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AN INTER-DISCIPLINARY BIO-PSYCHO-SOCIAL INTERVENTION FOR PROMOTION OF WELLNESS AMONG WOMEN EMPLOYEES: A COMPARATIVE PRE-POST STUDY ON OCCUPATIONAL DYNAMICS, METABOLIC RISK AND PHYSICAL ACTIVITY SUPPORTED BY RUSA

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ABSTRACT

Background: Women employees of higher educational institutions face varied occupational demands, sedentary exposure, dietary challenges, and psychological pressure. An integrated workplace wellness model can tackle these factors collectively, rather than treating physical, nutritional and psychological health as separate concerns. Objective: To assess a university-based bio-psycho-social wellness program among female employees and to compare selected anthropometric, metabolic and cardiovascular indicators pre- and post-participation. To characterise baseline physical-activity and sitting patterns across occupational groups. Methods: This prospective pre-post interventional cohort study was conducted in RUSA project "Integrated Bio-Psycho-Social Approach in Ensuring Wellness among Women" in Sri Padmavati Mahila Visvavidyalayam, Tirupati. The cohort consisted of 150 women aged 30–62 years: teaching (n=53), non-teaching (n=46) and janitorial (n=51). The intervention consisted of 40 days of structured physical activity, 40 minutes a day, and one workshop of nutritional awareness and one of psychological awareness. Body mass index, body fat, basal metabolic rate, blood glucose and blood pressure were measured before and after the program. Results: At baseline, 59.3% reported regular physical activity while 40.7% reported no regular exercise. 77.3% reported sitting for more than three hours per day. Mean BMI decreased from 28.32±5.22 to 27.71±5.02 kg/m², body fat from 39.15±9.66% to 37.23±9.40%, blood glucose from 124.95±47.70 to 115.37±37.97 mg/dL, systolic blood pressure from 123.58±16.64 to 119.32±14.55 mmHg and diastolic blood pressure from 77.08±10.32 to 74.07±9.12 mmHg. BMR was decreased from 1387.41±211.51 to 1380.50±210.44 kcal/day. The project analysis reports that these measures differed statistically significantly pre-post. Conclusion: The program was feasible in a university workplace and was associated with positive short-term changes in a number of health indicators measured. The results are promising for institutional wellness planning, but the single-group pre–post design does not allow for definitive causal attribution. Controlled studies are required with long-term follow-up.

INTRODUCTION

Non-communicable diseases (NCDs) are increasingly affecting adults during their working years. Excess adiposity, physical inactivity, prolonged sitting, unhealthy dietary patterns, elevated blood pressure, and psychological stress often coexist. Among working women, occupational responsibilities may overlap with household and caregiving responsibilities, potentially increasing the overall health burden. These interacting pressures may limit the time available for planned physical activity, regular meals, adequate sleep, and effective stress management.

Health promotion therefore requires an approach that extends beyond a narrow disease-centred model. Engel's **biopsychosocial model** emphasizes the interaction between biological processes, psychological states, and social circumstances. This framework is particularly relevant in occupational settings, where job roles, work organization, social relationships, financial circumstances, and access to health information may influence health behaviours and health outcomes.

Universities are important workplace settings for health promotion because they bring together employees from diverse educational, socioeconomic, and occupational backgrounds. Teaching staff may engage in prolonged sedentary academic, classroom, and administrative activities, while non-teaching staff may primarily perform desk-based administrative or technical work. Janitorial staff may have greater occupational mobility but may also experience physically demanding work, musculoskeletal stress, and different levels of access to preventive health education. Therefore, workplace health-promotion programmes require a common institutional framework while allowing flexibility according to occupational characteristics.

Workplace wellness interventions are increasingly recognized as practical approaches for promoting healthy behaviours and improving employee wellbeing. Physical activity can contribute to energy expenditure, functional capacity, and cardiometabolic health. Nutritional counselling may help participants translate dietary recommendations into realistic daily practices. Psychological-awareness activities may support coping, sleep hygiene, mindfulness, and emotional self-regulation. Together, these components may reinforce healthy behaviours and support overall wellbeing.

This integrated approach was adopted in the present RUSA project among women employees of **Sri Padmavati Mahila Visvavidyalayam, Tirupati, Andhra Pradesh**. The programme consisted of 40 days of structured physical activity, with 40-minute sessions conducted daily, together with a nutritional-awareness workshop and a psychological-awareness workshop. The present study reports the pre–post changes in selected health indicators and describes the occupational setting in which the programme was implemented.

