

The challenges facing innovation teams in healthcare organizations: A case study of King Abdullah Medical City

Kutob, Maryam Waiel¹, Alhothali, Ghada Talat²

¹ Executive Administration of Research and Innovation, King Abdullah Medical City

² Assistant Professor at the Marketing Department, College of Business, University of Jeddah

ABSTRACT

Understanding the challenges of team-based projects is a phenomenon that has become increasingly critical to both academics and practitioners. Identifying the obstacles which inhibit team-based project effectiveness is crucial to health organizations. Research exploring the challenges facing team members during the stages of team building is limited. Further, exploring the role of leadership style on Hence, the current study delves into the challenges facing innovation team members in King Abdullah Medical City during the team development stages. Based on Tuckman's stage development model, the study identifies the challenges facing members during the five stages of team development stages (i.e., forming, storming, performing, norming, and adjourning). Four focused groups, eight face-to-face interviews and unstructured personal observation have been used to collect data for this study. The findings reveal five critical themes related to the challenges confronting innovation team members during the stages of team development. In particular, the storming and norming stages are found to be the most critical stages, which involve many difficulties such as leader characteristics, communication, task distribution.

Keywords: Innovation Teams, Health Organizations, Challenges, Tuckman's Model, Leader Characteristics, Communication, Task Distribution, Design Thinking, Innovation Champion

Corresponding Author:

Kutob, Maryam Waiel
Executive Administration of Research and Innovation
King Abdullah Medical City
Makkah City 22195
E-mail: kutob.m@kamc.med.sa

1. Introduction

In today's complex and rapidly changing business environment, team innovation is increasingly critical to the survival and success of organizations [1]. Innovation is crucial to organizational success and is a process steered, and potentially thwarted, by individuals. Further, individuals are the key success indicators to achieve the innovation goals in the organizations. Creativity and innovation in organizations are considered the process of creating and develop new methods for getting things done. Creativity and innovation found to have a significant role in the performance of organizations in general and for health organizations in particular [2]. Creativity enables idea generation, and innovation allows the subsequent stage of ideas' implementation, leading to the best methods, practices, or products. Creativity and innovation appear at levels such as individuals, work teams, organizations, or in a combination of all these levels. However, the results can be recognized in one or more of these levels [3].

Cross-functional teams are essential for innovation projects, where organizations need a diverse group with a variety of perspectives and experiences to solve complicated problems [4]. However, functional diversity can

also lead to conflicts, which may hinder an optimal performance of teams [5]. The extant literature emphasizes that using groups in an organization for developing new products can promote both internal and external success [6], [7]. Further, successful teams have accelerated the product development cycle, reduced development costs, and increased new products quality [8], [9], [10], [11], [12]. New product development (NPD) teams are also associated with increased product success in the market [13], [12], more frequent introduction of new products, and higher customer satisfaction [12]. Collaborative NPD teams introduced new products a month ahead of schedule, has been found [14], achieved significant reductions in costs, and obtained twice the estimated sales. The professionals were more satisfied working in teams than on their own or solely in functional organizations additionally showed [10].

However, our understanding of the 'human component' of the innovation process [15] and exploring their barriers to innovation warrant further attention. Add to that, exploring the conditions that facilitate innovation teamwork has been a pursuit of researchers for nearly a half-century [16].

The Innovation Champion program is one of the Research and Innovation Center programs in King Abdullah Medical City (KAMC) at the Holy City of Makkah. The program focuses on qualifying KAMC staff to create innovative products and services that solve the problems occurring within KAMC. By using a unique design thinking approach established by innovation center in KAMC, and the participants in this program are committed to passing through three phases of Design Thinking (3Ds): Discover, Develop and Deliver. In the first phase (Discover), the participants must explore, empathize, and get a better understanding of the end-users needs. After they examined the user's needs, the participants move to the second phase (Develop) in which they brainstorm an unlimited number of ideas and solutions to address the user's challenges. Then, the team is engaged in the final phase (deliver) through which filtering and selecting the best idea for prototyping is administered.

Further, the innovation teams face various challenges and barriers during their stages of team development, as described by Tuckman and Jensen [17]. The innovation teams in the Innovation Champion Program (ICP) 2019 face various challenges which affect their performance and the projects' outcomes. Hence, the primary purpose of the current study is to explore the obstacles impeding the innovation process led by innovation teams in health care organizations from both the team members' and leaders' perspectives.

