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A Literature Review of Psychosocial Comorbidities Related to Working Capacity After Aneurysmal Subarachnoid Hemorrhage

Eleanor Turi, Yvette Conley, Ansley Grimes Stanfill

ABSTRACT

Objective: The aim of this study was to describe literature regarding the impact of psychosocial comorbidities on working capacity after aneurysmal subarachnoid hemorrhage (aSAH). **Design/Methods:** This study is a review of the literature using PubMed, CINAHL, PyschINFO, and Google Scholar. **Results:** Patients with aSAH affected by depression, anxiety, cognitive impairment, or posttraumatic stress disorder are less likely to return to work, although there are mixed results. These may be due to inconsistent inclusion, adjustment of demographic and clinical variables shown to be associated with return to work, and differences in instrumentation and sample size. **Conclusions:** Working capacity after aSAH is likely affected by poor psychosocial outcomes, but future research should consider the standardization of demographic and clinical data, use standardized measurement tools, and consider the interrelatedness between psychosocial comorbidities.

Keywords: cognitive, psychosocial issues, stroke

Strokes can have devastating effects on the physical, cognitive, and emotional well-being of survivors. These effects are especially felt for those affected by aneurysmal subarachnoid hemorrhage (aSAH). Although this subtype of stroke is often fatal, the treatment of aSAH has improved in recent years, and rates of survival are increasing.[1] Because of their comparative youth (often younger than 50 years), aSAH survivors are more likely to be working than those affected by other types of stroke.[2] Increased survival rates and a younger age give patients with aSAH a higher likelihood of returning to work after recovery than other populations with stroke.

However, many aSAH survivors experience poor psychosocial outcomes such as depression, reductions in cognitive functioning, anxiety, and posttraumatic stress disorder (PTSD), which could influence their ability to return to work.[3–5] Approximately one-third of all patients with aSAH have cognitive impairments or experience PTSD, and approximately one-fifth experience anxiety or depression.[4] These factors could influence not only return to work but also one's working capacity (the ability to productively return to a same or similar job). The aim of this literature review is to characterize the association between psychosocial outcomes and working capacity after aSAH. We aim to make neuroscience nurses aware of which factors are essential for the ability to return to gainful employment. Conclusions could be used to improve follow-up protocols after stroke and to direct research.

Methods

The online databases PubMed, CINAHL, and PyschINFO were searched in early September 2016. Searches used the headings and free-text terms "return to work" and "aneurysmal subarachnoid hemorrhage." Then, these terms were combined using "and" individually with each of the following: "depression," "cognitive function," "anxiety," and "posttraumatic stress disorder." The reference lists of included articles were manually searched for other relevant literature, and a reverse-citation search using the Google Scholar search engine was also performed. Articles were included if they (1) provided a quantitative rate of return to previous employment or working capacity, (2) were published before September 2016, (3) reported on subjects with aSAH,

