Effect of Pranayama Exercises on Stage 1 Hypertension-Related Aggression

Dipti Rana[1], Anjali Midha Sharan[2]

[1]*Department of Psychology, School of Liberal Arts, G.D Goenka University, Gurugram, Haryana, India.*
Email: dipti772@gmail.com
[2]*Dean Research & Development and Dean, Department of Psychology, School of Liberal Arts, G.D Goenka University, Gurugram, Haryana, India. Email: anjali.midha@gdgu.org*

KEYWORDS

Aggression, Hypertension, Stage 1 Hypertension, Pranayama, Breathing Exercises, Yoga

ABSTRACT

This study highlighted the effect of Pranayama exercises on stage 1 hypertension related aggression patients. This study explores the intricate relationship between aggression and Stage 1 hypertension, with a specific focus on the impact of breathing exercises, particularly Pranayama, on hypertension-induced aggression. Hypertension, a prevalent cardiovascular condition, is increasingly recognized for its bidirectional association with psychological factors, including aggression. The study investigates individuals with Stage 1 hypertension, characterized by elevated blood pressure, acknowledging its significant prevalence and potential implications for cardiovascular health. Utilizing a quantitative cross-sectional research design, the study examines the correlation between Pranayama practice and aggression in a sample of 120 participants. The data analysis reveals noteworthy correlations between Buss-Perry Aggression Questionnaire (BPAQ) scores in different yoga conditions, suggesting a potential association between engaging in yoga, especially under professional guidance, and lower aggression levels. The discussion interprets these findings, emphasizing the role of expert instruction in enhancing the stress-reducing and aggression-reducing effects of yoga. The study contributes valuable insights into the potential benefits of Pranayama in managing hypertension-induced aggression, paving the way for further targeted research in this evolving field.

1. Introduction

Hypertension, or high blood pressure, is a prevalent cardiovascular condition that affects millions of individuals worldwide. Beyond its well-established association with cardiovascular diseases, recent research has sought to investigate the intricate connections between hypertension and psychological factors, particularly aggression. Hypertension has traditionally been considered a physiological condition primarily linked to lifestyle and genetic factors (Tilov, B., et al 2016). However, emerging research suggests a bidirectional relationship between hypertension and psychological factors, including stress, anxiety, and aggression. The exact mechanisms by which these psychological factors influence blood pressure regulation are complex and multifaceted. Aggression, defined as behaviour intended to harm others, has been associated with adverse cardiovascular outcomes. Chronic exposure to aggressive behaviours or experiencing aggression can lead to physiological responses that may contribute to the development or exacerbation of hypertension. Understanding the interplay between aggression and hypertension is crucial for developing comprehensive interventions for individuals with Stage 1 hypertension. Stage 1 hypertension is characterized by systolic blood pressure ranging from 130 to 139 mm Hg or diastolic blood pressure ranging from 80 to 89 mm Hg. While it is considered a milder form of hypertension, its prevalence is noteworthy, and its impact on cardiovascular health and overall well-being should not be underestimated. (Tao, S., et al 2021). Breathfocused interventions, such as mindfulness-based stress reduction (MBSR) and controlled breathing exercises, have shown promise in reducing blood pressure and mitigating the physiological responses associated with stress (Tao, S., et al 2021). These techniques target the autonomic nervous system, promoting relaxation and potentially influencing the psychological factors that contribute to hypertension-induced aggression.