1.1. Innovation in healthcare industry

Health organizations need to employ creative and innovative solutions to survive and progress [18], [4]. Prior studies have found that the provision of a favorable organizational environment, focusing on innovation as value and norm, can encourage hospital managers to be creative [18]. The healthcare industry is one of the most sensitive and complex systems among other sectors, as it primarily focuses on treating humans. Hence, advanced technologies are highly encouraged to be utilized in all healthcare levels: promotion, prevention, diagnosis, treatment, and rehabilitation. The innovation projects support the idea of sharing the responsibility of creating new products, services, processes, or systems to serve either the patients, healthcare practitioners, or any other stakeholder to provide and receive a high-quality service with the minimum wastes, harms, and efforts.

The extant literature has explored diverse perspectives about innovation [19], [20], [21]. A pioneering attempt by Schumpeter [22] demonstrates the presence of five types of innovation: innovation as the presentation of new ideas, opening a new market, obtaining a source of supply, presenting a new technique for creativity, and the association of an industry [23], [8]. Existing literature described innovation from multiple points of view. Innovation is defined as "running from wide and great speculations to exceedingly explicit concentrating on specialized innovation" [24]. Further, Lynn and Gelb [25] define innovation as the "inclination of an individual purchaser to embrace new items before substantial quantities of others do" [25]. Notwithstanding, innovation is defined as noteworthy takeoffs from earlier systems for analysis, treatment, or anticipation, as controlled by the aggregate decisions of specialists in the field. Innovation in medicinal services refers to improvements focused

on the patient by helping human services experts to work more intelligent, quicker, better, and successfully led by healthcare specialists [26], [20].

Sosa and Connor [27] conducted a literature review to identify a potential dilemma faced by business organizations and determining whether it is better to promote creative behavior across a whole organization or focus on the development of small and highly creative teams. The study results in an informed examination of strategies to sustain innovation based on the introduction of either a small number of significantly novel ideas, or various novel but more simple designs. Besides, the study indicates that the change agency notices the possibility of the trade-off between a highly creative team and its efficiency, which is a critical mass in an organization.

Even though innovation teams are different in terms of job titles (e.g., Entrepreneurial teams, new venture teams (NVTs), research and development (R&D) teams), responsibilities and roles, they share in common one purpose of creating novice ideas, products, or services [4]. Although the dominating feature of innovation teams is a novelty, they are also characterized by substantial uncertainty due to the difficulty of clearly defining roles and responsibilities [4]. More recently, literature offers contradictory findings of the effectiveness of cross-functional innovation teams to performance [16], [5]. Driessen [5] has found that cross-functionality of the innovation team does not contribute to performance when there is a lack of connectedness at the organizational level. Edmondson and Nembhard [16] explore five attributes of teams that undermine their performance: (1) project complexity; (2) cross-functionality; (3) temporary membership; (4) fluid team boundaries; and (5) embeddedness in organizational structures. It argues here that effective management of these five attributes allows not only organization-level benefits but also team-level benefits in the form of new capabilities and team member resilience. The critical roles of leadership, communication, and conflict management training are also found to be essential in overcoming the challenges to team effectiveness in NPD. Overcoming such barriers enable the organization to realize five-team benefits: (1) project management skills, (2) broad perspective, (3) teaming skills, (4) expanded social network, and (5) boundary-spanning skills.

Shazi, Gillespie, and Steen [28] examine the influence of trust on the formation of social network ties for the idea generation and idea realization stages of innovation. The study found that perceived trustworthiness is indeed an overarching construct that determines network formation. Shazi and colleagues [28] also found that the two dimensions of trustworthiness, ability, and benevolence, predict tie formation for both idea generation and idea realization. In contrast, integrity predicts tie formation for idea generation only. Moderation analyses across both firms and stages of innovation reveal that a lack of benevolence makes ability mostly irrelevant as a criterion for choosing a partner for innovation activities.

In contrast, high benevolence increases the extent to which ability influences partner choice. Overall, the results suggest that people need to perceive others as benevolent and not lacking in integrity to seek out their skills and knowledge for innovation in project teams. Further, psychological safety is a significant factor in encouraging exploratory learning and hence team performance [29].

