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The Role of Sustainable Planning and Project Team Attitude in Achieving Sustainable Project Success in the Health Sector

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Abstract

This study rigorously examines the relationships among the principal drivers of sustainable project success (SPS) within the health sector, including Sustainable Project Management (SPM), Sustainable Project Planning (SPP), and Project Team (PT) attitudes towards sustainability. Utilizing 240 observations, the article illustrates robust relationships and antecedents of sustainable project success in the health sector. The influence of SPM (reflective-reflective) on SPS through the mediating variables SPP and PT was evaluated using Structural Equation Modelling (SEM). The objective of this research was to investigate the impact of SPM on SPS in the healthcare domain. A cross-sectional survey was employed to gather data from individuals directly or indirectly engaged in sustainable project management, such as doctors, nurses, paramedic staff, and administrative personnel in the health sector of Pakistan. Ultimately, 240 responses were analysed, followed by a partial least squares analysis. The findings revealed that sustainable project management significantly influences sustainable project success through sustainable project planning and project team attitudes towards sustainability. Furthermore, the results indicate that both SPP and PT mediate the relationship between SPM and SPS. These findings contribute to the existing body of knowledge regarding the project life cycle and imply that sustainable project planning is a crucial mechanism recognized within the discipline of project management, particularly in the context of achieving sustainable project success in healthcare projects. Such results may serve as a reference point for organizations intending to incorporate additional variables into the sustainable project process with minor methodological adjustments, ultimately to maximize the potential impact towards attaining sustainable project success.

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Keywords: Sustainable Project Management (SPM), Sustainable Project Planning (SPP), Project Team Attitude (PT), Sustainable Project Success (SPS), Healthcare Projects, Sustainability in Healthcare, Project Process, Sustainable Development.

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INTRODUCTION

The adoption of sustainable practices in modern project management has become integrated into practices more broadly, especially in the healthcare industry (Chow et al., 2021). The need to meet project goals while considering a broader scope of environment, society, and economy has created a shift in managing projects towards sustainability, where the principles of sustainability are practiced at every stage of a project (Chow et al., 2021). Sustainable project management is important to both the timely and successful delivery of projects as well as ensuring organizational success (Khatib et al., 2020). This change in approach requires the integration of other aspects, including, but not limited to, project delivery and stakeholder satisfaction, sustainable stewardship for the environment, social justice, and economic sufficiency (Shah et al., 2023). The core focus of sustainable project management is the ability to implement development solutions that respond to pressing challenges without compromising the

ability of future generations to meet their own needs (Addas, 2023). Given that the healthcare sector has a strong environmental footprint in resourcing, waste generation, and emissions, coupled with the sector's critical mandate of protecting public health, integrating sustainable project management practices becomes helpful and vital. The changing perspectives that healthcare organizations implement now understand the relationship between social responsibility, environmental sustainability, and profit, hence incorporating them into the operational processes and strategic planning (Hussain et al., 2024). The need for sustainable management practices in healthcare organizations directly stems from the social, environmental, and economic-related aspects that support a natural way of achieving sustainability in the healthcare system (Perilli et al., 2024). As noted, progressing towards sustainable improvements in health care requires a multidisciplinary approach incorporating the economic, social, and managerial spheres (Hussain et al., 2024).

Sustainable planning offers a distinct structure within which sustainable project management can operate and undergirds the latter with a coherent rationale (Kuchta & Mrzygłocka-Chojnacka, 2020). Ensuring alignment with long-term sustainability objectives necessitates achieving a well-defined project throughout its life cycle. In achieving such alignment, sustainable planning starts with precise forecasting of a project's prospective social, economic, and environmental impacts. This enables project teams with the required foresight and the ability to mitigate prospective risks while leveraging opportunities that may arise during the project's life cycle. By integrating sustainability into planning, project managers are empowered to avert greater environmental damage, social inequity, and resource waste, thus enhancing the enduring adaptability and sustainability of healthcare projects.

As stated by Hussain et al. (2024) and Perialathan et al. (2021), the project team must maintain a cohesive and unwavering attitude toward sustainability for the healthcare projects to be successfully undertaken and implemented. This commitment manifests itself as an accepted organizational culture where individual team members exhibit a sustained collective will to ecological, social, and governance (environmental, social, and corporate) responsibility to the fullest extent possible during the project, which enables adaptability to effortlessly overcome numerous challenges and recognize countless opportunities concerning sustainability. It also entails fostering collective agencies among team members and empowering them to actively campaign for sustainable policies, welcome transformative change, and articulate the relevance of sustainability to all stakeholders. With such a team attitude, project work performance is enhanced through collaboration and creativity in addressing the myriad and multifaceted challenges that must be undertaken to achieve sustainable outcomes in the healthcare sector (Khatib et al., 2020).

Sustainability in projects

All types of project-based work benefit from sustainability practices (Goedknecht, 2013). Companies that apply sustainability principles to project management functions will be able to achieve greater environmental benefits, a higher social return, and sustainable financial value, paradigm-shifting profit (Letlow et al. 2013). Due to their central roles in this practice, project managers tend to have a lot of impact on the adoption of sustainable practices as their function goes beyond traditional project boundaries to include wider ecological and social circles (Orieno et al., 2024). Every project will inevitably work within an ecological and social system. Moreover, the environment impacts the delivering processes and the outcomes which is executed by these projects, and these projects transform the environment

(Armenia et al., 2019). In the case of team members, attitudes shape how far sustainability goals will be achieved because a proactive and firm commitment to act in the holistic spheres of sustainability permeates the entire team, and it is critical in overcoming and harnessing project-specific challenges and opportunities (Armenia et al., 2019). Businesses can build a structure wide framework by integrating and incorporating sustainability principles into project management to achieve substantial environmental benefits through diminishing ecological footprints and resource conservation, improving social value by engaging communities and enhancing their lives, and achieving financial gains in the long run by resource efficiency and improving stakeholder relations (Goedknegt, 2013). Project teams are more likely to empower themselves if they adopt a universal approach, conduct self-evaluations, and learn from their strengths (Khatib et al., 2020).

