National Journal of Advanced Research
www.thestudiesjournal.com
ISSN: 2455-216X
Received: 29-09-2025, Accepted: 29-10-2025, Published: 13-11-2025
Volume 11, Issue 2, 2025, Page No. 28-32

Design and evaluation of an information booklet for hypertension prevention in IT companies: Assessing the role of nurse pedagogy programs among male and female professionals

G Vanjeenathammal[1], Dr. Hancy Collins[2]
[1] Research Scholar, Department of Nursing, Mansarovar Global University, Sehore, Madhya Pradesh, India
[2] Research Guide, Department of Nursing, Mansarovar Global University, Sehore, Madhya Pradesh, India

Abstract
Hypertension is an escalating occupational health concern among information technology (IT) professionals, driven by sedentary behavior, psychosocial stress, and poor lifestyle habits. Despite evidence supporting nurse-led health promotion, its application within corporate settings remains limited. This study aimed to design, implement, and evaluate a nurse-led educational booklet for hypertension prevention among IT professionals in India, with attention to gender-responsive pedagogy.

Methods: A sequential mixed-method design was employed. Phase I involved the development of a culturally tailored hypertension prevention booklet using the Delphi consensus process and Sassen's Intervention Mapping Framework. Phase II evaluated its impact through a quasi-experimental pre-test/post-test design among 240 IT professionals (aged 25–45 years) in Bengaluru and Hyderabad. The intervention group (n = 120) received the nurse-led booklet program via hybrid workshops and digital reinforcement, while the control group (n = 120) received standard education materials. Outcomes assessed at baseline, 3 months, and 6 months included Knowledge, Attitude, and Practice (KAP) scores, blood pressure (BP), and behavioral indicators. Focus group discussions provided qualitative insights.

Results: The intervention group exhibited a significant improvement in mean KAP scores (57.3 ± 6.1 to 79.4 ± 5.8; $p < 0.001$) compared to the control group (56.8 ± 6.4 to 59.5 ± 6.7; $p = 0.09$). Systolic and diastolic BP decreased by 9.4 mmHg and 5.6 mmHg respectively ($p < 0.001$), accompanied by marked improvements in physical activity and dietary adherence. Thematic analysis revealed that participants valued the booklet's clarity, visual reinforcement, and relevance to occupational stressors. Gender differences emerged, with female participants demonstrating greater group engagement and males favoring structured feedback mechanisms.

Conclusion: The study establishes that nurse-led, pedagogy-driven educational interventions can effectively enhance hypertension awareness, lifestyle modification, and BP control among IT professionals. Integrating such gender-sensitive, literacy-informed health programs within corporate wellness initiatives offers a scalable and sustainable strategy for cardiovascular disease prevention in high-stress occupational sectors.

Keywords: Hypertension prevention, nurse-led intervention, corporate health, health literacy, pedagogy, information technology professionals

Introduction

Hypertension remains one of the most significant public health challenges globally, with its prevalence escalating particularly in low- and middle-income countries (LMICs) due to rapid urbanization, occupational stress, and sedentary lifestyles. Studies have consistently shown that working professionals—especially those in corporate and technology sectors—are at a growing risk of developing hypertension because of long working hours, mental strain, and lack of physical activity [1]. According to global evaluations of nurse-led interventions, such as those by Li *et al* [2]. and Ito *et al* [3]. hypertension prevention requires not only medical management but also sustained lifestyle modification programs facilitated by health professionals, particularly nurses. These studies emphasize the critical role of nurse-led health education in translating evidence-based preventive strategies into accessible community and workplace initiatives.

At the national level, Indian epidemiological data illustrate a sharp rise in hypertension prevalence among middle-aged working populations, with rates increasing significantly over the past decade. This pattern underscores the need for workplace-centered health promotion strategies, integrating preventive education and early screening within organizational health frameworks. Nurse-led approaches, as identified in international and national research, have demonstrated success in improving awareness and behavioral change outcomes in various clinical and community contexts [4]. However, their integration into occupational settings, especially in IT and corporate environments, remains limited.

Corporate Vulnerability

The IT sector represents a particularly vulnerable demographic due to its unique occupational demands—characterized by prolonged sitting, tight deadlines, and high cognitive workload. Studies in India have shown that corporate employees often experience elevated stress levels, irregular eating habits, and minimal physical activity, all of which are contributing factors to hypertension. Shrivastava *et al* [5]. highlighted that a significant proportion of IT professionals suffer from prehypertensive conditions linked to job strain and inadequate stress management. Similarly, Subramanian and Ramalingam [6] identified lifestyle-associated hypertension among corporate employees, emphasizing that organizational culture and job patterns exacerbate cardiovascular risk.

