

Determining Staffing Needs for the Office of the Registrar at Visayas State University- Isabel Campus

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Abstract. The Registrar's Office at Visayas State University-Isabel Campus faces significant challenges due to understaffing, resulting in various work-related issues. This study determines the appropriate staffing needs to address these challenges and enhance office efficiency and effectiveness. A comprehensive work sampling study was conducted, collecting 1,225 observations over ten days from five staff members. Results indicated that staff productivity percentages exceeded the normal range of 70-75%, emphasizing the need for additional personnel to address excessive workload and mitigate associated risks. Two techniques—fractional manpower computation and workload analysis—were employed to determine optimal staffing requirements. Analysis revealed a fractional manpower value of 6.325, indicating that six staff members are necessary, considering fractional manpower cut-off values. The workload analysis corroborated this finding, ensuring an average workload of 95.04%, well below the 100% limit. The study concludes that the Registrar's Office should increase its staff from five to six individuals to achieve optimal functioning. This adjustment will significantly improve workload distribution and overall efficiency. The findings provide valuable insights for informed decision-making regarding personnel allocation in similar administrative settings, offering considerable practical implications for organizational management.

Keywords: Fractional manpower; Staffing efficiency; Staffing requirements; Work sampling; Workload analysis.

1.0 Introduction

Workplace productivity has emerged as a fundamental concern across all industries, with extensive research demonstrating its critical impact on organizational success and sustainability (Huynh Thi Thu et al., 2025; Bick et al., 2025; Bröchner, 2017). Contemporary definitions of productivity typically refer to the ratio of output to input, though this conceptualization has evolved to encompass broader measures of organizational effectiveness and employee well-being (Beaton et al., 2009; Choi, 2012; Van der Voordt & Jensen, 2023). As organizations strive for optimal performance, individual work productivity serves as a cornerstone for organizational progress, directly influencing satisfaction levels among employees and stakeholders while contributing to overall institutional performance (Asio, 2021; Gazi & Yusof et al., 2024; Zhenjing et al., 2022).

However, achieving sustainable productivity requires a nuanced understanding of optimal work intensity. Modern productivity research emphasizes that sustainable performance is not attained through maximum effort continuously applied. The "70 percent rule," derived from athletic performance principles, suggests that optimal productivity occurs when employees maintain a moderately intense pace most of the time, preserving capacity

to respond effectively to temporary demand increases without compromising performance quality (Whiteoak et al., 2023). This principle is supported by research consistently demonstrating that constantly operating at maximum capacity leads to stress accumulation, burnout syndrome, and subsequent performance deterioration over time (Lei et al., 2025; Mańkowska, 2025; Edu-Valsania et al., 2022). Furthermore, studies reveal a strong positive correlation between employee happiness and productivity, with happy workers demonstrating 13% higher productivity rates compared to their less satisfied counterparts (Oxford University, 2019).

Building on this understanding of sustainable productivity, the relationship between staffing levels and organizational productivity has been extensively documented in recent literature. Adequate manpower availability enables faster project completion, increased organizational capacity, and improved service delivery quality (Gallup, 2025). Conversely, insufficient staffing creates a cascade of adverse effects, including employee stress, physical and mental exhaustion, role ambiguity, and work overload, all of which significantly hinder productivity and organizational effectiveness (McKinsey & Company, 2023; Jonge & Peeters, 2025). The magnitude of this challenge is reflected in current global workforce statistics, which indicate that employee engagement has declined to 21% in 2024, with lost productivity costing the global economy approximately \$438 billion annually (Gallup, 2025).

This productivity-staffing relationship is particularly evident in academic institutions, where administrative efficiency directly impacts educational service delivery. This dynamic is clearly observable at Visayas State University (VSU), Isabel, where the administration building houses seven offices responsible for vital operational tasks essential to the university's functioning. Due to the institution's continued expansion and increasing student enrollment, several offices require additional staff to maintain service quality and operational efficiency standards. A comprehensive preliminary survey conducted by the researcher revealed critical understaffing issues, particularly affecting the Registrar, procurement, and budget offices, with the Registrar's Office experiencing the most severe workforce challenges. These understaffing conditions have resulted in significant operational problems, including accumulated backlogs, unfinished tasks, missed deadlines, extended service delivery times, and overlapping responsibilities among existing personnel, creating stress and potential burnout risks.

