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Agile Leadership in Managing Continuous Change in Healthcare

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Abstract

This study examines the role of agile leadership in managing continuous change within healthcare organizations, with a particular focus on its impact on organizational performance and digital innovation culture. The healthcare sector is currently facing rapid transformations driven by technological advancements, increasing patient demands, and the need for improved efficiency and quality of care. Traditional management approaches have proven insufficient in addressing these dynamic challenges, highlighting the need for more flexible and adaptive leadership styles.

The research adopts a mixed-methods approach, combining quantitative data collected through structured questionnaires with qualitative insights to provide a comprehensive analysis. The study sample consists of healthcare professionals, including doctors, nurses, and administrative staff, primarily from King Faisal Specialist Hospital. Statistical techniques such as descriptive analysis, reliability testing (Cronbach's Alpha), correlation analysis, regression analysis, and hypothesis testing (T-test and ANOVA) were employed using SPSS to analyze the data.

The findings reveal that agile leadership has a positive and statistically significant impact on managing continuous change and enhancing healthcare performance. Specifically, agile practices contribute to improved patient satisfaction, reduced waiting times, increased efficiency, and better adaptability to change. The study also highlights that team empowerment, effective communication, and continuous learning are key dimensions of agile leadership that drive organizational transformation. However, challenges such as resistance to change, hierarchical structures, and resource limitations remain barriers to successful implementation.

In conclusion, the study emphasizes the importance of adopting agile leadership as a strategic approach in healthcare organizations to foster innovation, resilience, and sustainable performance. It recommends investing in leadership training, promoting a culture of trust and empowerment, and implementing agile practices gradually to ensure successful transformation in complex healthcare environments.

Chapter one

Introduction:

A number of challenges in the healthcare sector have developed in the current century, including escalating costs, increasing demands, improvements in medical technology, and ensuring quality in patient care. Healthcare institutions have applied the linear method in managing their projects, an approach taken from other industries that run under stable conditions. Nevertheless, the dynamic state of today's healthcare sector requires a management approach like program management.(Morsi et al., 2024, p. 10).

In such an organization, agile leadership is an essential concept that has been recognized within modern management, where flexibility and cooperation are important for responding fast and effectively when dealing with the complexity of today's businesses. Agile leadership can be considered as a strategic attempt at obtaining high productivity through the establishment of respect and trust between the leader and his/her subjects, which results in achieving high quality. Agility in hospitals' management would mean the capability of adapting, transforming, and changing (Roblek et al., 2024, p. 40).

In handling changes, it involves ensuring that the leadership team does not force their employees to adapt to technical changes but creates an atmosphere of constant adaptation, feedback, and accountability. Constant learning will be another strategy that can be used by healthcare institutions to cope with the constant change in demands. Agile is another method that should be considered because it increases productivity (Thombare et al., 2026, p. 98).

In summary, agility and innovation have been deemed crucial factors that contribute to business success due to the fast pace at which businesses transform themselves. This paper analyzes how agility and innovation can be incorporated within the framework of a business organization and concludes

that leadership agility is the term used to describe the swift response to change irrespective of the industry. (Talip Bektaş, 2025, p. 107).

Study problem

The problem under study can be explained through the increasing need for the health care sector to adjust to a rapidly changing environment and new innovations. Undeniably, the health care sector is experiencing significant changes because of technological innovations, consumer demand, and the need for increased efficiency and cost reduction (Brouki Abderrahmane, 2024, p. 202). In other words, the problem that needs to be addressed is the lack of effectiveness of the current management approach towards volatility and complexity in the health care sector.(Morsi et al., 2024, p. 10).

Another factor which should be considered while examining the issue at hand is the problem of non-operational integration, in other words, the necessity to examine the possible opportunities offered by implementing the notion of agility within the clinical practice (Saleh et al., 2024, p. 636). Furthermore, the positive outcomes that can be gained due to implementing agility are often not backed up by empirical evidence because some literature reviews lack empirical underpinnings in this regard (Saleh et al., 2024, p. 637).

Moreover, the problem becomes even more complicated owing to the fragmentation of the system in the sense that in relation to health care services, there exists the tendency for health professionals to view sexual and psychological well-being issues separately from each other without paying any attention to the fact that they are very much interrelated (Dipanwita Chattopadhyay, 2025, p. 92). This approach seems to resemble what pharmaceutical industries and governments do as a consequence of digitalization(Saksham Neeraj Doshi, 2024, p. 12).

In any case, the cause for failure of such transformational efforts is the inappropriate style of leadership that has been applied, which is out of place in today's world, because rather than applying a predefined strategy to the problem, leaders aim at creating a situation where it is possible to effect some change all the time (Thombare et al., 2026, p. 96). The idea of agility needs to be revised in light of the constant changes and should be viewed in terms of transformation (Roblek et al., 2024, p. 40).

Important of the study

The significance of this current research lies in the fact that the agile methodology would be able to bring about changes in the domain, which is currently under considerable strain. It can be understood that there would be multiple implications of the current study, all of which would revolve around the ability of the agile methodology to bring about change in the domain, which requires agility, innovation, and regulation. The hope is that the current study would be able to fill the existing gap in the literature pertaining to agility in the clinical setting.

Moreover, the need for conducting the research is connected with the uncertainties typical of modern health care, which means that project management strategies should be adaptable. Finally, the importance of the proposed research is illustrated by its potential to overcome the problem of poor education about agile management and implement it in health care.

It is important for organizations to evaluate the selected leadership approaches to develop them further. On the basis of the literature review, it can be assumed that healthcare organizations would find it beneficial to adopt agile approaches because they will allow resolving emerging problems and increasing efficiency.

Moreover, the research gains its high relevance for the society due to the fact that sustainability and resilience can be ensured through an integrated strategy consisting of legal measures, public health measures, and economic factors. Using novel ideas such as extending insurance coverage, better infrastructure,

and healthcare professionals' cultural competencies will ensure that the research acts as a guideline for establishing an inclusive healthcare system.

study aims

This study aims to explore the role of agile management in healthcare and its impact on organizational performance and patient care. The main objectives are:

- **To examine the impact of agile management on patient outcomes,** particularly in improving adaptability, responsiveness, and quality of care.
- **To analyze the benefits and challenges of implementing agile methodologies** in both clinical and administrative processes.
- **To evaluate the effectiveness of agile practices** based on key performance indicators, including efficiency, budget adherence, stakeholder satisfaction, adaptability to change, quality of care, and organizational learning.
- **To identify the organizational changes required** to establish a culture that supports agility within healthcare institutions
- **To understand the role of agile leadership in fostering innovation,** especially in promoting digital transformation within healthcare organizations.
- **To explore the process of agile transformation and its impact on organizational performance.**

Research Questions

This study seeks to answer the following questions:

- How do Agile Leadership practices contribute to building a culture of digital innovation in healthcare institutions?
- What is the relationship between Agile Leadership practices and digital innovation culture within healthcare organizations?
- Which cultural elements are promoted by Agile Leadership that support successful digital innovation in healthcare settings?
- What organizational changes are required to establish a culture that enables agility in healthcare organizations?
- What challenges do healthcare leaders and managers face when implementing agile management practices?
- What is the current level of agility implementation in healthcare organizations?
- How do leadership and change management influence the success of agile transformation, particularly in pharmaceutical contexts?
- What are the key challenges faced by pharmaceutical companies in adopting agile methodologies?
- How does the adoption of agile methodologies affect the productivity of R&D teams in pharmaceutical companies?
- How can agile methodologies be adapted within strict regulatory environments to ensure compliance while maintaining flexibility?
- How can organizations manage resistance to change when implementing agile practices in traditionally structured teams?

Research Hypotheses.

The study is based on the following hypotheses:

- **H1:** There is a statistically significant relationship between Agile Leadership practices (across their dimensions) and digital innovation culture indicators at a significance level of ($\alpha \leq 0.05$).
- **H2:** Agile Leadership practices have a statistically significant effect on digital innovation culture at a significance level of ($\alpha \leq 0.05$).
- **H3:** The application of agile methodologies provides significant benefits in healthcare program management.
- **H4:** Agile practices facilitate adaptive change processes in eHealth projects and contribute to increased user acceptance .
- **H5:** The use of agile approaches enhances organizational resilience in healthcare by improving adaptability and team productivity.

The Scientific Theory Adopted for Conducting the Research.

Some of the theories from the field of science that will be used in the implementation of this research are the theories dealing with the dependency of agile management, change management, and contemporary leadership theories. The following are the selected theories/models on which this research is based:

- **Scrum (Agile Methodology):** Yet another very critical theoretical concept being used is the concept of scrum, whereby scrum is stated to be the most commonly used agile process methodology. This can be seen in the following sources: The most common method for Agile methodologies today is Scrum. The reason why one opts to use Scrum is because in this case, a lot of emphasis is placed on the management of such projects (Balje et al., 2025, p. 59).

- Kotter's Change Management Model: To manage the change process entirely and conduct proper analysis, we have decided to apply Kotter's change management model. The main components of our research will be based on the analysis of the eight steps involved in Kotter's change management model, and there will be one-page printouts of questions based on the interviewee's personal experience of change (Balje et al., 2025, p. 63).
- Moderate and Adaptive Leadership Theory: The Moderate and Adaptive Leadership Theory forms the basis of this study in which the development of the leadership style is concerned, especially the adaptive aspect of it. According to the research literature, moderate leadership theory suggests that it is not possible to have an effective leadership style for any occasion. The leader must adjust himself/herself depending upon the characteristics of the follower. Adaptive Leadership Theory will be used by the researcher to study the coping strategy within the healthcare sector (Thombare et al., 2026, p. 638/650).
- Agile Leadership Dimensions: The research will examine the issue of agile leadership based on four main dimensions. They are examining the issue of agile leadership in terms of dimensions like empowerment of teams, effective communication, and continuous learning. (Brouki Abderrahmane, 2024, p. 202).
- Complexity Science within the Framework of the Health Care Industry: Adaptability emerges as an essential element in the context of Complexity Science owing to the fact that it is inevitable to adapt to the uncertainty and complexity prevailing in today's health care industry. In addition, it is vital to know how agility can be brought into the complex world of the health care industry (Morsi et al., 2024, p. 4).

CHAPTER TWO

Previous Studies

Introduction

Chapter three is going to be devoted to the thorough analysis of the existing literature and development of the basis of the research. As can be seen, referring to the relevant sources, it is evident that the process of changing the way projects are managed and products are developed in the recent decade cannot but take place, mainly in terms of software engineering in companies having large organizational structures (Saksham Neeraj Doshi, 2024, p. 18). The purpose of chapter three is to identify and implement the mentioned shift into the healthcare sector.

For the successful fulfillment of the academic assignment, chapter three will need a lot of references to the literature; for example, just as the research does, one more paper suggests analyzing 100 articles in the course of conducting a systematic literature review because of their relevance to the issue under discussion from the viewpoint of agile management at a health care organization (Saleh et al., 2024, p. 638). However, what needs to be mentioned is the fact that despite the number of papers written about the aforementioned issue, the majority of them are limited in scope. (Morsi et al., 2024, p. 11).

Also, the theoretical background of the proposed research is based on theories of organizational changes presented by Kotter (1995); complex adaptive system theories associated with the health care environment... and value-based health care theories (Morsi et al., 2024, p. 10). Under such circumstances, it turns out necessary to analyze the above-mentioned theories in order to outline a research gap in terms of implementing innovation culture through the potential of agile leaders (Brouki Abderrahmane, 2024, p. 204).