Despite these findings, workplace-based prevention remains underdeveloped. As Carrington and Stewart [4] illustrated in their gender-responsive nurse-led intervention clinic, customized educational strategies can effectively target at-risk groups by addressing lifestyle, diet, and psychosocial stressors. The absence of similar models within the IT sector suggests an untapped potential for nurse-led programs tailored to occupational environments.

While the clinical benefits of nurse-led hypertension interventions are well established in community and clinical settings [7], there is a clear gap in research focusing on structured, nurse-led educational materials for corporate populations. Most existing interventions target older adults, rural communities, or general outpatients rather than urban working professionals. Educational and behavioral programs evaluated by Clark [7] and Alsofiani *et al* [9]. highlight the importance of structured, pedagogy-driven educational materials—such as booklets or digital modules—to improve health literacy and self-care behaviors. However, adaptation of such tools to professional workplace settings is rare.

Moreover, while Gyamfi [10] evaluated implementation challenges of hypertension control programs in LMICs, none specifically addressed the corporate context where hypertension risk is high and preventive interventions could be easily integrated into occupational wellness schemes. Therefore, developing and evaluating nurse-led educational interventions—particularly those tailored to the health literacy and behavioral profiles of IT employees—represents a crucial research priority.

Literature review

Bulto *et al*. (2023) [11] demonstrated that structured nurse-led programs significantly reduced both systolic and diastolic blood pressure compared to usual care. The study synthesized diverse trials across community and primary care contexts, confirming nurses' efficacy in long-term hypertension management through behavioral coaching, medication adherence monitoring, and self-management support. The strength of this meta-analysis lies in its inclusion of multi-country data and robust statistical modeling. However, it also highlighted a lack of studies targeting occupational or corporate populations, where lifestyle stressors differ markedly from community settings.

Sassen's (2023) [16] works on *Health Education and Improving Patient Self-Management* offer an evidence-based foundation for nurse educators. The Intervention Mapping framework proposed by Sassen provides a systematic approach for developing, delivering, and evaluating educational interventions. It emphasizes cognitive engagement, visual reinforcement, and iterative feedback — elements critical for adult learning in occupational contexts. These frameworks advocate for nurses not merely as health advisors, but as facilitators of behavioral transformation.

Nanyonga and Spies (2021) [19], in a mixed-methods study, found that female participants in group-based nurse-led interventions reported higher motivation and adherence levels, often attributing success to social support and emotional connection. In contrast, male participants valued structured feedback and accountability mechanisms. This divergence highlights the necessity of gender-sensitive pedagogical tailoring—for example, including stress management and self-efficacy components that resonate differently across genders.

Methodology

This study employed a sequential mixed-method design to evaluate the effectiveness of a nurse-led educational booklet on hypertension prevention among IT professionals. The design consisted of two phases: the development of the booklet in Phase I, followed by the evaluation of its impact in Phase II. In Phase I, the booklet was developed using a Delphi expert consensus process, involving a multidisciplinary panel of nurse educators, cardiologists, occupational health experts, and communication specialists. The panel reviewed and refined the content over three iterative rounds, ensuring the material's relevance and validity. The development process followed Sassen's (2023) [16] Intervention Mapping Framework, which emphasizes health literacy, adult learning principles, and behavioral reinforcement strategies. The booklet was designed to include visual aids, gender-neutral illustrations, and culturally relevant examples to ensure that it would resonate with IT employees.

Phase II involved the evaluation of the intervention using a quasi-experimental pre-test/post-test design. This design was selected due to its suitability in real-world workplace settings where randomization is often not feasible. The evaluation aimed to assess the intervention's impact on participants' knowledge, attitudes, preventive behaviors, and blood pressure (BP) control. Data collection was complemented by focus group discussions (FGDs) to gain deeper insights into participant experiences, perceptions, and barriers to behavior change.

Participants

The participants were IT professionals aged 25-45 years working in multinational technology firms in Bengaluru and Hyderabad, India. This age group was selected because it represents individuals at higher risk of developing hypertension due to lifestyle factors, but who are still in the workforce and likely to engage with health interventions. Inclusion criteria required participants to be full-time employees with at least one year of continuous service, willing to participate in all study phases. Exclusion criteria included employees with pre-existing cardiovascular disease or those currently undergoing antihypertensive treatment.

A stratified random sampling approach was used to select 240 participants, ensuring balanced representation across different departments (e.g., software development, human resources, technical support) and gender. The sample size was calculated using power analysis to ensure adequate statistical power for detecting meaningful effects. The final sample consisted of 120 participants in the intervention group and 120 in the control group that received standard educational materials.