Given the critical nature of these findings and the established connection between adequate staffing and organizational productivity, this research investigates the optimal staffing requirements for the Office of the Registrar at Visayas State University-Isabel Campus. The study employs evidence-based workforce planning methodologies to determine appropriate manpower levels that will enhance operational efficiency while promoting employee well-being and job satisfaction. Through systematic application of work sampling techniques and workload analysis, the research aims to provide the administration with empirically grounded recommendations for workforce requirements and assist in developing more equitable workload distribution strategies among the workforce. Ultimately, this investigation contributes to both improved organizational performance and enhanced employee satisfaction levels, offering a replicable framework for addressing similar staffing challenges in higher education administration.

2.0 Methodology

2.1 Research Design

The study utilized a descriptive-observational research design, which involves observing and analyzing the target respondent or subject in their natural environment without altering variables being studied, to gather necessary data for the study.

2.2 Research Locale

The study was carried out in the Registrar's Office of Visayas State University, Isabel, Leyte, Philippines.

2.3 Research Participants

The study observed five (5) research subjects, including the Head of the registrar's office and four (4) Administrative Aides-1 (JO), over a ten-day work sampling period to collect relevant data for the study.

2.4 Research Instrument

The researcher conducted a preliminary survey using a survey questionnaire. The results of this survey guided the selection of the office that became the focus of the study. For the ten days of actual observations, various

work sampling sheets were utilized to record, tally, and compute the gathered data, following protocols outlined in the revised Naval Maritime Academy handbook (NAVMAC, 2021). These sheets include the work sampling observation sheet, work sampling recap sheet, work sampling computation sheet, and work-hour requirements consolidation sheet. The methodology was further informed by recent peer-reviewed research on work sampling techniques and workforce analysis to ensure contemporary best practices.

2.5 Data Gathering Procedure

Before conducting the study, the researcher obtained permission from the Chancellor of Visayas State University-Isabel, which was approved by relevant department heads and officials. The data gathering procedure followed a systematic three-phase approach to ensure comprehensive and reliable results.

Phase 1: Preliminary Assessment

The study began with a preliminary survey using a structured questionnaire distributed to administrative office staff across the university to identify offices experiencing understaffing issues. This initial assessment revealed that the registrar's office had the most significant staffing challenges, making it the primary focus of the study. Following the survey results, the researcher conducted in-depth interviews with staff members to determine their specific duties and responsibilities, providing essential baseline information for the subsequent observation phases.

Phase 2: Preliminary Observations

Two days of preliminary observations were conducted to establish initial time measurements and work patterns. During this phase, the researcher analyzed the findings to determine elapsed time and occurrence percentages for each job element performed by the staff. This preliminary data was crucial for calculating the necessary number of observations required for the actual observation phase, ensuring both precision and reliability in the final measurements.

Phase 3: Actual Data Collection

Based on the preliminary findings, the researcher calculated and conducted the required number of actual observations. During this phase, comprehensive data were systematically gathered and analyzed to capture the complete work cycle and staffing patterns. This thorough analysis facilitated the determination of the optimal manpower requirement for the registrar's office, providing evidence-based recommendations for addressing the identified understaffing issues.

2.6 Ethical Considerations

This study adhered to ethical guidelines to ensure the integrity of the research and the well-being of participants. Prior to data collection, the researcher obtained approval from the Chancellor of Visayas State University-Isabel and relevant department heads. Informed consent was secured from participants, who were fully briefed on the study's purpose, scope, and objectives. Anonymizing responses and securely storing data maintained confidentiality and anonymity. Observations and interviews were conducted with minimal disruption to the work environment, ensuring participants were not subjected to undue stress. Participation was voluntary, with individuals having the right to withdraw at any time without consequences. The researcher remained impartial and assured participants that the findings would be used solely for academic purposes, protecting their roles and responsibilities. These measures upheld the ethical standards necessary for responsible and credible research.

3.0 Results and Discussion

This section of the study presents a comprehensive analysis of the findings from extensive data collection and rigorous analysis. It aims to provide a detailed exploration of the critical outcomes, their significance, and their implications for the research objectives.

3.1. Work Sampling Study

The Job Elements of Each Staff

Job elements are determined based on the duties and responsibilities of the staff, referring to the specific activities they perform. Categorizing job elements brings focus, consistency, and standardization to the study, enabling researchers to align observations with particular elements and ensure accurate and reliable data.