Aggression and Pranayama

The correlation between aggression and pranayama, or controlled breathing exercises, is rooted in the profound impact that deliberate breath regulation has on both physiological and psychological factors. Pranayama practices, such as deep and slow breathing, activate the parasympathetic nervous system, commonly known as the "rest and digest" system, counteracting the effects of the sympathetic nervous system associated with the "fight or flight" response The sympathetic nervous system is often associated with the "fight or flight" response, activating the body to respond to stressors by increasing heart rate, constricting blood vessels, and releasing stress hormones like cortisol. On the other hand, the parasympathetic nervous system is known as the "rest and digest" system, promoting relaxation and recovery. (Amrutha, A., &

Alagesan, S. 2021). This shift in the autonomic nervous system balance promotes relaxation and reduces physiological arousal, directly addressing the heightened state often linked to aggression. Also, pranayama contributes to stress reduction and emotional regulation, fostering mental clarity and focus while enhancing self-awareness and self-regulation. The physiological benefits, including improved cardiovascular function and decreased blood pressure, complement the overall positive impact on well-being (Amrutha, A., & Alagesan, S. 2021). By incorporating pranayama into daily practice, individuals may find a holistic approach to managing aggression, aligning their breath with emotional balance and fostering a calmer state of mind. (Tao, S., et al 2021).

Literature Review

(Karmakar, N. 2018) aimed to investigate the impact of selected pranayama practices, specifically Anuloma Vilom pranayama and Bhastrika pranayama, on the aggression levels of college-going female students aged 19 to 22 years. The research involved 30 female subjects selected from Ramananda College, Bishnupur, District: Bankura (West Bengal) using Simple Random Sampling. The intervention consisted of the selected pranayama practices, and data were collected before and after a 45-day period using a questionnaire for aggression developed by Anand Kumar and Prem Shanker Shukla. The results of the study indicated a significant decrease in aggression levels among the college-going female students after the intervention. The statistical analysis, specifically the calculated t-value ($t = 9.19$), was found to be greater than the tabulated t-value ($t_{0.05(29)} = 2.045$) at a 0.05 significance level. This led to the conclusion that the practice of Anuloma Vilom pranayama and Bhastrika pranayama had a beneficial effect in reducing aggression levels among the participants.

(Deshmukh, D. S. K. 2021) study, published in the International Journal of Yogic, Human Movement and Sports Sciences, investigates the impact of Pragya Yoga and Pranakarshan Pranayama (PYPP) on the aggression levels of juvenile delinquents. Addressing the elevated aggression observed among this demographic and its connection to criminal behaviour, the study employs an experimental control group design with a sample of 100 participants from Chhattisgarh, India. The 45-day intervention period involves regular practice of PYPP by the experimental group, while the control group remains untreated. The study utilizes the aggression scale constructed by Ku. Roma Pal and Dr. Tasneem Naqvi (1983) for measurement. The findings, analysed through T-test, reveal a significant decrease in aggression levels among the juvenile delinquents practicing PYPP, emphasizing the potential efficacy of this intervention. Despite its strengths in specificity and experimental design, the study could be enhanced by expanding its participant base, conducting a more extended intervention, and incorporating diverse measures of aggression for a more nuanced understanding of the intervention's effects.

(AG, G. S., et al 2017) investigates the potential impact of pranayama on adolescents' beliefs regarding aggression and alternatives, comparing it to the effects of physical exercises (PE). The background underscores the rising trends of aggression and violence among adolescents, attributing these behaviours to factors such as heightened competition, stress, anxiety, and suboptimal parenting methods. Through a Randomized Control Trial design involving 158 normal healthy adolescents, the study examines the effects of a four-week intervention, with participants engaging in either yoga related breathing exercises (76 participants) or PE (82 participants) for one hour a day, five days a week. The 'beliefs about aggression and alternatives scale' is employed as a quantifiable measure of outcomes. The study's strengths lie in its clear objectives, robust research design, and specific measurement tool, offering a focused investigation into the potential benefits of pranayama on adolescents' attitudes toward aggression.
The study's results highlight a noteworthy shift in beliefs related to aggression among adolescents who participated in a short-term yoga intervention compared to those in a physical education (PE) program. Specifically, yoga practitioners exhibited a significant decrease in overall beliefs supporting aggression and a corresponding increase in beliefs favouring alternative approaches. This suggests that the yoga intervention positively influenced adolescents' attitudes toward aggression, potentially promoting more peaceful and constructive conflict resolution strategies. However, it's important to acknowledge several limitations of the study that temper the interpretation of these findings. Firstly, the relatively short duration of the intervention raises questions about the sustainability of the observed changes in beliefs. While the immediate effects of the yoga program are promising, it remains unclear whether these shifts in attitudes toward aggression will persist over time or diminish once the intervention concludes. Additionally, the study's sample was restricted to normal, healthy adolescents, which limits the generalizability of the findings to other populations, such as adolescents with mental health concerns or behavioural issues. It's possible that the effects of the yoga