1. Rationale and Research Gap

Although the benefits of physical activity, dietary improvement, and psychological support are well established individually, real-world evidence on integrated programmes delivered across different occupational cadres within a university setting remains comparatively limited. Many workplace interventions focus on a single risk factor or are conducted among relatively homogeneous employee populations.

The present study addresses this practical gap by including women employees from teaching, non-teaching, and janitorial occupational groups within a single institution and by combining structured physical activity with targeted nutritional and psychological education.

2. Conceptual Framework

The intervention was developed around three interconnected domains of the biopsychosocial framework.

The **biological domain** included body mass index (BMI), body fat percentage, basal metabolic rate (BMR), blood glucose, and blood pressure.

The **psychological domain** included awareness of stress, coping strategies, sleep, mindfulness, and emotional regulation.

The **social domain** included occupational role, peer participation, institutional accessibility, and the practical circumstances of working women.

The programme was based on the premise that improved health awareness and social support may facilitate healthier behaviours, while regular physical activity and dietary modifications may contribute to improvements in selected biological indicators.

3. OBJECTIVES

The objectives of the study were:

- To identify and enrol women employees from teaching, non-teaching, and janitorial occupational groups and provide an integrated wellness programme.
- To assess selected anthropometric, metabolic, and cardiovascular indicators before and after the intervention.
- To describe baseline physical activity and sedentary sitting behaviour among the participants.
- To document changes in selected reported lifestyle-related health conditions following programme participation.

4. MATERIALS AND METHODS

4.1 Study Design and Setting

A **prospective, pre–post interventional cohort study** was conducted at Sri Padmavati Mahila Visvavidyalayam, Tirupati, Andhra Pradesh, under the RUSA project entitled **"Integrated Bio-Psycho-Social Approach in Ensuring Wellness among Women."**

The larger project was implemented over a period of two years. The structured intervention evaluated in the present study consisted of a 40-day physical-activity programme supported by two single-day awareness workshops focusing on nutrition and psychological wellbeing.

4.2 Participants and Occupational Strata

A total of **150 women employees aged 30–62 years** participated in the programme. The participants comprised **53 (35.3%) teaching staff, 46 (30.7%) non-teaching staff, and 51 (34.0%) janitorial staff**.

The age distribution was as follows:

- 91 (60.7%) participants were aged 30–45 years.
- 56 (37.3%) participants were aged 46–60 years.
- 3 (2.0%) participants were aged >60 years.

4.3 Intervention Protocol

Physical-Activity Programme

The physical-activity programme was conducted for **40 days**, with **40-minute sessions each day**. Activities were adapted according to participants' functional capacity and included walking or gym-based aerobic activity, simple strengthening exercises, selected yoga postures, and breathing and relaxation practices.

The programme was designed to provide structured physical activity in addition to routine occupational movement.

Nutritional-Awareness Workshop

A one-day nutritional-awareness workshop addressed balanced meals, practical meal planning, whole grains and millets, moderation of salt and refined sugars, adequate hydration, and healthier food choices within the constraints of working life.

The educational content was designed to improve practical nutritional awareness and was not intended to replace individualized clinical dietary management where required.

Psychological-Awareness Workshop

A one-day psychological-awareness workshop addressed stress recognition and management, coping strategies, time management, sleep hygiene, mindfulness-oriented practices, emotional self-regulation, and supportive social relationships. The workshop was educational and preventive in nature.

5. MEASUREMENTS

BMI, body fat percentage, and BMR were measured using an Omron Body Composition Monitor. Resting systolic blood pressure (SBP) and diastolic blood pressure (DBP) were recorded, and blood glucose was assessed.

Information regarding physical activity, daily sitting duration, and selected lifestyle- and health-condition variables was collected using questionnaires.

The supplied project material refers to the glucose assessment as a fasting assessment**.** This terminology should be verified against the original laboratory records before the final manuscript is submitted.

6. STATISTICAL ANALYSIS

Continuous variables were summarized using mean and standard deviation (SD)**.** Pre–post comparisons were performed using appropriate paired statistical tests according to the original project analysis. Categorical variables were summarized using frequencies and percentages. Comparative analyses of categorical variables were performed using appropriate statistical methods, including chi-square or paired categorical tests where applicable. A p-value <0.05 was considered statistically significant. The statistical output should be independently verified against the original dataset and statistical software output before manuscript submission, particularly the extremely small p-values reported for some outcomes.

