A STRATIFIED CLUSTER SAMPLING FRAMEWORK TO ASSESS HEALTH STATUS AND LIFESTYLE BEHAVIOURS AMONG CIVIL SERVANTS IN PUTRAJAYA

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INTRODUCTION

This study aimed to assess the health status and lifestyle behaviours of permanent civil servants in Putrajaya through a large-scale workplace health surveillance initiative. Specifically, it examined the prevalence of key health domains, including health literacy, physical activity, sedentary behaviour, dietary practices, mental health, tobacco use, and oral health. The survey design incorporated a stratified cluster random sampling approach, leveraging an official organisational-unit listing from 25 ministries and the Prime Minister's Department to ensure representative coverage. This methodological choice enabled proportional allocation across ministries and facilitated robust cross-ministry comparisons. Notably, national data indicate that Putrajaya records one of the highest prevalences of overweight and obesity in Malaysia (61.2%, NHMS 2023), alongside low physical activity and suboptimal health screening uptake trends that underscore the urgency for comprehensive, targeted workplace health interventions.

METHODS

A cross-sectional survey was conducted among permanent civil servants in Putrajaya, applying a stratified cluster random sampling approach to ensure proportional representation across all 25 ministries and the Prime Minister's Department. The sampling frame comprised 1,705 organisational units, obtained from official ministry organisational charts dated 8 September 2024.

From a total population of 51,348 civil servants, a final sample of 3,222 respondents was proportionally allocated to each ministry based on population size. The number of organisational units required for each ministry was calculated using the formula:

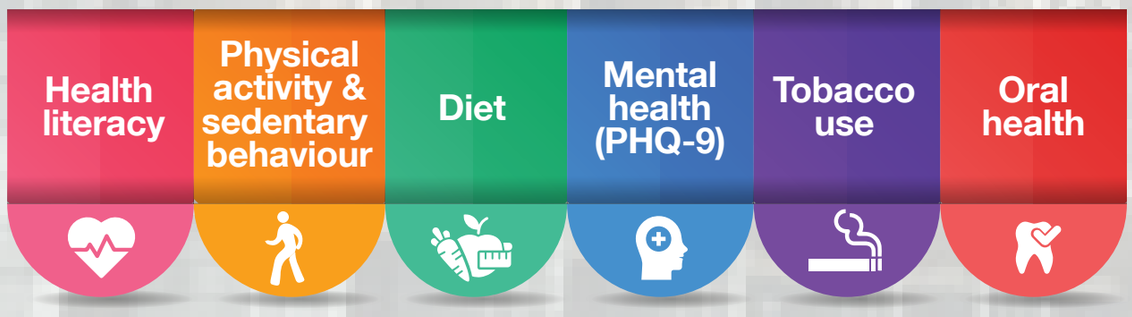
$$n = \frac{\text{Required sample size for each ministry/department}}{\text{Minimum sample size per organisational unit for each division/branch/section/sector/unit}}$$



The selection process involved:

- Preparing a complete list of organisational units (division/branch/section/sector/unit) for each ministry and department.
- Assign a unique numerical ID to each unit. (division/branch/section/sector/unit)
- Randomly selecting the required units using SPSS (Random Sample of Cases).
- Inviting all staff within the selected units to participate.

Data collection used a structured self-administered questionnaire adapted from the National Health and Morbidity Survey (NHMS) 2019/2023 and the Malaysian Healthy Lifestyle Index (MHLI), covering:



RESULTS & DISCUSSION

The adoption of a stratified cluster random sampling design was guided by the availability of a complete and current organisational-unit listing for all 25 ministries and the Prime Minister's Department. This resource enabled accurate proportional allocation of the sample across the civil service, ensuring equitable representation, minimising selection bias, and facilitating cross-ministry comparisons.

From a total population of 51,348 permanent civil servants, a final sample of 3,222 individuals was proportionally allocated and selected through random sampling of organisational units, with all staff in the chosen units invited to participate. This design struck a balance between statistical robustness and operational feasibility, reducing the logistical demands typically associated with large-scale surveys while preserving the generalizability of the findings.

Global studies among civil servants in Ethiopia (Angaw et al., 2015), Ghana (Agyemang-Pambour et al., 2023), and Malaysia (Ashri et al., 2021) report high rates of NCD risk factors, including physical inactivity, obesity, and reduced quality of life, often linked to sedentary work.

This study extends prior research by employing a multi-domain framework (health literacy, physical activity, sedentary behaviour, diet, mental health, tobacco use, and oral health) and a stratified cluster random sampling design, covering 25 ministries and the Prime Minister's Department. This approach ensured proportional representation, minimised bias, and delivered a robust, representative profile to guide targeted workplace health strategies.

Overall, the findings demonstrate that stratified cluster random sampling, anchored to an official organisational-unit frame, is both a practical and scientifically robust choice for large-scale workplace health assessments, with strong potential for replication in national-level civil service health monitoring.

CONCLUSION

This study establishes stratified cluster random sampling as an effective and scientifically rigorous approach for assessing the health status and lifestyle behaviours of civil servants in Putrajaya. The method's proportional allocation across ministries, based on an official organisational-unit sampling frame, enhances representativeness while maintaining operational feasibility. Adoption of this framework facilitates robust cross-ministry comparisons and supports evidence-based workplace health strategies. Future applications at the national level should ensure regular updates to the sampling frame and strengthen coordination mechanisms to optimise data quality and policy relevance.

RECOMMENDATION

To optimise the effectiveness and applicability of the stratified cluster random sampling framework, it is recommended to ensure regular updates to the official organisational-unit sampling frame to maintain data accuracy. Strengthening coordination mechanisms with ministry focal points will improve sampling efficiency and survey participation rates. Incorporating automated data management systems and streamlining survey distribution processes can further enhance operational efficiency. Additionally, periodic methodological reviews and pilot testing in selected ministries are advised to refine sampling parameters, reduce non-response rates, and ensure continued representativeness. Implementing these measures will support sustainable, high-quality workplace health surveillance and facilitate evidence-based decision-making at the national level.

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