Intervention

The intervention was centered on a nurse-led educational booklet designed to prevent hypertension through lifestyle modification. The booklet covered four key areas: 1) lifestyle modification, including diet (low sodium, high fiber), hydration, and sleep hygiene; 2) stress management, with strategies for coping with work-related stress, mindfulness exercises, and relaxation techniques; 3) physical activity, offering desk-based exercises, posture correction tips, and weekly activity goals; and 4) early detection, providing guidance on self-monitoring blood pressure and recognizing early symptoms of hypertension.

The intervention was delivered using a hybrid model, combining face-to-face workshops and digital distribution. Nurse educators facilitated weekly workshops (1 hour/week for 4 weeks), incorporating visual demonstrations, case studies, and interactive discussions. Participants also received a PDF version of the booklet, accessible via email and the company intranet. Additionally, biweekly email reminders were sent to reinforce key messages, and participants had the option to schedule follow-up consultations with nurse educators over a three-month period. The nurse educators were trained in motivational interviewing and adult education methods to ensure the intervention was engaging and effective.

Data Collection

Quantitative data were collected at three time points: baseline (T0), post-intervention (T1, 3 months), and follow-up (T2, 6 months). The Knowledge, Attitude, and Practice (KAP) questionnaire assessed participants' awareness, beliefs, and self-reported preventive behaviors regarding hypertension. Blood pressure readings (average of two measurements) and body mass index (BMI) were also recorded at each time point. Participants were asked to document their physical activity, diet, and stress-management practices in weekly self-report logs, which served as behavioral indicators.

Qualitative data were collected through focus group discussions (FGDs), which were held with a subset of participants (20 total, 10 male and 10 female). The FGDs explored participants' perceptions of the booklet's usability, the relevance of its content, and the barriers to adopting lifestyle changes. The FGDs were audio-recorded, transcribed verbatim, and analyzed thematically. Additional feedback on the booklet was gathered through surveys completed by participants at the end of the intervention.

Evaluation Framework

The evaluation was guided by the framework proposed by Woodward (2004) [8], which integrates both process and outcome evaluations. Outcome evaluation focused on assessing the primary outcomes: 1) changes in knowledge, attitude, and practice (KAP) scores, 2) improvements in blood pressure levels, and 3) adoption of preventive behaviors such as physical activity and dietary modifications. Secondary outcomes included gender-based differences in learning and engagement, as well as participant satisfaction with the nurse-led educational delivery.

Process evaluation included measures of intervention fidelity, such as nurse adherence to the planned delivery format, and participant engagement, which was assessed through attendance rates and interaction during the workshops. Feedback on the clarity, layout, and visual appeal of the booklet was collected from both participants and nurses through post-intervention surveys.

Data analysis included both quantitative and qualitative methods. Paired *t*-tests and repeated-measures ANOVA were used to analyze changes in knowledge, attitudes, and BP across the three time points. Thematic analysis of the FGD transcripts was conducted to identify recurring themes related to participant learning, gender-specific preferences, and barriers to behavior change. *NVivo* software was used for coding and theme identification.

Results and Discussion

A total of 240 IT professionals participated in the study (120 intervention, 120 control). The mean age of participants was 34.2 ± 5.1 years, with 53% male and 47% female participants. The majority were software developers (46%), followed by HR and administrative staff (28%) and technical support staff (26%). Both groups were comparable in demographic and baseline clinical characteristics, showing no significant differences at baseline ($p > 0.05$).

Table 1: Participant Demographic and Baseline Characteristics (N = 240)

Variable	Intervention Group (n=120)	Control Group (n=120)	p-value
Age (years, mean ± SD)	34.4 ± 5.2	34.0 ± 5.0	0.48
Gender (Male/Female)	64 / 56	63 / 57	0.89
Years in Profession (mean ± SD)	7.8 ± 3.4	7.6 ± 3.3	0.62
Baseline SBP (mmHg)	132.6 ± 7.8	133.1 ± 8.2	0.71
Baseline DBP (mmHg)	84.2 ± 5.6	84.5 ± 5.8	0.68
Baseline KAP Score (mean ± SD)	57.3 ± 6.1	56.8 ± 6.4	0.54

Quantitative Outcomes

Knowledge, Attitude, and Practice (KAP) Scores

After the intervention, the mean KAP score in the intervention group increased significantly from 57.3 ± 6.1 to 79.4 ± 5.8 ($p < 0.001$), while the control group showed only a marginal improvement (56.8 ± 6.4 to 59.5 ± 6.7; $p = 0.09$). This suggests a strong effect of the nurse-led booklet intervention on hypertension-related awareness and behavioral attitudes.