7. RESULTS

7.1 Occupational Distribution

Table 01: Occupational distribution of participants

Occupational group	n	%
Teaching staff	53	35.3
Non-teaching staff	46	30.7
Janitorial staff	51	34.0
Total	**150**	**100.0**

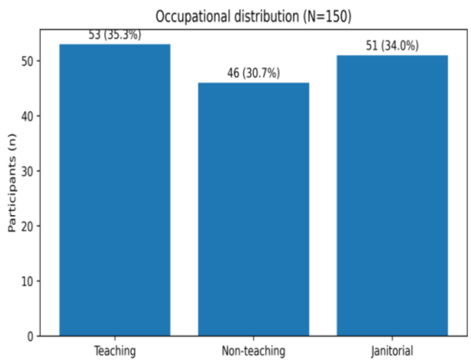


Figure 01: Occupational distribution of women employees included in the programme.

4.1 Baseline Demographic and Physical-Activity Profile

The baseline demographic, sitting-duration, and physical-activity characteristics of the participants are presented in Table 2. Of the 150 participants, the majority (60.7%) were aged 30–45 years, followed by 37.3% aged 46–60 years, while 2.0% were aged >60 years. Regarding daily sitting duration, 54.7% reported sitting for 3–6 hours per day, while 19.3% reported 6–9 hours and 3.3% reported >9 hours per day. Overall, 77.3% of participants reported sitting for at least 3 hours per day. Regular exercise was reported by 59.3% of participants, whereas 40.7% reported no regular exercise.

Table 02: Baseline Demographic, Sitting, and Physical-Activity Profile of Participants

Characteristic	n	%
Age 30–45 years	91	60.7
Age 46–60 years	56	37.3
Age >60 years	3	2.0
Sitting <3 h/day	34	22.7
Sitting 3–6 h/day	82	54.7
Sitting 6–9 h/day	29	19.3
Sitting >9 h/day	5	3.3
Regular exercise	89	59.3
No regular exercise	61	40.7
Total	**150**	**100.0**

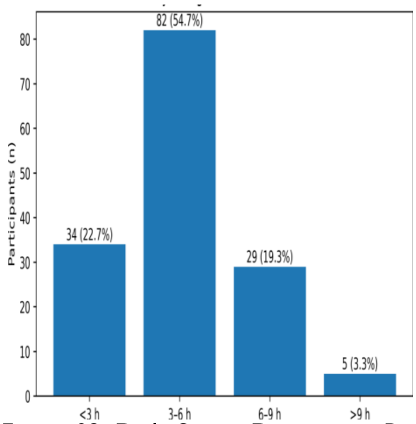


Figure 02: Daily Sitting Duration at Baseline

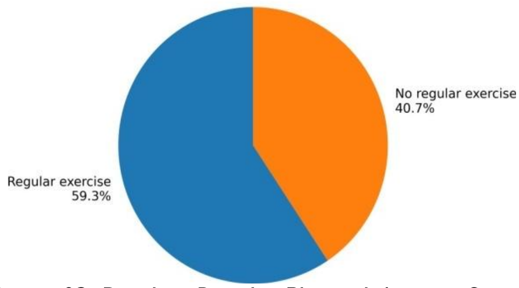


Figure 03: Baseline Regular Physical-Activity Status

The mean age of the participants was 44.13 ± 7.96 years**.** Although 59.3% reported engaging in regular exercise, 40.7% reported no regular exercise. Sitting exposure was substantial, with 116 participants (77.3%) reporting at least 3 hours of sitting per day**.** The coexistence of prolonged sitting and incomplete participation in planned physical activity highlights the need for workplace-based opportunities that facilitate regular movement throughout the working day.

4.2 Baseline BMI Distribution

The baseline body mass index (BMI) distribution of the participants is presented in Table 3. Among the 150 participants, 44.7% were classified as overweight and 30.7% as obese, while 24.0% had a normal BMI and 0.7% were underweight. Overall, 75.4% of the participants were classified as overweight or obese, indicating a substantial burden of excess body weight at baseline.