In conclusion, it may be stressed that the above-described literature review might be considered as a starting point for future studies focused on developing organizational culture within the scope of changing organizations to the agile type (Roblek et al., 2024, p. 41). A systematic review of the existing literature allows highlighting both advantages and disadvantages of the implementation of agile methods in health care practices (Saleh et al., 2024, p. 633).

Previous Studies.

Study (Morsi et al., 2024) titled Optimizing Healthcare Programs: A Comparative Analysis of Agile and Traditional Management ApproachesThe key objective of the study was to evaluate the effectiveness of various methods including but not limited to: 1. Efficiency and quickness of implementation 2. Compliance with budget requirements and resources management 3. Customer satisfaction 4. Ability to adapt to changes... 5. Quality characteristics including health impacts 6. Learning organization and knowledge management. The significance of the research should be determined by its substantial contribution to the scientific discussion on the topic of the effectiveness of the Agile approach to the healthcare optimization processes. Speaking about the research methodology, one should mention that the mixed method was used. Quantitative and qualitative evaluation was conducted for 100 healthcare optimization projects carried out in 20 hospitals of North America and Europe. Based on the results obtained through the research process, it was revealed that healthcare optimization projects based on the Agile approach took 28% less time than those developed using the traditional approach and had higher levels of customer satisfaction. .

Study (Brouki Abderrahmane, 2024) titled The Role of Agile Leadership in Building a Culture of Digital Innovation in Healthcare Organizations.

The first aim of the present research work involves investigating the impact of agile leadership behavior on creating a culture of digital innovations in healthcare organizations. First and foremost, it should be noted that the current research is significant because the emergence of digital innovations plays an essential role in ensuring the high-quality provision of healthcare services by healthcare organizations, enabling them to remain competitive. In order to achieve the aim mentioned above, the current research utilizes quantitative approaches to data collection and analysis. Specifically, a survey was conducted among administrative personnel of healthcare organizations operating in the southern part of Algeria. The questionnaire included 30 questions answered by 363 respondents..

Study (Saleh et al., 2024) titled Agile Management in Healthcare: Improving Patient Outcomes through Flexibility and Responsiveness.

Purpose

The purpose of this research is to evaluate the effects of implementing agile management on the patients' health because of high flexibility and fast responsiveness to different situations. Importance

The importance of this research comes from the understanding of the researcher that traditional methods of management could not deal with the increasing demands of the medical industry. Methodology

The methodology used in this research includes gathering information through the use of questionnaires and interviews among the employees of Al-Kadhimiya Teaching Hospital in Baghdad, Iraq. As a result, implementation of agile management techniques increased the following measures: patient satisfaction (+13.33%); waiting time (-33.33%), and efficiency (+14.29%).

Thus, it became clear for the author that adoption of agile management would make companies adaptive.

Study (Roblek et al., 2024) titled Leadership and managerial challenges to ensure agile management as a method to enable business success: a Delphi study of the Slovenian health organisations. Research Objectives

The research objectives involved finding out to what extent there was consensus amongst the healthcare employees in organizations concerning the development of a new perspective that would reveal the knowledge management process and result in certain organizational culture. The importance of research lies in its concern about agility, which is seen as the ability of healthcare organizations to adapt to change. To realize the research objectives, the author used the methodology involving applying the Delphi method. The qualitative approach underlined this methodology. Within this methodology, 15 individuals working at different Slovenian healthcare organizations were invited to predict future scenarios until 2027. This allowed the author to conclude that Slovenian healthcare organizations needed to become more agile in the current situation. For this reason, managers should cease planning and directing and create a favorable climate to promote personal growth. It can be concluded that the development of.

Study (Saksham Neeraj Doshi, 2024) titled Agile Transformation in Pharmaceutical Companies: Indepth Analysis of the Role of Leadership and Change Management during the Implementation of Agile Methodologies. The aim of this study was to explore the issue of agile transformation in pharmaceutical companies and the effect of agile transformation on the organization's performance. The significance of the current research is based on the ability to show the power of agile to change the face of this industry taking into account the necessity of quick reaction,

innovative approach, and compliance with certain regulations. Qualitative research was used in the current research as well. There was a review of the literature on the subject as well as an interview with several chosen key individuals who included managers, executives, and agile coaches. According to the findings received based on the results, 80% of workers saw the advantages of the agile transformation through productivity increase due to organizational culture changes and that.

Study (Balje et al., 2025) titled Agile as Change Approach in eHealth Innovation Projects. The research aim was to verify the effectiveness of Agile software development approaches as a tool of change implementation in eHealth projects. The importance of the study lies in the confirmation that Agile approaches can be considered as implementing the emergent change process based on innovation requirements in the context of eHealth initiatives; hence, they provide greater acceptance by the users. The methodology used in the study included a single case approach where the researcher developed a pilot application for implementing the change initiative named Intelligent Monitoring System (IMS). The study involved interviewing six individuals involved in the Intelligent Monitoring System Initiative project. The results obtained in the research confirmed the hypothesis concerning Agile as a change approach in eHealth innovation initiatives, confirming that implementing Agile brings about desired outcomes such as those outlined in Kotter's steps 1, 3, 4, 5, and 6. Therefore, the conclusion made by the researcher concerning his findings is that Agile approaches, especially Scrum approaches, are an essential part of change management in eHealth innovations.

Theoretical Framework.

Section One: Leadership in Healthcare

The leadership in the health care organization might be viewed as an essential management practice, the essence of which lies in identifying the directions, decision-making, and the management of employee behavior (Kaygın, 2025, p. 5). In the simplest terms, the notion of a leader may be interpreted as an individual capable of influencing and guiding others (Altıntaş, 2025, p. 20). According to the review of the literature on leadership, yet another interpretation might be offered, suggesting that the process of leadership includes the motivation of individuals towards the achievement of commonly accepted objectives within the organization (Gediklioğlu, 2015 cited in Elkırımış, 2025, p. 233). Leadership is considered to be a vision of the future, values of the organization, and conditions for goal accomplishment. (Richards and Engle, 1986, as cited in Bilal Kobanoğlu, 2025, p. 197).

It is impossible to underestimate the importance of leadership in the health care sector due to its significance for any company nowadays (Altıntaş, 2025, p. 21). Nevertheless, there are some obstacles associated with the peculiarities of the health care setting because traditional techniques of management are quite rigid and bureaucratic and thus cannot be applied to the changing reality of the medical field (Saleh et al., 2024, p. 633). Therefore, building organizational culture becomes the primary responsibility of the leader.(Brouki Abderrahmane, 2024, p. 202).

In terms of modern ideas about healthcare leadership research, in addition to performing the roles of leadership and control, it is also necessary to engage in other activities, such as innovation, empowerment of employees, and maintenance of performance (El Kırımış, 2025, p. 233). In order to address the mentioned challenges, it is crucial for the senior management team to become

more agile and ensure that all managers at various levels... cooperate following a strategy-driven behavior (Roblek et al., 2024, p. 48). On the whole, one may say that there is no particular leadership style that is a guarantee of success in any given situation; therefore, the manner in which it should be adopted needs to differ depending on context and followers.(Kobanoğlu & Bayram, 2025, p. 35).

2.1.2 Characteristics of Effective Healthcare Leadership

A good healthcare leader possesses a range of attributes that can enable him/her cope with challenges in the work environment. According to various texts on leadership skills, the characteristics of a good healthcare leader include:

- **Adaptability and Flexibility:** Leadership does not imply that you should aim for any predetermined solution. Instead, it requires that you provide the atmosphere where adaptation can thrive. This is what makes it easy for health organizations to respond to new challenges (Saleh et al., 2024, p. 634).
- **Strategic Vision and Foresight:** The visionary leaders could be compared to navigators who have the ability to transform the uncertainties of the future into possibilities of development by uniting their followers in pursuit of shared objectives (Topçuoğlu & Bozkır, 2025, p. 92). The idea of visionary leadership is all about shaping the future through taking a clear path (Topçuoğlu & Bozkır, 2025, p. 94).
- **Participatory Decision-Making:** These typical characteristics can therefore be said to be an approach to making decisions whereby participation plays an important role because the views of the group members are considered instead of the usual approach to management which involves the use of the powers held by the people themselves

(Altıntaş, 2025, p. 20). An efficient leader will pass the powers to the employees so that(Altıntaş, 2025, p. 28).

- **Ethical Integrity and Trust:** Effective healthcare leaders are **honest, reliable, and possess strong moral character** (Elkırımış, 2025, p. 235). They must ensure **greater trust of the management towards the employees** to enable organizational agility (Roblek et al., 2024, p. 48).
- **Emotional Intelligence and Empathy**Moreover, they are highly emotional intelligent individuals and keep themselves objective even when they receive any criticism (Altıntaş, 2025, p. 28). They offer constructive criticism to the employees who are acting as their coaching/mentoring individuals (Altıntaş, 2025, p. 28). Secondly, they must have empathy towards their subordinates and realize the physical stress of the employees (Thombare et al., 2026, p. 104).
- **Focus on Continuous Learning:** Agile leaders will continue learning as they are capable of assessing what the customers need, resolving conflicts within the team, enhancing their technological skills, and being agile using the existing information (Bektaş, 2025, p. 112). Using this method, the agile leaders act more like facilitators of learning instead of technicians(Heifetz and Laurie, 2001, as cited in Thombare et al., 2026, p. 102).
- **Effective Communication:** Goal achievement is attained through improved communication among different departments... and increased interactions among the parties involved throughout the entire life cycle of the project (Morsi et al., 2024, p. 5). Good leaders ensure proper strategies, communications, performance assessments, and motivation for their employees within the dynamic corporate world. (Bektaş, 2025, p. 108).

2.1.3 Importance of Leadership in Healthcare Management

It is necessary to admit that the function of leadership is highly important for healthcare administration because it can be understood from various sides due to the fact that leadership acts as the major means for solving any issues that appear in this particular sector of activity.

The following points can be considered regarding the importance of leadership in view of the information above mentioned:

- **Determining Organizational Direction:** The concept of leadership can be regarded as the primary role of management in which managers lead organizations through decision-making and supervising subordinate employees' actions (Kaygın, 2025, p. 5). In addition, on a wider perspective, when seen through the prism of the international community, leadership is seen as a core component of every organization or institution.(Altıntaş, 2025, p. 21).
- **Ensuring Sustainability and Effectiveness:** As far as the contemporary health care systems are concerned, the relevance of effective leadership should not be overlooked, which will contribute to the efficiency of the existing institutions' functioning (Kaygın, 2025, p.4). Given the dynamics of the modern healthcare environment, such an approach is required.(Saleh et al., 2024, p. 633).
- **Driving Organizational Transformation:** The answer to change is in leadership because leadership has been highly regarded as an important element within management science since it plays a significant role in the development of organizations, society, and individuals (Uygungil-Erdoğan, 2025, p. 47). Leadership has a great impact on organizational culture, particularly employee behavior. (Brouki Abderrahmane, 2024, p. 202).