Identifying job elements aids in designing an efficient sampling strategy and simplifies data analysis. It enhances observation ease, data quality, and the extraction of meaningful insights from the study. Table 1 below shows an example of job elements for staff E (*other staff's job elements were not included in the table*).

Table 1. *The Job Elements of the Staff*

Productive		Supportive		Non-productive	
1.	Prepares a schedule of classes (summer class)	1.	Cleans the table/ office	1.	Idle/ delays/ interruptions
2.	Prepares schedule for midterm exam	2.	Forwards documents to other offices	2.	Personal breaks
3.	Update the students' checklist with their grades	3.	Entertains various inquiries from students/clients		
4.	Prepares student clearance for the midterm examination	4.	Retrieves/ files student records		
5.	Prepares a checklist of grades	5.	Records released documents to the logbook.		
6.	Prepares the INC form				

Based on Table 1, the job elements of the staff are categorized into productive, supportive, and non-productive work. Productive work categories are the core tasks and responsibilities outlined in the staff's job description that directly contribute to achieving the organization's goals. Supportive work categories are activities that support the productive work of staff and enable them to perform their primary responsibilities effectively. It is also known as indirect productive activities. On the other hand, non-productive work categories are activities that are outside the staff's core responsibilities or the organization's primary objectives. Within each category, there are several related work activities that staff member engages in.

Preliminary Observation

After determining the job elements, the researcher conducted the two-day preliminary observation. Preliminary observation is a short initial observation that serves as the foundation for selecting the appropriate number of actual observations, sampling intervals, and duration for data collection.

The Required Number of Observations

After conducting the preliminary observation, the researcher computed the required number of actual observations. Among all the staff members, Staff A has been determined to need the most significant number of observations, totaling 245. Consequently, the researcher has decided to collect 245 observations for each staff member. This increase in the number of observations enhances the precision of the outcomes obtained from the study.

Schedule of Random Observations

After determining the required number of observations, the next step is to make a schedule of random observations. The purpose of preparing a schedule of random observations in a work sampling study is to obtain an unbiased and representative sample of an individual's or a group's work activities. In this study, Microsoft Excel was used to generate a random schedule of observations using the simulation formula.

Actual Observation

In a work sampling study, actual observation refers to the direct and real-time monitoring of workers' activities and behaviors to collect data and analyze their work patterns. It involves systematically observing employees over a period of time and recording their activities based on the predetermined schedule of random observations. The purpose of actual observation in a work sampling study is to obtain accurate and representative data about how workers spend their time and engage in various tasks.

Utilization Percentage of Each Staff

Upon the successful completion of 1,225 observations spanning a period of ten (10) days, the researcher derived valuable insights regarding the percentage utilization of the staff's time dedicated to various work categories, namely, productive, supportive, and non-productive tasks. Table 2 shows the utilization percentage of each staff member.

Staff members displayed varying levels of productivity based on recorded observations. Staff E stood out with the highest percentage of observations in the productive category at 83.67%, indicating a consistent focus on tasks contributing to overall office productivity. Staff C and Staff A also demonstrated high productivity with percentages of 81.63% and 80.82% respectively. Staff B and Staff D had slightly lower percentages but still

showed significant commitment to being productive, at 77.96% and 75.92% respectively. The supportive and non-productive categories varied without a clear pattern among staff members. Overall, this analysis highlights differing productivity levels among staff members, with Staff E leading in productivity, and all staff members dedicated to completing productive tasks.

Table 2. Utilization Percentage of Each Staff

Staff	Percentage of Occurrence per Category of Job Element (%)			
	Productive	Supportive	Non-productive	Total
A	80.82	12.24	6.94	100.00
B	77.96	12.24	9.80	100.00
C	81.63	9.39	8.98	100.00
D	75.92	15.92	8.16	100.00
E	83.67	5.71	10.61	100.00

The results also indicate that all of the staff's productivity percentages exceed the normal productivity level. A good productivity percentage means that workers spend 70-75% of their working hours working and 25-30% of their working hours on breaks. While over-productive staff members may achieve remarkable results, it is essential to acknowledge the potential risks they face, particularly the risk of experiencing burnout. Unfortunately, this can have adverse effects on their physical and mental well-being. If the issue of over-productivity and its associated risks is not addressed, it can lead to a decline in their overall performance. Thus, it is evident that there is a need to add additional manpower to the Registrar's Office.