Table 03: Baseline BMI Classification

BMI Category	n	%
Underweight	1	0.7
Normal	36	24.0
Overweight	67	44.7
Obesity	46	30.7
Total	**150**	**100.0**

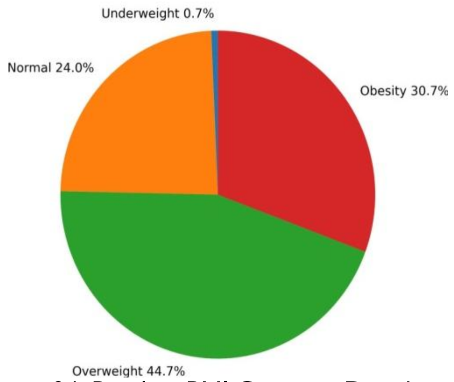


Figure 04: Baseline BMI Category Distribution

Figure 04 presents the baseline BMI distribution of the participants. Overweight was the most common category (44.7%), followed by obesity (30.7%). Overall, 75.4% of participants were classified as overweight or obese, indicating a substantial burden of excess body weight in the study population. This baseline profile supports the inclusion of structured physical activity and practical nutrition awareness as components of the integrated wellness programme.

4.3 Overall Pre–Post Physiological Outcomes

The overall pre–post changes in physiological parameters among the 150 participants are presented in Table 4. Following the intervention period, mean BMI decreased from 28.32 ± 5.22 to 27.71 ± 5.02 kg/m², while mean body-fat percentage decreased from 39.15 ± 9.66% to 37.23 ± 9.40%. Mean BMR decreased slightly from 1387.41 ± 211.51 to 1380.50 ± 210.44 kcal/day.

Mean blood glucose decreased from 124.95 ± 47.70 to 115.37 ± 37.97 mg/dL, representing a mean change of −9.58 mg/dL. Mean systolic blood pressure (SBP) decreased from 123.58 ± 16.64 to 119.32 ± 14.55 mmHg, while diastolic blood pressure (DBP) decreased from 77.08 ± 10.32 to 74.07 ± 9.12 mmHg.

The reported statistical tests indicated significant pre–post differences for all measured outcomes. However, because this was a single-group pre–post study without a control group, these changes should be interpreted as associations observed following the programme rather than definitive evidence of a causal intervention effect.

Table 04: Overall Pre–Post Comparison of Physiological Outcomes (N = 150)

Outcome	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	Mean Change	Reported *p*-value
BMI (kg/m²)	28.32 ± 5.22	27.71 ± 5.02	−0.61	2.02×10^{-71}
Body fat (%)	39.15 ± 9.66	37.23 ± 9.40	−1.92	7.14×10^{-92}
BMR (kcal/day)	1387.41 ± 211.51	1380.50 ± 210.44	−6.91	2.15×10^{-121}
Blood glucose (mg/dL)	124.95 ± 47.70	115.37 ± 37.97	−9.58	7.49×10^{-23}
SBP (mmHg)	123.58 ± 16.64	119.32 ± 14.55	−4.26	2.92×10^{-47}
DBP (mmHg)	77.08 ± 10.32	74.07 ± 9.12	−3.01	3.21×10^{-39}

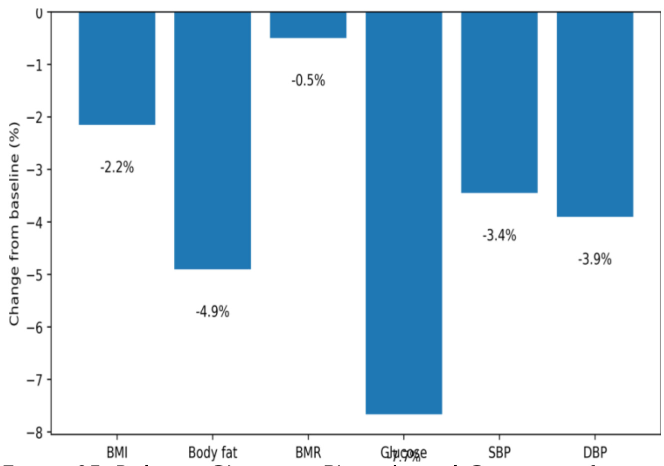


Figure 05: Relative Change in Physiological Outcomes from Baseline to Post-Intervention

Figure 05 illustrates the changes in selected physiological outcomes from baseline to post-intervention. Mean BMI decreased by 0.61 kg/m², while body-fat percentage decreased by 1.92 percentage points. Mean blood glucose decreased by 9.58 mg/dL, and systolic and diastolic blood pressure decreased by 4.26 mmHg and 3.01 mmHg, respectively. BMR showed a small absolute reduction of 6.91 kcal/day.