Although the literature highlights the role of sustainable planning and the project team's attitude in achieving sustainable project success, there appears to be a lack of empirical research that fully investigates the relationship between these two elements within the healthcare sector. While public organizations have been measuring performance in public organizations, much of the recent work on more advanced measurement systems focuses on public organizations. There is much work that needs to be done in understanding how various planning practices and promotional strategies on positive attitudes from project team members interact together in fulfilling the elusive project outcomes in the health care environment. Success in sustainable projects in healthcare is achievable only when there is a constructive and sound sustainable planning approach accompanied by a strong team attitude directed towards sustainability. Sound planning provides a foundation in which the project team can anticipate and mitigate the potential environmental, social, and economic impacts of the project, while a project team that shares the strategic plan must ensure that the plan is executed competently. In the absence of these two important conditions, truly sustainable achievement will be increasingly difficult to attain (Armenia et al., 2019; Chow et al., 2021). The field of health care is one of the areas that is developing rapidly and is of paramount importance.

This is also an area where both customers and workers demand solutions to healthcare that are efficient, cost-effective, and ecologically responsible. One of the most important measures of a health care system's success is appraisal in the short term and the long term (Bhatla et al., 2024). Continuous changes are occurring in the healthcare sector, which requires various teams to enhance the delivery of healthcare services in the short and long term. It is crucial to make sure that systems are created that improve the sustainability of healthcare projects over time (Hussain et al., 2024). This would allow healthcare teams to permanently and, in the decades to come, be able to address the needs of the population.

There is a great deal of focus on trying to meet the short-term and long-term healthcare needs simultaneously. Realizing this objective would enable healthcare teams to respond to both forecast and unforeseen future healthcare needs. This is the focus of the research, which aims to evaluate how healthcare teams formulate and implement responsive strategies to healthcare demands (Hussain et al., 2024; Sepetis et al., 2024). This research will analyze proactive measures and strategies that healthcare teams can put in place to address healthcare needs both in the near and long term. As regarded by Addas in 2023, sustainable project management is a growing trend due to the need for organizations to incorporate economic, environmental, and social factors into their projects. Preserving environmental

sustainability means protecting the ecosystem from consumption, preserving biodiversity, and caring for its cultural and landscape areas as well as the climate (Addas, 2023). There is a shift in organizations towards attempting to improve their sustainable performance while minimizing their negative impact on the environment (Martins et al., 2021). The health sector can lead by example by embedding environmental sustainability in their operations and creating sustainable green care buildings (Neira & Ramanathan, 2020). The health sector must strive to achieve optimal resource use to improve the quality of care and preserve resources for future generations. Concern for recently constructed hospitals has increased because of demographic changes, new disease trends, and advancing technologies (Sahamir et al., 2019). Health organizations are being proactive by adapting to changes through altering service delivery to meet user needs and employing new health technologies. The health industry stands to make profits by adopting green policies such as carbon credit programs while mitigating their carbon footprint.

The rise in complexity of the health care system and the rising need for better care make it hard to carry out health care projects in a good way. This is made worse by the need to add sustainability to how projects are run by trying to get a good balance between money, what is good for the world, and what is good for people, while also giving good health care. Even with the increasing concern for sustainability in health care project management, there are still many projects that are marred by attempts to achieve long-term, enduring success in initiatives aimed at achieving sustainability. This is, in part, because of inadequate planning, poor managerial capability, and insufficient collaboration within the project team. Within the health sector, Sustainable Project Management (SPM) has emerged as the most adopted solution to these problems. There is, however, limited research exploring the relationship between Sustainable Project Planning (SPP), Project Team Attitude (PT), and Sustainable Project Success (SPS) in health projects. More specifically, there is a knowledge gap in how planning activities that embed sustainability goals are supported by affirmative team attitudes and competencies, resulting in the enduring success of health projects. Most healthcare project teams encounter several competing challenges to achieve sustainable results, including budget constraints, regulatory changes, and a lack of collaboration from multi-priority stakeholders.

- Evaluate the relationship between Sustainable Project Planning (SPP) and Sustainable Project Success (SPS).
- Conduct a regression analysis to determine the effect of Project Team Attitude (PT) on Sustainable Project Success (SPS).
- To conduct mediation analysis to evaluate the mediating role of Project Team Attitude (PT) and Sustainable Project Planning (SPP) in the relationship between Sustainable Project Management (SPM) and Sustainable Project Success (SPS).

Moreover, health projects, in general, focus on meeting short-term, tangible results, such as completing schedules and spending within predefined budgets, while ignoring long-term, sustainability factors, including environmental considerations, social equity, and cost efficiency over time. These factors are made more difficult by the multidisciplinary and diverse nature of healthcare project teams, whose alignment in attitudes toward sustainability is essential in ensuring effective project delivery. This addressed these gaps by examining how strategic planning and managerial competencies impact sustainable outcomes in healthcare. The research investigates the interplay of Sustainable Project Planning (SPP) and Project Team Attitude (PT) to

drive the sustainable impact of healthcare projects, particularly the attainment of Sustainable Project Success (SPS). With this understanding of interrelationships, the research aims to provide practical advice on how healthcare organizations can maximize project benefits, ensuring that delivery is not just on time and within budget, but that there are enduring positive impacts on society, the environment, and the healthcare system.

LITERATURE REVIEW

Achieving success in healthcare projects greatly depends on incorporating sustainability considerations, both for the immediate project results and for the future. There is a greater adoption of Sustainable Project Management (SPM) in healthcare projects as it seeks to satisfy the present and provide future value. SPM advocates for the entire project life cycle to promote economic, social, and environmental sustainability so that healthcare projects are beneficial to society, the environment, and the economy (Opoku et al., 2024). Sustainable Project Planning (SPP) and Project Team Attitude (PT) are two of the most important Sustainable Project Success (SPS). These two areas need to be addressed to effectively integrate sustainability objectives within healthcare projects. These are the issues explored in this literature review, how they relate to one another, and how all of them together impact the success of healthcare projects.

The TBL or Triple-Bottom-Line theory was elaborated by Elkington and Rowlands (1999), describing assessing an organization's performance on three interdependent levels: social, environmental, and economic. TBL emphasizes the balance of the three pillars as a condition for achieving sustainable development, making it very appropriate for planning sustainable programs in the health sector. Therein, the theory maintains that healthcare organizations must consider social value as not only profits but also include community health and ecologically responsible practices like healthcare waste reduction. The application of TBL concepts in project planning and management is likely to encourage more holistic approaches towards sustainable results in the healthcare sector (Elkington and Rowlands 1999; Spurgin, 2004). This theory applies in guiding research such as Project Team Attitude, Sustainable Project Management, and Planning because it highlights the relationship between social and environmental performance with economic achievement in sustainable healthcare projects. For this study, the application of TBL Theory is crucial in explaining how the interdependencies of team attitude, project planning, and management impact the sustainability of healthcare projects. By adopting TBL's project outcome evaluation framework, healthcare organizations are likely to balance financial, social, and environmental goals. Besides subscribing to the basic goals of sustainable development, it also provides a holistic framework for tracking success in multiple facets of the project.