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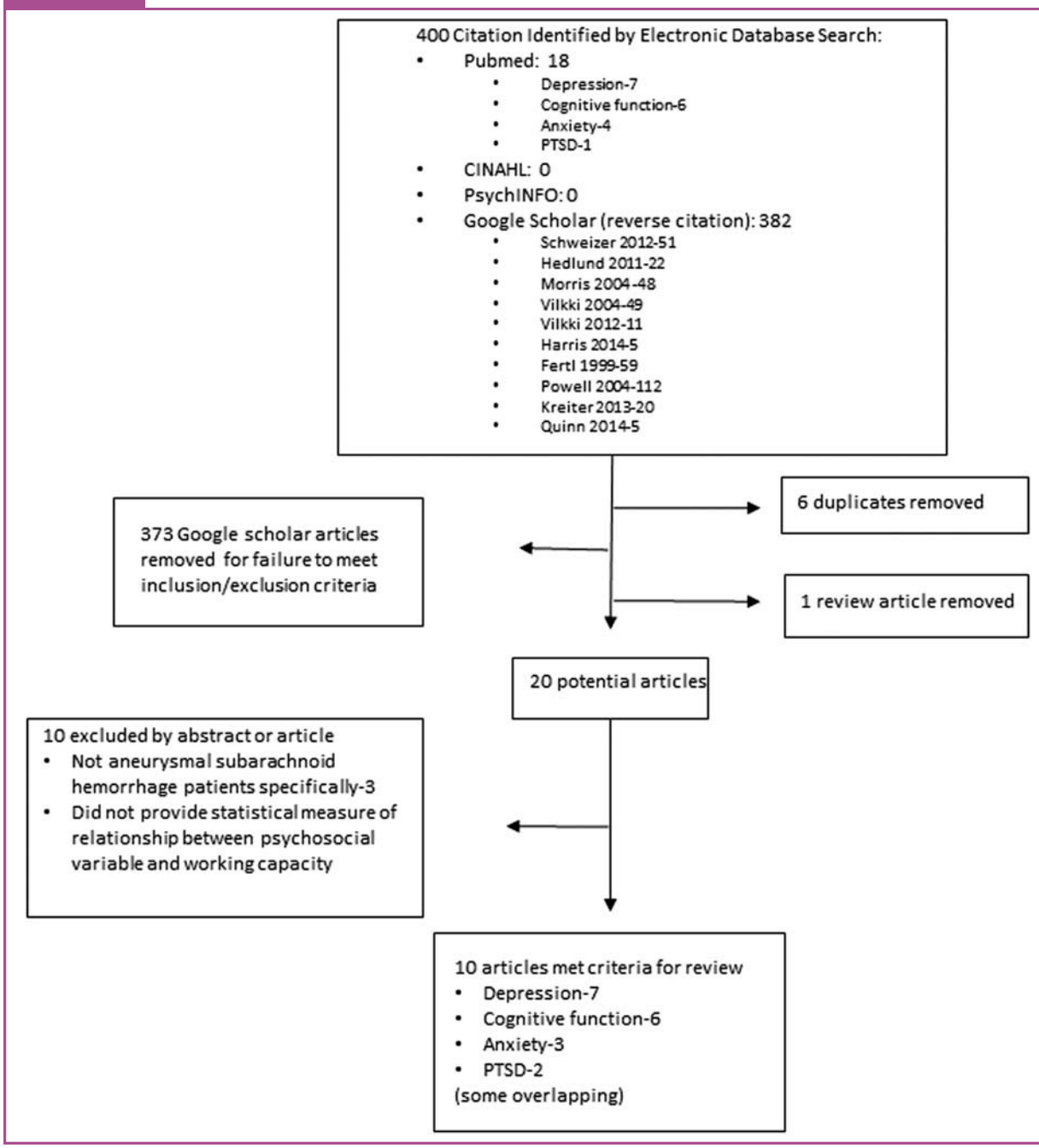
(4) were published in English, and (5) reported a statistical measure of the relationship between return to work rates and depression, anxiety, cognitive/executive function, or PTSD. Quantitative rate of return to work was defined as providing a rate of return to previous employment or working capacity after aSAH. Cognitive/executive functioning was defined as any quantitative assessment of memory, intelligence, or decision making.

Results

Twenty potential studies were found under these terms, but only 10 met the inclusion criteria (Fig 1). Most of the articles were published from 2004 to 2013, and the earliest article was published in 1999. Two of these 10 articles examined only 1 psychosocial variable, whereas the remaining examined multiple psychosocial variables. Those articles that examined multiple psychosocial variables were not consistent in which factors were included, but 7 articles measured depression, 6 measured executive function, 3 measured anxiety, and 2 studies measured PTSD (Fig 1). Included articles measured depression using the Beck Depression Inventory, Zung Self-Rating Depression Scale, or Hospital Anxiety and Depression Scale (HADS). Patients were considered

FIGURE 1 Flowchart for Search and Selection Strategy



depressed if they scored on the severe or moderate level on any of these assessments. Studies often measured anxiety using HADS. Posttraumatic stress disorder was measured using the Structured Clinical Interview for Axis I Disorders, and patients were included if they resulted in either diagnosable or subsyndromal PTSD. A summary of results is presented in Table 1.

