for depression, the significant factors associated included venting, self-blame, substance use and behavioural disengagement. In stroke population, increase in emotional support, self-blame and behavioural disengagement significantly increases the anxiety level, while increase in self-blame and behavioural disengagement increase depression level.

Conclusion: Coping strategies is personal factor, inside the ICF framework. As coping strategies are modifiable factors, more helpful coping can be instilled via education and training, in hoping for better positive adjustment and psychosocial outcomes among PwD population. *ASEAN Journal of Psychiatry, Vol. 27 (02) May, 2026; 1-13.*

Keywords: Brain Injury; ICF Framework; Coping Orientation to Problems Experience (COPE); Anxiety; Depression

Introduction

The prevalence of mental health conditions such as depression and anxiety is disproportionately higher among individuals with disabilities. The unique challenges faced by people with disabilities ranging from physical limitations to societal stigma can significantly impact their psychological well-being. Among these challenges, the need for effective coping mechanisms becomes essential in managing the daily stressors associated with both their disabilities and the broader societal barriers they encounter. Coping mechanisms, which encompass the strategies individuals employ to manage stress, can vary significantly and have a profound impact on mental health outcomes.

Coping mechanisms can be broadly classified into adaptive (e.g., seeking social support, problem-solving) and maladaptive (e.g., avoidance, substance use). The way in which individuals with disabilities utilize these coping strategies can influence their susceptibility to or resilience against mental health disorders like depression and anxiety. Research has demonstrated that effective coping mechanisms can reduce the severity of mental health conditions, whereas maladaptive strategies tend to exacerbate symptoms of anxiety and depression.

Despite the growing body of literature on coping mechanisms in general populations, there is a limited focus on

understanding these strategies within the disability context. Additionally, the specific association between coping mechanisms and the prevalence of depression and anxiety among individuals with disabilities remains underexplored. This gap in knowledge highlights the need for targeted studies that examine how various coping strategies are related to mental health outcomes in this population.

This cross-sectional study aims to assess the coping mechanisms employed by individuals with disabilities and investigate their association with symptoms of depression and anxiety. By exploring this relationship, the study intends to contribute valuable insights into the role of coping mechanisms in mitigating the mental health challenges faced by individuals with disabilities, with the goal of informing both clinical practice and policy interventions aimed at improving mental health outcomes in this vulnerable group.

Persons with Disabilities (PwD)

Globally, the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) and locally in Malaysia, the Person with Disabilities Act 2008, defines a disability as any long-term physical, mental, intellectual or sensory impairment which, in interaction with various barriers, may hinder the full and effective participation of disabled people in society on an equal basis with others. The International Classification of Functioning, Disability and Health, known more commonly as ICF, officially endorsed by World Health Organization (WHO) since 2001 has since been used worldwide as an international standard to describe and organise information on functioning and disability. It provides a standard language and a conceptual basis for the definition and measurement of health and disability. The ICF conceptualises a person's level of functioning as a dynamic interaction between her or his health conditions, environmental factors, and personal factors [1]. It is a biopsychosocial model of disability, based on an integration of the social and medical models of disability. In accordance with this ICF framework, disability has three dimensions:

- **Impairment:** A loss or abnormality in a body structure or function. Examples of impairments include loss of a limb, loss of vision or memory loss.
- Activity limitation takes place at an individual level, such as difficulty seeing, hearing, walking, or problem solving.
- Participation restriction involves a difficulty in engaging in life roles such as working employment, engaging in social and recreational activities.

According to WHO, an estimated 1.3 billion people, which is 16% of the global population is currently experiencing significant disability [2]. This figure is rising as noncommunicable disease become more prevalent and the average human lifespan increases. PwD are a diverse group whose life experiences and healthcare needs are influenced by a variety of factors such as gender, age, personality, religion, race, coping strategies and socioeconomic status. PwD have shorter lifespans, poorer health, and more difficulty

performing daily tasks than the general population [2].

Overview of depression and anxiety in PwD

PwD are at a higher risk of experiencing depression and anxiety, with studies showing that they are more likely to experience depressive symptoms compared to the general population. According to Jamie Konieg et al. [3], disabled people have significantly greater odds of both depression and anxiety diagnoses compared to non-disabled people. Those with high functional disability have 552% greater odds of an anxiety diagnosis (95% CI: 5.61–7.58; $p < 0.01$) and 697% greater odds of a depression diagnosis (95% CI: 6.97–9.12; $p < 0.01$) compared to those with no functional disability [3]. Shen SC et al. found that the incidence of depression in adults with physical and sensory disabilities was 3.7 times that in the general population.

In a study by Choi Y et al. [4], demonstrated that traumatic brain injury is significantly associated with an increased risk of depression in the South Korean population. The Secondary Prevention of Small Subcortical Strokes (SPS3) trial revealed that 19% of stroke patients suffered from Post-Stroke Depression (PSD), while a meta-analysis of 51 observational studies estimates that one out of every three stroke survivors suffer from the PSD [5,6]. A study by Lim SW et al. shows individuals with traumatic spinal cord injury have a higher risk of anxiety or depression than individuals in the other health conditions group [7].

Coping strategies

Coping has been defined as a response (activities, behaviours, thoughts) aimed at diminishing the physical, emotional and psychological burden that is linked to stressful life events and daily hassles. Lazarus and Folkman's model emphasized the interplay between an individual's perceived psychological stress, coping, and cognitive appraisals: What happens, how one deals with it, and what one thinks about what is happening. Coping strategies can generally be categorized into problem-focused, emotion-focused, and avoidance-focused approaches.

Problem-focused coping involves directly addressing the source of stress or the problem itself. Emotion-focused coping focuses on managing the emotional impact of the stressor, rather than changing the situation itself. Avoidant-focused coping involves avoiding the stressor or the feelings associated with it. In general, some coping strategies are considered as maladaptive while others are considered as more adaptive coping strategies.

It is well-documented that active coping strategies can lead to better positive adjustment and psycho-social outcomes among individuals with disabilities and illnesses. In a study by Desalegn et al. [8] done in Ethiopia, the emotional-focused coping strategy was the most frequently used when dealing with psychological distress among participants with physical disabilities. However, different findings in a study by Kim et al. [9], which suggests that problem-focused and social support coping strategies play important roles in improving

the personal growth and life satisfaction among Korean individuals with physical disabilities.

Rationale of this study

Previous studies have shown that PwD are at a higher risk of experiencing depression and anxiety, and the different type of coping strategies used. This study could measure the coping strategies used by PwD in our local setting, and the association between different coping strategies and development of depression and anxiety in them.

This will help for a more holistic approach, as coping strategies are modifiable component in the personal factors (in ICF framework), more helpful coping and adaptive strategies can be instilled *via* education and training, in hoping for better positive adjustment and psycho-social outcomes among PwD population.