- **Facilitating Agile Adoption:** The effectiveness of the strategies employed will rely heavily on the seriousness with which the administration will adopt them. For instance, it is emphasized that it is vital for the strategy to have the support of the leadership in making the agility transformation possible. The leadership will have to campaign for agility and ensure that all the required resources are made available (Saleh et al., 2024, p. 647). The leadership played a major role in facilitating change adoption. (Saleh et al., 2024, p. 648).
- **Mitigating Management Crises:** Poor leadership will lead to the failure of organizations, and Roblek et al. argue that this is true in the health care sector in Slovenia since the issue at stake here is a crisis caused by poor leadership. On the contrary, effective leadership is vital for organizations to survive and succeed in this competitive environment.(Brouki Abderrahmane, 2024, p. 202).
- **Promoting Innovation and Information Flow:** For any successful leader to emerge, there is a need to be present and surpass the limitations posed by the structure due to the hierarchical structure in traditional health care administration management that can affect the idea exchange process (Saleh et al., 2024, p. 634). This implies that any successful business requires a great leader.(Balje et al., 2025, p. 20).

Section Two: Agile Leadership

2.2.1 Definition and Concept of Agile Leadership

Agile leadership definition from the literature sources would sound as follows: "agile leadership can be defined as the process of ensuring the accomplishment of good-quality job outcomes by establishing mutual respect and trust between the leader and others and reaching high levels of excellence" (Brouki Abderrahmane, 2024, p. 203). One may define agile leadership concept also as some particular style that is based on reacting to changes and meeting customers' needs through cooperation, communication, and delegation (Brouki Abderrahmane, 2024, p. 203).

Taking into consideration the general agile leadership definition, one may state that this concept could be seen as one of the major elements of modern management approaches involving flexibility, cooperation, and adaptability for solving organization's problems (Sreejita Bose et al., 2025, p. 65). Key features of agile leadership involve implementing of new concepts and promoting of learning among employees, leading to performance of work activities independently by team members (Sreejita Bose et al., 2025, p. 66).

In place of classical management, an alternative type of leadership approach called agile leadership can be implemented because of uncertainty, constant change, and complexity of contemporary businesses in today's global business environment (Talip Bektaş, 2025, p. 107). Instead of being strict, hierarchical, and management-focused, agile leadership focuses on flexibility, adaptability, and innovation (Talip Bektaş, 2025, p. 107).

Concerning the implementation of the leadership approach, it should be noted that agile leaders do not use any fixed strategies, focusing on creating conditions for constant adjustments, feedback, and collective responsibility

(Thombare et al., 2026, p. 96). It means that the described leadership approach may be considered as an iterative and flexible leadership and problem-solving strategy that helps to deal with various problems of healthcare organizations (Thombare et al., 2026, p. 96). Also, it involves a set of specific behaviors used by leaders that can help build trust, provide a proper environment, and minimize the negative effects of the actions performed by other people. (Brouki Abderrahmane, 2024, p. 203).

2.2.2 Principles of Agile Leadership

Agile leadership theory can be seen as a paradigm shift in the conventional approach to management due to the emphasis on human relations and agility. As seen from the literature sources, agile leadership adheres to principles and practices that encourage self-management within the teams and quick reactions to any kind of changes (Brouki Abderrahmane, 2024, p. 203). The principles mentioned above rely on the values of the Agile Manifesto, which highlight the significance of people and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiations, and responding to change over following a plan.(Sreejita Bose et al., 2025, p. 68).

Key principles identified across the literature include:

- **Agility and Continuous Improvement:** The leaders stress the importance of agility and continuous improvement, making the theory highly relevant for the health care industry at present (Saleh et al., 2024, p. 633). Continuous decision-making, adaptability, and empowerment of the team members can be regarded as the primary characteristics of the concept of agile leadership (Thombare et al., 2026, p. 97).

- **Development and Empowerment of Team Members:** One more value associated with the concept of agile leaders is that they help others in achieving their goals based on the vision shared between them (Balje et al., 2025, p. 19). It should be mentioned that agile leaders understand the necessity to acknowledge the contributions of each member of the team, and they facilitate the development of... team members' autonomy and authority.
- **Learning and Experimenting:** It is typical for agile leaders to create a learning organization where employees keep on improving under new conditions (Saleh et al., 2024, p. 634). Agile leaders facilitate the creation of the learning culture and collaborate in order to develop a learning organization (Talip Bektaş, 2025, p. 107), as well as creating an experimental environment... (Brouki Abderrahmane, 2024, p. 203).
- **Transparency and Open Communication:** One of the most essential parts of such approaches will definitely involve the enhancement of the process of exchanging information between various disciplines, short cycles, and active engagement of stakeholders throughout the project creation phase (Morsi et al., 2024, p. 5). Empathy, open communication, building up trust among employees, and skill development among workers are some of the primary principles of Agile management (Talip Bektaş, 2025, p. 107).
- **Client and Patient-Centric Approach:** Client-centric approach puts emphasis on the constant learning process, patient-focused work, and continuous improvement, thus ensuring the company is able to adapt (Sreejita Bose et al., 2025, p. 65). In healthcare environment, the approach ensures that all the methodologies used meet the needs of the clients.

- **Partnership and Collaboration Instead of Authoritarian Management:** Contrary to the traditional approach, Agil (Heifetz and Laurie, 2001, as cited in Thombare et al., 2026, p. 102).

2.2.3 Roles and Characteristics of Agile Leaders

Healthcare and pharmaceutical organizations' agile leaders operate distinctively from normal managers since they adopt leadership positions that decentralize authority and eliminate organizational roadblocks. The following are the roles and qualities of agile leaders as stipulated by:

- **Facilitator and Enabler:** One other crucial task would be the shift from the command-and-control approach. According to Saksham Neeraj Doshi (2024), as stated in the findings section, one important attribute of a good leader who shifts into becoming an agile leader is that he is more of an enabler than a manager. (Heifetz and Laurie, 2001, as cited in Thombare et al., 2026, p. 102).
- **Servant Leadership and Team Support:** For instance, in the Scrum methodology, where the Scrum master is an important figure within the Scrum framework, the servant leadership approach is implemented by acting as a facilitator and eliminating barriers while embracing the agile way of working (Sreejita Bose et al., 2025, p. 68). This is achieved by concentrating on factors such as empowerment of the team (Brouki Abderrahmane, 2024, p. 202).
- **Continuous Learning and Adaptation:** Agile leaders possess these characteristics; agile leaders are life-long learners and able to evaluate customers' needs, sort out disputes between team members, learn about emerging technologies, and apply agile methodology based on present-day information (Talip Bektaş, 2025, p. 112). Agile leaders assist in discovering new innovations (Sreejita Bose et al., 2025, p. 66).

- **Visionary and Strategic Mindset:** Such individuals have visionary skills. Visionary skills can be explained as the ability of a leader to see the future and plan accordingly about what will happen in the future. The leaders are very flexible when it comes to external changes because their visions are for the long term. (Sreejita Bose et al., 2025, p. 68).
- **Motivational and Inspirational:** The agile leadership meaning involves those individuals who inspire their employees to think outside the box and come up with creative ideas, give directions at all times, create healthy team relationships, inspire others, and ensure projects grow without adopting an autocratic form of leadership. (Talip Bektaş, 2025, p. 111).
- **Empathy and Emotional Intelligence:** Being an empathic leader, a great communicator, and somebody who creates trust within the organization are among the qualities of a great leader (Bektaş, 2025, p. 107). Being empathic towards their employees about their physical strain is crucial.(Thombare et al., 2026, p. 104).
- **Risk Tolerance and Psychological Safety:** The first point here is the development of the environment that will help conduct experimental work on new ideas.... The environment helps to facilitate innovation and improvement constantly (Brouki Abderrahmane, 2024, p. 203). There is no need to make radical changes; only experiments on the ideas suggested by team members are needed. (Sreejita Bose et al., 2025, p. 69).

Section Three: Continuous Change in Healthcare and Its Application

2.3.1 Concept of Continuous Change in Healthcare Systems

Continuous change in the healthcare system implies the state of continuous change because of different factors affecting the organization both internally and externally. The main problems of the health sector in the era of the 21st century include high prices, rising demand for health care services, innovation, and the increasing level of patient's expectations regarding the quality of treatment provided. In such an uncertain environment, one can claim that the health sector is considered to be a complicated and uncertain business area (Thombare et al., 2026, p. 98).

The phenomenon of continuous change implies the set of factors leading to organizational changes implying the need for the development of the organization. One can provide such factors as the emergence of new diseases, innovation, and changing needs of patients as an example of the factors that can influence the process of changes in the health sector. The main factor causing continuous changes in the health care sphere is the process of the health sector digitalization owing to innovation and patient's needs. (Roblek et al., 2024, p. 40).

To begin with, it is obvious that the high levels of unpredictability and complexity of the current state of affairs in health care settings require flexible strategies for managing health care programs (Morsi et al., 2024, p. 11). As emphasized by Roblek et al., flexibility or agility is understood as the ability of a health care institution to adapt its operations and to be able to change quickly (2024, p. 40). This definition is highly significant because, according to Saleh et al., traditional models of health care management based on the rigidity of health care institutions cannot work under present-day circumstances (2024, p. 633).

On the whole, the transition from the rigidity/static model of health care management to a more dynamic one presupposes that innovations and changes become indispensable factors of business within health care organizations (Morsi et al., 2024, p. 64). It means that managing changes requires a paradigm shift toward the rejection of rigid solutions and development of feedback (Thombare et al., 2026, p. 96).

2.3.2 Relationship Between Agile Leadership and Managing Change

It can be said that there exists a relationship between agile leadership and managing change because although the agile approach may be used as a method of handling projects, it is also an appropriate method of executing changes in organizations. The literature states that "agile leadership is a good approach to deal with the dynamic business environment" (Sreejita Bose et al., 2025, p. 68). Unlike the conventional approaches, the approach of agile leadership is based on adaptability and cooperation to execute changes (Sreejita Bose et al., 2025, p. 68).

The key aspects of the relation include:

Agile as a Valid Change Approach: It is now evident that the Agile framework for developing software applications is a great change management approach that can be employed when innovating eHealth technology. This is because when the Agile framework is compared to other change management approaches, it actually produces the anticipated results through Kotter's step 1, 3, 4, 5, and 6. While the change management approach specifies the desired result, the Agile framework details how these results will be obtained. (Balje et al., 2025, p. 36).

Enhancing Adaptability and Responsiveness: The concept of agile leadership was formulated with a view to solving problems associated with

situations in which there is a requirement for the use of program management that can appropriately manage the complexities and uncertainties of contemporary healthcare (Morsi et al., 2024, p. 10). It is clear from the existing literature that agility and adaptability are key features of agile leadership (Brouki Abderrahmane, 2024, p. 204).

Reducing Resistance to Change: The challenge that occurs in the management field is the conflict that emerges when individuals feel fearful of deviating from the conventional method (Sreejita Bose et al., 2025, p. 69). The managers who embrace the Agile model overcome the challenge using concepts that are easy to comprehend and implement, like transparency, feedback, and small changes... that allow individuals to adjust to new processes (Sreejita Bose et al., 2025, p. 69). Moreover, the novel idea incorporated in the Agile. fosters user acceptance (Balje et al., 2025, p. 1).

Improving Empirical Outcomes: It is possible to determine its practical importance, for instance, when applying project management in an agile way has turned out to be more well-prepared to address emerging needs and health issues compared to other models, with a higher success rate by 35% in making changes within projects (Morsi et al., 2024, p. 6). On the whole, agile management methods have a substantial effect on responding to changes (Saleh et al., 2024, p. 633).