1.2. Leadership and team formation

Increased recognition of the importance of team leadership on team effectiveness is emphasized in the literature. The leader plays a significant role in guiding team directions and organizing their efforts to maximize their performance. It is argued that effective leadership processes represent perhaps the most critical factor in the success of organizational teams [30]. Prior studies have explored the influence of leadership on the progress of innovative team formation [1]. In an attempt to investigate the external factors influencing innovation teams, Shalley and Gilson [31] underscore communication, diversity, shared mental models, leadership, and climate as the critical factors for creativity. Ye, Wang, and Guo [1], for example, investigate the impact of inclusive leadership on team innovation by exploring the role of team voice and performance pressure. The study has also integrated the goal-setting theory into the input-process-output framework. It proposes a moderated mediation

model to examine the relationship between inclusive leadership and team innovation. The results demonstrated that team voice mediated the relationship between inclusive leadership and team innovation. It is also found that performance pressure moderated the direct link between inclusive leadership and team voice as well as the indirect relationship between inclusive leadership and team innovation via team voice.

Further, in a health care context, the findings of a study by West and colleagues [32] demonstrate a need to ensure that leadership is clear between innovation team members to achieve desirable team outcomes. Moreover, leadership style plays a critical role in cross-functional team processes and performance [33]. The study has also found that the participative leadership style was positively related to the process of team reflection. In particular, the participative leader in heterogeneous teams assists team members to better exploit heterogeneity of the groups in terms of the variety of professional backgrounds, knowledge, skills, and abilities, into significant processes of questioning, reviewing, and exploring. Transformational leadership is of vital importance to innovation teams' progress and performance [34]. By focusing on the effect of leadership style on job-related tension and psychological sense of community in work organizations, Lewin and colleagues [35] conduct a study on four organizations in Lagos State, Nigeria, and discussing the three leadership styles which are autocratic, democratic and laissez-faire. Besides, the author defines the autocratic leadership style as the leader responsible for taking all the decisions, has full authority over the work and team, assigning tasks, and control the communication within the group [35].

In contrast, the democratic leadership style is the leader who used a consultative approach, engaging the team members to participate in decision making and maintaining the relationship within the group. The laissez-faire leadership style is the leader, who does not have any constraints about who takes the decisions, permits the team member to work freely, and he did not engage himself in the process of leading. However, there is no one best style of leadership. The effectiveness of a particular style is dependent on the organizational situation [35].

Given the fact that the team is involved in a progressive stage to achieve the primary purpose of the group, the current study explores the challenges facing the teams during the team building stages, as developed by Tuckman and Jensen [17]. Tuckman and Jensen [17] modified the model of small-group development. Tuckman's model is one of the widely used models in describing the process of team building. The model composed of five stages: forming, storming, norming, performing, and adjourning. Therefore, the current study uses Tuckman's model as a framework to model the improvement of the innovation champion program.

2. Material and methods

The mixed-method approach of four focused groups (3 to 4) members, eight face-to-face interviews, and unstructured personal observation have been used for this study. Semi-structured interviews allow interviewees to speak freely about challenges, experiences, and opinions concerning what they thought about improving the innovation teams' performance in healthcare projects. In contrast, the focus group is more convenient as it enables the researcher to meet and hence collect more views at once. Face-to-face interviews were also used due to the interviewee's preference for not talking in front of their leaders or other team members. Besides, unstructured personal observation is used during the program, and the findings of researcher observation are also considered in data analysis.

A convenience sample of participants was recruited to participate in the study. Data were collected from King Abdullah Medical City (KAMC), a healthcare organization located in Makkah, a Holy City on the Eastern side of Saudi Arabia in March 2019. The ICP's owner has approved permission to start data collection. The data collected from six innovation teams with the total number of 36 of KAMC staff from different departments and positions and backgrounds (medical and non-medical) who participated in the ICP in 2019.

After receiving permission from the research and Innovation Center in KAMC, the researcher started by listing all the participants' contact information and contacted them via phone calls to schedule an appointment for the

interview or the focus groups. All the face-to-face interviews were recorded after taking the participants' permission.

The interview and focus groups questions are divided into four parts: the first category is general knowledge about the definition of team and significant differences between the innovation team and other projects' teams. Secondly, they were asked about their insights about the program nomination, communication, team building, and challenge design mechanism. Finally, the interviews and focus groups were ended by closing questions about their next projects as a team and whether they are planning to continue working with each other

Total sample size is 22, yielding an effective response rate of 68.8%. Table 1 shows the participants' background data and characteristics.

