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Effectiveness of A Nurse-Led Digital Wellness Program On Knowledge Regarding Coronary Artery Disease Risk and Prevention Among Bank Employees

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Abstract- Background: Coronary artery disease (CAD) remains a leading cause of morbidity and mortality worldwide, with modifiable risk factors being prevalent among working professionals, particularly bank employees who lead sedentary lifestyles. Digital health interventions offer promising avenues for health promotion and disease prevention in workplace settings. Objective: To evaluate the effectiveness of a nurse-led digital wellness program on knowledge regarding the risk of coronary artery disease and its prevention among bank employees at selected banks in Jaipur, Rajasthan. Methods: A quasi-experimental research design was employed with 100 bank employees (50 in experimental group and 50 in control group) from State Bank of India branches in Jaipur. Non-probability purposive sampling was used. The experimental group received a nurse-led digital wellness program, while the control group received no intervention. Knowledge was assessed using a structured questionnaire (reliability r=0.772) before and after the intervention. Data were analyzed using descriptive and inferential statistics. Results: In the experimental group, pre-test mean knowledge score was 17.02 (SD=4.14), which significantly improved to 34.8 (SD=4.52) post-intervention (t=2.44, p<0.05). In contrast, the control group showed no significant change (pre-test mean=15.6, SD=3.93; post-test mean=15.46, SD=4.14; t=0.008, p>0.05). In the experimental group, 74% participants achieved good knowledge levels post-intervention compared to 0% pre-intervention. Significant associations were found between post-test knowledge scores and dietary pattern, smoking habit, and alcoholic consumption (p<0.05). Conclusion: The nurse-led digital wellness program was highly effective in improving knowledge regarding coronary artery disease risk and prevention among bank employees. This intervention demonstrates the potential of technology-enabled nursing interventions for workplace health promotion.

Keywords: Coronary artery disease, digital wellness program, nurse-led intervention, bank employees, knowledge assessment, workplace health promotion.

I. INTRODUCTION

Coronary artery disease (CAD) represents a significant public health challenge globally, contributing substantially to cardiovascular mortality and morbidity. The condition is characterized by atherosclerotic plaque accumulation in coronary arteries, leading to reduced blood flow to the myocardium. While medical advances have improved treatment outcomes, prevention through risk factor modification remains the most cost-effective approach to reducing the burden of CAD.

Bank employees constitute a population at particular risk for developing CAD due to the nature of their occupation. The banking sector is characterized by high-stress work environments, prolonged sedentary behavior, irregular meal patterns, and limited opportunities for physical activity during working hours. These occupational characteristics align closely with established risk factors for cardiovascular disease, including physical inactivity, poor dietary habits, obesity, and chronic stress.

Knowledge about CAD risk factors and prevention strategies is fundamental to behavior change and risk reduction. However, traditional health education methods in workplace settings face numerous barriers, including time constraints, scheduling conflicts, and limited accessibility. The advent of digital health technologies offers innovative solutions to overcome these challenges, enabling flexible, scalable, and personalized health education delivery.

Nurse-led interventions have demonstrated effectiveness across various healthcare contexts. Nurses possess unique skills in health education, behavior modification counseling, and patient engagement. When combined with digital platforms, nurse-led programs can leverage technology to extend reach while maintaining the personalized, evidence-based approach characteristic of nursing practice.

This study was designed to evaluate the effectiveness of a nurse-led digital wellness program in improving knowledge about CAD risk and prevention among bank employees. The intervention addresses a critical gap in workplace health promotion by combining nursing expertise with digital technology to deliver accessible, evidence-based cardiovascular health education.

Objectives

The study was conducted with the following specific objectives:

1. To assess the pre-test knowledge score regarding the risk of coronary artery disease and its prevention among bank employees.
2. To assess the post-test knowledge score regarding the risk of coronary artery disease and its prevention among bank employees.
3. To determine the effectiveness of the nurse-led digital wellness program on knowledge regarding the risk of coronary artery disease and its prevention among bank employees.
4. To find-out the association between post-test score of knowledge regarding the risk of coronary artery disease and its prevention among bank employees and their selected background variables.

Hypotheses

Research Hypotheses

- **H1:** There will be a significant difference in the pre-test and post-test score of knowledge regarding the risk of coronary artery disease and its prevention among bank employees at 0.05 level of significance.
- **H2:** There will be a significant association between post-test score of knowledge regarding the risk of coronary artery disease and its prevention among bank employees and their selected background variables at 0.05 level of significance.