Research questions

- What are the sociodemographic profiles of specific adult PwD group?
- What is the prevalence of depression and anxiety in PwD population?
- What is the type of coping strategies used in each group?
- Are there associations between different coping strategies and development of depression and anxiety in PwD population?

Research objectives

- To determine the sociodemographic profile of adult PwD.
- To screen the prevalence of depression and anxiety symptoms in adult PwD.
- To measure the different coping strategies used in adult PwD.
- To explore the association of different types of coping strategies and negative emotional status.

Materials and Methods

Study design/setting

This is a cross-sectional study conducted from September 2023 till September 2024. This study is approved by the Medical Research Ethics Committee (MREC), University Malaya Medical Centre (UMMC) with the MREC ID 20231129-13066. It involved outpatients attending Rehabilitation Medicine Clinic, UMMC.

Sampling method/study population

A convenient sampling method was used in this study, which means participants are selected based on availability and

willingness to take part. Individuals who fulfilled the inclusion criteria were given explanation regarding the study, including the objectives and nature of the study.

A patient information sheet given either in Malay or English language. Investigators ensured patients that participation is voluntary, and confidentiality of information will be preserved. Those with informed consent were recruited for the study. The inclusion criteria were:

- Patients with established diagnosis of stroke/ acquired brain injury/ spinal cord injury for at least one-year duration (to allow enough time for adaptation and use of coping strategy).
- Aged more than 18 years old.
- Has normal cognitive function in which the screening of Montreal Cognitive Assessment (MoCA) score ≥ 26 .
- Medical stable and have the capacity to give informed consent.
- Able to answer self-rated questionnaires in Malay or English language.

The exclusion criteria were:

- Patients with active psychiatry disorder and currently receiving treatment.
- Those who are unwell medically.
- Patients with progressive neurological disorder such as multiple sclerosis, Parkinson's disease or dementia.

Sample size calculation

For a cross-sectional prevalence studies, sample size calculated as:

$$n = Z^2 P(1-P) / e^2$$

$$n = ((1.96)^2 0.19 (1-0.19)) / (0.05)^2$$

$$n = 236$$

Where, n=required sample size, Z=confidence level at 95%, standard value of 1.96, P=estimated prevalence from study*, e: margin of error at 5%, standard value of 0.05

*Number of possible cases of depression in post-stroke patients (5) was 19%.

In this study, a total of 142 patients were recruited (47 stroke patients, 42 acquired brain injury patients and 48 spinal cord injury patients). This is due to the limiting factors of time constraint during outpatient clinic session, patients not willing to take part and due to patients fulfilling exclusion criteria of actively receiving treatment for psychiatry disorder.

Flowchart of recruitment process

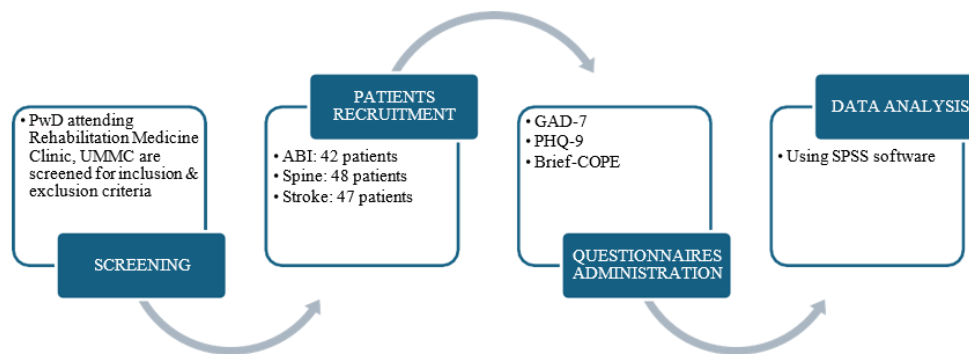


Figure 1. Flowchart of the study methodology showing participant screening, recruitment, questionnaire administration, and data analysis.

Study instruments – outcome measures

In this study, there are 3 self-administered questionnaires given to participants:

- Patient Health Questionnaire-9 (PHQ-9) for measurement of depression.
- Generalised Anxiety Disorder-7 (GAD-7) for measurement of anxiety.
- Brief-Coping Orientation to Problems Experienced Inventory (Brief-COPE) for measurement of coping strategies.

All three questionnaires were available in English language and validated in Malay language version for the participants to choose. The participants identified to have moderate to severe/high score of depression and/or anxiety were offered referral to psychiatry/psychological services with their permission for further assessment.

PHQ-9: PHQ-9 is a 9-item self-rated depression scale. It is a brief validated questionnaire based on the Diagnostic and Statistical Manual (DSM-IV) diagnostic criteria for major depressive disorder. Participants rated items on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day). Possible scores range from 0 to 27. A cut off point ≥ 10 had sensitivity of 88% and a specificity of 88% for major depression with cut off scores of 5, 10, 15, and 20 representing mild, moderate, moderately severe and severe depression, respectively. In a study by Dajpratham P et al., the Thai PHQ-9 has acceptable psychometric properties for detecting a mixture of major depression and adjustment disorder in post-stroke patients, with a recommended cut-off score of ≥ 6 for a Thai population.

In a local study by Azah et al., the Malay version of PHQ-9 is a valid and reliable screening tool for detection of depression in primary care. It shows that the internal reliability of PHQ-9 is good with a Cronbach's alpha of 0.67. Test-retest reliability was also good with alpha of 0.73. The best cut-off score of the Malay version of PHQ-9 was 5 with the sensitivity of 69.0% and specificity of 60.5%. The best

cut-off score for severe depression was 10 with sensitivity of 60.9%, specificity of 80.7% with positive predictive value of 38.6%.

GAD-7: GAD-7 is a 7-item scale which uses some of the DSM-5 criteria to identify probable cases of general anxiety disorder along with measuring anxiety symptom severity. Like PHQ-9, participants rated items on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day) with possible scores range from 0 to 21. A score ≥ 10 as reasonable cut off for identifying cases of GAD and cut points of 5, 10, and 15 is interpreted as representing mild, moderate and severe levels of anxiety on the GAD-7. The GAD-7 scale has been shown to highly correlate not only with specific anxiety but also with disability measures.

Brief-COPE: The Brief-COPE is a 28 items self-report questionnaire designed to measure adaptive and maladaptive ways to cope with a stressful life event. The Brief-COPE measures how frequently a person uses certain approaches to cope with stressful situations in their life. Each item is rated through Likert scores of 1/2/3/4 with 1=I have not been doing this at all; 2=a little bit; 3=a medium amount; 4=I have been doing this a lot.