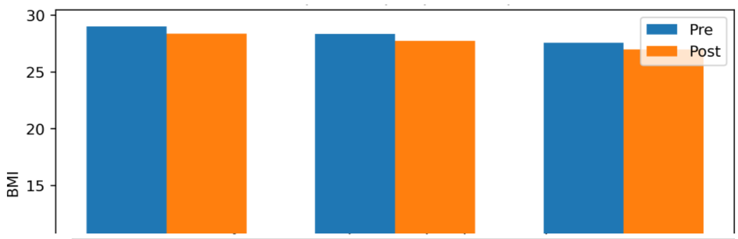
The reported statistical analysis indicated significant paired pre–post differences across the measured outcomes. However, given the absence of a control group, these findings should be interpreted as observed within-person changes following programme participation and should not be considered definitive evidence of a causal intervention effect.

4.4 Occupational Subgroup Outcomes

The pre–post changes in selected physiological outcomes across the three occupational groups are presented in Table 5. All three groups showed reductions in mean BMI, body-fat percentage, blood glucose, and systolic blood pressure following the intervention period.

Table 05: Occupational Subgroup Pre–Post Changes in Selected Outcomes

Occupation	Parameter	Pre	Post	Change	Reported *p*-value
Teaching	BMI (kg/m²)	29.01	28.37	−0.64	1.63×10^{-26}
Teaching	Body fat (%)	39.15	37.14	−2.01	9.10×10^{-34}
Teaching	Glucose (mg/dL)	117.06	109.40	−7.66	1.20×10^{-9}
Teaching	SBP (mmHg)	123.68	119.32	−4.36	7.19×10^{-17}
Non-teaching	BMI (kg/m²)	28.36	27.75	−0.61	1.91×10^{-23}
Non-teaching	Body fat (%)	40.11	38.20	−1.91	8.62×10^{-29}
Non-teaching	Glucose (mg/dL)	138.87	126.13	−12.74	1.70×10^{-8}
Non-teaching	SBP (mmHg)	124.67	120.30	−4.37	1.98×10^{-16}
Janitorial	BMI (kg/m²)	27.57	26.98	−0.59	6.11×10^{-24}
Janitorial	Body fat (%)	38.30	36.46	−1.83	7.52×10^{-32}
Janitorial	Glucose (mg/dL)	120.61	111.88	−8.73	1.10×10^{-8}
Janitorial	SBP (mmHg)	122.49	118.43	−4.06	1.57×10^{-16}



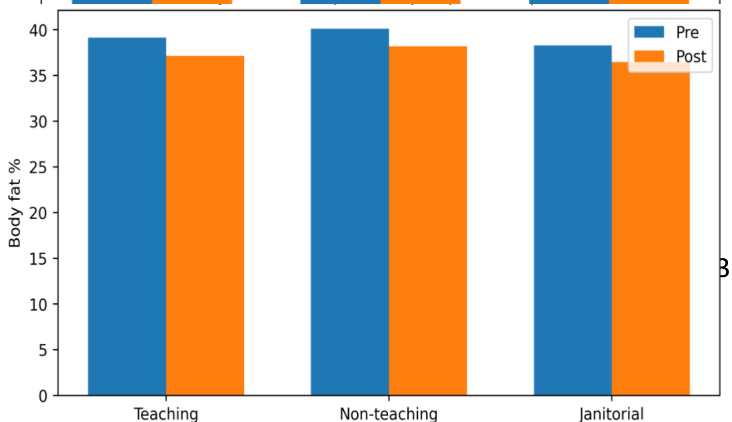


Figure 06: Occupational Pre–Post Comparison of BMI
Figure 07: Occupational Pre–Post Comparison of Body Fat Percentage