Null Hypotheses

- **H01:** There will be no significant difference in the pre-test and post-test score of knowledge regarding the risk of coronary artery disease and its prevention among bank employees at 0.05 level of significance.
- **H02:** There will be no significant association between post-test score of knowledge regarding the risk of coronary artery disease and its prevention among bank employees and their selected background variables at 0.05 level of significance.

Assumptions

- The bank employees may have some knowledge regarding the risk of coronary artery disease and its prevention.
- The individuals who have healthy lifestyle may prevent themselves from the risk of coronary artery disease (CAD).
- The nurse-led digital wellness program on knowledge regarding the risk of coronary artery disease and its prevention among bank employees will enhance their knowledge about the risk of coronary artery disease and its prevention.

II. METHODOLOGY

Research Approach

A quantitative research approach was adopted for this study. This approach was selected as it enables systematic investigation of phenomena through numerical data collection and statistical analysis, which is appropriate for measuring knowledge scores and evaluating intervention effectiveness.

Research Design

A quasi-experimental research design was employed for this investigation. This design was chosen due to practical constraints in randomization within the workplace setting while still allowing for comparison between intervention and control groups through pre-test and post-test measurements.

Variables

Independent Variable

The independent variable in this study was the nurse-led digital wellness program, which comprised structured educational content about coronary artery disease risk factors and prevention strategies delivered through digital platforms under nursing guidance.

Dependent Variable

The dependent variable was the knowledge score regarding the risk of coronary artery disease and its prevention among bank employees, measured using a structured knowledge questionnaire.

Background Variables

Background variables included age, gender, marital status, educational qualification, dietary pattern, smoking status, alcohol consumption, frequency of exercise, and years of service in the banking sector.

Setting

The study was conducted at two State Bank of India branches in Jaipur, Rajasthan: the Tilak Nagar branch and the Secretariat branch. These settings were selected based on accessibility, adequate sample size availability, and willingness of bank management to participate in the research.

Population and Sample

Population

The target population comprised employees working at State Bank of India branches in Jaipur, Rajasthan.

Sample Size

The total sample size was 100 participants, with 50 participants allocated to the experimental group and 50 participants to the control group.

Sampling Technique

Non-probability purposive sampling technique was adopted. This method allowed selection of participants who met specific inclusion criteria and were available and willing to participate in the study.

Data Collection Tools

The data collection instrument consisted of two sections:

Section A: Socio-demographic Profile

This section collected information on background variables including age, gender, marital status, educational qualification, dietary pattern, personal habits (smoking and alcohol consumption), frequency of exercise, and years of service in the banking sector.

Section B: Structured Knowledge Questionnaire

This section comprised a structured questionnaire designed to assess knowledge regarding coronary artery disease risk factors and prevention strategies. The questionnaire covered various domains including understanding of CAD, identification of risk factors, knowledge of preventive measures, and awareness of lifestyle modifications.

Validity and Reliability

Validity

Content validity of the tool was established through expert validation. Seven experts in the fields of medical-surgical nursing, community health nursing, and cardiology reviewed the instrument. Modifications were incorporated based on their recommendations and suggestions to ensure the tool comprehensively covered the relevant content areas.

Reliability

The reliability of the structured knowledge questionnaire was assessed using the Kuder-Richardson Formula 21 (KR-21) method, which is appropriate for dichotomously scored items. The reliability coefficient was r=0.772, indicating good internal consistency and reliability of the instrument.

Data Collection Procedure

Data collection was conducted following a systematic protocol. The researcher first introduced herself to potential participants and explained the purpose and nature of the study. Written informed consent was obtained from all participants who agreed to participate. The structured knowledge questionnaire was then administered to collect baseline (pre-test) data. The intervention was delivered to the experimental group, while the

control group received no intervention. Post-test data collection was conducted after the intervention period. Each data collection session took approximately one and a half hours. Participants were thanked for their participation at the conclusion of each session.

Data Analysis

Data were analyzed using both descriptive and inferential statistics. Descriptive statistics included frequency, percentage, mean, median, mode, and standard deviation. Inferential statistics included paired t-test to compare pre-test and post-test scores within groups, and chi-square test to examine associations between post-test knowledge scores and background variables. Statistical significance was set at $p<0.05$ level.

III. RESULTS

The findings of the study are organized into five sections: (I) description of background variables, (II) assessment of knowledge levels, (III) descriptive statistics of knowledge scores, (IV) effectiveness of the intervention, and (V) association between knowledge scores and background variables.