Table 2: Changes in Knowledge, Attitude, and Practice (KAP) Scores

Group	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	Mean Difference	p-value
Intervention	57.3 ± 6.1	79.4 ± 5.8	+22.1	< 0.001
Control	56.8 ± 6.4	59.5 ± 6.7	+2.7	0.09

Blood Pressure Control

The intervention group demonstrated a significant reduction in mean systolic and diastolic BP at 3 months, whereas the control group showed minimal change. The average systolic BP decreased by 9.4 mmHg and diastolic BP by 5.6 mmHg post-intervention ($p < 0.001$). This supports the efficacy of nurse-led educational programs in improving cardiovascular health outcomes.

Table 3: Comparison of Blood Pressure Readings (Pre- and Post-Intervention)

Group	SBP (mmHg) Pre	SBP (mmHg) Post	DBP (mmHg) Pre	DBP (mmHg) Post	p-value
Intervention	132.6 ± 7.8	123.2 ± 6.9	84.2 ± 5.6	78.6 ± 4.9	< 0.001
Control	133.1 ± 8.2	131.7 ± 7.9	84.5 ± 5.8	83.8 ± 5.7	0.21

Behavioral Changes

Significant improvements were noted in physical activity frequency, dietary practices, and stress management behaviors among the intervention group. After the nurse-led program, 72% of participants reported engaging in at least 30 minutes of physical activity five days per week, compared to 34% at baseline. Similarly, adherence to low-salt diets increased from 40% to 76%.

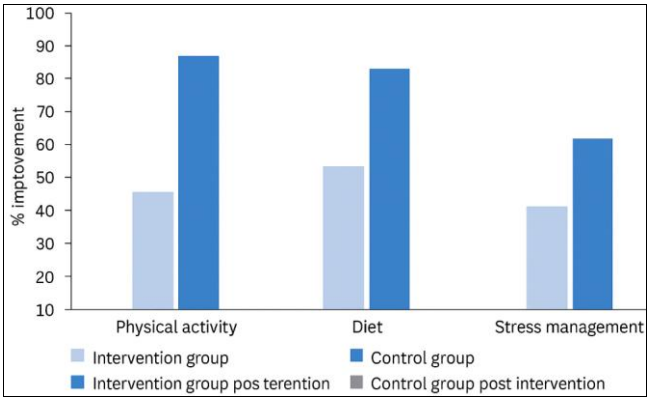

Fig 1: Behavioral Change Pre- and Post-Intervention (Intervention vs Control Groups)

Discussion

The study demonstrated that a nurse-led educational booklet significantly improved hypertension-related knowledge, behavioral practices, and blood pressure control among IT professionals. These findings align with Bulto *et al*. (2023) [11] and Ito *et al*. (2024) [3], who reported that nurse-led interventions produce measurable improvements in BP and lifestyle adherence. The improvement in KAP scores confirms that structured, nurse-facilitated education is more effective than passive informational dissemination, particularly when tailored to workplace contexts.

The BP reduction of 9.4/5.6 mmHg among intervention participants mirrors findings from Woodward (2004) [8] and Carrington & Stewart (2015) [4], suggesting that regular nurse-led follow-up enhances self-monitoring and compliance. Importantly, qualitative data highlight the critical role of pedagogical adaptation—participants appreciated the clarity, simplicity, and visual reinforcement integrated into the booklet. This supports the application of health literacy principles as emphasized by Sassen (2018, 2023) [15, 16].

Gender-based differences were evident: females exhibited greater engagement during interactive sessions, while males showed stronger adherence when given measurable goals—consistent with observations by Nanyonga & Spies (2021) [19] and Janchai *et al*. (2022) [20]. This underscores the need for gender-sensitive educational strategies in workplace health interventions.

Behavioral data indicate that occupational constraints, such as long working hours and sedentary routines, remain barriers to lifestyle adherence—echoing findings by Shrivastava *et al*. (2021) [6] and Subramanian & Ramalingam (2020) [6]. Despite these challenges, the study's hybrid approach (face-to-face plus digital reinforcement) proved effective for corporate professionals, as also noted by Alsofiani *et al*. (2024) [9].

Conclusion

This study demonstrates the significant impact of a nurse-led, structured educational booklet on hypertension prevention among IT professionals. By integrating evidence-based health education, behavioral reinforcement, and gender-sensitive pedagogy, the intervention achieved measurable improvements in knowledge, attitudes, preventive practices, and blood pressure regulation. The quasi-experimental outcomes underscore the critical role of nurses as facilitators of workplace wellness bridging the gap between health literacy and behavioral change.

