



Change Management in Medical Contexts, especially in Medical Education: A Systematized Review

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Abstract

Introduction: Change is a multifaceted and challenging process. Due to the growing and increasing volume of technologies and organizational processes, there is a need to adapt to these changes because adaptation to changes is essential for the organization survival. The purpose of this study was to investigate change management in medical education in order to identify and categorize the strategies, barriers, and other important issues related to change management.

Methods: A systematized review of the related studies was carried out according to the Khan et al.'s guideline. Five bibliographic databases and search engines including Cochrane Library, Eric, PubMed, SCOPUS, and Web of Sciences were searched. The following keywords were used with a period constraint of 2017 to March 2021 to search various online data sources: change management and medical issues. Advanced search options and Boolean operator (AND) were also used to find out more relevant records.

Results: Overall, 498 records were identified. After removing duplicate records and those with irrelevant titles, abstracts, or full texts, we selected 40 articles for data extraction. The Kotter model is frequently used to manage change. Also, consideration of resistance to change and having a plan for it have been important elements of change management.

Conclusion: In most cases, resistance to change was observed, and several ways for resolution merged. Resistance to change and coping strategies are considered as one of the most important factors that must be considered in change situations. Awareness of change management principles and utilization of available models can pave the way for management of the change.

Keywords: Management, Change management, Medical education

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Introduction

Change is a multifaceted and challenging process (1). Due to the growth and increasing volume of technologies and organizational processes, it is essential to adapt to the changes because adaptation to changes is essential for the organization survival (2). Further, adaptation

to change needs to be well managed (3).

It is also worth noting that physicians are more affected by changes due to their job specifications (4). Healthcare and medical education systems are constantly becoming more complex and changed (2). A healthcare organization is very large and complex, and a wide range of professionals (such

as physicians, nurses, pharmacists, and managers) and other stakeholders (patients and government) with different interests and perspectives participate in it; the ultimate goal is providing services for the benefit of the patient. Given these points, it is emphasized that healthcare leaders have a responsibility to adapt the organization to change and implement it successfully (5).

In addition, the field of medical education is constantly faced with the development of educational insights and progress (2), which certainly requires management to adapt to these changes as well. Change management is a classic topic in the management literature that has long been popular in the field of health and medical education and in various fields, which have their own challenges, and if not implemented properly, there is a possibility of failure (6).

The COVID-19 pandemic and its impact on the healthcare system and medical universities, especially medical education, is a clear example of the importance of change management. This pandemic caused a major disruption to medical education around the world. On the other hand, it could be considered an opportunity to develop innovative teaching methods. However, in the critical situations, the ethical responsibilities of medical educators are important for having an effective leadership role (7).

We found during the COVID-19 pandemic that medical education and supply of medical services were hindered, and knowing that in the current global setting, such crises may recur, we can expect similar crises happen again. Therefore, this study was conducted to identify common change management strategies, barriers, and other crucial components of change management, so that, if necessary, interventions can be made to avoid disruptions.

Bearing all this in mind, we conducted a systematized review. The purpose of this study was to investigate change management in health care providers and medical education to

identify and categorize the strategies, barriers, and other important issues related to change and management with a closer look.

Methods

A systematized review of the related studies was carried out according to Khan et al.'s guideline (8). Step one is forming questions for review. In this regard, as the purpose of this systematized review was to search, select, and analyze exciting literature on change and change management in medical education, we posed the following two questions:

1. What experiences have been reported in the field of change and change management in medical contexts and medical education?
2. What are the focus and key points of these experiences?

The second step is to identify relevant works. For this purpose, five bibliographic databases and search engines including Cochrane Library, Eric, PubMed, SCOPUS, and Web of Sciences were searched. The following keywords were used to search with time limitations from 2017 to March 2021 through online data sources including change management and medical issues. Advanced search options and Boolean operator (AND) were used to find out more relevant records as well. Details of the search strategy are displayed in Table 1.

The third step is assessing the quality of the studies. All the records were preserved, and duplicates were reviewed to choose the most appropriate papers for data collection. The titles were then scrutinized in light of the requirements for qualifying. Records with titles that could be potentially relevant were preserved for abstract screening, whereas those with titles that were entirely irrelevant were excluded. Abstracts that were uncertain and pertinent were selected for full text assessment. Full texts were carefully examined to identify the articles that were qualified. We used Endnote version X8 as the