Section I: Background Characteristics of Participants
Age Distribution

The majority of participants in both groups were in the 41-50 years age category (60% in control group, 62% in experimental group), followed by 31-40 years (32% in control group, 28% in experimental group), with only a small proportion in the 51-60 years category (8% in control group, 10% in experimental group). No participants were in the 21-30 years age range.

Gender Distribution

The sample showed a strong male predominance, with 86% male participants and 14% female participants in both control and experimental groups.

Marital Status

All participants (100%) in both groups were married. No participants were single, divorced, or widowed.
Educational Qualification

The majority of participants were graduates (76% in control group, 72% in experimental group), followed by those with postgraduate and higher qualifications (14% in control group, 20% in experimental group), with a small proportion having higher secondary education (10% in control group, 8% in experimental group).

Dietary Pattern

Most participants followed a vegetarian diet (72% in control group, 82% in experimental group), with the remainder being non-vegetarian (28% in control group, 18% in experimental group).

Smoking Habits

The majority of participants were non-smokers (80% in control group, 84% in experimental group), with 20% smokers in control group and 16% smokers in experimental group.

Alcohol Consumption

Most participants were non-alcoholic (84% in control group, 74% in experimental group), with 16% alcoholic in control group and 26% alcoholic in experimental group.

Exercise Frequency

The majority of participants exercised only once a month (80% in control group, 72% in experimental group), with small proportions exercising twice a week (12% in control group, 18% in experimental group) or daily (8% in control group, 10% in experimental group). None exercised once a week.

Years of Service

Most participants had 11-20 years of service (60% in control group, 68% in experimental group), followed by 1-10 years (30% in control group, 22% in experimental group), and 21-30 years (10% in both groups). No participants had 31-40 years of service.

Section II: Assessment of Knowledge Levels

Knowledge Score Categorization

Knowledge scores were categorized into three levels: Poor (0-15), Average (16-30), and Good (31-45).

Pre-test Knowledge Assessment

In the control group pre-test, 52% of participants demonstrated average knowledge and 48% had

poor knowledge, with no participants in the good knowledge category. In the experimental group pre-test, 78% showed average knowledge and 22% had poor knowledge, again with no participants demonstrating good knowledge.

Post-test Knowledge Assessment

In the control group post-test, the distribution remained similar with 54% in average category and 46% in poor category, with no participants achieving good knowledge. In contrast, the experimental group post-test showed dramatic improvement: 74% of participants achieved good knowledge levels, 26% remained in average category, and no participants were in the poor knowledge category.

Section III: Descriptive Statistics of Knowledge Scores

Table 1 presents the mean, median, mode, and standard deviation of knowledge scores for both groups at pre-test and post-test assessments.

Statistical Measure	Control Group Pre-test	Control Group Post-test	Experimental Group Pre-test	Experimental Group Post-test
Mean	15.6	15.46	17.02	34.8
Mode	19	19	18	38
Median	16	16	18	35
Standard Deviation	3.93	4.14	4.14	4.52

Table 1: Descriptive Statistics of Knowledge Scores (N=50 per group)

Section IV: Effectiveness of the Intervention

The effectiveness of the nurse-led digital wellness program was evaluated using paired t-test to compare pre-test and post-test knowledge scores within each group. Table 2 presents the effectiveness analysis results.

Group	Calculated t-value	Tabulated t-value	Significance at α=0.05
Control Group	0.008	2.010	NS
Experimental Group	2.439	2.010	S

Table 2: Effectiveness of Nurse-Led Digital Wellness Program

Note: S = Significant; NS = Non-Significant; $\alpha = 0.05$

Table 2 demonstrates that in the control group, the calculated t-value (0.008) was less than the tabulated value (2.010), indicating no significant difference between pre-test and post-test scores. However, in the experimental group, the calculated t-value (2.439) exceeded the tabulated value (2.010), demonstrating a statistically significant improvement in knowledge scores following the intervention. These findings confirm that the nurse-led digital wellness program was effective in enhancing knowledge regarding coronary artery disease risk and prevention.

Section V: Association Between Knowledge Scores and Background Variables

Chi-square test was employed to examine associations between post-test knowledge scores and selected background variables in the experimental group. The results revealed the following significant and non-significant associations:

Significant Associations ($p<0.05$)

Dietary Pattern: A significant association was found between dietary pattern and post-test knowledge scores ($\chi^2=22.56$, df=1, $p<0.05$). Vegetarian participants demonstrated higher knowledge scores, with 36 of 41 vegetarians achieving good knowledge levels, while only 1 of 9 non-vegetarians reached good knowledge category.