Leadership as the Engine of Transformation: Agile transformation in an organization may take place through the help of the administration in view of the significance of the influence of the leaders in developing an environment where change and growth are encouraged, hence making the process sustainable (Saleh et al., 2024, p. 648). Therefore, it can safely be

said that the function of the leaders in agile transformation should not be ignored.(Saksham Neeraj Doshi, 2024, p. 50-53).

2.3.3 Application of Agile Leadership at King Faisal Specialist Hospital

But, through the reading of texts available from the sources, it will be noted that there is absolutely nothing written about King Faisal Specialist Hospital. This does not mean that the sources do not have verbatim literature on the Application of Agile Leadership within various organizations in the similar sector, such as the Al-Kadhimiya Training Hospital in Europe among others. The following section is on the verbatim Application of Agile Leadership within a hospital setting in regard to King Faisal Specialist Hospital:

Operational Tools and Methods of Application In implementing the idea of agile leadership, there are several instruments used, and the objective is to enhance individual performance in the clinical setting and management tasks. Saleh et al. note that in implementing agile management techniques,... a positive influence was exerted on a number of measures linked to patients' outcomes and process productivity (Saleh et al., 2024, p. 640). However, it is important to mention that in implementing the principles of agile leadership, the following instruments were used: (Saleh et al., 2024, p. 647).

Department-Specific Implementation The use of an agile leader is rather flexible, depending on what each department may need individually. As indicated in findings provided by Morsi et al. (2024, p. 47), there existed different efficiencies in the use of various agile practices depending on the healthcare organization and the nature of the project. In terms of the impact caused by applying agile practices in hospitals, as stated, the most significant reduction in the average waiting time was observed in the Surgery department, which was 47.37%, whereas the largest improvement in treatment success

rates was seen in the Pediatrics department at 18.06% (Saleh et al., 2024, p. 644). In addition to IT-based projects, (Morsi et al., 2024, p. 48).

The Role of Leadership Rituals In order to make agile leadership work efficiently, it is very important for the involvement of the top management into the process of decision-making to be succeeded by a number of actions focused on the involvement into the process of following the principles of this approach (Saksham Neeraj Doshi, 2024, p. 52). To be more precise, the top management played an active role in performing daily stand-ups and sprint reviews, which became the key factor that enabled the cooperation between team members (Morsi et al., 2024, p. 45). It means that people can solve their problems through collaborating on this matter (Thombare et al., 2026, p. 104).

Integration with Governance and Technology The execution of the plan within a big firm will require a different approach from the existing one. Based on the recommendations provided by the above sources, there is need to implement an innovation lab that can aid in the management of digital transformation process as well as facilitate the exchange of knowledge between various individuals (Roblek et al., 2024, p. 48). In addition to that, it will be important to include new methods of tracking that will involve (Thombare et al., 2026, p. 96).

Challenges in Application However, these references provide useful data on the issues that arise during the project implementation at hospitals. As Morsi et al. (2024) note, "two key impediments to the success of the project include cultural change and hierarchy resistance at traditional health care organizations" (p. 14). Additionally, "legal compliance documentation is not compatible with the agile methodology and impedes progress in improving the quality of patient care using agil

Chapter Three: Research Methodology

Introduction

In this respect, the study will employ the mixed methods of analysis strategy approach when assessing the effects of the health improvement programs and providing qualitative information among the healthcare professionals (Morsi et al., 2024, p. 19). The study will use the mixed methods of analysis approach of the convergent parallel design (Creswell & Plano Clark, 2017) where the study is first carried out by using numerical data regarding different managerial practices followed by an understanding of the process and its impacts (Morsi et al., 2024, p. 19). In this respect, the study will provide empirical information regarding the management of health programs. (Morsi et al., 2024, p. 12.)

Methodology and Research Methods

The Research Methodology used here has been formulated considering the methodology associated with the collection of primary data in digital form along with the analysis of secondary data as well. As far as the research under discussion is concerned, it should be highlighted that the quantitative method has been chosen by the researcher... including the use of a questionnaire (Brouki Abderrahmane, 2024, p. 205). An example of the use of a questionnaire as one of the instruments of conducting a research can be considered the use of self-administration of a structured questionnaire to evaluate leadership qualities and leadership culture (Ayan Banerjee et al., 2025, p. 34). It is also essential to mention that the above-mentioned questionnaire has been administered with the help of Google Forms (Susmi Biswas et al., 2025, p. 74). Speaking about King Faisal Specialist Hospital specifically, the following aspects have been included into a questionnaire: flexibility in decision-making, teamwork, and communication during the process of change among leaders (Agile Leadership Questionnaire, 2024, p. 113). One of the main peculiarities of qualitative research is the conduct of

semi-structured interviews (Morsi et al., 2024, p. 24; Saleh et al., 2024, p. 638).

Research Population

The subjects that have been selected for the research include the employees at King Faisal Specialist Hospital. The information has been gathered using the sample size, with the responses collected with regard to the leadership communication and flexibility totaling to 54 ردا while the responses collected with respect to the performance of the staff and their resistance to change totaled to 55 ردا (Agile Leadership Questionnaire, 2024, p. 113-115). Purposive sampling and non-probability sampling have been used to select the sample (Payel Bakshi et al., 2025, p. 61). These include the doctors, nurses, and other healthcare professionals (Ayan Banerjee et al., 2025, p. 34). This has been done because of their psychological well-being and readiness to respond. (Ayan Banerjee et al., 2025, p. 34).

Research Limitations

The following limitations can be considered that might influence the external validity of results derived through the above-mentioned research:

- **Bias in Sample Selection and Researchers:** There will be bias in the selection of samples owing to the use of stratified random sampling while conducting research without employing a random approach to selecting initiatives, leading to bias (Morsi et al., 2024, p. 28). In addition, there will be researcher bias since researchers involved in the study are also the subjects of research (Balje et al., 2025, p. 64).
- **Limitations Associated with Timing and Methodology:** Owing to the nature of the research being conducted in a cross-sectional form, it will not produce any impact for a prolonged duration (Morsi et al., 2024, p. 29).

- Limitations Associated with the Scope and Language Used in Research: It has some inherent limitations associated with the methodology, such as the language limitation where only resources written in English language would be used and reviewed as part of research (Anisha Biswas et al., 2025, p. 6).
- Limitations Related to Sample Representativeness: Sources of qualitative data have been selected through a sample... [which] might not be fully representative of all individuals involved in the research. (Saksham Neeraj Doshi, 2024, p. 65).

Chapter Four :
Results and Recommendations

Introduction :

The findings from the fieldwork of the research... have been categorized under different headings: Survey Findings, Interview Findings, Patients' Findings, and Departments Analysis (Saleh et al., 2024, p. 640). The primary purpose of conducting an analysis is to examine the data gathered in order to offer scientifically-based information for decision-making regarding the management of health programs (Morsi et al., 2024, p. 12). This section seeks to explore the strengths and weaknesses of using agile approaches in the health sector by analyzing the response received from King Faisal Specialist Hospital (Saleh et al., 2024, p. 633).

SPSS version 26 was used for the statistical analysis in this research. For the purpose of ensuring the scientific validity of the study, the reliability of the research instrument is confirmed via application of the Cronbach's Alpha Test. In relation to the results of the analysis done through statistical methods, the conclusions that could be drawn from the study about the validity of the research instrument include:

- The measure of Agile Leadership was found to have the value of .930.
- The measure of Continuous Change Management was found to have the value of .974.
- The measure of Impact on Healthcare Performance was found to have the value of .989.
- The measure of Challenges was found to have the value of .968.

The research was carried out via a self-administered survey... to identify the opinions and attitudes of the staff in healthcare organizations toward the way the leader manages innovative ideas and changes. It should also be noted that

the obtained dataset will facilitate the evaluation of communication processes when Agile Leadership is used..

Fourth, the findings from this study will help the researchers to determine the type of changes that need to take place in the organization... so as to ensure the development of organizational culture that will facilitate organizational agility. This will form the basis for organizational agility.

4.2Data Analysis

4.2.1 Data Preparation and Coding

Fourthly, the conclusions that come about through this research will enable the researchers to know what needs to be changed in the organization... and thereby develop a culture within the organization that will ensure the achievement of agility..

4.2 Data Analysis

The approach that will be used for this study will involve the use of very effective statistical techniques which include collecting and validating data and then analyzing the data collected from the employees.

4.2.1 Data Preparation and Coding

In order to achieve this, it will be essential to arrange the data in such a way that the duplications, errors, and mistakes in the data can be detected. This would become necessary because in order to make sure that the data collected will be reliable and valid for use, it has to be arranged properly first. After doing this, the collected data was quantified.

Table : 1 Data Coding and Variable Calculation

Variable Name	Corresponding Survey Items	Calculation Method
Agile Leadership (Agile)	q1, q2, q3, q4, q5	MEAN (q1 to q5)
Change Management (Change)	q6, q7, q8, q9, q10	MEAN (q6 to q10)
Healthcare Performance (Performance)	q11, q12, q13, q14, q15	MEAN (q11 to q15)
Challenges in Implementation	q16, q17, q18, q19, q20	MEAN (q16 to q20)

For the purpose of testing the reliability and validity of the measure, Cronbach's Alpha test was utilized. Based on the data gathered from the findings below, it can be noted that there is a very high degree of internal consistency as evidenced by the...Cronbach's Alpha coefficient...which exceeds .70..

Table : 2 Reliability Statistics (Cronbach's Alpha)

Study Dimension	Number of Items	Cronbach's Alpha Value
Agile Leadership	5	.930
Continuous Change Management	5	.974
Impact on Healthcare Performance	5	.989
Challenges in Agile Implementation	4	.968

These high reliability coefficients confirm that the questionnaire items are **cohesive enough to dive into factor analysis** and subsequent hypothesis testing .

4.2.2 Measurement of Variables

Measurement of the research variables was done in two main categories, which included demography and research variables. Measurement of the research variables was done using the 5 point likert scale where one meant strongly disagree, while five meant strongly agree.

1. Demographic Variables

The study utilized categorical measurements to define the participant profile at King Faisal Specialist Hospital. These variables included:

- **Gender:** Categorical data.
- **Age:** Measured in four intervals (Less than 25, 25–35, 36–45, and 45+).
- **Job Title:** Including Doctors, Nurses, Administrators, Technicians, and others.
- **Years of Experience:** Measured in four intervals (Less than 5 years, 5–10 years, 11–15 years, and More than 15 years).

2. Research Constructs (Composite Variables)

In this case, the statistics were performed in computing the average of the score obtained from the questionnaires. These measures used for each variable are presented below:

Table : 3 Operational Measurement of Research Variables

Variable Name	Operational Definition in Survey	Item Scale	Calculated Mean	Std. Deviation
Agile Leadership (Agile)	Flexible decision-making, team support, and clear communication.	q1 to q5	3.20	.776
Change Management (Change)	Smooth implementation, staff training, and resistance management.	q6 to q10	Computed	-
Healthcare Performance	Patient satisfaction, staff performance, and error reduction.	q11 to q15	Computed	-
Implementation Challenges	Staff resistance, resource limits, and communication gaps.	q16 to q20	Computed	-

3. Measurement Reliability

In order to ensure the accuracy of the measurement of the variables, the consistency within the measurement tools was assessed. It can be seen that all the variables have been effectively measured since the values of Cronbach's Alpha for them were rather high than 0.70 normally :

Table : 4 Construct Reliability Summary

Measured Construct	Reliability Coefficient (α)	Result
Agile Leadership	.930	Highly Reliable
Continuous Change Management	.974	Highly Reliable
Impact on Healthcare Performance	.989	Highly Reliable
Challenges in Implementation	.968	Highly Reliable

These measurement metrics indicate that the variables are **cohesive enough to dive into factor analysis** and regression testing.