Table 1: Search strategy details

Database or Search engine	Search Strategy
PubMed	("Change management" [Title/Abstract] AND "medical" [Title/Abstract]) AND ((journalarticle [Filter]) AND (humans [Filter]) AND (English [Filter]) AND (2016:2021 [pdat])).
SCOPUS	TITLE-ABS-KEY ("change management" AND medical) AND (LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017)) AND (LIMIT-TO (SUBJAREA, "MEDI") OR LIMIT-TO (SUBJAREA, "NURS") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "HEAL") OR LIMIT-TO (SUBJAREA, "PHAR") OR LIMIT-TO (SUBJAREA, "PSYC")) AND (LIMIT-TO (LANGUAGE, "English")).
WOS	TOPIC: ("change management" AND medical) Timespan: Last 5 years. Indexes: SCI-EXPANDED, SSCI, A&HCI, ESCI.
Cochrane	("Change management" AND medical): ti, ab, kw" (Word variations have been searched).
ERIC	"Change management" AND medical.

reference manager tool. The following items were set as inclusion criteria in this review:

- Paper format: Journal Article (research, analytical, and review articles).
- Paper language: English.
- Paper subject: Change and change management in medical education and other medical contexts.

However, we used CIMO logic for assessing the included articles. CIMO was developed by Danyer et al. (2008), using the abbreviation CIMO (Context, Intervention, Mechanism, and Outcome) (9).

- *Context*: Which aspects of institutional setting and relationships and individuals are of interest? The context were medical education and medical contexts, generally.

- *Intervention*: What is the intervention of interest? The intervention was change management and activities performed in the field of change.

- *Mechanism*: What are the mechanisms of

interest? We were looking for the mechanisms of change management.

- *Outcome*: What are the relevant outcomes? We were looking for outcomes of managing or not managing changes.

Figure 1 shows the PRISMA flowchart for including papers in the review. It is also worth mentioning that there are no ethical issues applicable in this study.

The five above databases were systematically searched for papers describing change and change management in medical education and other medical contexts. The search strategy generated 498 studies electronically. According to the given criteria, the titles were screened, and duplicate records were eliminated (144 articles). Examining the titles resulted in 113 studies, and reviewing the abstracts revealed 61 studies on change management in medical education. Full texts were reviewed to determine whether quality appraisal criteria were met. After reading the full texts, 40 studies were included. The flow chart of

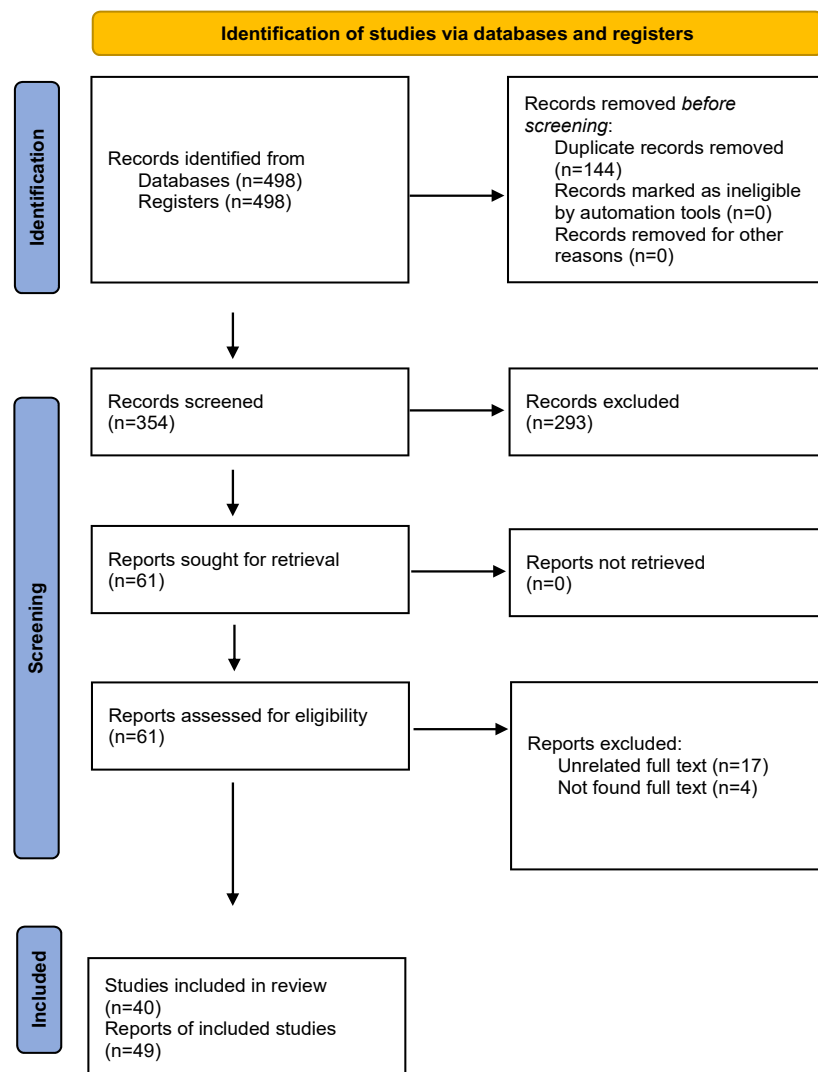


Figure 1: PRISMA flowchart for including the papers

the search process is displayed in Figure 1.