Table 1. Participants' description

Team Code	Type of Team Participation	Gender	Participant Code	Department
1	Member	Male	1	Executive Administration of Operation
	Member	female	2	Associate Executive Administration of Patient Affairs
	Member	female	3	Associate Executive Administration of Patient Affairs
	Member	Male	4	Innovation Center – Taif City
	Member	Male	5	Innovation Center – Taif City
2	Member	Male	6	Executive Administration of Operation
	Member	female	7	Executive Administration of Research and Innovation
	Leader	Male	8	Executive Administration of Medical and Clinical Affairs
3	Member	female	9	Executive Administration of Medical and Clinical Affairs
	Member	female	10	Executive Administration of Medical and Clinical Affairs
	Leader	female	11	Executive Administration of Medical and Clinical Affairs
	Member	female	12	Executive Administration of Operation
4	Leader	female	13	Executive Administration of Operation
	Member	Male	14	Health Economics Department
	Member	Male	15	Patient Experience Center
	Member	Male	16	Executive Administration of Medical and Clinical Affairs
5	Leader	Male	17	Executive Administration of Operation
	member	female	18	Executive Administration of Administrative and Financial Affairs
	member	female	19	Executive Administration of Operation
6	member	Male	20	Marketing and Corporate Communication Department
	member	Male	21	Legal Affairs Department
	member	female	22	Executive Administration of Medical and Clinical Affairs

Based on the five-stage Design Thinking model proposed by the Hasso-Plattner Institute of Design at Stanford [36], the Innovation Center in KAMC adopt their model of Design Thinking and develop three phases: Design, develop and deliver. First of all, the Design phase is a combination of Empathize and Define in d.school methodology. Second, the Develop phase, which represents the ideate phase, and the last stage is Deliver, which is a combination of Prototype and Test phases. Table 2 shows the project life cycle and its relationship to the d.school model. These three phases of Design Thinking methodology become later on the project phases of each innovation team.

Table 2. The Innovation Champion project phases as adapted from d.school model

D.school Model	Empathize	Define	Ideate	Prototype	Test

Definition	Gain an empathic understanding of the problem trying to solve.	Analyze the observations and synthesize them in order to define the core problems the team have identified.	Identify new solutions to the problem statement and evaluate the options then select the suitable option for the problem.	Implement the solution and investigate either accepted, improved and re-examined, or rejected on the basis of the users' experiences.	Alternate and refine the solution in order to rule out problem solutions and derive as deep an understanding of the product and its users as possible.
KAMC Model	Design	Develop	Deliver		

The analysis begins with a comprehensive approach informed by in-depth research questions using Miles and Huberman's steps [37]. The first stage was to conduct interviews and focus groups on collecting data. The second stage was about identifying what the participant discussed when answering the main questions.

The third stage involves drawing conclusions from the data and then checking the raw data to verify the assumptions. Respondents were asked to explain their experience in light of the five stages of the Tuckman model. In particular, they are encouraged to discuss the problems they face during the five stages of the team development model. The formation of the first stage represents the stage in which members are chosen and where design thinking is done. Second, the stage of storming in which the team faces conflicts and issues in dealing with each other. Then, the standard-setting stage by which the group becomes more stable and familiar with each other. As the team becomes more effective and efficient in the performance stage, the team improves significantly and provides valuable results. The final stage of the Tuckman model is the next stage in which the team closes its project, and an opportunity arises to start a new project with the same team.

3. Results & Discussion

Tables 3 summarizes the themes as discussed by the participants when asked about the challenges they have encountered through the development stages of the innovation teams. Five major themes have been explored: communication, leader selection criteria, leader characteristics, cross functionality and task distribution. In contrast, table 4 displays the major themes and categories as discussed by participants.

Table 3. frequency distribution of the frequently mentioned themes

Themes contributing to value	Absolute Frequency of theme mentioned	Number of Interviewees who identified this theme	% of interviewees out of 22
Communication	36	22	100%
Leader selection criteria	23	18	82%
Leader personal characteristics	35	15	68%
Cross functionality	13	13	59%
Tasks distribution	25	9	41%
Team reformation	9	8	36%