Sustainable Project Management (SPM)

Sustainable Project Management (SPM) is the approach to managing a project while factoring its impact in each step from start to finish. In the context of the healthcare industry, It is very critical to SPM as it has the power to influence public health and the environment for decades to come (Robichaud & Anantatmula, 2011). SPM aims to meet all the environmental, economic, and social sustainability issues to ensure that the healthcare projects provided to the users are more than just mere outputs and restore enduring value in terms of sustainable outcomes (Opoku et al., 2024).

Sustainability in the practice of project management also refers to sustaining a profit alongside social and environmental value creation. These initiatives advance socially responsible design delivery systems, such as the green building and energy-efficient design that promote public health and social justice (Pan et al., 2020). They align with international benchmarks such as the United Nations Sustainable Development Goals, which stress the need for sustainable, inclusive, and long-lasting development (Carnero, 2015). Thus, the application of SPM in health care institutions helps address issues such as high costs of healthcare services, an aging population, and sustainably increasing demand for services. Altogether, it provides a strategic approach for solving such issues (Robichaud & Anantatmula, 2011).

Sustainable Project Planning (SPP)

Sustainable Project Planning (SPP) integrates guiding principles of project sustainability into the goals and objectives of a health project. Effective planning, as noted by Sarriot et al. (2004), not only ends the technical and financial aspects of a project but also makes clear expectations regarding sustainability. Consideration of sustainability during the planning phase involves garnering support for an orderly approach to addressing the economic, environmental, and social aspects of healthcare provision and problem-solving. Effective resource management that includes stakeholder participation, risk assessment, project framing within the context of sustainable development, and many more fall under the most critical primary considerations. Medical projects that do not integrate sustainability in the planning phase tend to incur higher costs and inefficiency, along with social and environmental consequences due to unsustainable solutions. Planning, alongside the other phases of the project life cycle, has received attention in prior research as an area of focus aimed at ensuring that health care projects address contemporary and future needs.

An instance would be sustainable planning that involves the use of green healthcare construction methods such as the use of energy-efficient features, renewable sources of energy, and waste cutback (Pan et al., 2020). In the same breath, it also involves caring for the community to make sure that the projects are designed just for the needs of the communities involved, especially the rural or underserved communities (Sarriot et al., 2015). To do this, all-round planning also guarantees that health projects meet the triple bottom line, fiscal, environmental, and social sustainability, besides patient care results. SPP also must consider the issues or risks that could happen while the project is being done.

These are funding gaps, unexpected effects on the environment, legal changes, and changes in what is important to health. As pointed out by Aghajani et al. (2023), dealing with these issues at the planning stage allows those who plan the project to come up with ways that will also make sure that the project will last and be successful in the end. This makes SPP an important part of the healthcare field, which is often full of unknowns and risks of failure of the project, which can not only hurt the project team but also the healthcare system and the larger group of patients.

SPPs (Sustainable Project Planning) frameworks help guarantee that the principles of sustainability are observed on all fronts, from the objectives and operations to the results of a project. As Aghajani et al. (2023) interpreted SPP, it is about making sustainability objectives and undertaking social and environmental sustainability risk assessment, policymaking, and resource allocation. Generally, projects developed with SPP considerations are more likely to be finished faster and at reduced costs. Stakeholder participation is essential to SPP. In healthcare projects, representativeness

by stakeholders, for example, clinicians, patients, community citizens, and regulators, ensures that their expectations and concerns are cared for, which enables acceptability and successful outcomes. Detailed planning also anticipates policy changes or funding cuts and plans risk management strategies to mitigate these challenges. Without the adoption of inclusive sustainability planning, such projects are likely to be burdened with untold disadvantages, which will, in turn, cause delays and increased costs. Investments in the 'green' design or construction of buildings, which minimize operational costs while maximizing staff and patient satisfaction, also fall under SPP, or sustainability planning. According to Roh et al. (2023), the Sustainable Patient Satisfaction Systems (SPSS) relies on these factors too.

Project Team Attitude (PT)

The study focuses on the project team's attitude towards taking sustainability initiatives as needed for the completion of projects, and the project team should follow the plan and goals of the organization. So, for sustainable project success, everyone in the team should work as per the sustainable plans given to them. Their attitude plays a vital role in achieving sustainable projects. This study named the attitude of the team as Project Team Attitude towards sustainability (PT). Project Team Attitude towards sustainability (PT) looks at how the team felt about the work, but also how motivated and how happy they were in doing the work for the health care project. Manyathi and Terblanche (2023) say that PT's good and steady ways of being show how well they can reach the goals for health care that they set when they made their plan. Positivity, which is like sticking to a goal for health care and being committed to doing health care in a way that will last, can help the project do well a lot more than it would have if it had not been positive. While health care projects get a lot of focus for Project Team Attitude towards sustainability (PT), it is such an important thing because how well a health care project does, depends on how well the team works together and how well they work together to get past problems. Zaman et al. (2022) agree that the attitude of the project team is what makes the project strong and able to last for a long time and a short time. Team cultures that are good and have a lot of good actions can help spark new and different ideas, and make finding better ways to get health care done by having all the team members willing to work on the goals for health care.

Healthcare initiatives frequently require multidisciplinary professional teams, like an engineering and architecture team, project managers, policy advisors, or even medical specialists. The interplay between different groups of people must be seamless if sustainability is to be an inherent constituent of the entire project. Also, the ability of the project team to come up with new creative solutions, for example, to a sudden lack of funds, regulatory hurdles, or even new tech changes, is critical in shaping long-term sustainability (Rahat et al., 2024).

Project Team Attitude towards sustainability (PT) focuses on how a project team works together, their general disposition, and how far they are willing to go in terms of devotion to a shared goal, which qualifies them for maximal project performance. Manyathi and Terblanche (2023) studied the contribution of healthcare through projects and found that it depends a great deal on sustainability goal congruence alignment within the project team. Attitudes that are well sustained, co-responsibility for the success of the project, and communication that is free of conflict are basic to executing tactical results from the planning phase (Zaman et al., 2022). Most healthcare projects necessitate the input of multi-disciplinary crews that involve other medical staff, engineers, architects, and even project managers. The ability of plural

teams to work together to achieve the sustainability goal is a major factor that determines the successful integration of sustainability (Rahat et al., 2024). A responsive many teams can also set long-range objectives, such as social equity and justice, as well as diminishing environmental footprints (Yazici, 2020). Equally critical, but from the perspective of endurance, is the capacity of the project team to deal with unanticipated ordered surges like surprise patient demand or a shift in the regulatory framework. Rahat et al. (2024) report that improving health care access, along with lowering the environmental impact of these services, are vital, sustainable benefits of the programs.