Depression

Most studies found that depression was associated with reduced working capacity. This can be considered in 2 ways: either a lifetime history of any depression or as a new onset of clinical depression after aSAH. There is evidence that is associated with a reduced likelihood of return to work. For example, 1 study (n = 83) found that a lifetime history of major depression was associated with lower return to full-time work rates 7 months after aSAH.[2] New onset of minor or major depression after aSAH also indicated a reduced likelihood of return to full-time work.[2] Patients who failed to return to work more than a year after aSAH were more likely to score on the moderate to severe level on HADS (n = 52).[4] Other studies also found that any history of depression at all correlated with reduced working capacity.[5,7,9]

However, not all the literature agrees. In a study of factors affecting return to work 19 months poststroke, there was no difference in depression rates between patients who did and did not return to work. This study measured depression in 134 patients using the Functional Status Questionnaire, a questionnaire that assesses mental health and social interaction, and return to work was dichotomized.[8] Another study added that combined risk scores of depression, PTSD, and anxiety did not indicate altered rates of productive employment on the Brain Injury Community Rehabilitation Outcome scale.[10]

Cognitive Function

There is also mixed evidence for the relationship between cognitive function and return to work. Kreiter et al[11] studied the effect of both depression and cognitive function on health-related quality of life, including working ability. Depressive symptoms were measured in 192 subjects using the Center for Epidemiological Studies-Depression scale, cognitive function was measured using the Telephone Interview for Cognitive Status scale, and health-related quality of life was measured using the Sickness Impact Profile scale. They found that return to work rates were associated with depression but were not associated with cognitive function 3 and 12 months poststroke.

On the other hand, other studies found that impairments in cognitive function were associated with reduced working capacity. One small study (n = 32) using the Montreal Cognitive Assessment found that performance on the Animal Naming and Abstraction Montreal Cognitive Assessment subtest was associated with higher rates of return to any level of work.[6] Similarly, impairments in the Trail Making Test and the Wechsler Digit Span Test were associated with reductions in working ability.[9] Speech memory problems (measured by the Everyday Memory Questionnaire) were also associated with lower rates of return to work at 1-year poststroke (n = 214).[12]

Other researchers have focused more specifically on executive function after aSAH. Lower scores on the Culture Fair Intelligence Test correlated with a failure to return to work at 1 year.[5] These impairments may also be associated with work outcomes in the distant future. Superior performance on the Culture Fair Intelligence test 12 months after aSAH was associated with high employment rates 9 to 13 years after aSAH in a sample of more than 100 patients.[7]

Anxiety

The literature also showed mixed evidence regarding anxiety. In 1 study, mood (described by the authors as an analysis of both anxiety and depression) was measured using the Wimbledon Self-Report Scale, in which the patient rates the frequency of 30 moods from a scale of 0 (none) to 4 (often). People who did not return to work at 12 months poststroke were borderline or diagnosable for a mood disorder (n = 214).[12] Similarly, moderate to severe anxiety was associated with lower rates of return to previous employment as long as a decade after aSAH (n = 101).[7]

PTSD

Although there are not many studies looking at the relationship between PTSD and return to work, the existing literature has also resulted in mixed evidence. A PTSD diagnosis after aSAH likely would be associated with reduced working capacity.[2] However, a combined score of depression, anxiety, and PTSD was not associated with reduced productive employment more than a year poststroke.[10]

Discussion

In general, negative psychosocial outcomes seem to be associated with reduced return to work rates and working capacity after aSAH. There is, however, an abundance of mixed evidence. Each variable—depression, cognitive impairment, anxiety, and PTSD—showed mixed results in its relationship with working capacity.