Table 4. Barriers impacting team members during team building stages

Tuckman Model Stages	Themes related to the stage	Categories related to the stage
Forming	Leader selection criteria refers to the way on how the team selecting their leader.	<ul style="list-style-type: none"> - Selecting the leader depends on: - Previous experiences - Networking
	Leader personal characteristic refers to the personal traits of the leader.	<ul style="list-style-type: none"> - Bossy, assertive and commanding leaders. - Considerate, liberal and indulgent leaders - Favoritism
Storming & Norming	Task distribution refers to assigning roles, responsibilities, tasks among the team members	<ul style="list-style-type: none"> - Project and job-related duties imbalance. - Lack of accurate assigning of the roles.
	Communication refers to any means of communication between team members, including the leader of the team.	<ul style="list-style-type: none"> - Lack of engagement in discussions and decision making. - Lack of openness to other opinions. - Lack of common language between members. - Facing aggressive behavior
Performing	Cross-functionality refers to the level of diversity between team members	<ul style="list-style-type: none"> - Member selection criteria (all members from one department) - Challenges related to time and place
Adjourning	Team reformation refers to the team's intention to continue with the same members in future projects.	<ul style="list-style-type: none"> - Intention to re-join the team

3.1. Communication

Participants (100%) agreed upon the critical role of communication between members of the group and the interaction between the leader and team members to facilitate the progress of the innovation team. A group of respondents indicates that were suffering from the lack of common language between the members. The respondents emphasize that one member of their group was being aggressive in her way of communicating with other members in the team.

"Each member is supposed to focus on a task, and we are all busy, and we have responsibilities to do. As we sat down to distribute the functions of the next phase, she refused and said, I will not do any job from home." (Team member (7) – female).

As displayed in table 4 (above), another group of respondents indicate that some members were demotivated and disengaged to participate in discussion or decisions. Other respondents claim that some members and leaders are inflexible to accept different points of view. A female respondent emphasizes that the leader takes decisions without considering team members point of views.

"Our leader refuses any other opinion: In fact, he is resisting our attempts to reach an agreement and finding any reason to complicate the situation and rejected our views." (Team member (3) – female).

Other participants stressed the role of having good networking with other departments to the success of the project. For example, some leaders have good relations with employees in different departments related to the tasks at hand, which enables them to be more potent in and to have full control over the progress of the project.

"... one of the things that helped us at the design phase is that some of the members have good relationships with other departments. This relationship encourages other employees to cooperate with us on solving the problems" (Team member (7) – female).

3.2. Leader selection criteria

The findings in table 3 (above) have shown that the leader selection criteria are the second most frequent topic of discussion; The majority (82%) of respondents' stress that they struggle with the shortage of the leader selection criteria. The respondents also emphasize the critical role of the leader in directing and ensuring the performance of the group in different stages of group development. Respondents noted the lack of leader selection guidelines neither by the program administrative nor by the team members. Hence, each innovation team has a way of choosing his/her leader. *"Selection of leader was random and useless" (Team member (20) – male).*

As shown in table 4 (above), the researcher notices some issues related to leader selection criteria; some of the participants indicate that they depend on some members' previous experience to choose him/her to be the leader of the group.

"He has the knowledge and experience in the field of emergency management, and this motivated me to be with him." (Team member (7) – female).

The results indicate that the members depend on the leader's networking. The team member who is having well-established relationships with other departments is hence nominated to be the leader of the group.

"...he has many relationships with the key people in other departments" (Team member (7) – female).

3.3. Leader personal characteristics

More than half of the respondents (68%) indicate that the leader characteristic is a challenge. Respondents emphasize that some of the leaders are difficult to work with and manage. One the one hand, respondents, struggle when coping with the commanding leader. For example, during the storming stage, the respondents stress that the bossy leader is dealing with team members as being one of his/ her staff in giving orders and instructions.

"The team leader sent a report without considering the group's opinions. He does not differentiate between dealing with team members and with staff under his supervision" (Team member (3) – female).

One the other hand, dealing with a liberal leader is also a challenge as it leads to members' lack of concerns and irresponsible attitudes.

"The sense of people working and people not especially when someone comes and tells you I will be responsible for this task and at the due date, we found that the task has not been submitted and therefore the project lags." (Team member (7) – female).

Besides, respondents notice that their leader favors some team members over others in assigning the tasks or conducting side discussions without the presence of the whole team.

"I felt that he satisfies only some members, and we do not like confrontation with him because we knew that the project would be for a certain period, and we have to be patient till it ends." (Team member (18) – female).

3.4. Cross-functionality

59 % of the participants emphasize that members' selection criteria were also an obstacle. This might be attributable to its impact on the cross-functionality of the members. As an example, nominating team members from the same department will adversely impact the performance of the group. A group of respondents emphasizes the critical role of cross-functionality in influencing the performance of the group.