Sustainable Project Success (SPS)

Sustainable Project Success (SPS) is the final impact and success of a project, i.e., its capacity to attain the sustainability goals set at the planning stage. Unlike more conventional definitions of project success that were generally aimed at scope, time, and cost, SPS transcends the short-term success of a finished project to examine the final effect of the project on society, the environment, and the health care system (Sarriot et al., 2004). A good health care project not only meets its short-term objectives but is also long-term advantageous in that it helps in sustaining health care systems. SPS in health care projects also involves assessing the economic, environmental, and social impacts of the project. For example, integrated health facility construction projects combined with energy-saving technologies that reduce their environmental footprint can go a long way in reducing operating expenses, enhancing the effectiveness of the use of resources, and reducing the environmental footprint of the health facilities (Silvius & Schipper, 2014).

Except for the fact that projects that help people get care in a way that can cut down on the real health gaps and can help make the lives of the people better in a big way can be very big in a lot of ways (Castro et al., 2015). To get SPS, you should follow a great way of judging how well the effort is doing, not just when it ends, but as it goes on. The loop of change means you keep watching things, get back to see how it's doing, and change it so that it keeps working well and is right for the long run. Sustainable Project Success (SPS) interdisciplinary measures amplify project metrics beyond mere cost, time, and scope. It strikes a balance on a project's more far-reaching impacts, whether it's on environmental conservation, societal welfare, or even economic advancement. This is achieved by projects that demonstrate a greater focus on the indirect effects instead of the direct impacts, therefore augmenting the health of the covered healthcare system and population in a holistic sense (Stanitsas & Kirytopoulos, 2023). SPS is achieved by health projects that are focused on corporate social responsibilities, energy conservation, waste reduction, and community engagement (Carnero, 2020).

The resulting benefits include operational cost savings, maximized energy efficiency, reduced environmental impact, and thus achieving economic and environmental sustainability. Moreover, advancing equitable healthcare access or improving health outcomes for vulnerable populations aids in fostering socio-sustainable prevention of health inequities and the realization of socio-structural health equity (Roh et al., 2023). SPS adds to the planning and implementation phase the need for continuous proactive tracking and feedback control systems, the ability to adapt to change, and the ability to evolve flexibly to sustained circumstances. Continuous monitoring of the changing health systems and demographics is essential. SPP, PT, and SPS are key processes that frame the steps aimed at improving and sustaining the impact and health of the projects over time. Accomplishment in SPP indicates that the project was

carved out with some sustainability milestones aimed at the project life cycle; however, rational planning depends on the very deeply rooted enduring culture of sustainability within the project team. Evidence by Sarriot et al. (2004) supports that sustainable implementation provides greater advantages to the project team, which benefits the health system and society. The integration of SPP and PT ensures that in the project life cycle and during the planning phase, the sustainability objectives are outlined and achieved. This combination of planning along with team mentality fosters the perpetual accomplishment of health care projects as noted by Rattan et al. (2022). By deliberately infusing sustainability during the planning and implementation stages, healthcare organizations are positioned to deliver sustained net benefits economically, ecologically, and socially. In conclusion, the conceptual framework of Sustainable Project Planning (SPP) and Project Team Attitude towards sustainability (PT) provides the reasoning to accomplish Sustainable Project Success (SPS) for health care projects.

In relation to sustainability drivers, understanding the balance between long-term value against short-term achievements helps in balancing other factors. Integrating sustainable development into the planning and implementation stages facilitates the creation of healthcare projects that generate value for society, the environment, and the health domain.

HYPOTHESES

H₁. There is a significant impact of sustainable project management (SPM) on sustainable project success (SPS)

H₂. There is a significant impact of sustainable project management (SPM) on sustainable project planning (SPP).

H₃. There is a significant impact of sustainable project planning (SPP) on project team attitude towards sustainability (PT).

H₄. There is a mediating impact of sustainable project planning (SPP) and project team attitude towards sustainability (PT) between sustainable project management (SPM) and sustainable project success (SPS).

CONCEPTUAL FRAMEWORK

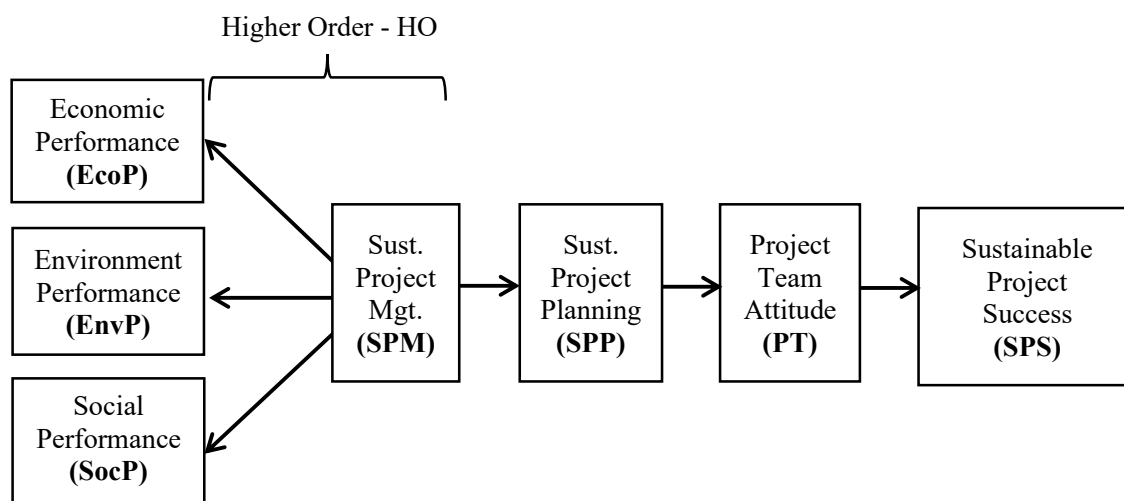


Figure 1.
Conceptual Framework

METHODOLOGY

The study employs a quantitative research approach in investigating the SPP, PT, and SPS in health projects. Data was obtained through a survey method from respective stakeholders in the management of health projects. Through the survey, the study evaluates the impacts of SPM practices, planning, and attitudes of the project team on healthcare project long-term success. The following are the in-depth constituent parts of research methodology.