The items could be grouped into three main scales: problem-focused, emotion-focused, and avoidant coping. From these three main scales, fourteen subscales of coping are reported: Self-distraction, Denial, substance use, behavioural disengagement, emotional support, venting, humour, acceptance, self-blame, religion, active coping, use of instrumental support, positive reframing, and planning. The minimum and maximum scores for each subscale being 2 and 8, respectively for each of the fourteen subscales. Total scores on each of the scales are calculated by summing the appropriate items for each scale. Higher scores indicate high utilization of that specific coping strategy.

For problem-focused, a high score indicates coping strategies that are aimed at changing the stressful situation. High scores also are indicative of psychological strength, grit, a practical approach to problem solving and are predictive of positive outcomes.

In emotion-focused coping, a high score indicates coping strategies that are aiming to regulate emotions associated with the stressful situation. High or low scores are not uniformly associated with psychological health or ill health.

In avoidant coping, a high score indicates physical or cognitive efforts to disengage from the stressor. Low scores are typically indicative of adaptive coping (Table 1).

Table 1. Classification of brief-COPE coping strategies.

Problem-focused	Emotion-focused	Avoidant
Active coping (A) Informational support (A) Positive reframing (A) Planning (A)	Emotional support (A) Venting (MA) Humour (A) Acceptance (A) Religion (A) Self-blame (MA)	Self-distraction (MA) Denial (MA) Substance use (MA) Behavioural disengagement (MA)
Note: A: Adaptive coping, MA: Maladaptive coping		

Statistical analysis

Data were analysed using SPSS version 26.0. The distribution of continuous variables was explored using skewness and kurtosis, as well as histogram. The continuous variables were presented as mean $\pm$ standard deviation if the data were normally distributed, otherwise median (25th percentile, 75th percentile). Categorical variables were presented as frequency and percentage.

The demographic characteristics as well as the prevalence of depression and anxiety in each group (ABI, spine and stroke) were compared using one-way ANOVA and Kruskal Wallis tests. The correlation between coping to depression and anxiety were explored using Spearman correlation tests. Linear regression was further used to explore the relationship between coping strategies with outcome depression and anxiety.

Simple linear regression was first used as variable exploration purposes, and variables with $p < 0.250$ in simple linear regression were included into the variable selection process of multiple linear regression model. Multicollinearity of the final model was checked, and assumptions of heteroskedasticity was checked using Breusch-Pagan/Cook-Weisberg test. In the event where assumptions for heteroskedasticity was found violated, linear regression with robust variance estimator was used. All the tests were two sided and statistical significances was denoted by $p < 0.05$.

Results

Sociodemographic profiles of specific adult PwD group

A total of 137 patients were included into the study, with 42 ABI patients, 48 spine patients and 47 stroke patients. The overall mean age of the patients were 47.64 years old (SD: 15.04), and significant differences was observed in age between ABI, spine and stroke patients. Post hoc pairwise comparison showed that stroke patients were significantly older than ABI patients mean difference (95% CI): 17.36 (10.53, 24.19); $p < 0.001$ and spine patients mean difference (95% CI): 12.02 (5.42, 18.63); $p < 0.001$.

Majority of the patients were married (57.7%) Malay (51.8%) male (65.0%) patients who studied up to secondary level (44.5%) and were professionals (18.2%). A significant association was observed between marital status with the three groups of patients, with majority of the stroke patients were married (83.0%), and higher proportion of single patients were observed among the ABI patients' group (61.9%) ($p < 0.001$, Table 2).

The diagnosis for ABI patients included haemorrhagic stroke (52.4%), tumour (9.5%), and trauma brain injury (38.1%). While the diagnosis of the spine patients included traumatic SCI (70.8%) and non-traumatic SCI (29.2%). For stroke patients, the diagnosis included left stroke (48.9%), right stroke (46.8%), and posterior stroke (4.3%).

Table 2: Sociodemographic profile of the patients.

Demographic characteristics	Overall (n = 137)	ABI (n=42)	Spine (n=48)	Stroke (n=47)	P value
Age in years, mean ± SD	47.64 ± 15.04	39.81 ± 13.22	45.15 ± 15.37	57.17 ± 10.78	<0.001 ^a
Gender, n (%)					
Female	48 (35.0)	14 (33.3)	15 (31.3)	19 (40.4)	0.620 ^b
Male	89 (65.0)	28 (66.7)	33 (68.8)	28 (59.6)	
Ethnicity, n (%)					
Malay	71 (51.8)	27 (64.3)	20 (41.7)	24 (51.1)	0.293 ^b
Chinese	40 (2.2)	10 (23.8)	7 (35.4)	13 (27.7)	
Indian	26 (19.0)	5 (11.9)	11 (22.9)	10 (31.3)	

Education, n (%)						
Primary	3 (2.2)	0 (0.0)	0 (0.0)	3 (6.4)	0.172 ^c	
Secondary	61 (44.5)	18 (42.9)	24 (50.0)	19 (40.4)		
College	34 (24.8)	10 (23.8)	15 (31.3)	9 (19.1)		
Tertiary	39 (28.5)	14 (33.3)	9 (18.8)	16 (34.0)		
Occupation, n (%)						
Administrative	21 (15.3)	8 (19.0)	6 (12.5)	7 (14.9)	0.355 ^c	
Educational	5 (3.6)	0 (0.0)	2 (4.2)	3 (6.4)		
Elementary	13 (9.5)	4 (9.5)	6 (12.5)	3 (6.4)		
Operational	11 (8.0)	2 (4.8)	3 (6.3)	6 (12.8)		
Self-employed	12 (8.8)	1 (2.4)	7 (14.6)	4 (8.5)		
Pensioner	13 (9.5)	3 (7.1)	3 (6.3)	7 (14.9)		
Professional	25 (18.2)	9 (21.4)	6 (12.5)	10 (21.3)		
Services	20 (14.6)	8 (19.0)	8 (16.7)	4 (8.5)		
Unemployed	17 (12.4)	7 (16.7)	7 (14.6)	3 (6.4)		
Marital statis, n (%)						
Single	54 (39.4)	26 (61.9)	22 (45.8)	6 (12.8)	<0.001 ^c	
Married	79 (57.7)	15 (35.7)	25 (52.1)	39 (83.0)		
Widowed	4 (2.9)	1 (2.4)	1 (2.1)	2 (4.3)		
Diagnosis, n (%)						
Haemorrhagic	22 (16.1)	22 (52.4)	-	-	NA	
Stroke	4 (2.9)		-	-		
Tumour	16 (11.7)	4 (9.5)	-	-		
Trauma brain	34 (24.8)	16 (38.1)	-	-		
Injury	14 (10.2)	-	-	-		
Traumatic SCI	23 (16.8)	-	34 (70.8)	-		
Non-traumatic SCI	22 (16.1)	-	14 (29.2)	-		
Right stroke	2 (1.5)	-	-	23 (48.9)		
Left stroke		-	-	22 (46.8)		
Posterior stroke			-	2 (4.3)		
Note: ^a One Way ANOVA; ^b Pearson <i>chi-squared</i> test; ^c Fisher Exact test						

Prevalence of depression and anxiety in PwD population, and measurement of coping strategies used respectively

Table 3 presented the anxiety, depression as well as the coping strategies of the patients. It was observed that the mean GAD7 and PHQ9 were 5.65 (SD: 5.14) and 7.22 (SD: 5.98) respectively. Although ABI group observed to have the lowest GAD 7 (mean $\pm$ SD: 4.93 $\pm$ 4.46) and PHQ9 (mean $\pm$ SD: 6.02 $\pm$ 5.30), and highest were observed among the stroke patients for both GAD7 (mean $\pm$ SD: 6.74 $\pm$ 5.72) and PHQ9 (mean $\pm$ SD: 8.43 $\pm$ 6.55), the differences were not significant.