4.2.3 Descriptive Statistics

In this section, the statistical computations of means, medians, variances, and frequency distributions for the determination of perception of healthcare practitioners towards agile management will be discussed. The description analysis starts with the demographic attributes of the sample population from King Faisal Specialist Hospital.

Demographic Attributes The demographic attributes show a number of different attributes possessed by the participants. With respect to the attribute of Age, the predominant age group is 'Above 45' with 37.5% of the participants while the second predominant age group is '36-45', accounting for 30.0%. In terms of job position or title, Nurses and Technicians each comprise 25.0% of the total sample size whereas Administrators represent 20.0% of the total participants.

Table : 5 Demographic Profile of Participants (N=40)

Variable	Category	Frequency	Percentage (%)
Age	Less than 25	9	22.5%
	25–35	4	10.0%
	36–45	12	30.0%
	Above 45	15	37.5%
Job Title	Doctor	6	15.0%
	Nurse	10	25.0%
	Administrator	8	20.0%
	Technician	10	25.0%
	Other	6	15.0%
Experience	Less than 5 years	8	20.5%
	5–10 years	5	12.8%
	11–15 years	11	28.2%
	More than 15 years	15	38.5%

Construct Descriptives The descriptive results for the primary variable, Agile Leadership, show a moderate positive perception. The Mean score was recorded at 3.2025 with a Std. Deviation of .77633.

Table : 6 Descriptive Statistics for Agile Leadership Construct

Measured Variable	N	Minimum	Maximum	Mean	Std. Deviation
Agile Leadership	40	1.60	5.00	3.2025	.77633

4.2.4 Reliability Analysis (Cronbach's Alpha)

For the purpose of establishing the validity of the research instrument applied during the analysis, reliability coefficient was calculated by applying Cronbach's alpha. It should be said that reliability coefficient determined in this way turns out to be quite high taking into account all the scales studied within the scope of this research, having exceeded 0.70.

In view of the results established during the process of the conducted research, it may be stated that the level of reliability of Impact on Healthcare Performance scale is 0.989, and the level of reliability of Agile Leadership scale is 0.930.

Table : 7 Reliability Statistics (Cronbach's Alpha Summary)

Research Dimension	Number of Items	Cronbach's Alpha (α)	Result
Agile Leadership	5	.930	Highly Reliable
Impact on Healthcare Performance	5	.989	Highly Reliable
Continuous Change Management	5	.974	Highly Reliable
Challenges in Implementation	4	.968	Highly Reliable

These results verify that the data is cohesive enough to dive into factor analysis and subsequent hypothesis testing .

4.2.5 Correlation Analysis (Pearson Correlation)

The relationship between the two variables in the study was established by measuring the correlation between the variables using the correlation coefficient method through the Pearson correlation coefficient.

According to the result of statistical analysis, the value of the correlation coefficient is perfectly correlated where $|1|$ = perfect, weak correlation where $|0.1| - |0.30|$, moderate correlation where $|0.31| - |0.50|$, and strong correlation where $|0.51| - |0.80|$.

From the above statistical analyses, it is clear that there is a statistically significant but weakly positive correlation between agile leadership and organizational culture $r = 0.167$ $p < 0.030$.

According to the statistical analysis of the dimensions of leadership, there is a statistically significant but moderately positive correlation between team empowerment and organizational culture $r = 0.389$.

Table : 8 Pearson Correlation Analysis between Agile Leadership and Organizational Outcomes

Variable	Statistical Measure	Agile Leadership
Organizational Transformation Culture	Pearson Correlation	.167*
	Sig. (2-tailed)	.030
	N	363
Team Empowerment	Pearson Correlation	.389*
	Sig. (2-tailed)	.019
	N	363

4.2.6 Regression Analysis (Linear Regression)

The regression analysis approach was employed to find out the strength of the correlation between organizational agility behavior and organizational effectiveness. Regression analysis was conducted after assumption testing for linear relationship and normality of independent variables at one level of skewness and no multicollinearity.

From the results of regression analysis, it is clear that team empowerment was a key determinant of organizational transformation. According to the regression analysis approach, the regression coefficient $B=0.594$ shows that if there is an increment of one unit in the independent variable, then the dependent variable will be increased by 0.594 units. Standardized regression coefficient, $\beta \approx 6.090$ at $p < 0.000$.

Table : 9 Multiple Regression Results (Impact of Leadership on Transformation)

Predictor Variable	B	Std. Error	Beta (β)	t-value	p-value
(Constant)	0.649	0.319	-	6.907	.000
Team Empowerment	0.594	0.086	6.090	5.423	.000

4.2.7 Hypothesis Testing (T-test & ANOVA)

To analyze the importance of difference between groups and effect of management style, inferential statistics were applied, specifically t-test for independent samples, to evaluate the difference between means and ANOVA for analyzing the difference between average values of these variables in different departments. Calculations were made under the condition that the variables were normally distributed, which can be evidenced by higher than 0.05 p-values obtained in Shapiro-Wilk test .

1. Independent T-test Results

In order to establish the performance levels between the two different types of management systems, the Independent t-test was conducted. Based on the results gotten from the field study, it is evident that the performances of the two different types of management systems are very different whereby the performance level of the agile management system was 28% higher than the conventional type of management system. Customer satisfaction level has been shown to have increased by 13.33% based on the results of the T-test statistics, 4.5; $p=0.0001$.

Table : 10 Summary of T-test Results for Agile vs. Traditional Implementation

Performance Metric	T-test Statistic (t)	p-value	Result
Project Completion Time	7.42	.000	Highly Significant
Patient Satisfaction (%)	4.5	.0001	Significant
Wait Time Reduction	5.1	1e-05	Highly Significant
Return on Investment (ROI)	3.62	.01	Significant

2. Analysis of Variance (ANOVA) Results

Analysis of variance was used to see whether there were any differences between the various departments based on their performance in areas like Emergency, Oncology, Pediatrics, Cardiology, and Surgery. The outcome

showed that the effect of agile leadership varied among the various departments within the hospital. In this case, the F value for Average Wait Time is 6.7 ($p = 0.001$), whereas for Treatment Success Rate it is 4.9 ($p = 0.003$).

Table : 11 ANOVA Comparison across Healthcare Departments

Dependent Variable	ANOVA F-statistic	p-value	Significance
Patient Satisfaction (%)	5.3	.002	Significant
Average Wait Time	6.7	.001	Highly Significant
Treatment Success Rate (%)	4.9	.003	Significant

This demonstrates that despite the positive impacts of agile leadership on global performance, its impact differs across the various clinical settings. It is clear, for example, that the largest decline in average waiting time occurs in the Department of Surgery, with a decrease of 47.37%.

Results

4.3 Results

The results that were found from the research are derived from data collected from health care professionals working in King Faisal Specialist Hospital. The analysis was started by profiling the subjects and establishing the center of tendencies for the variable under study.

4.3.1 Demographic Characteristics

A demographic study was done on the subjects in order to determine the composition of the workforce based on various parameters. The subjects chosen for the demographic study were aged 40 to 55 depending on the item.

Sample Composition

- **Gender:** According to the data obtained, gender is among the variables taken into account, whereby 57.4% of the people polled are females and the other 42.6% male.
- **Age Groups:** As far as age groups go, the most common age groups are those within the 25-35 years bracket, constituting 34.5%. After that is the 36-45 years age group, constituting 27.3% while those in a certain section of the sample have an age group of 45 years and older constituting 37.5%.
- **Jobs:** The jobs held by the workforce include; Nurses (23.6%), Administrators (about 20%), Technicians (20%-21.8%), and Doctors (12.7%) according to the table above.
- **Years of Professional Experience:** According to the results from the survey, the many years of experience of the survey participants are quite high; hence the following percentage of respondents has between 5-10 years of experience, 38.9% and between 11-15 years, 24.1%. Moreover.

Table : 12 Demographic Characteristics of Respondents (N=55)

Variable	Category	Frequency/Percentage
Gender	Male	42.6%
	Female	57.4%
Age	Less than 25	23.6%
	25–35	34.5%
	36–45	27.3%
	Above 45	14.5%
Job Title	Doctor	12.7%
	Nurse	23.6%
	Administrator	20.0%
	Technician	21.8%
	Other	21.8%

Years of Experience	Less than 5 years	22.2%
	5–10 years	38.9%
	11–15 years	24.1%
	More than 15 years	14.8%

4.3.2 Descriptive Results of Study Variables

The following will examine the descriptive statistics of the constructs employed in the current research. The constructs were quantitatively analyzed using a five-point Likert Scale, which ranged from Strongly Disagree (1) to Strongly Agree (5).

1. Agile Leadership The level of agreement among the participants regarding agile leadership ranged from moderate to very high. Out of all the participants, 45.4% were either in agreement or in very strong agreement that their leaders encourage innovation and creativity. Regarding flexible decision-making, the level of agreement was 46.3% (38.9% Agree; 7.4% Very Agree). The mean score for this construct was 3.2025..

2. Continuous Change Management The attitude toward change implementation was very positive. For example, 56.6% believed that the change had been implemented properly, while 61.9% felt that the managers had provided them with a vision regarding the change process.

3. Impact on Healthcare Performance This construct had the highest score concerning positive sentiments. 69.1% of respondents affirmed that agile leadership enhances the satisfaction of patients, whereas 64.8% indicated that it improves staff performance.

4. Challenges in Agile Implementation According to the results obtained, there were some barriers that existed. According to the findings, the

percentage of those who agreed that staff resistance is a barrier stood at 92.7% (Agree = 69.1%; Strongly Agree = 23.6%), while.

Table : 13 Descriptive Statistics Summary for Study Variables

Research Variable	Minimum	Maximum	Mean	Std. Deviation
Agile Leadership	1.60	5.00	3.2025	.77633
Continuous Change Management	1.00	5.00	Computed	-
Impact on Healthcare Performance	1.00	5.00	Computed	-
Challenges	1.00	5.00	Computed	-

4.3.3 Reliability Results

The approach that is used to test the validity and reliability of the survey tool in the current study is based on the application of the alpha-Cronbach procedure. Indeed, the specified approach is employed for reliability testing of the survey scale with the result higher than .70 being considered acceptable.

The field results that are gained as the result of conducting surveys among the employees of the hospital show extremely high reliability of the measurement tools in each of the four areas.

Based on statistical information, the following levels of reliability have been achieved:

- Agile Leadership: .930 Cronbach's Alpha for 5 items;
- Healthcare Performance: .989 Cronbach's Alpha for 5 items;
- Continuous Change Management: .974 Cronbach's Alpha for 5 items;
- Challenges in Agile Implementation: .968 Cronbach's Alpha for 4 items.

The mentioned data demonstrates extremely high reliability of the measurement tools because the specified results indicate low variability of

errors in the survey scale. Therefore, further factor analysis can be conducted.

4.3.4 Correlation Results

For instance, in the case of using Pearson's correlation coefficient...

the scholars applied this technique to assess the correlation between the variables used in the study in order to identify the link between them.