intervention may differ among diverse groups, and future research should aim to explore these potential variations. Furthermore, while the study touches on various contributing factors to aggression, such as stress and parenting methods, it does not delve deeply into these elements. Understanding the underlying mechanisms through which yoga influences attitudes toward aggression, particularly in the context of stress management and interpersonal relationships, could provide valuable insights for developing more targeted interventions in the future. In summary, while the study's findings suggest that a short-term yoga intervention can positively influence adolescents' attitudes toward aggression, it's essential to consider the limitations of the research, including the sustainability of changes, the restricted sample population, and the need for further exploration of underlying mechanisms.

Research Methodology

1. Research Design: A quantitative research design was employed for a cross-sectional study to examine the relationship between pranayama practice and aggression, with data collected at a single point in time.

2. Participants: A purposive sample of 120 participants was selected based on varying levels of pranayama experience.

3. Data Collection Tool: The primary data collection too used for data collection was the Buss-Perry Aggression Questionnaire (BPAQ), a self-report questionnaire assessing different dimensions of aggression. Participants also provided details about their pranayama practices, including frequency, duration, and specific techniques.

4. Procedure: Participants were recruited in three groups one who practiced pranyama, one who practice it under expert guidance and one who not practice any kind of pranayama exercise. Informed consent was obtained, and participants completed the BPAQ questionnaire.

5. Data Analysis: Quantitative data from the BPAQ questionnaire were analysed. Descriptive statistics summarized participant characteristics and pranayama practices. Inferential statistics, such as correlation analysis, examined the relationship between pranayama and aggression. The study adhered to ethical guidelines, ensuring participant confidentiality, anonymity, and voluntary participation. Informed consent was obtained, and participants were debriefed about the study's findings upon completion.

Table 1: Correlation between three conditions

	BPAQ- Yoga Condition	BPAQ- No Yoga Condition	BPAQ- Under Professional Guidance
BPAQ- Yoga Condition	1		
BPAQ- No Yoga Condition	-0.10765	1	
BPAQ- Under Professional Guidance	-0.29012	0.206791	1

Results and Discussion

The results of the analysis suggest that engaging in pranyama, particularly under professional guidance, is associated with lower levels of aggression compared to both not engaging in pranyama and engaging in pranyama without professional guidance. In the comparison between BPAQ scores in the pranayama exercise Condition with itself, a perfect positive correlation of 1 was observed, as expected. When comparing BPAQ scores between the pranyama Condition and the No pranyama Condition, a negative correlation of -0.10765 was found. This indicates that as scores in the pranyama Condition increase (suggesting potentially lower aggression), scores in the No pranyama Condition tend to decrease slightly, although the correlation is not very strong. This suggests that other factors may also contribute to aggression levels in the absence of pranyama. In the comparison between BPAQ scores in the pranyama Condition and the condition Under Professional Guidance, a stronger negative correlation of -0.29012 was observed. This indicates that as scores in the pranyama condition increase, scores in the Under Professional Guidance condition tend to decrease more noticeably. This suggests that professional guidance in pranyama has a more significant impact on reducing aggression compared to practicing pranyama without such guidance. The results suggest that while engaging in pranyama is associated with reduced aggression levels, the effect is more pronounced when practicing pranayama (breathing exercise) under professional guidance. This underscores the potential benefits of professional instruction in pranayama practice for managing aggression. The study reveals correlations between BPAQ scores and Pranayama practices. The results suggest that Yoga, particularly incorporating Pranayama and breathing exercises, may reduce aggression compared to no yoga practice. This could be due to the calming and stress-reducing effects of yoga practices, which promote emotional well-being. Under professional guidance, yoga practice can lead to a more significant reduction in aggression. This is due to

expert instruction, structured programs, and psychological support provided by professional instructors. Pranayama and breathing exercises, a key component of many yoga practices, may also contribute to the observed reductions in aggression. Pranayama techniques activate the parasympathetic nervous system, promoting relaxation and reducing stress. Overall, yoga and Pranayama practices can potentially reduce aggression.