The mean problem coping score was 22.88 (SD: 6.26), with the mean scores for each subdomain including active coping, use of informational support, positive reframing and planning

of 5.93 (SD: 1.89), 5.47 (SD: 1.90); 5.88 (SD: 1.89) and 5.59 (SD: 1.88) respectively. The mean emotion coping score was 28.45 (SD: 6.41), with the mean scores for each subdomain of emotional support, venting, humour, acceptance, religion and self-blame of 5.27 (SD: 1.85), 3.82 (SD: 1.54), 3.34 (SD: 1.70), 6.56 (SD: 1.69), 6.03 (SD: 2.14) and 3.43 (SD: 1.64) respectively.

Lastly but not the least, the mean avoidance coping score were 13.67 (SD: 3.68), with mean scores for subdomain self-distraction, denial, of 5.21 (SD: 1.91) and 3.44 (SD: 1.79), while median (IQR) scores for substance use and behavioural disengagement were 2 (2, 2) and 2 (2, 4) respectively. There were no significant differences in the coping strategies observed between the three groups ($p > 0.05$, Table 3).

Table 3: Anxiety, depression and coping strategies of the patients.

	Overall	ABI	Spine	Stroke	P-value
GAD7	5.65 ± 5.14	4.93 ± 4.46	5.21 ± 5.02	6.74 ± 5.72	0.191 ^a
PHQ9	7.22 ± 5.98	6.02 ± 5.30	7.08 ± 5.85	8.43 ± 6.55	0.164 ^a
Problem coping	22.88 ± 6.26	23.31 ± 6.08	23.19 ± 6.84	22.17 ± 5.85	0.635 ^a
Active coping	5.93 ± 1.89	5.90 ± 2.02	6.19 ± 1.85	5.70 ± 1.81	0.465 ^a
Use of informational support	5.47 ± 1.90	5.79 ± 1.89	5.31 ± 2.01	5.36 ± 1.78	0.441 ^a
Positive reframing	5.88 ± 1.89	6.10 ± 1.79	5.92 ± 2.00	5.64 ± 1.88	0.518 ^a
Planning	5.59 ± 1.88	5.52 ± 1.84	5.77 ± 1.98	5.47 ± 1.83	0.709 ^a
Emotion coping	28.45 ± 6.41	28.90 ± 5.34	28.27 ± 6.82	28.23 ± 6.96	0.862 ^a
Emotional support	5.27 ± 1.85	5.36 ± 1.79	5.31 ± 1.95	5.15 ± 1.84	0.855 ^a
Venting	3.82 ± 1.54	3.64 ± 1.25	3.77 ± 1.67	4.04 ± 1.65	0.457 ^a
Humour	3.34 ± 1.70	3.21 ± 1.84	3.63 ± 1.73	3.15 ± 1.53	0.342 ^a
Acceptance	6.56 ± 1.69	6.83 ± 1.56	6.54 ± 1.85	6.34 ± 1.63	0.389 ^a
Religion	6.03 ± 2.14	6.64 ± 1.65	5.75 ± 2.37	5.77 ± 2.21	0.082 ^a
Self-blame	3.43 ± 1.64	3.21 ± 1.46	3.27 ± 1.51	3.79 ± 1.88	0.182 ^a
Avoidance coping	13.67 ± 3.68	12.81 ± 2.81	13.88 ± 3.75	14.23 ± 4.21	0.171 ^a
Self-distraction	5.21 ± 1.91	5.00 ± 1.79	5.46 ± 1.98	5.15 ± 1.95	0.507 ^a
Denial	3.44 ± 1.79	2.95 ± 1.41	3.69 ± 1.74	3.62 ± 2.06	0.104 ^a
Substance use	2 (2, 2)	2 (2, 2)	2 (2, 2)	2 (2, 2)	0.101 ^b
Behavioural disengagement	2 (2, 4)	2 (2, 4)	2 (2, 3)	2 (2, 4)	0.121 ^b
Note: ^a One Way ANOVA; ^b Kruskal-Wallis test					

Correlation between anxiety and depression with coping strategies for ABI, spine and stroke patients respectively

Table 4 presented the correlation between anxiety and depression with coping strategies for ABI, spine and stroke patients respectively. There were a weak to moderate, positive correlation observed between use of informational support with GAD7 (coeff: 0.378; p=0.009) and PHQ9 (coeff: 0.441; p=0.002) in stroke patients.

Emotion coping was observed to have a weak to moderate and positive correlation with GAD7 and PHQ9 in both spine (GAD7 coeff: 0.364; p=0.011; PHQ9 coeff: 0.514; p<0.001) and stroke patients (GAD7 coeff: 0.534; p<0.001; PHQ9 coeff: 0.449; p=0.002). Specifically, for the venting and self-blame subdomains, significant moderate and positive correlation with GAD7 and PHQ9 was observed in all patients including ABI, spine and stroke patients with strength of correlation ranged between 0.315 to 0.616

(p<0.05, Table 4).

Significant moderate and positive correlation was observed between avoidance copings with GAD7 and PHQ9 in ABI patient's spine (GAD7 coeff: 0.539; p<0.011; PHQ9 coeff: 0.496; p=0.001), spine (GAD7 coeff: 0.574; p<0.001; PHQ9 coeff: 0.604; p<0.001) and stroke patients (GAD7 coeff: 0.535; p<0.001; PHQ9 coeff: 0.516; p<0.001). A significant weak to moderate correlation was observed between denial and behavioural disengagement with GAD7 and PHQ9 in all patient groups (ABI, spine and stroke), with correlation coefficient ranging between 0.329 to 0.616 (p<0.05, Table 4). Apart from that, a significant weak and positive correlation was observed between self-distraction with GAD7 among ABI patients (coeff: 0.312; p=0.044), as well as the substance use with PHQ9 among spine patients (coeff: 0.319; p=0.027). A weak and negative correlation was observed between substance use with GAD7 among stroke patients (coeff: -0.311; p=0.033).