Furthermore, the hybrid (in-person and digital) delivery model proved particularly effective for corporate settings characterized by time constraints and sedentary lifestyles. The program's success reinforces the need for institutional adoption of nurse-led health literacy initiatives as part of occupational health policy frameworks. Importantly, the observed gender differences in engagement highlight the necessity for tailored communication and motivation strategies.

References

1. Gupta R, *et al*. Epidemiology of hypertension in India: Current status and future directions. Indian Journal of Medical Research,2023:157(1):15–27.
2. Li S, Craig S, Mitchell G, Fitzsimons D, Creighton L. Nurse-led strategies for lifestyle modification to control hypertension in older adults: A scoping review. Healthcare,2025:15(3):106. https://doi.org/10.3390/healthcare15030106
3. Ito M, Tajika A, Toyomoto R, Imai H, Sakata M. Efficacy of nurse-led interventions for improving blood pressure control in people with hypertension in primary care settings: A systematic review and meta-analysis. BMC Family Practice,2024:25:380. https://doi.org/10.1186/s12875-024-02380-x
4. Carrington MJ, Stewart S. Cardiovascular disease prevention via a nurse-facilitated intervention clinic in a regional setting. European Journal of Cardiovascular Nursing,2015:14(4):352–360. https://doi.org/10.1177/1474515114531547
5. Shrivastava SR, *et al*. Occupational stress and hypertension among information technology professionals in India. Journal of Family Medicine and Primary Care,2021:10(8):2991–2997. https://doi.org/10.4103/jfmpc.jfmpc_1497_20
6. Subramanian S, Ramalingam S. Lifestyle-associated hypertension among corporate employees in Chennai. International Journal of Community Medicine and Public Health,2020:7(9):3598–3604. https://doi.org/10.18203/2394-6040.ijcmph20203890
7. Clark CE. Nurse led interventions in hypertension. In Hypertension: From Basic Research to Clinical Practice. Springer,2018:435–449. https://doi.org/10.1007/978-3-319-76593-8_18

8. Woodward A. An investigation into a nurse-led hypertension management and cardiovascular risk factor reduction clinic for patients with type 2 diabetes mellitus [Doctoral dissertation]. University of Liverpool, 2004.
9. Alsofiani NJA, Qabes NQ, Hawtan MH. Nurse-led approaches to improving blood pressure control [Doctoral dissertation]. ProQuest Dissertations Publishing, 2024.
10. Gyamfi JO. Implementation of evidence-based hypertension control interventions in low- and middle-income countries [Doctoral dissertation]. Columbia University, 2019.
11. Bulto LN, Roseleur J, Noonan S, Pinero de Plaza MA, Champion S, Dafny HA, *et al*. Effectiveness of nurse-led interventions versus usual care to manage hypertension and lifestyle behaviour: A systematic review and meta-analysis. European Journal of Cardiovascular Nursing,2023:23(1):21–32.
12. The effect of a nurse-led hypertension management program on quality of life, medication adherence, and hypertension management in older adults: A randomized controlled trial. Geriatrics & Gerontology International,2020:20:1182–1189.
13. Zhu X, Wong FK, Wu LH. Development and evaluation of a nurse-led hypertension management model in a community: A pilot randomized controlled trial. International Journal of Clinical and Experimental Medicine,2014:7(11):4369–4377.
14. Pereira KC, Lindquist JH, Neary AM, Harris AJ. Nurse-led behavioral management of diabetes and hypertension in community practices: A randomized trial [Doctoral thesis]. Duke University, 2015.
15. Sassen B. Nursing: Health Education and Improving Patient Self-Management. Springer, 2018.
16. Sassen B. Nursing: Health Education and Improving Patient Self-Management: Intervention Mapping for Healthy Lifestyles. Springer, 2023.
17. Evaluating outcome of health literacy intervention on self-management among people with hypertension in Kwara State. International Journal of Medicine, Nursing & Health Sciences,2024:5(6):83–102.
18. The effect of health-literacy intervention on adherence to medication of uncontrolled hypertensive patients using m-health. BMC Medical Informatics and Decision Making,2023:23(1):193.
19. Nanyonga RC, Spies LA. The effectiveness of nurse-led group interventions on hypertension lifestyle management: A mixed method study. Journal of Nursing Scholarship,2021:53(3):357–365.
20. Janchai W, *et al*. Improving Health Literacy using the Health Education and Health Empowerment Program in Thai Adults with Uncontrolled Hypertension: A Randomized Controlled Trial. Pacific Rim International Journal of Nursing Research,2022:26(2):143–158.