The fourth step is summarizing the findings. As a result, Table 1 in the review of studies presents the data. The table for classifying the data and showing the summary of the studies included in the review was designed.

Results

The final step of Khan et al. guideline is interpreting the findings. In total, 498 records were recognized by searching 5 online data sources. 40 publications were selected for data extraction after duplicate records and records with pointless titles, abstracts, or full papers were eliminated. The selection process to include papers in the review is displayed in Figure 1. The selected papers had different foci, which are categorized into six groups, as summarized in Table 2.

The use of a model for change management was reported in 11 papers; these models were used to facilitate the change management process in different settings; as shown in detail in Table 3.

Totally, 6 papers used Kotter model for change management, which are 54.5% of the first category articles. Four papers (11-14) in Medical Education field and 2 papers (17, 20) in other medical contexts in this category used Kotter model of change management. This model was used for implementing IPE seminars in a curriculum (11), curriculum improvement (12), effective guidance of fundamental changes in the needs and well-being of trainees during the Covid-19 outbreak (20), classification of the reported student roles in curriculum changes (13), interprofessional education, and lessons learned from (14) and used in the society of black academic surgeons (17).

Key factors in change management were

described in 7 studies; Table 3 displays the summary of these papers. One of the most important key factors in change management is considering resistance to change and having solutions for dealing with, which was mentioned in 5 articles of this category (21-23, 25, 27). Another important issue is consultation and attracting participation for proper managing of changes, which was considered in 3 articles of this category (21, 25, 27). The third and significant factor that emerged from papers of this category is leadership and the importance of his/her role and presence and awareness, which was explained in 4 papers (22, 23, 25, 27).

In 9 articles, *change management strategies* were discussed. Those strategies and some details of them are shown in Table 4.

In 5 cases, the authors discussed *Readiness and skills for change management*. Table 5 shows the details of these articles which had argued readiness conditions and skills necessary for managing changes.

3 studies had brought to light the *Facilitators and barriers to change and change management*. Bank (2019) referred to common commitment, ownership, support structure, open culture, and reinvention as the facilitating factors. Resistance, imbalance in tasks, behavior change, disaffiliation, lack of consensus, and insecure culture and hierarchy were mentioned as barriers in this article (42). Two other studies (43, 44), which had been done in other medical contexts were about the barriers, such as resistance to change and lack of change management as a whole. Harrison et al. (2019) also categorized the barriers into three topics, which included the organizational field, in the field of awareness, knowledge, and the patient's attitude and perceptions as a service consumer.

Table 2: Summary of studies included in the review

Classification	Medical Education Articles	Other Medical Contexts Articles
Use of a model for change management	Banerjee Y. 2019 (10); Berger S. 2017 (11); Haas MRC. 2019 (12); Burk-Rafel J. 2020 (13); Kumar A. 2018 (14); Collins E. 2020 (15).	Heath R. 2019 (16); Kirton OC. 2017 (17); Porter B. 2017 (18); Sale C. 2019 (19); Weiss PG. 2020 (20).
Key factors in change management	Bartlett M. 2020 (21); Bank L. 2017 (22); Velthuis F. 2018 (23).	Nisar MA. 2019 (24); Adsul P. 2017 (25); Hovlid E. 2020 (26); Munn Z. 2020 (27).
Change management strategies	Maaz A. 2018 (28); Ahmed S. 2020 (29).	Clark KD. 2017 (30); Kuhlman J. 2019 (31); Palmer VJ. 2019 (32) Rajiah P. 2017 (33); Stuart Oake J. 2017 (34); Threath T. 2020 (35); Whitwell K. 2020 (36).
Readiness and skills for change management	Coleman DL. 2017 (37); Quearry M. 2019 (38).	Giussi Bordoni MV. 2019 (39); Raskind IG. 2019 (40); Stuckelman J. 2017 (41).
Facilitators and barriers to change and change management	Bank L. 2019 (42).	Scott Kruse C. 2018 (43); Harrison-Blount M. 2019 (44).
An example of change implementation		Justinia T. 2017 (45); Pugel S. 2018 (46); Fitch MI. 2018 (47); Hébert GJ. 2017 (48); Victoria GM. 2017 (49).