Table 4: Correlation between anxiety and depression with coping strategies for ABI, spine and stroke patients respectively.

		ABI		Spine		Stroke	
		GAD-7	PHQ-9	GAD-7	PHQ-9	GAD-7	PHQ-9
Problem coping	Correlation coefficient	0.205	0.045	0.072	0.098	0.266	0.183
	p value	0.193	0.778	0.627	0.508	0.071	0.218
Active coping	Correlation coefficient	0.135	0.033	0.144	0.193	0.101	-0.022

	p value	0.394	0.835	0.327	0.19	0.497	0.884
Use of informational support	Correlation coefficient	0.211	0.043	0.013	-0.037	0.378	0.441
	p value	0.179	0.785	0.928	0.804	0.009	0.002
Positive reframing	Correlation coefficient	0.116	-0.014	0.115	0.121	0.23	0.155
	p value	0.464	0.927	0.437	0.413	0.12	0.298
Planning	Correlation coefficient	0.126	-0.014	0.105	0.142	0.222	0.108
	p value	0.427	0.93	0.479	0.335	0.134	0.471
Emotion coping	Correlation coefficient	0.302	0.149	0.364	0.514	0.537	0.449
	p value	0.052	0.347	0.011	<0.001	<0.001	0.002
Emotional support	Correlation coefficient	0.187	-0.031	0.217	0.173	0.415	0.401
	p value	0.236	0.846	0.139	0.238	0.004	0.005
Venting	Correlation coefficient	0.315	0.353	0.379	0.513	0.431	0.324
	p value	0.042	0.022	0.008	0	0.002	0.026
Humour	Correlation coefficient	0.368	0.224	0.12	0.251	0.161	0.152
	p value	0.016	0.154	0.416	0.085	0.28	0.307
Acceptance	Correlation coefficient	-0.062	-0.157	0.014	0.101	0.257	0.17
	p value	0.697	0.32	0.924	0.494	0.081	0.253
Religion	Correlation coefficient	-0.064	-0.059	0.118	0.28	0.166	0.124
	p value	0.688	0.712	0.423	0.054	0.266	0.408
Self-blame	Correlation coefficient	0.407	0.428	0.534	0.568	0.606	0.566
	p value	0.008	0.005	<0.001	<0.001	<0.001	<0.001
Avoidance coping	Correlation coefficient	0.539	0.496	0.574	0.604	0.535	0.516
	p value	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Self-distraction	Correlation coefficient	0.312	0.227	0.273	0.322	0.27	0.245
	p value	0.044	0.148	0.061	0.026	0.067	0.097
Denial	Correlation coefficient	0.364	0.329	0.616	0.574	0.387	0.338
	p value	0.018	0.034	<0.001	<0.001	0.007	0.02
Substance use	Correlation coefficient	Na	Na	0.257	0.319	-0.311	-0.068
	p value	Na	Na	0.078	0.027	0.033	0.651
Behavioural disengagement	Correlation coefficient	0.324	0.532	0.507	0.483	0.575	0.548
	P value	0.036	<0.001	<0.001	0.001	<0.001	<0.001
Note: Spearman correlation							

Table 5 explored the relationship between coping strategies with depression and anxiety among ABI patients. In the simple linear regression, emotion coping, venting, self-blame and avoidance coping was observed to be significantly related to both GAD7 and PHQ9 outcomes. However, the coping strategies that were significant in the final model included emotion coping, self-blame and avoidance coping only.

It was observed that an increase in emotion coping, and avoidance coping will increase the GAD7 by 0.26 (coeff. (95% CI): 0.26 (0.01, 0.51); $p=0.043$) and 0.68 (coeff. (95% CI): 0.68 (0.39, 0.97); $p<0.001$) respectively. Besides, an increase in self-blame and avoidance coping was observed to increase the PHQ9 by 1.39 (coeff. (95% CI): 1.39 (0.34, 2.74); $p=0.045$) and 0.66 (coeff. (95% CI): 0.66 (0.07, 1.25); $p=0.017$) respectively.

Table 5: Relationship between coping to depression and anxiety among ABI patients.

	GAD-7				PHQ9			
	Simple linear regression		Multiple linear regression		Simple linear regression		Multiple linear regression	
	Coef (95% CI)	P value	Adj. coef (95% CI)	P value	Coef (95% CI)	P value	Adj. coef (95% CI)	P value
Problem coping	0.19 (-0.04, 0.42)	0.097			0.08 (-0.20, 0.36)	0.561		

Active coping	0.46 (-0.23, 1.15)	0.187			0.26 (-0.58, 1.09)	0.536		
informational support	0.64 (-0.08, 1.37)	0.081			0.29 (-0.60, 1.18)	0.508		
Positive reframing	0.40 (-0.39, 1.18)	0.312			0.21 (-0.73, 1.16)	0.652		
Planning	0.47 (-0.29, 1.23)	0.223			0.05 (-0.87, 0.98)	0.906		
Emotion coping	0.38 (0.15, 0.62)	0.002	0.26 (0.01, 0.51)	0.043	0.32 (0.02, 0.62)	0.04		
Emotional support	0.66 (-0.11, 1.43)	0.089			0.35 (-0.58, 1.29)	0.45		
Venting	1.18 (0.10, 2.26)	0.033			1.47 (0.19, 2.74)	0.025		
Humour	0.67 (-0.07, 1.42)	0.074			0.52 (-0.38, 1.43)	0.249		
Acceptance	0.25 (-0.66, 1.16)	0.589			0.14 (-1.22, 0.95)	0.797		
Religion	0.23 (-0.63, 1.09)	0.588			0.01 (-1.01, 1.04)	0.981		
Self-blame	1.62 (0.79, 2.45)	<0.001			1.94 (0.96, 2.92)	<0.001	1.39 (0.34, 2.74)	0.045
Avoidance coping	0.85 (0.43, 1.28)	<0.001	0.68 (0.39, 0.97)	<0.001	0.97 (0.45, 1.49)	<0.001	0.66 (0.07, 1.25)	0.017
Self-distraction	0.66 (-0.11, 1.43)	0.09			0.66 (-0.26, 1.58)	0.155		
Denial	1.42 (0.51, 2.32)	0.003			1.6 (0.52, 2.68)	0.005		
Behavioural disengagement	1.37 (0.19, 2.54)	0.024			1.79 (0.42, 3.16)	0.012		

Table 6 presented the coping strategies associated with depression and anxiety among spine patients. For GAD7, the significant factors included self-blame, avoidance coping and self-distraction.