3.2 Optimal Manpower Requirement based on Fractional Manpower

Determining the optimal manpower requirement is a crucial aspect of workforce planning and resource allocation within an organization. The calculation of fractional manpower enables a more precise estimation of the required number of employees to accomplish specific tasks or sets of functions. The computation of fractional manpower involves the utilization of the Work Sampling Computation Sheet and the Work-Hour Requirements Consolidation Sheet.

Work Sampling Computation Sheet

Table 3 shows the summary of the work sampling computation sheet. The work sampling computation sheet contains several columns that facilitate the computation and analysis of work elements.

Table 3. Summary of Work Sampling Computation Sheet

Categories	Summary of Work Sampling Computation Sheet			
	Frequency	Percentage of Occurrence (%)	Measured Time (Hrs.)	Allowed Time (Hrs.)
	(From WSRS)	(a/1225)	((400/1225)x(a))	(c x1.15)
	(a)	(b)	(c)	(d)
Total Productive	980.00	80.00	320.00	368.00
Total Supportive	136.00	11.10	44.41	51.07
Total Non-productive	109.00	8.90	-	-
Total Available Observations	1225.00	-	-	-
Total Work Hours Sampled (Available)	400.00	-	-	-

The findings from the work sampling computation sheet reveal essential insights into the distribution and nature of job elements among the five staff members. Out of 1,225 observations, the productive category of job elements emerges as the most frequent, with a recorded frequency of 980, accounting for a substantial percentage of occurrences at 80.00%. This indicates that the staff members are over-productive and primarily engage in activities directly contributing to their work's main goals or output. Conversely, the supportive category demonstrates a lower frequency of 136, representing an occurrence percentage of 11.10%. In contrast, the non-productive category of job elements has a frequency of 109, with an occurrence percentage standing at 8.90%. The total frequency by category among the five staff members was derived from the work sampling recap sheet.

The frequency of occurrence for each category of job elements was utilized in the calculation of both measured and allowed time. The computed measured time for the productive category amounts to 320.00 hours, while the permitted time is 368 hours. In contrast, the supportive category contributes 44.41 hours of estimated time and 51.07 hours of allowed time. Subsequently, the computed allowed time for each job element was forwarded to

the work-hour requirements consolidation sheet for further calculations.

Work-hour Requirements Consolidation Sheet

Table 4 shows the summary of the work-hour requirements consolidation sheet. It is used in computing the monthly adjusted working time and fractional manpower.

Table 4. Summary of Work-hour Requirements Consolidation Sheet

Categories	Allowed Time From		Total (a+b) (c)	Monthly Adjusted Allowed Time (c x 2.017) (d)
	Work Sampling (a)	Non-Sampled Overtime (b)		
Total Productive	368.00	11	379.00	764.44
Total Supportive	51.07	0	51.07	103.01
TOTAL	419.07	11	430.07	867.45
Note: (1) 10 days of work sampling				867.45
Total Work Hours Required				867.45
Fractional Manpower (Total/WAF)				6.325

The monthly adjusted allowed time, which includes both the productive and supportive categories, amounts to a total of 867.45 hours. This comprehensive figure is obtained by summing the monthly adjusted allowed times assigned to the fruitful and supportive job elements. In terms of the optimal manpower requirement, the Office of the Registrar currently employs five (5) staff members, while the ideal number for optimal functioning is six (6). This determination is based on the calculated fractional manpower of 6.325. Increasing the staff count to six (6) in the Office of the Registrar improves workflow, productivity, and staff well-being, enhancing overall effectiveness.

3.3 Optimal Manpower Requirement Using the Work Load Analysis (WLA)

Aside from computing the fractional manpower, the Workload Analysis technique was also used in this study to determine the optimal manpower requirement of the Registrar's Office. Calculation of workload with the Work Load Analysis (WLA) method begins with calculating the percentage of productivity using the Work Sampling method. Next, determine the value of the Performance Rating using the Westinghouse Method and the Allowance value using the Industrial Labor Organization (ILO) Allowance Table.

Productivity Percentage

Table 5 shows the productivity percentage of each staff member based on the results of the work sampling study.