Some of this mixed evidence may be attributed to the varying study designs seen in Table 1. Different periods for assessment (ranging from months to years after stroke) limit the conclusions that can be made for associations between psychosocial variables and working capacity. Furthermore, inconsistency in instrumentation

TABLE 1. Psychosocial Comorbidities Related to Working Capacity After Aneurysmal Subarachnoid Hemorrhage

Author(s)/Year	Study Design and Participants	Rate of Return to Work	Psychosocial Measures	Instruments	Main Findings
Schweizer et al,[6] 2012	n = 32	48% full-time RTW	Cognitive impairment	MMSE and MoCA	Superior performance on cognitive function tests predicts higher RTW.
Hedlund et al,[3] 2011	n = 83	23.8% RTW at all	Depression and PTSD	SCID-I	Patients with depression and/or PTSD RTW at significantly lower rates than those without depression and/or PTSD.
Morris et al,[4] 2004	n = 52	63.5% RTW at all	Depression and anxiety	HADS, BDI, State-Trait Anxiety	Ability to RTW was lowered in patients with depression and anxiety.
Vilkki et al,[5] 2004	n = 138	68% RTW at all	Cognitive function and depression	Culture Fair Intelligence and Self-Rated Depression	Superior executive functioning predicts higher RTW rates, and self-rated depression is associated with lower working ability as evaluated by the partner.
Vilkki et al,[7] 2012	n = 101	43.6% RTW at all	Depression, anxiety, and cognitive impairment	Self-rated A&D, Culture Fair Intelligence	Anxiety, depression, and impaired cognitive function are associated with lower RTW rates.
Harris,[8] 2014	n = 134	54% RTW at all	Depression	FSQ	Depression does not differ between patients who do and do not RTW.
Fertl et al,[9] 1999	n = 40	43% RTW at all	Depression and cognitive function	Trail Making Test, Wechsler Memory Scale, BDI	Depression and cognitive impairments are associated with reduced working capacity.
Powell et al,[10] 2004	n = 52	Productive employment scale	Depression, cognitive impairment, anxiety, and PTSD	HADS, BICRO-39, RIES, Self-rated Fatigue	Depression, fatigue, anxiety, and PTSD do not affect productive employment.
Kreiter et al,[11] 2013	n = 192	SIP scale	Depression and cognitive impairment	CES-D, TICS	Depression had a significant impact on work, but cognitive function did explain a significant amount of variation.
Quinn et al,[12] 2014	n = 214	33.1% RTW at all	Depression, cognitive impairment, and anxiety	WSRS, EMQ	The patients who did not RTW were significantly likely to be borderline or case for depression or anxiety. Superior performance in speech memory was associated with RTW.

Abbreviations: BDI, Beck Depression Inventory; BICRO-39, Brain Injury Community Rehabilitation Outcome Scale; CES-D, Center for Epidemiological Studies–Depression; EMQ, Everyday Memory Questionnaire; FSQ, Functional Status Questionnaire; HADS, Hospital Anxiety and Depression Scale; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; RIES, Revised Impact of Events Scale; RTW, return to work; SCID-1, Structured Clinical Interview for Axis-1 Disorders; SDS, Zung Self-Rating Depression Scale; Self-Rated A&D, Self-Rated Anxiety and Depression; SIP, Sickness Impact Profile; TICS, Telephone Interview for Cognitive Status; WSRS, Wimbledon Self-Report Scale.

most certainly contributes to the mixed evidence found in this review. For example, one of the articles analyzed in this review[10] found an insignificant relationship between psychosocial outcomes and working capacity (n = 52), but the instruments used were different than typically used in this type of literature. Instead of looking at depression, anxiety, and PTSD separately, authors combined the HADS and Revised Impact of Events Scale scores into a single assessment and measured its effect on productive employment—a self-reported measure of engagement in work, childcare, or education.[10] Thus, it is difficult to compare the results of this study with those of other existing literature. If the instruments measuring outcomes are standardized, it becomes easier to compare and generalize conclusions. The PROMIS initiative, a project funded by the National Institutes of Health to identify a set of self-report measurement tools that are reliable and comparative, could bring about this standardization (http://www.nihpromis.org/).

Another question that arises in this review is precisely how work should be measured. Some studies examined work productivity, whereas others reduced return to work to a binary variable. A simple return to work does not equate to a return to full capacity and does not indicate a return to the same type of employment before stroke. These 2 concepts are not equal, and the measurement of return to work as a binary variable does not give a complete picture of a particular patient's recovery. From a patient-centered perspective, the most important assessment might be working capacity—as measured by the patient's ability to function at work as compared with his/her previous ability.