An increase in the self-blame and avoidance coping was observed to increase the GAD7 scores by 0.85 (coeff. (95% CI): 0.85 (0.04, 1.69); $p=0.040$), 1.31 (coeff. (95% CI): 1.31 (0.76, 1.86); $p<0.001$) respectively; while an increase in self-distraction was observed to decrease the GAD7 by 1.52

(coeff. (95% CI): -1.52 (-2.48, -0.57); $p=0.002$).

While for PHQ9, the factors associated with PHQ9 included venting, self-blame, substance use and behavioural disengagement. An increase venting, self-blame, substance use and behavioural disengagement was observed to increase the PHQ9 score by 1.22 (coeff. (95% CI): 1.22 (0.47, 1.96); $p=0.002$), 1.22 (coeff. (95% CI): 1.22 (0.38, 2.05); $p=0.005$), 3.13 (coeff. (95% CI): 3.13 (0.95, 5.31); $p=0.006$), 1.91 (coeff. (95% CI): 1.91 (0.88, 2.95); $p=0.001$) respectively.

Table 6: Relationship between coping to depression and anxiety among spine patients.

	GAD-7				PHQ9			
	Simple linear regression		Multiple linear regression		Simple linear regression		Multiple linear regression	
	Coef (95% CI)	P value	Adj. coef (95% CI)	P value	Coef (95% CI)	P value	Adj. coef (95% CI)	P value
Problem coping	0.10 (-0.12, 0.31)	0.38			0.08 (-0.17, 0.33)	0.524		
Active coping	0.55 (-0.24, 1.34)	0.164			0.68 (-0.24, 1.59)	0.143		
informational support	0.01 (-0.75, 0.73)	0.976			0.26 (-1.12, 0.60)	0.547		
Positive reframing	0.38 (-0.36, 1.11)	0.308			0.25 (-0.62, 1.11)	0.568		
Planning	0.28 (-0.47, 1.03)	0.458			0.38 (-0.48, 1.25)	0.377		
Emotion coping	0.29 (0.09, 0.49)	0.006			0.41 (0.19, 0.63)	0.001		
Emotional support	0.52 (-0.23, 1.27)	0.168			0.49 (-0.39, 1.37)	0.265		
Venting	1.17 (0.34, 1.99)	0.007			1.62 (0.70, 2.55)	0.001	1.22 (0.47, 1.96)	0.002
Humour	0.48 (-0.37, 1.33)	0.26			0.80 (-0.17, 1.78)	0.103		
Acceptance	0.21 (-0.60, 1.02)	0.602			0.52 (-0.41, 1.45)	0.267		
Religion	0.36 (-0.26, 0.98)	0.245			0.69 (-0.02, 1.39)	0.055		
Self-blame	1.72 (0.87, 2.56)	<0.001	0.85 (0.04, 1.69)	0.04	2.05 (1.07, 3.02)	<0.001	1.22 (0.38, 2.05)	0.005
Avoidance coping	0.76 (0.43, 1.09)	<0.001	1.31 (0.76, 1.86)	<0.001	0.93 (0.55, 1.30)	<0.001		
Self-distraction	0.61 (-0.13, 1.34)	0.102	1.52 (-2.48, -0.57)	0.002	0.86 (0.02, 1.69)	0.046		

Denial	1.78 (1.11, 2.45)	<0.001			1.79 (0.95, 2.64)	<0.001		
Substance use	2.02 (-0.72, 4.76)	0.145			4.11 (1.08, 7.14)	0.009	3.13 (0.95, 5.31)	0.006
Behavioural disengagement	1.78 (0.61, 2.94)	0.004			2.32 (1.00, 3.64)	0.001	1.91 (0.88, 2.95)	0.001

Table 7 explored the relationship between coping strategies with anxiety and depression among stroke patients. It was observed that an increase emotional support, self-blame and behavioural disengagement will increase the GAD7 scores by 0.82 (coeff. (95% CI): 0.82 (0.03, 1.62); p=0.043), 1.62 (coeff. (95% CI): 1.62 (0.80, 2.45); p<0.001) and 1.16 (coeff.

(95% CI): 1.16 (0.35, 1.97); p=0.006) respectively.

On the other hand, an increase in self-blame and behavioural disengagement was observed to increase the PHQ9 by 1.76 (coeff. (95% CI): 1.76 (0.84, 2.68); p<0.001) and 1.21 (coeff. (95% CI): 1.21 (0.07, 2.34); p=0.038) respectively.

Table 7: Relationship between coping to depression and anxiety among stroke patients.

	GAD-7				PHQ9			
	Simple linear regression		Multiple linear regression		Simple linear regression		Multiple linear regression	
	Coef (95% CI)	P value	Adj. coef (95% CI)	P value	Coef (95% CI)	P value	Adj. coef (95% CI)	P value
Problem coping	0.25 (-0.03, 0.53)	0.082			0.19 (-0.15, 0.52)	0.265		
Active coping	0.44 (-0.50, 1.39)	0.348			0.15 (-0.94, 1.24)	0.788		
Informational support	1.01(0.09, 1.93)	0.032			1.18 (0.13, 2.23)	0.029		
Positive reframing	0.56 (-0.33, 1.46)	0.213			0.34 (-0.70, 1.38)	0.515		
Planning	0.58 (-0.34, 1.51)	0.21			0.29 (-0.78, 1.36)	0.588		
Emotion coping	0.42 (0.20, 0.63)	<0.001			0.4 (0.15, 0.66)	0.003		
Emotional support	1.28 (0.42, 2.13)	0.004	0.82 (0.03, 1.62)	0.043	1.21 (0.20, 2.21)	0.02		
Venting	1.22 (0.25, 2.19)	0.015			0.97 (-0.18, 2.12)	0.097		
Humour	0.50 (-0.61, 1.61)	0.371			0.45 (-0.82, 1.73)	0.477		
Acceptance	1.12 (0.12, 2.12)	0.029			0.92 (-0.25, 2.10)	0.12		
Religion	0.34 (-0.43, 1.12)	0.373			0.28 (-0.61, 1.17)	0.529		
Self-blame	1.84 (1.12, 2.57)	<0.001	1.62 (0.80, 2.45)	<0.001	2.21 (1.40, 3.02)	<0.001	1.76 (0.84, 2.68)	<0.001
Avoidance coping	0.67 (0.32, 1.03)	<0.001			0.7 (0.28, 1.12)	0.002		
Self-distraction	0.64 (-0.23, 1.50)	0.144			0.45 (-0.55, 1.46)	0.366		
Denial	1.21(0.46, 1.96)	0.002			1.22 (0.34, 2.11)	0.008		
Substance use	2.95 (-6.20, 0.31)	0.305			0.67 (-4.52, 3.19)	0.729		
Behavioural disengagement	1.88 (1.01, 2.75)	<0.001	1.16 (0.35, 1.97)	0.006	2.05 (1.03, 3.06)	<0.001	1.21 (0.07, 2.34)	0.038

Discussion

Sociodemographic profile of adult PwD

A total of 137 patients were included into the study, with 42 ABI patients, 48 spine patients and 47 stroke patients. ABI patients have the lowest mean age (39.8 years old) among the three group of patients, followed by spine patients (45.1 years old) and stroke (57.1 years old).

