

DEVELOPMENT AND VALIDATION OF A YOGA MODULE IN PATIENTS WITH ANKYLOSING SPONDYLITIS

Abstract:

Background:

The pathogenesis of Ankylosing Spondylitis (AS) is driven by chronic inflammation, structural damage, and dysregulation of immune-neuroendocrine mechanisms. Aberrant pro-inflammatory cytokine signaling, impaired spinal mobility and persistent pain contribute to progressive functional limitation and reduced quality of life. Given that disease progression and treatment response are influenced by behavioral and lifestyle factors and biopsychosocial determinants.

Aim: The present study aimed to develop and validate a standardized yoga module for patients with AS and evaluate its clinical efficacy.

Methodology: A three-phase research design was employed: (i) literature review and expert consultation to develop a comprehensive yoga module consistent with AS-specific therapeutic needs; (ii) validation of the module by a panel of experts using the Lawshe Content Validity Ratio approach; and (iii) a structured feasibility trial to assess its effects on disease symptoms and quality of life. A total of 70 active ankylosing spondylitis patients were initially assigned to either the yoga intervention arm (n = 35) or the control arm (n = 35). At study completion, 29 participants remained in each arm. The yoga intervention group (YG) received a 60-minute structured yoga module for 24 weeks, delivered through a hybrid model (virtual monitoring 5 days per week and face-to-face supervised sessions once every 15 days), in addition to standard medical care. In contrast, the control group (CG) continued with standard medical care only for the same duration. Primary outcomes were measured as disease activity [Bath Ankylosing Spondylitis disease activity index (BASDAI)], functional disability [Bath Ankylosing Spondylitis functional index (BASFI)], spinal mobility [Bath Ankylosing Spondylitis metrology (BASMI)] and chest expansion, inflammatory biomarkers [C-reactive protein (CRP), ESR and TNF- α]. Psychological variables (depressions, fear avoidance belief, pain catastrophizing and quality of life), physiological variables (heart rate, haemoglobin, platelet count) considered as secondary outcome measure. Due to non-normal distribution of data Friedman test (non-parametric repeated-measures ANOVA) with Bonferroni correction was applied to analyze within-group changes over time using SPSS Version 27, significant at 0.05 level.

Results: Based on CVR values, 38 out of 80 yogic techniques met the threshold ($CVR \geq 0.385$) and were retained, while 42 techniques were excluded. CVR values ranged from 0.385 to 0.846, indicating good agreement among experts. In the third phase of the study i.e. feasibility test of the yoga module, after 24 weeks, the Yoga group demonstrated a significant decrease in the severity of Ankylosing spondylitis as seen by reduction in BASDAI, BASFI, BASMI and a significant increase in chest expansion. The yoga group also showed a significant reduction in inflammatory markers: CRP and TNF- α , except ESR. Improvement of psychological outcomes measures as reduction in depression and all subscales of fear avoidance belief: fear avoidance belief in physical activity, fear avoidance belief in work activity, FABQ Total Score. Significant reduction also observed in pain catastrophizing subscales: rumination, magnification, helplessness and pain catastrophizing total score. Significant improvement was found in every dimension of health related quality of life at both post 12 week and post-24-week follow-up for the yoga group. Collectively, the validated yoga module improved disease activity, spinal mobility, physical function and psychological well-being in patients with AS.

Conclusion: The findings suggest that yoga serves as an effective holistic adjunct to standard medical care by modulating inflammatory status, reducing pain-related beliefs and disability, and improving global health status of patients with AS. Integration of an evidence-based yoga module into routine management may enhance long-term clinical outcomes in ankylosing Spondylitis.