"The team must be diverse and composed of members from different departments. We greatly benefited the participation of expert members from the medical department and their valuable contributions to the project." (Team member (13) – female).

Another group agreed that selecting members of the team does not take into consideration the project's needs for a specialized member in the bioengineering field within the team, which leads to delays in the project progress. This is due to inaccurate member selection criteria. For example, one of the teams express their need to having a physician in the group, but due to this shortage, they could not progress in the project.

One of the defects of having diversity of disciplines is that the work routine is diverse between departments which affect the meetings, work progress and task accomplishment.

"Some of us have a free time to work on the project and some are not. Also, some of the team activities need the whole team to take the decisions and some need to distribute equally among the team. It is necessary to have the project team as fulltime commitment to be more achievable." (Team member (10) – female).

This finding confirms prior studies into the substantial role of cross-functionality [4]. We came to realize that cross-functionality is substantial and should be determined according to the objectives of the project. Hence, the administration of ICP should bear in mind this deficiency by nominating the right members according to the problem, need to be solved.

3.5. Task distribution

41% of participants emphasize that distributing the tasks between the members, which is usually taking place during the storming stage, is of great significance. Most of the team members face a great deal of stress and anxiety due to the imbalance between the project duties and other duties such as their work responsibilities and personal life after working hours.

"The leader does not distribute the tasks equally. He bombarded some members with many tasks and keep other members do nothing. For example, he asked a member to perform some tasks outside the official working hours leading the members to quit and exit the program." (Team member (6) – male).

The inequality between members in distributing the tasks varies among the teams and could create various conflicts and disputes between the team members. The participants agree that equal task-distribution can eliminate the consequences of these conflicts.

"Of course, the clarity of the distribution of tasks and the scheduling of tasks and periodic meetings of the most important reasons for the success of the task forces" (Team member (6) – male).

Another participant emphasizes that some leaders lack to gauge the time required for each task, so they asked to perform many tasks in short times. "they did not take into consideration that we have other responsibilities we need to handle" (Team member (10) – female).

A participant (Leader (11), female) emphasizes that her inability to distribute the task equally is due to her lack of knowledge about the task as the design thinking approach was new to her and the members alike.

Another participant indicates that some leaders try to be equal in distributing the tasks. However, they lack to consider the previous experience or skills of the members. For example, one member, in team code 2, fails to achieve the required task (collecting data via interviews) due to her shortage of skills in conducting interviews.

3.6. Team reformation

36% of participants emphasize that the team reformation is a phase where the team members have reached the project closure. During this stage, which is in parallel with the adjourning stage, the members encounter several feelings regarding their intention to participate in the next program. It is having been found that their current experience within this program can have a significant impact on their plan to join the following program and whether to rejoin the same group. Respondents who have had a successful experience have expressed that they are willing to re-join the same group.

“...we became like one family, and I’m very proud to work with them, we worked hard, and I hope to continue with the same members in other projects.” (Team member (3) – female).

However, other members emphasize their resentment towards working with the same team in further projects due to the conflicts, misunderstandings, and disharmony.

“Next project, I will choose the team members according to their enthusiasm and specialization. I prefer members who can support me and add value to the project.” (Team member (3) – female).

4. Conclusions

Encouraging team innovation projects is of great importance to organizations in general and health organizations in particular. However, exploring the challenges facing the innovation teams which undermine their progress is limited. Hence, the current study delves into exploring the challenges confronting innovation team members during the team development stage (i.e., forming, norming, storming, performing, and adjourning) [17].

In pursuit of exploring the challenges facing the innovation teams during the progress of the teams, four focus groups, eight face-to-face interviews, and researcher observation were conducted. Respondents were asked to identify the significant problems that impede their progress through the innovation project. The findings of the current study identify five critical challenges which were manifest during the staging of the teams (i.e., Leader selection criteria, Leader personal characteristics, communication, cross-functionality, and task distributions). It is also found that the storming and norming stages were the critical stages for the progress of the teams.

These findings have important implications for innovation project management. First of all, leaders' selection criteria should be developed concerning the leaders' background, skills, and experience. Furthermore, the selection of the team leader must be determined at the beginning of the program. Next, designing a customized leadership manual in addition to orientation sessions on how to manage and direct the team and dealing with conflicts through at all team-building stages. The team leader should be trained on how to distribute the project tasks based on the members' abilities, skills, and talent to enhance their motivation, self-confidence, and enthusiasm towards task accomplishment, besides, to speed up the workflow of the project.