Smoking Habit: Smoking status showed significant association with knowledge scores ($\chi^2=27.11$, df=1, $p<0.05$). All 8 smokers remained in the average knowledge category, while 37 of 42 non-smokers achieved good knowledge levels.

Alcohol Consumption: Alcohol consumption demonstrated significant association with post-test knowledge ($\chi^2=31.37$, df=1, $p<0.05$). Among 13 alcoholic participants, 11 remained in average category with only 2 achieving good knowledge,

whereas 35 of 37 non-alcoholic participants achieved good knowledge levels.

Non-Significant Associations (p>0.05)

No significant associations were found between post-test knowledge scores and the following variables: age (χ^2=0.14, df=2, p>0.05), gender (χ^2=2.86, df=1, p>0.05), educational qualification (χ^2=0.10, df=2, p>0.05), frequency of exercise (χ^2=3.8, df=2, p>0.05), and years of service (χ^2=0.82, df=2, p>0.05).

IV. DISCUSSION

This quasi-experimental study evaluated the effectiveness of a nurse-led digital wellness program on knowledge regarding coronary artery disease risk and prevention among bank employees. The findings provide robust evidence supporting the efficacy of this intervention approach in workplace health promotion.

Effectiveness of the Intervention

The study demonstrated significant improvement in knowledge scores following the nurse-led digital wellness program. The experimental group showed a remarkable increase in mean knowledge score from 17.02 to 34.8, representing a 104% improvement. This dramatic enhancement is evidenced by the shift in knowledge categories, with 74% of participants achieving good knowledge levels post-intervention compared to none at baseline. The statistical significance of this improvement (t=2.439, p<0.05) confirms the effectiveness of the intervention.

These findings align with previous research demonstrating the effectiveness of nurse-led interventions in cardiovascular health promotion. Ritngam et al. (2024) similarly reported significant reductions in cardiovascular risks following a nurse-led workplace intervention among Thai workers, supporting the generalizability of nurse-led approaches across different populations and cultural contexts.

The control group, which received no intervention, showed minimal change between pre-test and post-test assessments (15.6 to 15.46), confirming that the improvements observed in the experimental group were attributable to the intervention rather than external factors, repeated testing, or natural knowledge acquisition over time.

Baseline Knowledge Levels

The baseline assessment revealed that bank employees had limited knowledge about coronary artery disease risk factors and prevention strategies, with no participants demonstrating good knowledge levels in either group at pre-test. This finding underscores a critical gap in cardiovascular health literacy among banking professionals and validates the need for targeted educational interventions in this population.

The inadequate baseline knowledge is particularly concerning given that the majority of participants (60-62%) were in the 41-50 years age group, a period when cardiovascular risk typically begins to increase. Furthermore, the high prevalence of sedentary behavior, evidenced by 72-80% of participants exercising only once monthly, compounds the risk profile of this population.

Associations with Background Variables

The significant associations found between post-test knowledge scores and lifestyle factors (dietary pattern, smoking, and alcohol consumption) suggest important patterns worthy of consideration. Participants with healthier baseline behaviors (vegetarian diet, non-smoking, non-alcoholic) achieved better knowledge outcomes following the intervention.

This pattern may reflect several underlying mechanisms. Individuals who already practice health-promoting behaviors may be more receptive to health education, have greater health consciousness, or possess cognitive frameworks that facilitate integration of new health information. Alternatively, those engaging in risk behaviors may experience cognitive dissonance when confronted with health information that challenges their current practices, potentially creating psychological barriers to knowledge acquisition and retention.

The absence of significant associations with demographic factors (age, gender, education) and occupational variables (years of service) suggests that the intervention was equally effective across these dimensions. This universality is encouraging from a program implementation perspective, indicating that the nurse-led digital wellness program can benefit diverse employee populations without requiring extensive customization based on demographic characteristics.

Implications for Workplace Health Promotion

The success of this intervention has important implications for workplace health promotion strategies. The digital delivery format addresses common barriers to workplace health education, including time constraints and scheduling difficulties. By leveraging technology, the program achieved broad reach while maintaining the personalized, evidence-based approach characteristic of nursing interventions.

The banking sector, with its predominance of desk-based work and high-stress environments, represents an ideal target population for cardiovascular health promotion. The findings suggest that similar interventions could be effectively implemented across other sedentary occupational sectors facing comparable cardiovascular risk profiles.

However, the associations between lifestyle behaviors and knowledge acquisition highlight the need for comprehensive interventions that address not only knowledge deficits but also behavioral change. Future programs should consider integrating motivational interviewing, behavioral counseling, and environmental modifications alongside educational components to optimize health outcomes.