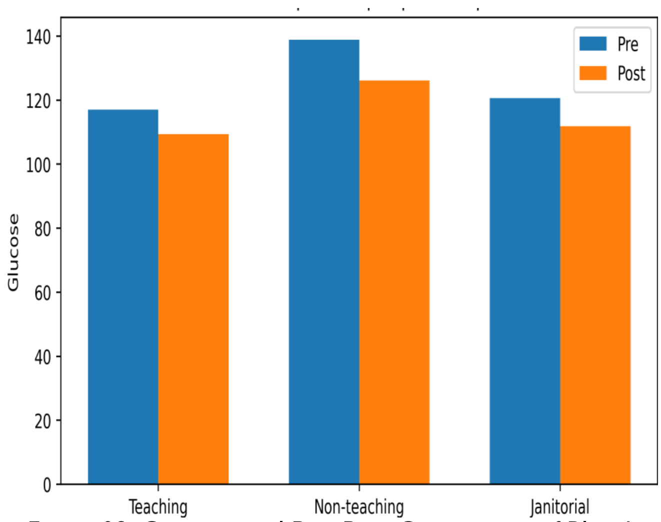


Figure 08: Occupational Pre–Post Comparison of Blood Glucose

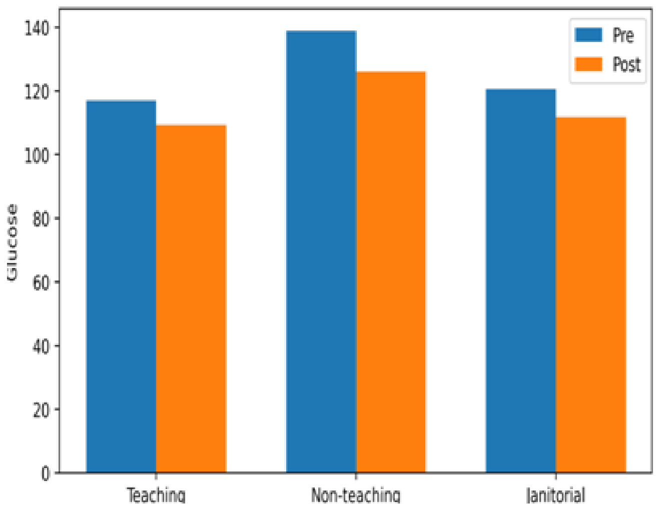


Figure 09: Occupational Pre–Post Comparison of Systolic Blood Pressure

The direction of change was consistent across all three occupational groups for each reported physiological outcome. Teaching staff showed the largest reduction in body-fat percentage (−2.01 percentage points), whereas non-teaching staff showed the largest reduction in blood glucose (−12.74 mg/dL), corresponding with their higher baseline mean glucose level. Janitorial staff also demonstrated reductions in the measured outcomes despite having greater occupational movement at baseline. This pattern suggests that structured physical activity may complement routine occupational movement rather than simply duplicate it.

4.5 Reported Health-Condition Prevalence

The reported prevalence of selected lifestyle- and health-related conditions before and after the programme is presented in Table 6. The proportion of participants reporting high body-fat adiposity decreased from 35.4% to 28.0%, while reported hypertension decreased from 16.6% to 13.3%. Smaller reductions were observed across the other reported conditions, including thyroid-related symptoms, arthritis/joint pain, osteoporosis/low bone mass, anaemia symptoms, type 2 diabetes mellitus, bronchial asthma, kidney disorders, lung disorders, and cardiovascular disorders.

Because the measures represent reported health conditions or symptoms, and the available information does not establish whether all conditions were confirmed using standardized clinical diagnostic criteria at both time points, these findings should be interpreted as changes in reported prevalence rather than evidence of disease resolution or remission.

Table 06: Reported Prevalence of Selected Lifestyle- and Health-Related Conditions Before and After the Programme

Condition	Pre (%)	Post (%)	Absolute Reduction (percentage points)	Relative Reduction (%)
High body-fat adiposity	35.4	28.0	7.4	20.9
Hypertension	16.6	13.3	3.3	19.9
Thyroid-related symptoms	11.3	10.0	1.3	11.5
Arthritis/joint pain	8.6	7.3	1.3	15.1
Osteoporosis/low bone mass	6.6	5.3	1.3	19.7
Anaemia symptoms	6.0	5.3	0.7	11.7
Type 2 diabetes mellitus	5.0	3.6	1.4	28.0
Bronchial asthma	5.3	4.6	0.7	13.2
Kidney disorders	3.3	3.0	0.3	9.1
Lung disorders	1.3	1.0	0.3	23.1
Cardiovascular disorders	1.0	0.7	0.3	30.0