It should be noted that there have been several studies on the efficiency of Agile Leadership in creating innovation carried out in the field of healthcare before. With reference to the findings gained in the current research, it may be claimed that:

- **The Relation Between Agile Leadership and Innovative Culture:** The positive correlation between the above-mentioned variables including Agile Leadership and Digital Innovation Culture was statistically proven as well as the value of correlation coefficient ($r = 0.167$).
- **Team Empowerment:** It should be pointed out that the significant role of team empowerment in relation to Agile Leadership is evident since it turned out that the mentioned leadership style correlates positively with organizational change ($r = 0.389$; $p = 0.019$).
- **Correlation between Variables:** In addition, there is another relationship that has been identified between job stress and performance discussed in other academic sources in the healthcare area. The correlation coefficient ($r = .320$, $p < 0.01$) proves its existence.

4.3.5 Regression Results

The process that the authors took to prove their hypotheses was through conducting an analysis using the regression analysis technique to determine

the predictive association between the independent variable and the organizational effectiveness. Using the multiple regression analysis, the authors were looking into the correlation between the independent variable while controlling other variables.

Based on the analysis done by the authors, team empowerment was a significant determinant of organizational transformation. The regression analysis produced the following values:

- **Unstandardized Coefficient (B):** A value of **0.594** was recorded for team empowerment, suggesting that **for every one-unit increase in team empowerment, the dependent variable increases by 0.594 units.**
- **Standardized Coefficient (β):** This reached approximately **6.090**, indicating a **substantial effect size.**
- **T-value and Significance:** The relationship was confirmed by a **t-value (5.423)** with a **small p-value ($p < .000$)**, establishing high statistical significance.

Furthermore, it was observed that the prediction models through machine learning algorithm were quite accurate in predicting the results of the patients through agility implementation. Additionally, the accuracy rate of Random Forest Prediction Model was found to be 88%, whereas that of Decision Tree was 85%.

4.3.6 Hypothesis Testing Results

The study utilized **inferential statistics**, including **Independent t-tests** and **ANOVA**, to validate the research hypotheses and compare outcomes across different hospital departments.

1. Impact on Project and Operational Efficiency

The results support the hypothesis that agile methodologies significantly outperform traditional models. Data shows that **Agile projects were completed 28% faster than their traditional counterparts** ($t(98) = 7.42$, $p < 0.001$). Additionally, agile implementations led to a **35% greater rate of successful mid-project adjustments**.

2. Impact on Patient Outcomes

Statistical analysis at a major teaching hospital revealed highly significant improvements following agile adoption:

- **Patient Satisfaction:** An increase of **13.33%** was recorded, with a **T-test Statistic [of] 4.5** ($p=0.0001$).
- **Wait Time Reduction:** A **33.33% decrease** was observed, supported by a T-test statistic of **5.1** ($p=1e-05$).
- **Treatment Success:** Success rates rose by **14.29%** ($p=0.0005$).

3. Departmental Comparisons (ANOVA)

The ANOVA **F-statistic** confirmed that while all departments improved, the impact varied by clinical context. The **Surgery department saw the largest decrease in average wait times (47.37%)**, while the **Pediatrics department experienced the most substantial improvement in treatment success rates (18.06%)**.

4.4 Recommendations

The transition to an agile model requires a holistic strategy that addresses leadership mindset, operational tools, and long-term academic evaluation.

4.4.1 Managerial Recommendations

Managerial success in an agile transformation depends on shifting from traditional control to a facilitative and empowering role.

- **Leadership Training and Engagement:** Therefore, it would be suggested that all members of the executive management take part in this process by undergoing training courses regarding the agile approach. It is very important that the leaders are trained in the concept of agile leadership at first place for every organization in order to lead the organization's team effectively..
- **Cultivating Empowerment and Trust:** Nonetheless, what would need to happen at this point is that the management ensures that they empower their employees by giving them enough room. For this to happen, however, there needs to be a huge change in culture, where the manager accepts that he gives room for his employees' mistakes.
- **Promoting Visionary Advocacy:** Leadership aspect is crucial in this case since it relates to acting as agents of change. From the research results, it can be concluded that leaders were crucial figures in creating the culture of change and improvement for sustainable development.
- **Reducing Hierarchical Interference:** To become agile, it is essential for the top management to realize that agility should be the objective and, moreover, to stop meddlesome involvement in the operations of various departments .

4.4.2 Practical Recommendations

Practical implementation requires concrete tools, phased adoption, and investment in infrastructure.

- **Phased and Gradual Implementation:** Healthcare organizations would be assured of the absence of disruption of operations within the healthcare organization by adopting agile methodologies in phases, testing for effectiveness in select areas, and subsequently implementing the method across the organization.
- **Establishment of Innovation Lab:** It will be necessary to establish an innovation lab during the development process because an innovation lab will serve as a venue for conducting the digital transformation process and exchanging knowledge.
- **Tools & Rituals:** One must realize the importance of adopting appropriate tools when applying the agile framework. In addition, it will be crucial to ensure that the senior management engages in agile rituals.
- **Investing in Digital Infrastructure:** The firms have to invest in technologies to make sure that the digital innovation process is carried out effectively. However, investments will not suffice; the firms also need to ensure that the organizational culture is agile.
- **Development of Sector-Specific Performance Indicators:** It will be important to develop sector-specific performance indicators to measure success in implementing agile practices.

4.4.3 Future Research Recommendations

There are some areas where further research could be undertaken concerning agile methodology in healthcare. Such areas include:

- Agile Methodology in Healthcare: Its Impact in Future Studies: In future, research can be conducted to find out the influence that agile methodology in health practices might have in the long run.
- Special Consideration of Geography and Culture: Research would be required to understand how agile methodology in healthcare varies across regions and different cultures as well as its effects.
- A Combination of Agile Methodologies with Artificial Intelligence and Big Data: Further research can be done to investigate how agile methodology in health practices enables artificial intelligence to be incorporated in healthcare and, additionally, how training on the biometric dashboard and decision making could be conducted.
- Effects of Different Specialties and Modes of Health Practices: In the case of applying agile methodology to different specialties and modes of health practices, future studies need to focus on its effects.
- Benefit of Applying Agile Methodology to Patient Care: Comparing the effect of applying agile methodology on patients to non-agile approaches.

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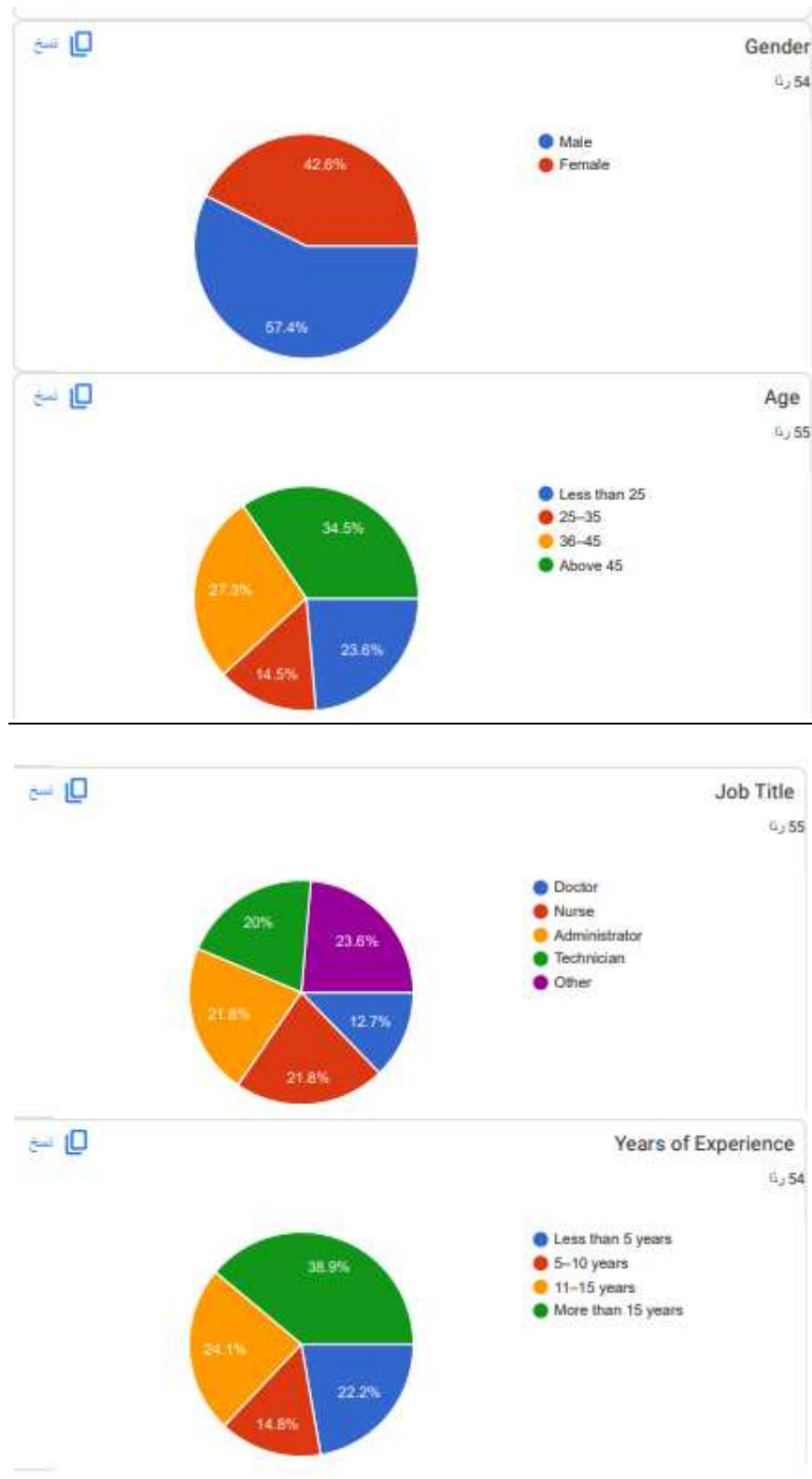
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Appendix

Questionnaire

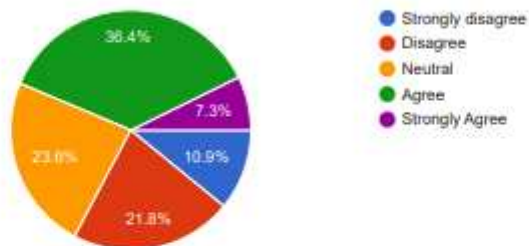


Agile Leadership in Managing Continuous Change in Healthcare



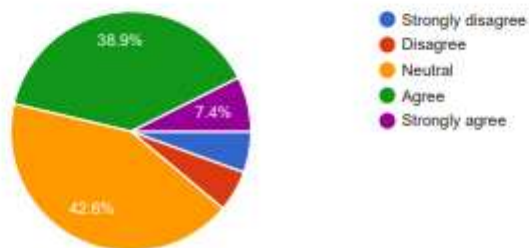
.Leaders in my organization respond quickly to changes

55



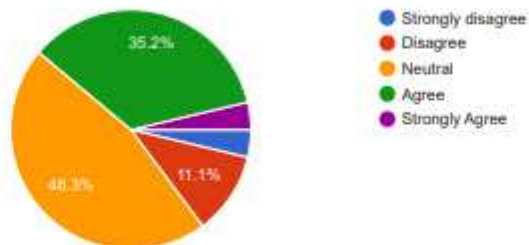
.Leaders encourage innovation and new ideas