Research Design

The research employs a descriptive correlational design, which allows for the investigation of relationships between variables without manipulating them. The design aims to examine the strength and direction of the relationships between the independent variable (Sustainable Project Management (SPM)), the mediating variable (Sustainable Project Planning (SPP)), and the dependent variable (Sustainable Project Success (SPS)). A quantitative approach is appropriate to capture the measurable relationships among these variables, allowing for the generalizability of the results to other healthcare projects.

Population and Sample Size

The target population of this research is healthcare project management professionals, like project managers, team members, and other stakeholders in healthcare projects. Such respondents are selected based on experience and the degree of participation in planning, implementation, and monitoring healthcare projects. The sample comprises 240 participants. The size is sufficient for quantitative analysis and mirrors standard survey study guidelines for purposes of acquiring an adequate level of statistical power to observe significant relationships among variables.

Sampling Strategy

Convenience sampling was used to ensure the respondents were easily available and capture a diversity of healthcare projects (e.g., infrastructure, installation of healthcare systems, service delivery). The focus of convenience sampling was on professional roles, geographic locations, and types of healthcare projects, guaranteeing that the results reflect diversity in healthcare project management. The selection process targeted respondents with hands-on experience in planning, implementing, or assessing projects to guarantee they possess experience and knowledge in the field of study.

Data Gathering

Data gathered through the standardized survey instrument was utilized to quantify variables in the conceptual framework:

1. **Part A: Demographics** – Demographic information like age, tenure, industry of work, employment status, and place are noted in this section.
2. **Part B: Sustainable Project Management (SPM)** – Questions capture the economic, environmental, and social performance of health care projects. Questions try to measure the contribution of these variables towards the overall sustainability of the project.

3. Part C: Sustainable Project Planning (SPP) – The part discusses the use of sustainability principles in risk response, managerial control, and work agreement in project planning.

4. Part D: Project Team Attitude (PT) – Team attitude towards sustainability, teamwork, and overall attitude for project success.

5. Part E: Sustainable Project Success (SPS) – This encompasses the healthcare projects in five aspects of success: project efficiency, stakeholder influence, team influence, business success, and sustainability outcomes (economic, environmental, and social).

The questionnaire employed a 5-point Likert scale where the respondent marks the degree to which respondents agree with each statement (1 = Strongly Disagree, 5 = Strongly Agree). The scale provides accurate measurement of practices, perceptions, and attitudes.

Ethical Considerations

This study adhered to the highest ethical research standards. Participants were informed of the purpose, procedures, and their right to confidentiality and voluntary participation in the study. Participants provided an informed consent form that guarantees participants awareness of the scope of the study and how their data will be used. No personal identifiers were asked on the survey to provide respondents with anonymity. In addition, the subjects must be advised that they may withdraw from the study at any time without cost.