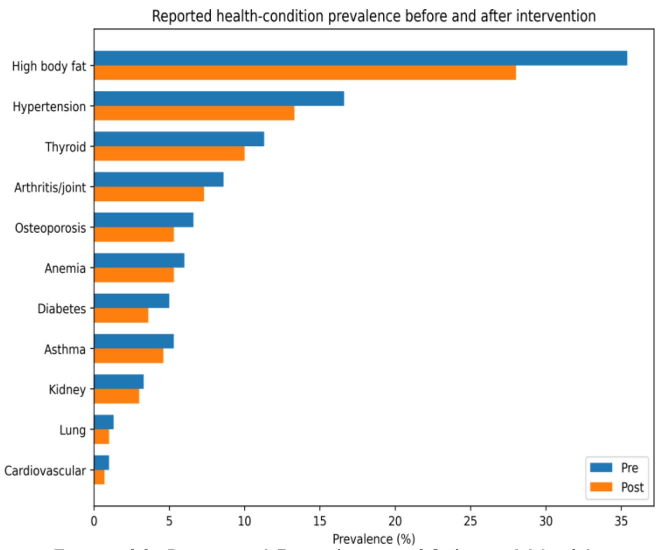


Figure 10: Reported Prevalence of Selected Health Conditions Before and After the Programme

High body-fat adiposity showed the largest absolute reduction, decreasing from 35.4% to 28.0%. Reported hypertension declined from 16.6% to 13.3%, while reported type 2 diabetes mellitus declined from 5.0% to 3.6%. These findings should be interpreted cautiously because the available project material does not establish whether every condition was clinically reassessed using consistent diagnostic criteria at both time points. Furthermore, multiple conditions could have been present in the same participant; therefore, the percentages should not be summed.

4. DISCUSSION

The present evaluation demonstrates the feasibility of implementing an integrated wellness programme across different occupational groups within a university setting. The principal finding was a favourable pre–post change in anthropometric, glycaemic, and blood-pressure measurements following 40 days of structured physical activity combined with nutritional and psychological awareness components.

The baseline sitting pattern is particularly relevant to workplace wellness. More than three-quarters of the participants (77.3%) reported sitting for at least three hours per day. Teaching and non-teaching roles may involve prolonged desk-based, computer-based, classroom, or administrative activities, whereas janitorial staff may accumulate greater occupational movement. However, occupational movement should not necessarily be considered equivalent to planned health-promoting exercise. The 40-minute structured sessions provided a common opportunity for intentional physical activity across occupational groups.

The baseline BMI distribution provides important context for interpreting the intervention findings. Overall, 75.4% of participants were classified as overweight or obese, indicating a substantial burden of excess body weight in the study population. The observed reductions in BMI and body-fat percentage are directionally consistent with the intended effects of repeated physical activity and nutrition awareness. However, the 40-day intervention represents a relatively short period for evaluating sustained changes in body composition; therefore, the immediate post-intervention findings should not be interpreted as evidence of long-term weight control.

The observed reduction in blood glucose was also notable. Non-teaching staff had the highest baseline mean glucose level and demonstrated the largest numerical reduction (12.74 mg/dL). Structured physical activity may facilitate glucose uptake by skeletal muscle, while dietary education may support healthier meal composition and reduced consumption of refined foods. However, because the study lacked a control group and the available project material does not fully document the independent laboratory assessment procedures, the individual contribution of physical activity, nutrition education, and other factors cannot be separated.

The reductions observed in systolic and diastolic blood pressure are consistent with the cardiometabolic rationale underlying the programme. Regular physical activity, changes in body composition, dietary awareness, and stress-management practices may each contribute to cardiovascular health. The integrated structure of the programme therefore provides a comprehensive workplace-health framework, although the design does not permit attribution of the observed changes to any individual programme component.

Particular caution is required when interpreting the reported reductions in health-condition prevalence. Chronic conditions such as thyroid disorders, diabetes, and osteoporosis would not generally be expected to resolve solely as a result of a short-term lifestyle programme. Changes in recorded prevalence may reflect differences in symptom status, measurement, reporting, clinical follow-up, or classification. Accordingly, these findings should be considered project-level reported prevalence indicators rather than evidence of disease remission.

The inclusion of psychological awareness was an important component of the integrated approach because stress may influence health-related behaviour, sleep, eating patterns, and cardiovascular regulation. Nevertheless, a single awareness workshop cannot be expected to produce sustained psychological or behavioural changes. It may instead serve as an initial entry point for institutional wellbeing support and subsequent behaviour-change initiatives. Future programmes could incorporate repeated booster sessions and validated psychosocial outcome measures.

The nutrition-awareness workshop provided a practical link between health knowledge and everyday behaviour. The emphasis on balanced meals, affordable nutrient-dense foods, whole grains and millets, moderation of salt and refined sugars, hydration, and meal planning may be particularly relevant for employees with demanding work schedules. Future evaluations should include quantitative dietary assessments to determine whether nutritional awareness translates into sustained changes in dietary intake.