Table 5. Productivity Percentage of the Staff

Productivity Percentages of the Staff				
Staff A	Staff B	Staff C	Staff D	Staff E
93.06%	90.20%	91.02%	91.84%	89.39%

The productivity percentage was calculated by combining the productive and supportive utilization percentages of each staff member, while excluding the non-productive category.

Performance Rating Determination

Table 6 presents the performance rating of each staff member that was determined using the Westinghouse Performance Rating Table.

Table 6. Performance Rating

Staff	Westinghouse System				Total	Performance Rating
	Skill	Effort	Condition	Consistency		
A	C1=0.06	D=0	B=0.04	D=0	10%	1.10
B	C1=0.06	D=0	B=0.04	D=0	10%	1.10
C	C1=0.06	D=0	B=0.04	C=0.01	11%	1.11
D	C1=0.06	D=0	B=0.04	D=0	10%	1.10
E	C1=0.06	D=0	B=0.04	C=0.01	11%	1.11

The determination of performance ratings using the Westinghouse systems was based on four factors: skill, effort, consistency, and condition. These ratings were derived from subjective observations made by the researcher within 10 days, alongside a work sampling study. Additionally, the rating values were also

influenced by the staff's perception. Regarding skill, all staff members received a rating of good (C1) with a value of +0.06. This rating primarily considered the staff's computer literacy since computers are their primary tools for accomplishing the majority of tasks. The staff possesses a good level of skill in terms of computer literacy, which is crucial for their tasks. An effort was rated as average (+0.00) for all staff members. Despite their high productivity, they work at a normal pace. The condition rating focused on the lighting, thermal, and acoustic aspects of the registrar's office. The researcher sought the staff's opinions for this rating, which was determined to be excellent (B) with a value of +0.04. The lighting was rated as exceptional due to adequate fluorescent lighting and large glass windows. The thermal condition was deemed excellent as the office is well-ventilated and air-conditioned. Acoustically, the closed office prevents outside noise from reaching the staff, with the only noise being that of the staff members themselves conversing. Lastly, the consistency rating varied among the staff. Staff members A, B, and D received an average rating (D) with a value of 0.00, while Staff C and E were rated as good (C) with a value of 0.01. Thus, the performance ratings for staff A, B, and D are 1.10, while staff C and E have a rating of 1.11.

Allowance Determination

Table 7 illustrates the allowance values for the staff, which were determined using the ILO Allowance table. The majority of the allowances for the workers are the same due to their similar tasks and workplace environment.

Table 7. Allowances

Allowances of the Staff				
Staff A	Staff B	Staff C	Staff D	Staff E
1.14	1.14	1.14	1.12	1.16

Similar to the Westinghouse rating, the allowance values were determined based on the researcher's observations and the staff's perceptions. The allowance values for Staff A, B, and C are 1.14, while for Staff D, it is 1.12, and for Staff E, it is 1.16.

The Workload Analysis

Table 8 displays the computed workload percentages for each staff member based on the workload analysis.

Table 8. The Workload Percentage Value of Each Staff

Staff	Workload Percentage	Percent Overload	Workload Category
A	117%	17%	High/ Overload
B	113%	13%	High/ Overload
C	115%	15%	High/ Overload
D	113%	13%	High/ Overload
E	115%	15%	High/ Overload

The workload analysis reveals the following information: Staff A has a workload of 117%, Staff B has a workload of 113%, Staff C has a workload of 115%, Staff D has a workload of 113%, and Staff E has a workload of 115%. Under typical conditions, a workload percentage of 100% is regarded as the standard or average level. However, all staff members have workload percentages above 100%, indicating a high workload for each. Considering these values, the average workload percentage across the staff members is calculated to be 114.60%. This suggests that, as a group, the staff is collectively handling a workload that is 14.60% higher than what is considered regular or average. These findings are supported by previous studies, including those by Sari et al. (2019), Sari et al. (2021), and Izzah and Hidayat (2022), which similarly observed elevated workload levels among staff exceeding the standard threshold of 100%.

High workloads can lead to increased employee stress, burnout, decreased motivation, and reduced job satisfaction. Quality of work and productivity may suffer. To address this, management should assess workload distribution and consider hiring additional manpower for task redistribution.