Majority of the patients were male (65.0%). This is aligned with the data by Department of Statistic Malaysia that shows from the total PwD population in Malaysia; males gender predominates by 52.3%, compared to female gender.

From our finding, majority of the patients are Malay (51.8%) by ethnicity. This is aligned with the demography of

population in Malaysia whereby Malay is the largest ethnic group accounted for 58.1% (17.9 million) of the population in the fourth quarter of 2024.

Most of the patients studied up to secondary level (44.5%), achieving completion of compulsory education in Malaysia. Data from Bureau of Labor Statistics, Department of Labor, United States of America shows that people with a disability were less likely to have completed a bachelor's degree or higher than were those with no disability. The barriers to higher education probably due to the nature of the disability, lack of accessible education and accommodation and limited support services. A local study in Malaysia by Abdul Rahman A et al. revealed facilities for PwD in building within higher institutions in Malaysia are still inadequate and require immediate improvement to enhance the quality of the facilities and ensure the comfort of PwD in receiving quality

education. This result also supported by another local study by Glory Albert et al. that shows a lack of compliance for accessibility on some facilities and infrastructures, whereby the facilities provided do not fully meet the universal design criteria especially for 'flexibility in use' due to the facilities unable to cater to a wide range of personal preferences and capabilities and 'perceptible information' which does not efficiently provide important information to users as well as the criteria of 'tolerance for error' which reduces harm to the users.

Majority of the PwD included in this study were professional by occupation (18.2%). This could be attributed by the location of our study setting, which is located at the urban area in Kuala Lumpur. Department of Statistics Malaysia published latest data about employment of PwD in Malaysia that shows 3.5% increment of PwD employment in the public sector from year 2022 to 2023. This indicates that Malaysian government is actively promoting the inclusivity and employment of PwD through multiple collaboration with international and local civil society organisations, the private sector, and relevant parties to create a more inclusive and equitable society for all. From our study, PwD were also employed in administrative sector (15.3%), educational (3.6%), elementary (9.5%), operational (8.0%), services 14.6%. Some initiate own business/self-employed (8.8%), pensioner (9.5%) and 12.4% are unemployed.

In ABI group, 61.9% of them are single, while for stroke and SCI group, majority are married with 83.0% and 52.1% respectively. Overall, 2.9% of adult PwD in this study are either widowed/separated with the spouse.

In ABI group, 52.4% are patients with haemorrhagic stroke which include cortical and subcortical haemorrhagic stroke, followed by patients with traumatic brain injury (38.1%) and brain tumour patients (9.5%). Based on the definition of ABI employed by the Toronto Acquired Brain Injury Network, ABI is defined as damage to the brain that occurs after birth and is not related to congenital disorders, developmental disabilities, or processes that progressively damage the brain. This encompasses traumatic and non-traumatic aetiologies. Common traumatic causes include motor vehicle accidents, falls, assaults, gunshot wounds, and sport injuries. According to the National Trauma Database Malaysia, nearly 80 percent of trauma cases stem from road traffic accidents, with 64% involving TBI. Non-traumatic causes of ABI include diffuse brain lesions, anoxia, tumours, aneurysm, vascular malformations, and infections of the brain (Toronto Acquired Brain Injury Network, 2005). Stroke is not included under ABI classification due to its focal nature; ABIs tend to be more diffuse.

From our finding, traumatic spinal cord injury predominates in the SCI group (70.8%), compared to the non-traumatic SCI (29.2%). This is aligned with a study in China that shows the prevalence of traumatic SCI is highly outnumbered non-traumatic SCI. In the recent trends in causes of traumatic spinal cord injury provided by National Spinal Cord Injury Statistical Centre, vehicular accidents top the list, followed by fall, act of violence, sports and recreational activities and

others (medical/surgical complication, hit by falling/flying objects, pedestrian, machinery accidents). Aetiology of non-traumatic SCI are very heterogeneous which includes congenital or genetic disorders and acquired (vertebral column degenerative disorders, vascular disorders, inflammatory/autoimmune diseases, benign or malignant tumours).

In stroke group, it shows that 48.9% patients have right sided ischemic stroke, 46.8% with left sided stroke, followed by posterior stroke (4.3%). In a study by Abdu H et al., Middle Cerebral Artery (MCA) territory was the commonest site of arterial territory infarctions in ischemic stroke, followed by anterior cerebral artery, posterior cerebral artery territories (3.8%). In same study, also states that the vertebrobasilar arterial territories were the least affected area of the brain that was observed in 2.2% patients. Locally, in the Annual Report of the Malaysian Stroke Registry 2009-2016, partial anterior circulation infarct and lacunar infarct are the predominant clinical manifestation in 32% and 35% of all ischemic stroke cases respectively whereas total anterior circulation infarct comprises about 15% of them, whereas posterior circulation infarct comprises 9% of the stroke patients.

Prevalence of depression and anxiety symptoms in adult PwD

In this study, stroke patients have the highest level of PHQ-9, and GAD-7 score with the mean $\pm$ SD: 8.43 ± 6.55 and mean $\pm$ SD: 6.74 ± 5.72 respectively, compared to ABI and SCI group. ABI group observed to have the lowest GAD 7 (mean $\pm$ SD: 4.93 ± 4.46) and PHQ9 (mean $\pm$ SD: 6.02 ± 5.30). The differences of GAD-7 and PHQ-9 score were not statistically significant among the three groups.

In a study in Korea, stroke survivors had a greater risk of developing depression than the matched control group with an adjusted hazard ratio of 2.12 (95% confidence interval 2.09–2.15). In same study also stated that stroke survivors with more severe disabilities were associated with a higher risk of depression than those with mild disabilities. A study by Adebisi concluded that even though stroke patients receive more social support and have a higher quality of life, they are still more depressed and have lower self-esteem compared to spinal cord injury patients. The attributing factors could be the perception of loss of independence, social isolation, fear and trauma, feeling like a burden and biochemical changes that disrupt the normal balance of neurotransmitters in the brain, such as glutamate, which can contribute to depression. This is supported by a study from Wijeratne T et al., that stated the inflammatory basis of post-stroke depression which involves bioenergetic failure, deranged iron homeostasis (calcium influx, Na influx, potassium efflux etc.), excitotoxicity, acidotoxicity, disruption of the blood brain barrier, cytokine-mediated cytotoxicity, reactive oxygen mediated toxicity, activation of cyclooxygenase pathway and generation of toxic products could subsequently results in cell death, maladapted, persistent neuro-inflammation and deranged neuronal networks in mood-related brain regions.