Still, it is important to remember that return to work is not solely related to the capacity to work. For example, despite having full working capacity, some patients who are eligible for retirement choose not to return to work.[7] Surviving a life-threatening stroke can reorder priorities related to work and family. In these patients, this new hierarchy of priorities may lead them to spend the time they have with loved ones instead of working. No studies included in this review asked patients their decision-making process on return to work. A qualitative study in this population could elucidate other reasons fully functional patients do not return to work.

Although some studies in this review evaluated psychosocial outcomes separately, these outcomes are likely interrelated and are most certainly affected by previous history. Premorbid conditions were only considered in the Hedlund et al[3] study, which found that patients with a lifetime history of major depression or treatment with antidepressants before aSAH had a significantly lower rate of return to work than those without any psychiatric history. It may be possible that premorbid psychiatric history, combined with the impact of an aSAH, results in difficulties in returning to work independent of other factors. Furthermore, a diagnosis before the development of aSAH may be a biologically distinct process from a diagnosis after aSAH (ie, history of depression vs poststroke depression). Combining these 2 phenomena into 1 catch-all category could certainly confound results.

It is also important to remember that clinicians' assessments of psychosocial changes can vary from the patient's perception. This is especially true for cognitive impairments. Patients and partners' ratings of impairments are often more significant predictors of reduced working capacity than clinical assessments.[5] Although a patient may seem to be fully functional in the clinical setting, he/she may not have the cognitive ability to be effective in the workplace. Identifying which aspect of cognitive function has the greatest impact on working capacity can focus the clinicians' assessment. The ability to memorize new information and make decisions may be the most important factors. Assessing these aspects of cognition can help flag patients at the highest risk for failure to return to work.

Many articles did not mention demographic and social characteristics that may be important for the ability to return to work. Factors such as age, education, socioeconomic status, and social support can also affect return to work. Racial and ethnic background was also not mentioned in most included articles. The 1 study that examined the effect of racial or ethnic background on return to work found an insignificant association between the variables.[8] This study was limited by small subgroup sizes (89 Caucasian, 38 African American, 5 Asian, and 2 persons from "other" backgrounds).[8] However, other work in ischemic stroke shows that people of African ancestry exhibit reduced rates of returning to work at 1 year in ischemic stroke.[13]

Despite these limitations, most evidence in this review suggests that poor psychosocial outcomes are associated with reduced working capacity after aSAH. Nurses need to be properly educated on the prevalence of such outcomes to allow early identification of those most at risk. Once admitted to a stroke unit, a detailed psychosocial history should be collected to help identify those at a higher risk for developing psychological impairments after aSAH. Although the endorsement of a specific questionnaire is outside the scope of this article, many electronic medical records have embedded forms that can direct such assessment. There are many such screening forms available, as well as the instruments mentioned in this article. Nurse managers can consult with physicians, psychologists, and social workers about selecting an appropriate tool and adapting that tool for use in their facility.

Even in the absence of such tools, directed conversations about the patient's previous employment and future

plans can guide nursing interventions. Those individuals who are desirous of returning to work, but who are at risk for an inability to do so, can be streamlined for counseling and other services.[3] The nurse should act as an advocate for their patient's wishes. The nurse can also be a driving force to bring together an interdisciplinary clinical team, which may reach out to involve family members and community resources to achieve the patient's goals. The acute period is an ideal time for psychosocial and medical interventions, which would be enacted with the hopes of bringing more patients back to their level of previous employment. Open communication between nurses and patients about possible interventions can help the patient feel informed throughout recovery.

Conclusions

Despite some mixed results, evidence suggests that poor psychosocial outcomes are associated with reductions in working capacity. Nurses should seek to identify patients at risk for poor psychosocial outcomes early in the recovery process so that timely interventions can be started. Future researchers in this area should consider standardized measurement tools that account for the interrelatedness of psychosocial outcomes and also consider the assessment of demographic and clinical factors related to working capacity.

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