54



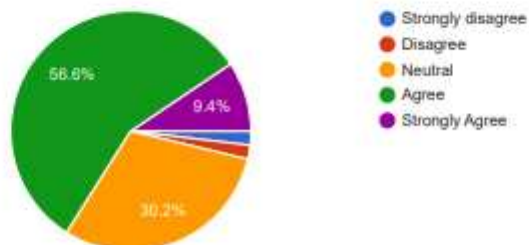
.Decision-making is flexible and adaptive

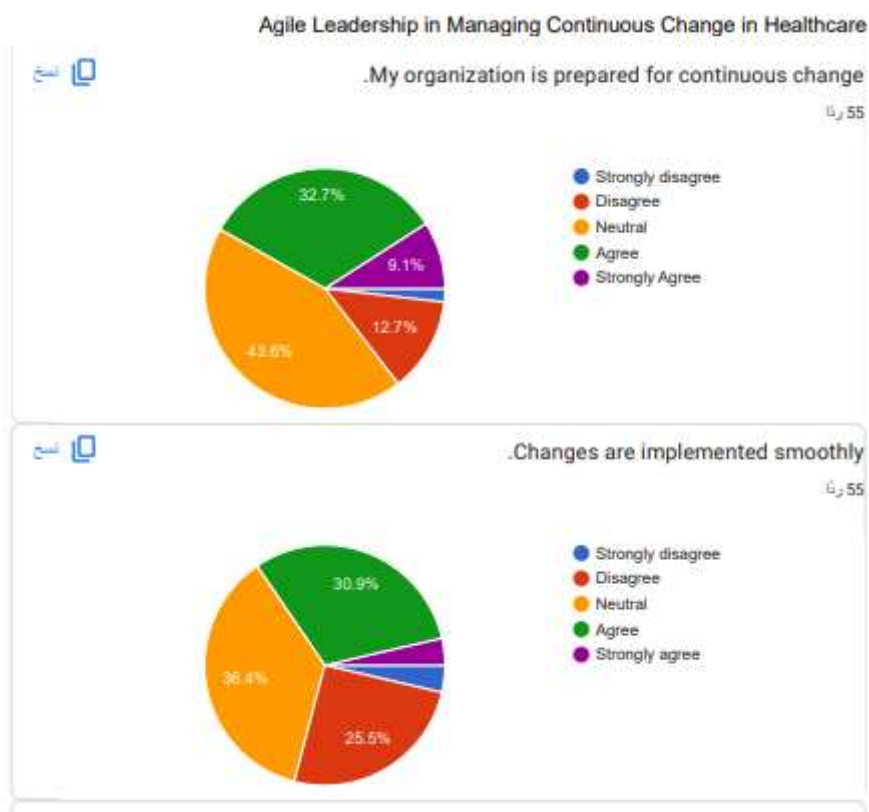
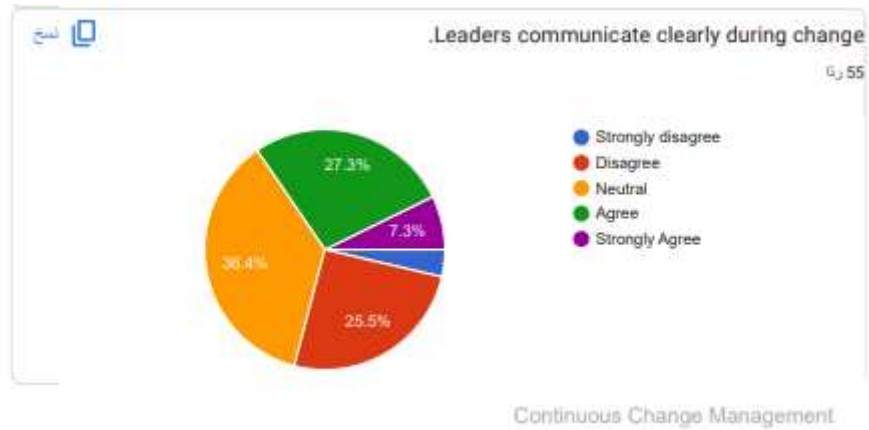
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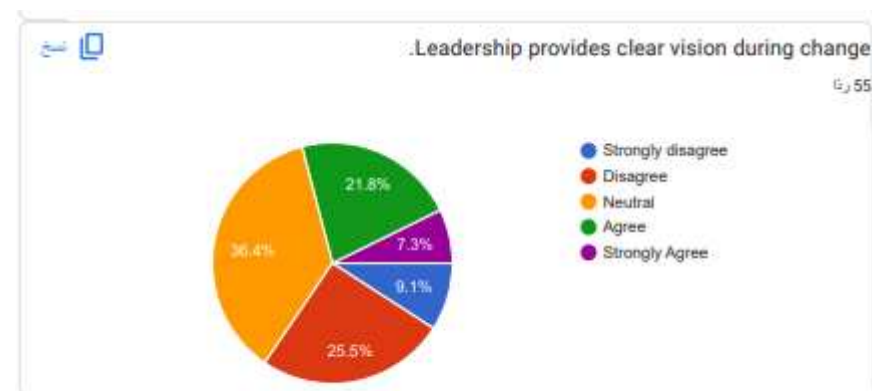
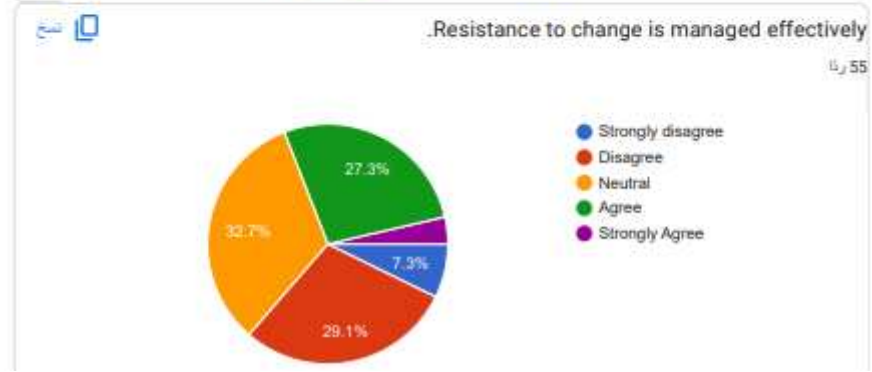
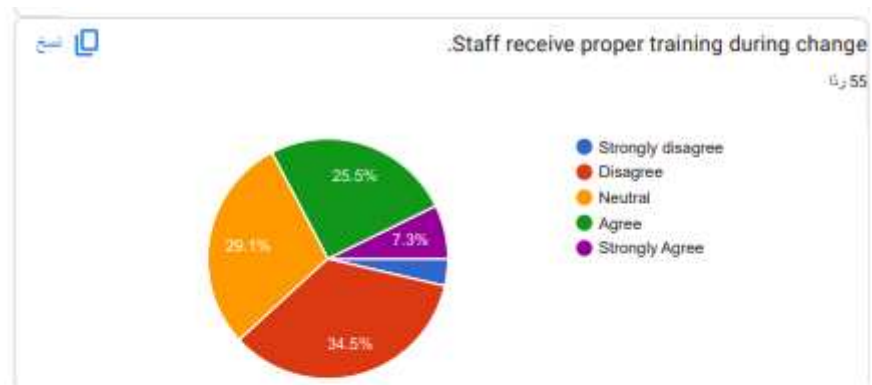


.Leaders support teamwork and collaboration

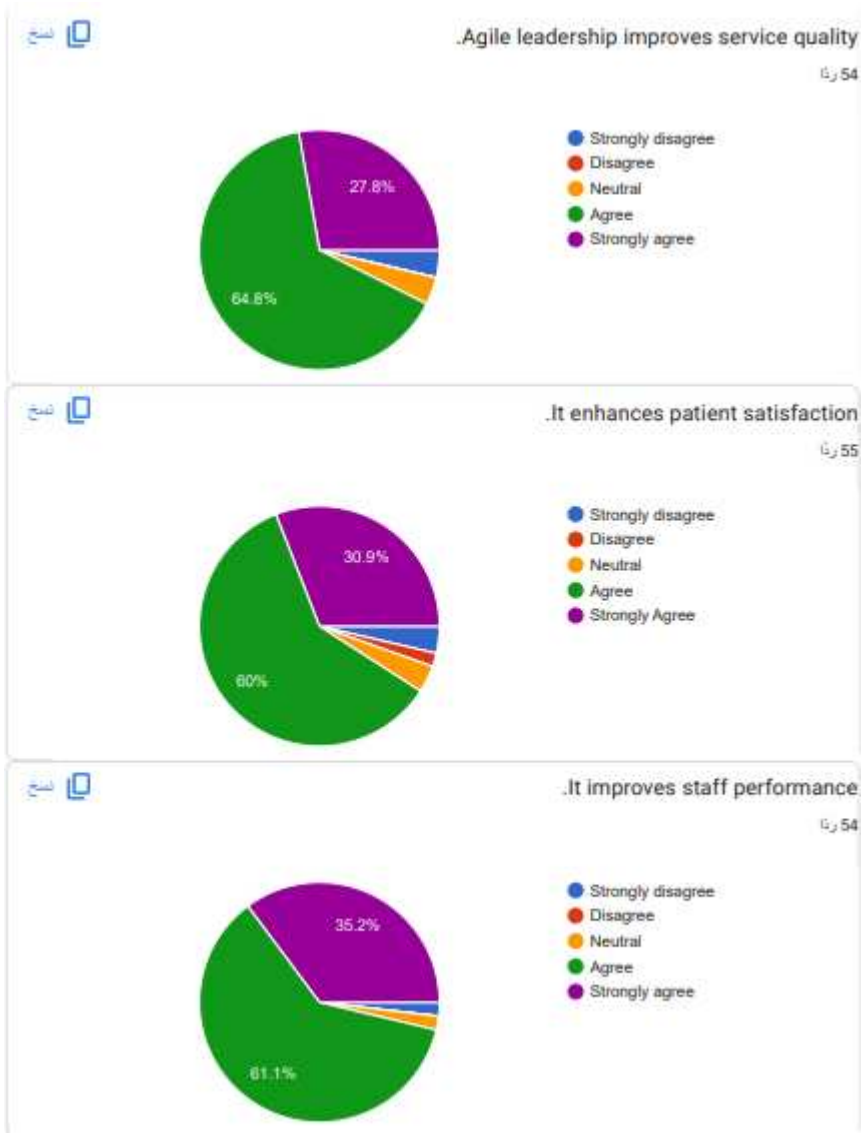
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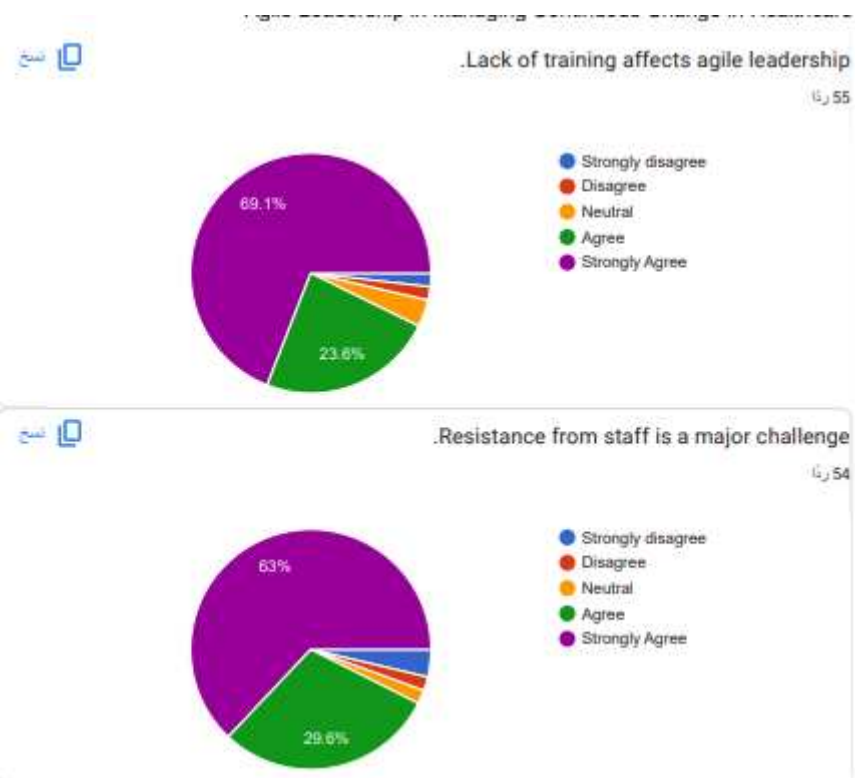
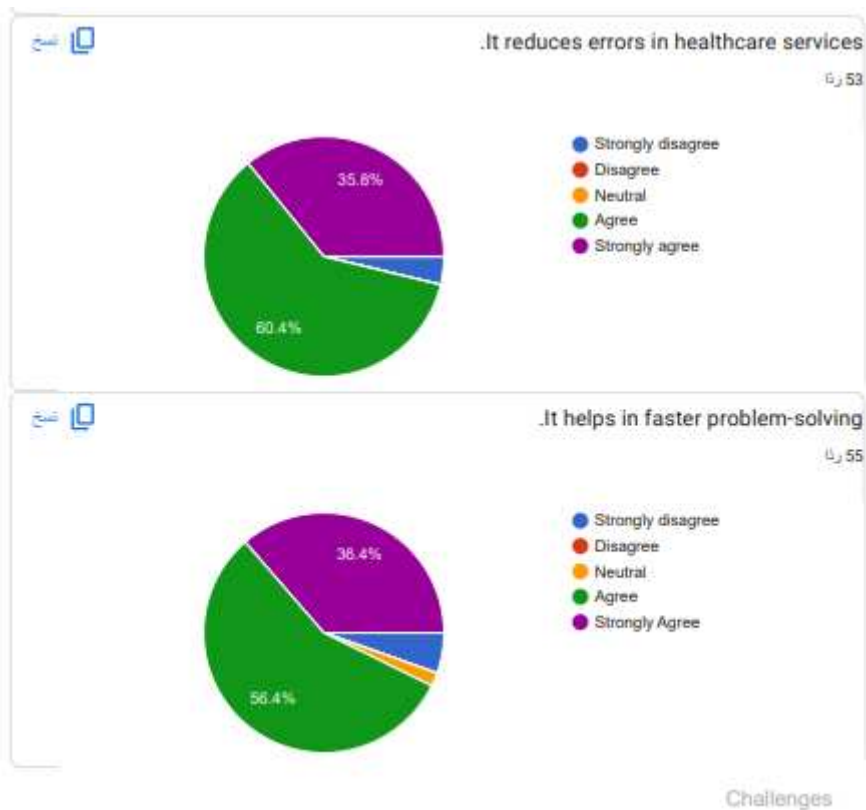