Hassanpour K in his study shows that the prevalence of depressive symptoms following acute SCI is rather low and remains stable within the first year after injury despite the severe neurological impairment and loss of independency. In comparison to other neurological disorders that also involve brain function SCI patients seem to be less challenged by depressive symptoms that constitute additional burdens to respond to the severe functional impairments.

As mentioned earlier, ABI group observed to have lowest PHQ-9 and GAD-7 scores in this study. In a recent finding by Murphy et al in 2024, depression symptom levels in an ABI did not appear to be accounted for by the severity of the injury or cognitive impairment.

This could suggest that the relationships between potential cognitive vulnerabilities and mood disturbance are likely to be more complex following ABI than in the general population. Thus, there is possibility that the influence of ABI-related cognitive impairment could be the attributing factor to the lowest score of PHQ-9 and GAD-7 in this study.

Measurement of coping strategies used in adult PwD

The highest used coping strategies of all three groups of PwD is emotion coping, followed by problem coping, and lastly avoidance coping. All groups have similar score ranges for each problem coping, emotion coping and avoidance coping. There were no statistically significant differences in the coping strategies observed between the three groups.

Our finding is aligned with the study by Desalegn et al., which revealed that the emotional-focused coping strategy was the most frequently used when dealing with psychological distress among participants with physical disabilities in Ethiopia. In Saudi Arabia, participants with learning disabilities reported a greater use of substance abuse and religious coping.

PwD often face long-term, complex, and unchangeable stressors that make emotion-focused coping more practical and effective than problem-solving approaches. This includes managing emotions related to physical pain, social stigma, discrimination, and identity. In many cases, emotional coping is not a sign of weakness, but a powerful tool for psychological survival and growth.

Associations between different coping strategies and development of depression and anxiety in PwD population

There are significant moderate and positive correlation for venting and self-blame (subdomains of emotional coping) avoidance coping with GAD-7 and PHQ-9 in all three groups, with strength of correlation ranged between 0.315 to 0.616 ($p < 0.05$, Table 3).

For ABI group, based on the simple linear regression analysis, emotion coping, venting, self-blame and avoidance coping was observed to be significantly related to both GAD7 and PHQ9 outcomes. However, the coping strategies that were significant positive correlation in the final model

included emotion coping, self-blame and avoidance coping only (Table 4).

For spine patients: There is positive correlation between self-blame, avoidance coping and self-distraction to GAD-7 score. There is positive correlation between approach of venting, self-blame, substance use and behavioural disengagement to PHQ-9 score (Table 5).

As for stroke patients, an increase in emotional support, self-blame and behavioural disengagement will increase the GAD-7 scores (positive correlation as in Table 6). While increase in self-blame and behavioural disengagement increase the PHQ-9. Interestingly, this raised a question as why emotional support (which is an adaptive coping strategy) has a positive correlation with GAD-7 score in our finding. While emotional support is crucial for stroke recovery, excessive or poorly delivered support can inadvertently increase anxiety in stroke patients by creating pressure, dependency, or feelings of inadequacy. There could also be possibilities of PwD feeling overwhelming or unrealistic expectations, lack of privacy or autonomy, misunderstanding of emotional needs or caregiver anxiety.

Conclusions

From this study, we found that the usage of maladaptive approach such as venting, self-blame, self-distraction, substance use, and behavioural disengagement leads to the development of anxiety and depression in adult PwD. Non-effective emotional support could lead to increment of anxiety levels in adult PwD.

We recommend supportive measures and effort to reduce maladaptive coping in adult PwD as listed below:

- Identifying the maladaptive coping signs such as avoidance, negative thinking, emotional masking/suppression.
- Promoting adaptive coping strategies as problem solving, social support, physical activities, hobbies and interest, mindfulness and relaxation techniques, cognitive restructuring, self-compassion and coping statements
- Addressing underlying issues such as trauma, mental health condition and disability-specific challenges.
- Seek professional help like therapist, counsellors, medical professional and support groups.

We also recommend providing effective emotional support to adult PwD through:

- Focusing on empowerment.
- Active listening and validation.
- Collaborative goal setting between medical team, caregiver and patient.
- Seek professional guidance.
- Encourage social interaction.
- Prioritize caregiver well-being.

PwD use a variety of coping strategies in response to limitations they encounter when participating in education, vocational training and employment. Individual coping strategy takes place within and in interaction with the physical and social environment. Not all coping strategies have the same transformative potential, and not all PwD people are able or willing to resort to strategies that are confrontational and/or transformative.

Thus, to improve the well-being of PwD people and to effectively increase their inclusivity in the participation in society, interventions are necessary both at the level of individual coping and at the level of social structure. As coping strategies are modifiable component in the Personal Factors in ICF framework, more helpful coping and adaptive strategies can be instilled *via* education and training, in hoping for better positive adjustment and psycho-social outcomes among PwD population.

References

1. Koenig J, McLean KJ, Bishop L. Psychological distress and mental health diagnoses in adults by disability and functional difficulty status: Findings from the 2021 national health interview survey. *Disabil Health J*. 2024;17(4):101641.
2. Choi Y, Kim EY, Sun J, Kim HK, Lee YS, et al. Incidence of depression after traumatic brain injury: A Nationwide longitudinal study of 2.2 million adults. *J Neurotrauma*. 2022;39(5-6):390-397.
3. White CL, McClure LA, Wallace PM, Braimah J, Liskay A, et al. The correlates and course of depression in patients with lacunar stroke: Results from the Secondary Prevention of Small Subcortical Strokes (SPS3) study. *Cerebrovasc Dis*. 2011; 32:354–360.
4. Hacket ML, Pickles K. Part I: Frequency of depression after stroke: An updated systematic review and meta-analysis of observational studies. *Int J Stroke*. 2014; 9:1017–1025.
5. Lim SW, Shiue YL, Ho CH, Yu SC, Kao PH, et al. Anxiety and depression in patients with traumatic spinal cord injury: A nationwide population-based cohort study. *PLoS One*. 2017;12(1): e0169623.
6. Desalegn GT, Zeleke TA, Shumet S. Coping strategies and associated factors among people with physical disabilities for psychological distress in Ethiopia. *BMC Public Health*. 2023;23(1):20.
7. Kim J, Han A, Piatt JA, Kim J. Investigating relationships among coping, personal growth, and life satisfaction among individuals with physical disabilities. *Health Promot Perspect*. 2020;10(4):401-408.
8. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? *Indian J Psychol Med*. 2013;35(2):121-126.
9. Shen SC, Huang KH, Kung PT, Chiu LT, Tsai WC. Incidence, risk, and associated factors of depression in adults with physical and sensory disabilities: A nationwide population-based study. *PLoS One*. 2017;12(3):e0175141.

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