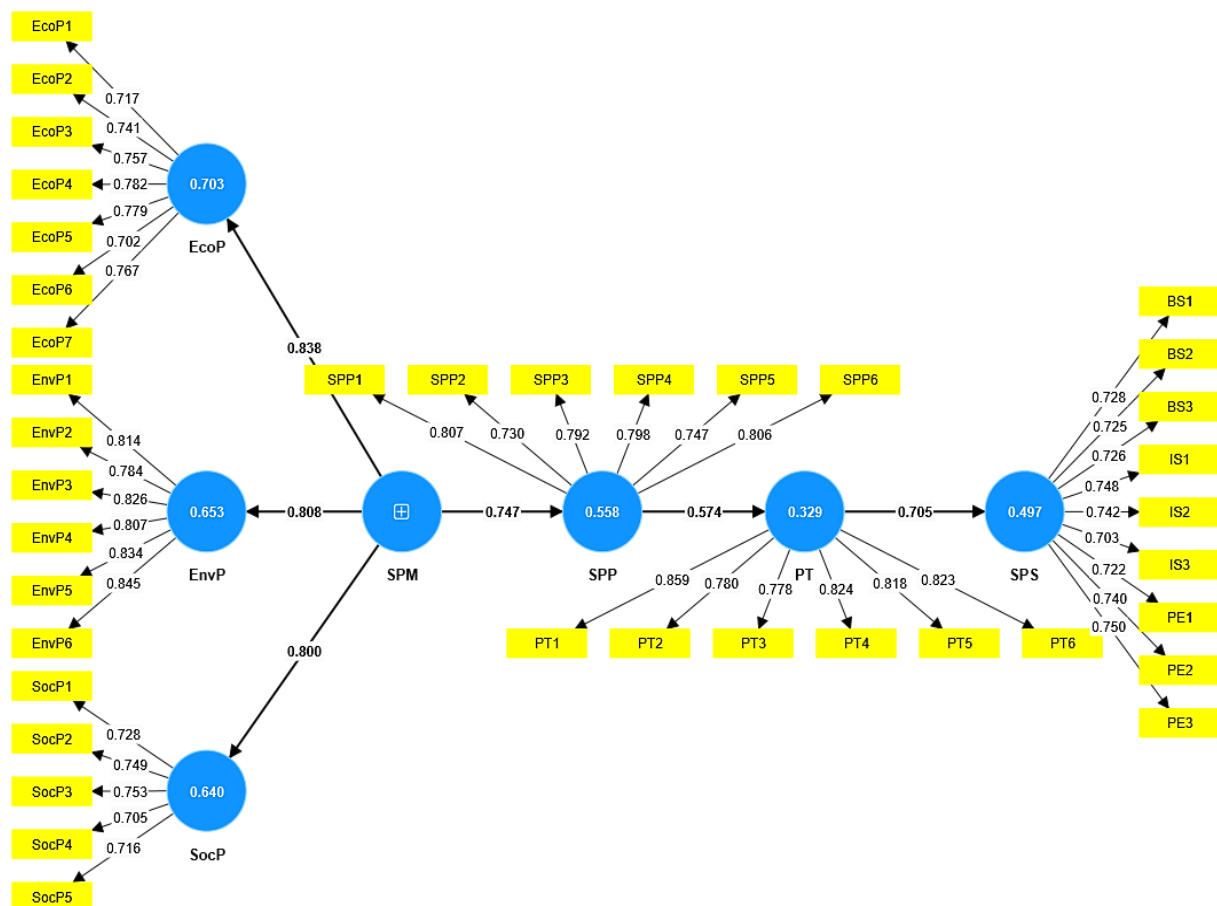
Data Analysis

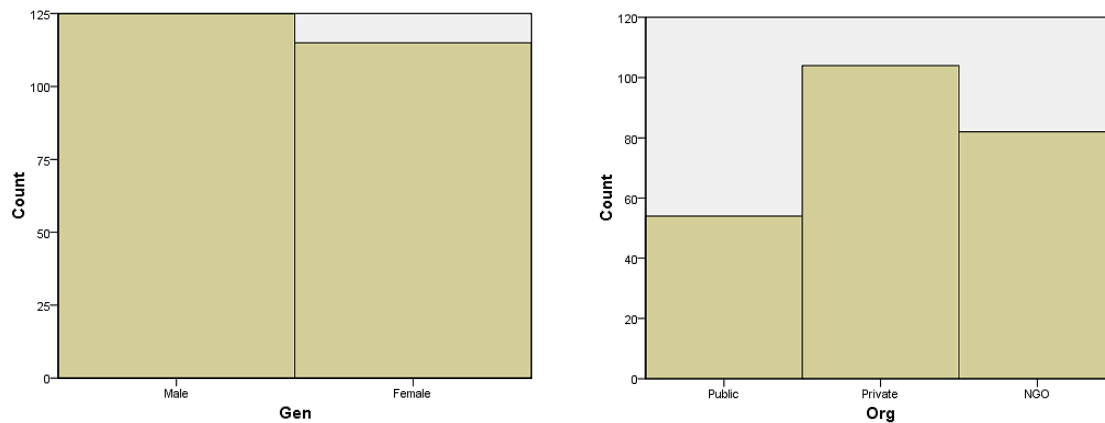
Data collected and investigated using SPSS and SmartPLS 4, software, to determine the effectiveness of the variables. This study examines interrelations between the most significant determinants of success for sustainable health sector projects, i.e., Sustainable Project Management (SPM) as higher order (reflective-reflective) for the study, Sustainable Project Planning as first mediating variable (SPP – Med₁), Project Team Attitude towards sustainability as second mediating variable (PT – Med₂), and Sustainable Project Success (SPS) as dependent variable. The data analysis depicts variation and correlation between these variables, using a sample of 240 observations. Descriptive statistics show medium to high variability between the four variables, with SPM having the greatest spread, which reflects diversified project management strategies in the health sector. PT, SPP, and SPS reflect higher homogeneity, though there remains a certain degree of variation in project teams' attitudes and the planning processes. The study further examines the strong correlations between the variables and reflects on the dependency among management practices, planning quality, and the success of sustainable projects in the health sector.

It was shown by regression analysis that SPM, SPP (Med₁), and PT (Med₂) significantly predicted SPS, with the highest effect of SPM. Other than that, mediation analysis also attested that PT (Med₂) fully mediated the path between SPP (Med₁) and SPS, and attitude on the part of the project team is a factor influencing the interpretation of sustainable planning as successful project performance. This is why it is important to develop a positive and proactive attitude in project teams and to arrange project management and planning appropriately to achieve long-term success in health sector projects.

Descriptive Statistics

Descriptive statistics were calculated for the respondents' demographic characteristics and the key survey items related to the constructs being studied. These statistics provide an overview of the sample distribution and general trends in the responses. The descriptive analysis of the demographic data of the study will help to understand the sample characteristics to be used in subsequent analysis. The sample included 240 respondents, with nearly an equal gender ratio; 52.1% (n = 125) were males and 47.9% (n = 115) were females. This gender ratio provides a mixed perspective on the results of the study. As for organizational affiliation, most of the respondents came from the private sector (43.3%, n = 104), followed by 34.2% (n = 82) from NGO's and 22.5% (n = 54) from the public sector. This is an important representation of the private sector and NGOs, key players in sustainable project implementation. Less than two-thirds of participants, 64.2% (n = 154), were from the hospital sector, while more than a third (35.8%) (n = 86) were from the wider healthcare sector. This is not surprising given the emphasis on health-related projects and serves to highlight that the hospital sector is centrally featured in the data. In general, the sample's demographics reflect a broad and diverse cross-section of practitioners, improving the results' transferability to different organizational (and sectoral) settings.





Firstly, reliability is evaluated using several metrics, including Cronbach's alpha, rho_a, and Composite Reliability (CR). For the construct of Sustainable Project Management (SPM reflective-reflective), the different dimensions show promising results: Economic Performance (CR = 0.870, rho_a = 0.871), Environmental Performance (CR = 0.901, rho_a = 0.902), and Social Performance (CR = 0.781, rho_a = 0.783). All CR values exceed the acceptable threshold of 0.7, indicating good internal consistency across measures. Similarly, Sustainable Project Planning (SPP) and Project Team Attitude (PT) also demonstrate strong reliability with CR values of 0.871 and 0.898, respectively. Finally, Sustainable Project Success (SPS) achieves a CR of 0.892, further affirming its reliability.

As for assessing convergent validity, this is done using Average Variance Extracted (AVE). An AVE value above 0.5 indicates that the construct explains more than half of the variance of its indicators. Concerning SPM, the EcoP, EnvP, and SocP dimensions attained AVE scores of 0.562, 0.670, and 0.533, respectively, all surpassing the AVE benchmark. Also demonstrating strong convergent validity were SPP and PT with AVEs of 0.609 and 0.663, respectively. SPS achieves an AVE of 0.535, which, while acceptable, confirms all constructs capture the intended variance.

To ensure that there are no multicollinearity problems regarding the constructs, VIF (Variance Inflation Factor) scores are checked. A VIF score below 5 indicates the absence of significant multicollinearity. For SPM, the corresponding VIF scores ranged from 1.40 to 2.56, which are all below the critical value, confirming no multicollinearity. This is also true for SPP, PT, and SPS, as all VIF scores remain below 5, further strengthening the reliability of the constructs.

The examination of Factor Loadings (FL) is particularly important when explaining the strength of the associations between the indicators and constructs because it establishes their relations. Acceptable loadings are generally over 0.7. In the case of SPM, the EcoP loadings are between 0.702 and 0.782, while for EnvP and SocP loadings are from 0.784 to 0.845 and 0.705 to 0.753, respectively. Most of these loadings are within the criteria, thus demonstrating strong relations. Both SPP and PT show loadings of 0.735 to 0.790 and 0.778 to 0.859, respectively, which indicates strong relationships. Lastly, SPS has loadings between 0.703 and 0.750, which is above the minimum acceptable threshold.

In conclusion, the evaluation of the measurement model suggests all constructs satisfy the fundamental thresholds for reliability, validity, and multicollinearity. This develops a firm foundation for performing a subsequent structural model analysis in SmartPLS 4, which will assess the relationship of an independent variable (SPM reflective-

reflective) to a dependent variable (SPS), including the intervening variables SPP and PT. Such an analysis is expected to aid in understanding the effect of sustainable project management on the success of projects in the healthcare sector, with an emphasis on the importance of good planning and team attitude.