Optimal Manpower Requirement in Accordance with Workload

Based on the previous results, it is evident that additional manpower is required in the office to alleviate the staff's workload. Table 9 below shows the recommended optimal number of manpower in the Registrar's Office. The computed optimal manpower requirement of staff recommended at the Registrar's Office is 6. This ensures an average workload of 95.50%, which is ideal as it does not exceed 100%. According to Sari et al. (2019), a reasonable workload, preferably close to 100% or under normal conditions, is preferred. A typical workload

implies that a worker can consistently work for 8 hours in normal conditions.

Table 9. *The Optimal Number of Manpower based on the Workload Analysis*

Number of Manpower	Average workload percentage	Category
5 (existing)	114.60%	High/ Overload
6 (recommended)	95.50%	Normal/ In-load

By addressing the high workloads and taking steps to create a more balanced and manageable workload for the staff members, management can mitigate the potential adverse effects, such as increased stress and decreased productivity. This, in turn, can contribute to a healthier work environment, improved employee well-being, and enhanced overall performance within the team.

3.4 Optimal Manpower Requirement in the Registrar's Office

According to the findings of the computed Fractional Manpower and Workload Analysis (WLA), the optimal number of staff members required in the Office of the Registrar is six (6). Therefore, the results indicate the need to hire one additional staff member to meet this optimal manpower requirement. The addition of this staff member will contribute to enhanced staff productivity by ensuring a balanced workload and allowing ample time for efficient task completion. Table 10 shows the job description of one (1) additional staff to be hired.

Table 10. *Job Description of One (1) Additional Staff*

Position: Administrative Aide 1- (JO)	Designation: Clerk
Duties and Responsibilities:	
1. Does clerical and messengerial services.	
2. Responsible for the registration and enrolment of students (ENGLISH, BSIE, BSAB).	
3. Accountable for computing and rechecking students' GPAs (ENGLISH, BSIE, BSAB).	
4. Review the class schedule of faculty and students every semester.	
5. Posting/ updating of grades in the student's checklist (hard copy).	
6. Follows up with both faculty and department clerks regarding deferred grades for students.	
7. Receives and checks the requirements for graduating students (ENGLISH, BSIE, and BSAB).	
8. Responsible for the preparation and review of the CAV, TOR, Diploma, COR, and other related documents.	
9. Review the tentative list of graduating students.	
10. Renders official travel to support the services of the Registrar's office.	
11. Maintains the cleanliness and orderliness of the office.	
12. Performs other tasks assigned by the Head of the office.	
13. Does other related jobs.	

The job description of the staff encompasses the job position, designation, and a detailed list of the duties and responsibilities. The Head of the Registrar's office is the one responsible for determining the duties and responsibilities of the additional staff to be hired. The duties and responsibilities of the additional staff are those that have been deducted from the existing staff. This strategic approach will reduce the workload of the existing staff, allowing them to focus on their core responsibilities.

4.0 Conclusion

This study makes significant contributions to human resource planning within academic institutions by demonstrating the practical application and effectiveness of integrated workforce analysis methodologies. The successful implementation of work sampling techniques, fractional manpower computation, and workload analysis validates these tools as reliable approaches for addressing staffing challenges in university administrative settings. The research advances knowledge in organizational management by providing a systematic framework that other academic institutions can adopt to assess and optimize their administrative workforce requirements.

The study's methodological approach offers valuable insights into how quantitative techniques can inform evidence-based staffing decisions, moving beyond intuitive or budget-driven personnel planning toward data-driven human resource management. By establishing clear productivity benchmarks and workload thresholds, this research contributes to the broader understanding of optimal workforce utilization in higher education administration. The findings demonstrate that systematic workforce analysis can effectively identify staffing gaps while providing quantifiable justification for resource allocation decisions.

The implications extend beyond the immediate institutional context, offering a replicable model for similar

administrative units facing staffing challenges. Future research should explore the application of these methodologies across diverse organizational contexts within academic institutions, examine long-term impacts of optimized staffing on service quality, and investigate the integration of emerging technologies in workforce planning processes. Regular implementation of such analytical approaches can enhance organizational effectiveness while supporting sustainable human resource management practices in the evolving landscape of higher education administration.

5.0 Contributions of Authors

Author 1: Responsible for the conceptualization of the study, data collection, and data analysis.

Author 2: Served as the research adviser and provided critical feedback and guidance throughout the study.

6.0 Funding

This research was entirely self-funded by the primary researcher. No external funding was received.

7.0 Conflict of Interests

The authors declare no conflict of interest related to this research.

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