From an occupational-health perspective, the findings support the need for university wellness initiatives that are accessible to different categories of staff. The barriers and opportunities experienced by teaching, administrative/technical, and support-service employees may differ. A common institutional wellness framework can therefore be maintained while adapting exercise intensity, scheduling, nutritional examples, and psychosocial support to the occupational circumstances of each group.

5. IMPLICATIONS FOR PUBLIC HEALTH AND INSTITUTIONS

Universities can incorporate physical activity into the working day through supervised exercise sessions, active breaks, and accessible spaces for physical activity. Periodic nutrition-awareness activities may also be integrated into workplace settings, including canteens and staff programmes, with emphasis on practical meal planning.

Psychological wellbeing initiatives could be incorporated into broader staff-support systems rather than being limited to one-time awareness activities. For predominantly sedentary employees, strategies to interrupt prolonged sitting may represent an important complementary target. For employees engaged in physically demanding occupations, wellness initiatives may place greater emphasis on safe strengthening, mobility, recovery, hydration, and musculoskeletal protection.

This occupationally responsive approach may improve the practical relevance and accessibility of workplace wellness programmes. The 40-day intervention structure may also provide an initial period for establishing health-related routines. Future programmes could include maintenance phases, monthly reinforcement sessions, and reassessment at 3, 6, and 12 months to determine whether observed changes are sustained over time.

6. BENEFITS

- Representation of three occupational groups within a university setting.
- Integration of physical activity, nutrition awareness, and psychological awareness.
- Structured physical-activity exposure of 40 minutes per day for 40 days.
- Assessment of body composition, blood glucose, and blood pressure before and after the programme.
- Implementation within a real-world institutional setting, providing potential for adaptation and wider implementation.

7. CONSTRAINTS

- The study used a single-group pre–post design without an independent control group.
- The observation period was relatively short, limiting assessment of long-term sustainability.
- Regression to the mean, concurrent behavioural changes, and measurement effects may have contributed to the observed pre–post differences.
- Reported health-condition prevalence requires verification of the diagnostic definitions and reassessment procedures used at both time points.
- The reported statistical output should be independently verified, particularly the extremely small reported *p*-values.
- The specific blood-glucose sampling conditions should be verified before using the term “fasting blood glucose” in the final manuscript.

8. CONCLUSION

The integrated biopsychosocial wellness programme implemented under the RUSA project demonstrated the feasibility of delivering a workplace wellness intervention among women employees of Sri Padmavati Mahila Visvavidyalayam, Tirupati. The combination of 40 days of 40-minute daily physical activity, a nutritional-awareness workshop, and a psychological-awareness workshop was associated with favourable pre–post changes in BMI, body-fat percentage, blood glucose, and blood pressure. Similar directional changes were observed across the teaching, non-teaching, and janitorial groups.

The programme provides a practical institutional framework for addressing physical, nutritional, and psychological dimensions of workplace wellbeing. However, because the study did not include a control group and had a short follow-up period, the findings should not be interpreted as definitive evidence of causal effectiveness or long-term sustainability. Controlled comparative studies with longer follow-up and validated behavioural and psychosocial measures are warranted.

9. CONTRIBUTIONS

Prof. G. Sarah Sarojini, Principal Investigator-I, provided overall scientific leadership, project supervision, and guidance.

M. Aruna, Principal Investigator-II, contributed to project planning, implementation, and supervision.

S. Prema Swarupa, Research Project Fellow and Doctoral Research Scholar, was primarily involved in data management, manuscript preparation, and scientific writing.

Prof. N. Rajani, Co-Principal Investigator, contributed to academic guidance, scientific review, and intellectual input.

Assist. Prof. G. Sireesha, Co-Principal Investigator-II, contributed to academic guidance, scientific review, and intellectual input.

10. ACKNOWLEDGEMENTS

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11. ETHICS APPROVAL AND CONSENT

Ethical approval was obtained from the Institutional Ethics Committee of Sri Padmavati Mahila Visvavidyalayam, Tirupati, under approval number IEC No. SPMVV/Acad/IEC/CI/XXI/2025, dated 27-03-2025. All participants provided written informed consent before participation in the study.

12. FUNDING

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13. DATA AVAILABILITY

The participant-level dataset is retained in the project records. De-identified data may be shared where appropriate, subject to institutional policies, ethical approval, and the conditions of participant consent.

14. REFERENCES

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