Table 1 (a).
Independent Variable (IV-Higher Order-HO)

Sustainable Project Management (SPM)		VIF	FL	CR	rho_a	AVE
EcoP - Economic Performance				0.870	0.871	0.562
EcoP1		1.67	0.717			
EcoP2		1.73	0.741			
EcoP3		1.75	0.757			
EcoP4		1.98	0.782			
EcoP5		2.10	0.779			
EcoP6		1.61	0.702			
EcoP7		1.90	0.767			
EnvP - Environmental Performance				0.901	0.902	0.670
EnvP1		2.33	0.814			
EnvP2		1.96	0.784			
EnvP3		2.52	0.826			
EnvP4		2.11	0.807			
EnvP5		2.56	0.834			
EnvP6		2.50	0.845			
SocP - Social Performance				0.781	0.783	0.533
SocP1		1.48	0.728			
SocP2		1.52	0.749			
SocP3		1.74	0.753			
SocP4		1.40	0.705			
SocP5		1.47	0.716			

Table 1 (b): Mediating Variable - Med1

		VIF	FL	CR	rho_a	AVE
Sustainable Project Planning (SPP)				0.871	0.873	0.609
SPP1		2.03	0.790			
SPP2		1.61	0.786			
SPP3		2.08	0.777			
SPP4		1.96	0.735			
SPP5		1.65	0.778			
SPP6		2.02	0.783			

Table 1 (c): Mediating Variable - Med2

		VIF	FL	CR	rho_a	AVE
Project Team Attitude (PT)				0.898	0.903	0.663
PT1		2.60	0.859			
PT2		1.94	0.780			
PT3		1.97	0.778			

PT4	2.20	0.824
PT5	2.21	0.818
PT6	2.16	0.823

**Table 1 (d): Dependent Variable – DV
Sustainable Project Success (SPS)**

	VIF	FL	CR	rho_a	AVE
Sustainable Project Success (SPS)			0.892	0.895	0.535
SPS - Project Efficiency (PE)					
PE1	1.963	0.748			
PE2	1.522	0.742			
PE3	1.79	0.703			
SPS - Impact on Stakeholder (IS)					
IS1	1.691	0.722			
IS2	1.376	0.740			
IS3	1.55	0.750			
SPS - Business Success (BS)					
BS1	1.464	0.728			
BS2	1.788	0.725			
BS3	1.627	0.726			

Note: **VIF** (Variance Inflation Factor), **FL** (Factor loading), **CR** (Cronbach's alpha), **rho_a** (Composite reliability), **AVE** (Average Variance Extracted).

**Table 2 (a).
R-square value**

	R-square	R-square adjusted
EcoP	0.703	0.702
EnvP	0.653	0.652
SocP	0.640	0.639
SPP	0.558	0.556
PT	0.329	0.326
SPS	0.497	0.495

Table 2 (b): f-square value

	EcoP	EnvP	SocP	PT	SPP	SPS
SPM	2.366	1.886	1.780		1.263	
PT						0.987
SPP				0.491		

The interpretation of Tables 2 (a) and 2 (b) gives important information about the constructs of the study. As for the R-square values, they suggest that the independent variable, Sustainable Project Management (SPM), accounts for a substantial share of the variance in the dependent variables. Take Economic Performance (EcoP) for example, which has an R^2 value of 0.703. This indicates that EcoP is statistically explained at 70.3% by SPM, while EnvP and SocP are explained at 65.3% and 64%,

respectively. These figures attest to the powerful impact that SPM has on the sustainable project management dimensions. In the opposite case, Project Team Attitude (PT) and Sustainable Project Success (SPS) have lower R^2 values of 0.329 and 0.497, respectively, indicating that those dependents might be influenced by additional variables. Besides, the f-square values further contextualize the impact SPM, SPP, and PT have on their respective dependent variables by illustrating the effect sizes. The EcoP, EnvP, and SocP f^2 values of 2.366, 1.886, and 1.780, respectively, suggest that SPM has a very large long-term impact on these areas, and SPP also has a sizeable impact on PT ($f^2 = 0.491$).

Notably, PT has a considerable long-term impact on SPS ($f^2 = 0.987$), which highlights the critical role of positive team attitude in achieving sustainable project success. Overall, the results accentuate the importance of incorporating sustainability into project management and improving health sector project performance through team spirit and collaboration.

Table 3.
Heterotrait-Monotrait (HTMT) ratio

	EcoP	EnvP	PT	SPP	SPS
EcoP					
EnvP	0.498				
PT	0.597	0.727			
SPP	0.774	0.593	0.644		
SPS	0.568	0.667	0.770	0.612	
SocP	0.670	0.605	0.719	0.756	0.784

The assessment of the constructs' discriminant validity from the model, due on the analysis of Tables 3 and 4. The Heterotrait-Monotrait ratio (HTMT) shown in Table 3 demonstrates that all values are below the critical limit of 0.85, suggesting that the constructs are separate from each other. For example, the HTMT ratio between EcoP and EnvP is 0.498, and the highest ratio of 0.784, which occurs between SocP and SPS, is still within the cutoff threshold.

In Table 4, by applying the Fornell-Larcker criterion, it is shown that the square roots of the averages of the variance extracted (AVE) for each construct (EcoP = 0.750, EnvP = 0.819, PT = 0.814) are greater than the inter-construct correlations, like EcoP and EnvP 0.445, PT and SPS 0.705. These results affirm that the constructs have adequate discriminant validity, failure of which can result in the loss of specificity regarding the model. The outcome of both methods, the HTMT ratio and the Fornell-Larcker criterion, reinforces the overall dependability and credibility of the research outcomes regarding sustainable project management and its influence on the success of projects.