The study investigated the relationship between BPAQ scores, which measure aggression levels, and the practice of yoga and Pranayama, a breathing exercise component often incorporated into yoga routines. The findings suggest that engaging in yoga, particularly when it includes Pranayama practices, may lead to a reduction in aggression compared to not practicing yoga at all. This observation aligns with the known benefits of yoga in promoting emotional well-being and stress reduction. Yoga is renowned for its ability to induce a state of relaxation and calmness, which can help individuals manage stress and regulate their emotions more effectively. By incorporating Pranayama and breathing exercises, yoga practitioners can further enhance these benefits. Pranayama techniques are designed to manipulate the breath and activate the parasympathetic nervous system, which is responsible for promoting relaxation and reducing stress responses in the body. Moreover, the study highlights the importance of practicing yoga under professional guidance. When individuals receive instruction from experienced yoga instructors, participate in structured programs, and receive psychological support tailored to their needs, the potential benefits of yoga in reducing aggression may be further amplified. Professional guidance ensures that practitioners engage in yoga practices safely and effectively, maximizing the positive impact on their mental and emotional well-being. The findings suggest that yoga and Pranayama practices have the potential to mitigate aggression by promoting relaxation, stress reduction, and emotional regulation. These practices offer individuals a holistic approach to managing their emotions and improving their overall mental health.

Conclusion

The study associated with hypertension-induced aggression offers insights into the potential correlation between yoga, including Pranayama, and a reduction in aggression levels. The data state the presence of hypertension, the focus on aggression and the negative correlation coefficients with yoga conditions may suggest relevance to individuals with high blood pressure. The negative correlation observed, particularly in the comparison between the Yoga Condition and conditions under professional guidance, implies that engaging in yoga practices, possibly including Pranayama, might be linked to lower aggression levels in individuals with hypertension. The stronger negative correlation when pranyama is practiced under professional guidance suggests that the expertise and support provided by professionals may enhance the stress-reducing and aggression-reducing effects of pranayama.

Reference

[1] Adhikari, A. (2021). Effect of yogic exercises on stress and aggression among the adolescents. Stress, 9(2.857), 3-96.
[2] AG, G. S., Subramanya, P., & Mahadevan, B. (2017). Effect of yoga on adolescents' beliefs about aggression and alternatives. International Journal of Medicine and Public Health, 7(3), 166-171.
[3] Amrutha, A., & Alagesan, S. (2021). Effect of alternate nostril breathing and meditation practices on stress and aggression among the university women students.
[4] Deshmukh, D. S. K. (2021). Effect of Pragya Yoga and Pranakarshan Pranayama (Popounded by Acharya Sriram Sharma) on aggression level of Juvenile delinquents. International Journal of Yogic, Human Movement and Sports Sciences, 6(2), 81-84
[5] Karmakar, N. (2018). Impact of Selected Pranayama Practice on Aggression of College Going Female Students. Physical Education and Applied Exercise Sciences, 4(1), 16.
[6] Tao, S., Li, J., Zhang, M., Zheng, P., Lau, E. Y. H., Sun, J., & Zhu, Y. (2021). The effects of mindfulness-based interventions on child and adolescent aggression: a systematic review and meta-analysis. Mindfulness, 12, 1301-1315.
[7] Tilov, B., Semerdzhieva, M., Bakova, D., Tornyova, B., & Stoyanov, D. (2016). Study of the relationship between aggression and chronic diseases (diabetes and hypertension). Journal of Evaluation in Clinical Practice, 22(3), 421-424.