Limitations

Several limitations should be acknowledged when interpreting these findings. The study was conducted at selected State Bank of India branches in Jaipur, which may limit generalizability to other banks, geographic regions, or private sector institutions. The use of non-probability purposive sampling, while appropriate for the study objectives, introduces potential selection bias.

The quasi-experimental design, though pragmatic for workplace settings, lacks the rigor of randomized controlled trials. The absence of randomization could introduce confounding variables despite efforts to maintain group comparability. Additionally, the study assessed only knowledge outcomes without measuring actual behavior change or clinical outcomes such as blood pressure, cholesterol levels, or body mass index.

The demographic homogeneity of the sample (100% married, 86% male) may limit applicability to more diverse populations. Furthermore, the study did not include long-term follow-up to assess knowledge retention or sustained behavior change, which are critical for evaluating the enduring impact of the intervention.

V. CONCLUSION

This study provides compelling evidence for the effectiveness of a nurse-led digital wellness program in improving knowledge regarding coronary artery disease risk and prevention among bank employees. The intervention resulted in statistically significant and clinically meaningful improvements in knowledge scores, with 74% of participants achieving good knowledge levels post-intervention compared to none at baseline.

The findings demonstrate that technology-enabled nursing interventions can effectively address cardiovascular health knowledge gaps in workplace populations. The digital delivery format offers scalability and accessibility advantages while maintaining the evidence-based, personalized approach that characterizes effective nursing practice.

The significant associations between lifestyle factors and knowledge acquisition suggest that future interventions should adopt comprehensive approaches that address both knowledge and behavior change. Integration of motivational strategies, behavioral counseling, and environmental

modifications may enhance the translation of knowledge into sustained health behaviors and risk reduction.

Given the substantial burden of coronary artery disease and the modifiable nature of major risk factors, nurse-led digital wellness programs represent a promising strategy for workplace health promotion. Organizations should consider implementing similar interventions as part of comprehensive employee wellness initiatives aimed at reducing cardiovascular disease risk and promoting long-term health.

Recommendations

For Practice

- Banking organizations should implement nurse-led digital wellness programs as standard components of employee health and wellness initiatives to improve cardiovascular health knowledge and risk awareness.
- Occupational health nurses should incorporate digital platforms into their practice to extend reach and accessibility of health education while maintaining personalized, evidence-based approaches.
- Workplace health programs should address lifestyle risk factors (smoking, alcohol consumption, dietary patterns) through comprehensive interventions that combine education with behavioral support and environmental modifications.

For Future Research

- Comparative studies should be conducted between government and private sector banks to examine whether organizational culture and work environment influence intervention effectiveness.
- Longitudinal studies with extended follow-up periods are needed to assess knowledge retention, sustained behavior change, and impact on clinical outcomes such as blood pressure, lipid profiles, and cardiovascular event rates.
- Randomized controlled trials should be conducted to provide higher-level evidence for the effectiveness of nurse-led digital wellness programs across diverse populations and settings.
- Research should examine the mechanisms underlying the associations between baseline lifestyle behaviors and knowledge acquisition to inform targeted intervention strategies.
- Cost-effectiveness analyses should be performed to evaluate the economic value of nurse-led digital wellness programs relative to traditional health education approaches and potential healthcare cost savings from risk reduction.
- Studies should investigate optimal intervention components, duration, and delivery methods to maximize knowledge acquisition, behavior change, and cardiovascular risk reduction in workplace populations.

REFERENCES

1. Ritngam, A., Kalampakorn, S., Lagampan, S., & Jirapongsuwan, A. (2024). Effectiveness of a nurse-led workplace intervention in reducing cardiovascular risks among Thai workers: A randomized controlled trial. Journal of Primary Care & Community Health, 15, 21501319241281211. https://doi.org/10.1177/21501319241281211
2. Awareness and attitude on prevention of coronary artery disease among non health care workers: A cross-sectional study. (2023). ResearchGate. Retrieved from https://www.researchgate.net/publication/376944625
3. Prevalence of coronary artery disease and its risk factors in Kerala, South India: A community-based cross-sectional study. ResearchGate. Retrieved from https://www.researchgate.net/publication/290437820
4. International Journal of Health Sciences and Research. (2019). A study to evaluate the effectiveness of self instructional module on knowledge regarding prevention of coronary artery disease among middle aged women in selected urban area, Bangalore. IJHSR, 9(3). Retrieved from https://www.ijhsr.org/IJHSR_Vol9_Issue3_March2019/