Table 4.
Fornell-Larcker criterion

	EcoP	EnvP	PT	SPP	SPS	SocP
EcoP	0.750					
EnvP	0.445	0.819				
PT	0.530	0.657	0.814			
SPP	0.676	0.529	0.574	0.780		
SPS	0.505	0.599	0.705	0.545	0.732	
SocP	0.557	0.509	0.607	0.626	0.657	0.730

Table 5.
Path coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
SPM -> SPP	0.747	0.748	0.046	16.257	0.000
SPP -> PT	0.574	0.579	0.075	7.618	0.000
PT -> SPS	0.705	0.705	0.051	13.799	0.000

The path coefficients, which describe the interrelationships between the constructs in the model, are found in Table 5. It can be seen from the results that there is a strong positive correlation between Sustainable Project Management (SPM) and Sustainable Project Planning (SPP), with an original sample coefficient of 0.747 and a T-statistic of 16.257 with a p-value of 0.000, which is statistically significant. The SPP to Project Team Attitude (PT) also has a significant relationship with a coefficient of 0.574, T-statistic of 7.618, p-value of 0.000, which is significant. Finally, from PT to Sustainable Project Success (SPS), the relationship has a path coefficient of 0.705, a T-statistic of 13.799, and a p-value of 0.000, which indicates that team attitude is very important in enhancing project success. All in all, the results demonstrate the magnitude and importance of the comprehensive routes connecting sustainable project management and the success of the project, which are planning and team relations.

Table 6: Specific Indirect Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
SPP -> PT -> SPS	0.404	0.409	0.063	6.428	0.000
SPM -> SPP -> PT -> SPS	0.302	0.308	0.061	4.947	0.000

In Table 6, we observe the concrete indirect impacts of the model, which depict the dual mediation of Sustainable Project Planning (SPP) and Project Team Attitude (PT). SPP's indirect influence on Sustainable Project Success (SPS) via PT is noted with an original sample coefficient of 0.404 with a T-stat of 6.428 and p-value of 0.000, confirming its significance. Furthermore, the indirect effect of SPM on SPS through both SPP and PT is documented with a coefficient of 0.302, T-stat of 4.947, and p-value of 0.000, which also confirms significance. These results underline the importance of sustainable project mid-planning and team attitude in the attainment of sustainable project results while demonstrating that the effectiveness of project management leads to measurable performance outcomes that are mediated through these factors.

The study offers far-reaching evidence that all three mediation constructs fully mediate the relationship between Sustainable Project Planning and Sustainable Project Success. The direct of SPP on PT and indirect impacts of SPP on SPS are high, as sound healthcare project planning coupled with a positive sustainable attitude from the project team ensures success in sustainable projects, as strongly illustrated. These findings strengthen and emphasize the necessity to enhance project team culture during the sustainability planning and execution phases in the health sector.

CONCLUSION

This research presents robust evidence that the independent variable, Sustainable Project Management, and all the mediation constructs - Sustainable Project Planning

and Project Team Attitude, fully mediate the relationship between Sustainable Project Management and Sustainable Project Success. The direct and indirect effects of Sustainable Project Planning and the Project team's attitude on Sustainable Project Success are high. This profoundly emanates the call for robust healthcare planning and the focus on sustainability taken by the project team's approach towards success for long-lasting projects. These conclusions stress the importance of needing to nurture and fostering the project team culture positively while executing health sector sustainability projects. Moreover, the study emphasizes the important roles of middle-level planning as well as the project team's mental attitude toward achieving sustainable project goals, demonstrating that project management effectiveness results framed through those factors. By articulating the application of the Triple Bottom Line theory, the study offers a comprehensive framework for assessing multi-dimensional success in sustainable healthcare projects, encompassing financial, social, and environmental objectives.

The implementation of the theory of Triple Bottom Line serves as an excellent theoretical underpinning for this research. TBL was coined in 1994 by Elkington and was later studied by Elkington and Rowlands (1999), highlighting that an organization's performance ought to be gauged on three interrelated scales: the environmental, social, and economic realms. This is particularly applicable for sustainable healthcare initiatives because it not only obligates organizations to report their infringements in official documents but also holds them accountable for their social and environmental repercussions. The TBL framework combines economic success with benefits to societal well-being, such as community health and environmentally sustainable practices like reducing waste in the healthcare sector. Integrating the TBL paradigm with this research signifies that, beyond finances, the social and ecological aspects sustain the paradigm of healthcare projects. This study's findings all support the TBL approach by showing how better project management, along with enhanced planning and improved team attitudes, can positively change social, environmental, and economic performance in healthcare projects. This integrated view expands the understanding of sustainable healthcare initiatives.

This study addresses critical gaps regarding the determinants of successful sustainable healthcare projects. This integrates effective project management, its planning, and the collective positive attitude of the team, resulting in success. In addition, the application of the Triple Bottom Line framework reinforces a sustained differentiated policy approach towards healthcare sustainability by weighing economic, social, and environmental factors along with its components. These findings yield actionable recommendations to healthcare practitioners and policymakers aimed at enhancing program sustainability and efficiency, thus driving targeted and sustainable change in the healthcare system.

LIMITATIONS

While the research uncovers the complex relationship between Sustainable Project Planning, Project Team Attitude, and Sustainable Project Success, it suffers from multiple limitations:

- The sample size of 240 observations in the research may not sufficiently capture all the healthcare projects across different regions or systems. With that said, the authors believe that this sample size is adequate for discovering the most important trends and links.

- In this study, the quantitative approach used was lacking qualitative input like interviews or case studies that could have enriched the analysis. While qualitative data could provide additional context, the quantitative approach facilitates more rigorous statistical scrutiny.
- Government policies, socio-economic conditions, and technological factors were not included. The authors recognize that these factors might affect the sustainability of healthcare projects and warrant further consideration in subsequent studies.
- Follow-up studies will be limited to focusing on qualitative methods, a broader perspective, and external factors. The authors support the idea that a multi-method design integrating qualitative and quantitative data would enhance understanding of the issue.

IMPLICATIONS

This research has significant implications, including:

- Actively fostering positive team attitudes, improving management structure, and concentrating on sustainable planning increases the outcomes of healthcare projects.
- Advocating for the application of TBL framework is vital, since it gives incentive for the healthcare organizations to consider also the social and environmental aspects alongside the finances.
- This study offers compelling evidence to support the continued investigation, and the creation of a curriculum aimed at sustainable health care management.
- A truly sustainable healthcare agenda can only be achieved with the cooperation and collaboration of all the healthcare stakeholders, the service providers, the community, and the ecosystem.

RECOMMENDATIONS

- Develop special leadership and team-building programs to cultivate enthusiasm and a positive attitude towards sustainable healthcare practice.
- Develop and implement a uniform project management system focused on sustainable practices for healthcare to ensure uniformity and success across projects.
- Encourage healthcare organizations to adopt the TBL approach to simultaneously address social, environmental, and financial elements of their operations.
- Create a more comprehensive model by adding more variables of sustainable project management processes with the addition of resource-based view theory.
- Examine the impact of extrinsic factors such as government policies, technological advancements, stakeholders, and community needs on the sustainability of healthcare programs.

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