Moreover, the leaders should have the ability to deal with and manage difficult personalities by using a different type of leadership style based on the team member characteristics. Further, leaders should be able to diagnose the stage of teams' progress and make appropriate decisions that move the project forward. Besides, the administration of the program should take into consideration the need to improve the means of communication among the team members by emphasizing respect to others' opinions, transparency, and setting the mindset of solutions-based discussion. Besides, the innovation team should be multidisciplinary by selecting the members based on the project problem, specialization, network zones, and other supporting capabilities.

5. Acknowledgements

We would also like to thank the experts who have involved in the facilitation of data collection for this research project from the Research and Innovation Center at King Abdullah Medical City and all their participants. Without their passionate participation and input could not have been successfully conducted.

6. References

- [1] Q. Ye, D. Wang, and W. Guo, "Inclusive leadership and team innovation: The role of team voice and performance pressure," *European Management Journal*, vol. 37, no. 4, pp. 468–480, 2019.
- [2] M. R. A. Moreira, M. Gherman, and P. S. A. Sousa, "Does innovation influence the performance of healthcare organizations?," *Innovation*, vol. 19, no. 3, pp. 335–352, 2017.
- [3] N. Anderson, K. Potočnik and J. Zhou, "Innovation and Creativity in Organizations," *Journal of Management*, Vol. 40, no. 5, pp.1297-1333, 2014.
- [4] A. L. Thayer, A. Petruzzelli, and C. E. Mcclurg, "Addressing the paradox of the team innovation process: A review and practical considerations.," *American Psychologist*, vol. 73, no. 4, pp. 363–375, 2018.
- [5] F. Driessen, "The (In)Effectiveness of Cross-Functional Innovation Teams: The Moderating Role of Organizational Context," *IEEE Transactions on Engineering Management*, vol. 62, no. 1, pp. 29–38, 2015.
- [6] R. H. Hayes, S. C. Wheelwright, and K. B. Clark, *Dynamic manufacturing creating the learning organization*. New York: Free Press, 1988.
- [7] K. B. Clark and S. C. Wheelwright, *Revolutionizing product development: quantum leaps in speed, efficiency and quality*. New York: MacMillan, 1992.
- [8] R. G. Cooper and E. J. Kleinschmidt, "Determinants of Timeliness in Product Development," *Journal of Product Innovation Management*, vol. 11, no. 5, pp. 381–396, 1994.
- [9] K. Gupta and D. L. Wilemon, "Accelerating the Development of Technology-Based New Products," *California Management Review*, vol. 32, no. 2, pp. 24–44, 1990.
- [10] E. F. Mcdonough, "Investigation of Factors Contributing to the Success of Cross-Functional Teams," *Journal of Product Innovation Management*, vol. 17, no. 3, pp. 221–235, 2000.
- [11] S. Sarin and V. Mahajan, "The Effect of Reward Structures on the Performance of Cross-Functional Product Development Teams," *Journal of Marketing*, vol. 65, no. 2, pp. 35–53, 2001.
- [12] S. Valle and L. Avella, "Cross-functionality and leadership of the new product development teams," *European Journal of Innovation Management*, vol. 6, no. 1, pp. 32–47, 2003.
- [13] E. W. Larson and D. H. Gobeli, "Organizing for Product Development Projects," *Journal of Product Innovation Management*, vol. 5, no. 3, pp. 180–190, 1988.
- [14] A. R. Jassawalla and H. C. Sashittal, "Building collaborative cross-functional new product teams," *Academy of Management Executive*, vol. 13, no. 3, pp. 50–63, 1999.
- [15] S. Bankins, B. Denness, A. Kriz, and C. Molloy, "Innovation Agents in the Public Sector: Applying Champion and Promotor Theory to Explore Innovation in the Australian Public Service," *Australian Journal of Public Administration*, vol. 76, no. 1, pp. 122–137, 2016.