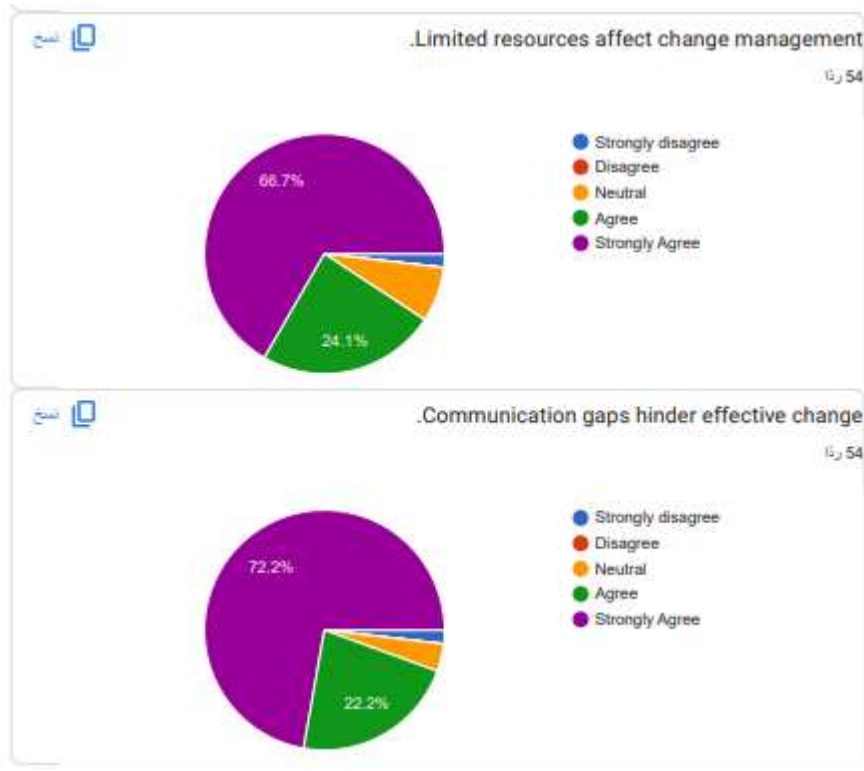




Impact on Healthcare Performance







Frequencies

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Statistics					
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Frequency Table

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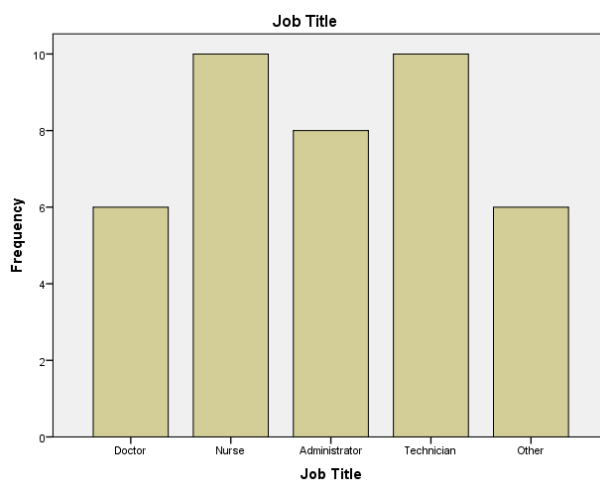
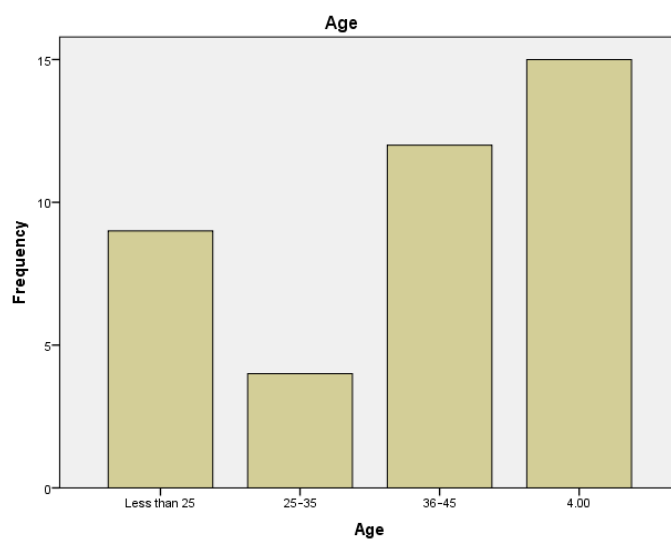
Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 25	9	22.5	22.5	22.5
	25–35	4	10.0	10.0	32.5
	36–45	12	30.0	30.0	62.5
	4.00	15	37.5	37.5	100.0
	Total	40	100.0	100.0	

Job Title					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Doctor	6	15.0	15.0	15.0
	Nurse	10	25.0	25.0	40.0
	Administrator	8	20.0	20.0	60.0
	Technician	10	25.0	25.0	85.0
	Other	6	15.0	15.0	100.0
	Total	40	100.0	100.0	

Years of Experience				
		Frequency	Percent	Cumulative Percent

Valid	Less than 5 years	8	20.0	20.5	20.5
	5–10 years	5	12.5	12.8	33.3
	11–15 years	11	27.5	28.2	61.5
	More than 15 years	15	37.5	38.5	100.0
	Total	39	97.5	100.0	
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Total		40	100.0		

Bar Chart





Descriptives

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Descriptive Statistics

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Agile	40	1.60	5.00	3.2025	.77633
Change	0				
Performance	0				
Challenges	0				
Valid N (listwise)	0				

Reliability

Notes		
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Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	37	92.5
	Excluded ^a	3	7.5
	Total	40	100.0

Reliability Statistics	
Cronbach's Alpha	N of Items
.930	5

Reliability

Notes		
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Syntax		RELIABILITY /VARIABLES=q11 q12 q13 q14 q15 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA.
Resources	Processor Time	00:00:00.00
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Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	37	92.5
	Excluded ^a	3	7.5
	Total	40	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.989	5

Reliability

Notes		
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Resources	Processor Time	00:00:00.00

	Elapsed Time	00:00:00.01
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Scale: ALL VARIABLES

Case Processing Summary

	N	%
Cases Valid	40	100.0
Excluded ^a	0	.0
Total	40	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.974	5

Reliability

Notes		
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Scale: ALL VARIABLES

Case Processing Summary

	N	%
Cases Valid	38	95.0
Excluded ^a	2	5.0
Total	40	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.968	4

Correlations

Notes		
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	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.
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Resources	Processor Time	00:00:00.08
	Elapsed Time	00:00:00.51

Correlations

		Agile	Change	Performance
Agile	Pearson Correlation	1	. ^a	. ^a
	Sig. (2-tailed)		.	.
	N	40	0	0
Change	Pearson Correlation	. ^a	. ^a	. ^a
	Sig. (2-tailed)	.	.	.
	N	0	0	0
Performance	Pearson Correlation	. ^a	. ^a	. ^a
	Sig. (2-tailed)	.	.	.
	N	0	0	0

Regression

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Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Performance /METHOD=ENTER Agile Change.
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Bootstrap

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Bootstrap Specifications	
Sampling Method	Simple
Number of Samples	1000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Oneway

Notes		
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Comments		
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	Cases Used	Statistics for each analysis are based on cases with no missing data for any variable in the analysis.
Syntax		ONEWAY Performance BY Age /MISSING ANALYSIS.
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Bootstrap

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	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		BOOTSTRAP /SAMPLING METHOD=SIMPLE /VARIABLES TARGET=Performance INPUT=Gender /CRITERIA CILEVEL=95 CITYPE=PERCENTILE NSAMPLES=1000 /MISSING USERMISSING=EXCLUDE.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.13

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	1000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

T-Test

Notes		
Output Created		11-APR-2026 02:35:05
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST GROUPS=Gender(1 2) /MISSING=ANALYSIS /VARIABLES=Performance /CRITERIA=CI(.95).
Resources	Processor Time	00:00:00.08
	Elapsed Time	00:00:00.13

Group Statistics^b

Gender		N	Mean	Std. Deviation	Std. Error Mean
Performance	1.00	0 ^a	.	.	.
	2.00	0 ^a	.	.	.