- [16] A. C. Edmondson and I. M. Nembhard, "Product development and learning in project teams: the challenges are the benefits," *The Journal of Product Innovation Management*, vol. 26, no. 2, pp. 123–138, 2009.
- [17] B. W. Tuckman and M. A. C. Jensen, "Stages of Small-Group Development Revisited," *Group Facilitation: A Research & Applications Journal*, vol. 10, pp. 43–48, 2010.
- [18] A. K. Ameryoun, M. K. Shojai, H. K. Rafati, S. K. Heidari, S. K. Tofighi, and Z. K. Moghadam, "Factors influencing the creativity and innovation in managers of military and civilian hospitals in Tehran, Iran," *Journal of Research & Health*, vol. 5, no. 3, pp. 257–264, 2015.
- [19] F. Damanpour, "Organizational Innovation: A Meta-Analysis of Effects of Determinants and Moderators," *Academy of Management Journal*, vol. 34, no. 3, pp. 555–590, 1991.
- [20] A. D. Meyer and J. B. Goes, "Organizational Assimilation of Innovations: A Multilevel Contextual Analysis," *Academy of Management Journal*, vol. 31, no. 4, pp. 897–923, 1988.
- [21] J. R. Kimberly and M. J. Evanisko, "Organizational Innovation: The Influence of Individual, Organizational, and Contextual Factors on Hospital Adoption of Technological and Administrative Innovations," *Academy of Management Journal*, vol. 24, no. 4, pp. 689–713, 1981.
- [22] J. A. Schumpeter and J. E. Elliott, *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*, vol. 46. Harvard University Press, 1934.
- [23] R. Evangelista and G. Sirilli, "Measuring innovation in services," *Research Evaluation*, vol. 5, no. 3, pp. 207–215, 1995.
- [24] Z. Sušanj, "Innovative climate and culture in manufacturing organizations: differences between some European countries," *Social Science Information*, vol. 39, no. 2, pp. 349–361, 2000.
- [25] M. Lynn and B. D. Gelb, "Identifying innovative national markets for technical consumer goods," *International Marketing Review*, vol. 13, no. 6, pp. 43–57, 1996.
- [26] A. Greer, S. Greer, and A. D. Meyers, *The Diffusion of Medical Technology to Community Hospitals: An Institutional Analysis*, University of Wisconsin-Milwaukee, 1983.
- [27] R. Sosa and A. Connor, "Innovation Teams and Organizational Creativity: Reasoning with Computational Simulations," *The Journal of Design, Economics, and Innovation*, vol. 4, no. 2, pp. 157–170, 2018.
- [28] R. Shazi, N. Gillespie, and J. Steen, "Trust as a predictor of innovation network ties in project teams," *International Journal of Project Management*, vol. 33, no. 1, pp. 81–91, 2015.
- [29] K. C. Kostopoulos and N. Bozionelos, "Team Exploratory and Exploitative Learning: Psychological Safety, Task Conflict, and Team Performance," *Group & Organization Management*, vol. 36, no. 3, pp. 385–415, 2011.
- [30] S. J. Zaccaro, A. L. Rittman, and M. A. Marks, "Team leadership," *The Leadership Quarterly*, vol. 12, no. 4, pp. 451–48, 2001.
- [31] C. E. Shalley and L. L. Gilson, "What leaders need to know: A review of social and contextual factors that can foster or hinder creativity," *The Leadership Quarterly*, vol. 15, no. 1, pp. 33–53, 2004.
- [32] M. A. West, C. S. Borrill, J. F. Dawson, F. Brodbeck, D. A. Shapiro, and B. Haward, "Leadership clarity and team innovation in health care," *The Leadership Quarterly*, vol. 14, no. 4-5, pp. 393–410, 2003.
- [33] A. Somech, "The Effects of Leadership Style and Team Process on Performance and Innovation in Functionally Heterogeneous Teams," *Journal of Management*, vol. 32, no. 1, pp. 132–157, 2006.

- [34] S. A. Eisenbeiss, D. V. Knippenberg, and S. Boerner, "Transformational leadership and team innovation: Integrating team climate principles.," *Journal of Applied Psychology*, vol. 93, no. 6, pp. 1438–1446, 2008.
- [35] K. Lewin, R. Lippitt, and R. K. White, "Patterns of Aggressive Behavior in Experimentally Created 'Social Climates,'" *The Journal of Social Psychology*, vol. 10, pp. 271–301, 1939.
- [36] H. Plattner, C. Meinel, and U. Weinberg, *Design thinking: Innovation lernen - Ideenwelten öffnen*. München: mi-Wirtschaftsbuch, FinanzBuch, 2009.
- [37] M. B. Miles and A. M. Huberman, *Qualitative data analysis: a methods sourcebook*. London: Sage Publications, 1994.