Table 3: Articles classified under the “key factors in change management” category

Scope	First Author Year	Key Factors
Medical Education	Bartlett M. 2020 (21)	<ul style="list-style-type: none"> ● Definition and sharing the vision. ● Extensive and consistent consultation with groups. ● Decide on applications. ● Change implementation. ● Maintenance, evaluation, and development of changes. ● Resistance to change.
	Bank L. 2017 (22)	<ul style="list-style-type: none"> ● Official leaders’ role (committed and responsible). ● Staff’s culture. ● Resistance to change.
	Velthuis F. 2018 (23)	<ul style="list-style-type: none"> ● Awareness of emerging situations. ● Detailed strategy formulation. ● Direct and indirect resistance. ● Leaders’ awareness.
Other medical contexts	Nisar MA. 2019 (24)	<ul style="list-style-type: none"> ● Ensure the need for change. ● Strategy clarity. ● Create internal support. ● Ensure the support of top managers. ● Create external support. ● Provide resources. ● Identity change. ● Follow a systemic approach.
	Adsul P. 2017 (25)	<ul style="list-style-type: none"> ● Motivation for change. ● Leadership commitment. ● Employee participation. ● Align goals with resources and actions. ● Resistance to change. ● Continuity of changes in the organization.
	Hovlid E. 2020 (26)	<ul style="list-style-type: none"> ● External assessment.
	Munn Z. 2020 (27)	<ul style="list-style-type: none"> ● Participatory processes and critical reflection. ● Leadership and facilitation. ● Emergency or scheduled changes. ● Resistance to change. ● Implement existing evidence and change strategies. ● Action Research. ● Sustainability of change. ● Essential components of successful change.

Table 4: Articles classified under the “Change management strategies” category

Scope	First Author Year	Strategy
Medical Education	Maaz A. 2018 (28)	Transformation of a discipline-based curriculum into a competency-based curriculum in three stages (initiation, development and implementation, sustainability) described based on a change management approach.
	Ahmed S. 2020 (29)	Strategies for proper crisis management are provided for medical educator leaders, including: <ul style="list-style-type: none"> ● Create responsive teams. ● Communicate effectively. ● Learners’ participation etc.
Other medical contexts	Clark KD. 2017 (30)	Strategies for the five main areas of focus for complex change management, including supporting the vision, strengthening collaboration, creating a culture of change, data use, and financing integration, are listed.
	Kuhlman J. 2019 (31)	Successful clinical change strategies include Selecting strategic topics, selecting active physicians, using a comprehensive algorithm, removing obstacles, transferring vision to everyone, etc.
	Palmer VJ. 2019 (32)	Emphasis on Participation in creating change as one of the most important mechanisms of change.
	Rajiah P. 2017 (33)	The important strategies are readiness for change, change Implementation based on a model, managing people in the transition period, etc.
	Stuart Oake J. 2017 (34)	Continues change principles are prepare for change, vision and change process, cost of change and the difference between transition and change and leadership.
	Threatt T. 2020 (35)	Using Hubble application (a mobile app) for change management with features like task management tools.
	Whitwell K. 2020 (36)	Strategic planning for change management taking into account geographical change, leadership, training, clinical guidance, psychological support during the change period, etc.

Table 5: Articles classified under the “Readiness and skills for change management” category

Scope	First Author Year	Readiness Factors and necessary skills
Medical Education	Coleman DL. 2017 (37)	The article counts faculty development strategies to improve their change management skills.
	Quearry M. 2019 (38)	The readiness of faculty members to implement changes in the medical curriculum was assessed using the MORC questionnaire.
Other medical contexts	Giussi Bordoni MV. 2019 (39)	This paper describes the design and development of a soft skills training course to change management in HIS projects in a hybrid learning environment.
	Raskind IG. 2019 (40)	This paper evaluates the capacity of the workforce to maximize opportunities created by ongoing change, including change management and adaptive leadership.
	Stuckelman J. 2017 (41)	Change management is discussed as an essential skill for program coordinators.

5 articles were examples of managing a change (45-49). In other words, those papers explained how a change was implemented and managed. All of them were on the contexts other than medical education. For instance, one of them was about implementation of digitalization in health care at the British National Health Service NHS, which had failed due to lack of change management (45).

In terms of methodology, descriptive studies in the contexts other than medical education were dominant, while in the medical education context quantitative studies were more common.

Discussion

The healthcare system and medical education are both continually changing and evolving, and they are both more and more complex every day. These changes ultimately affect all stakeholders, so they must be properly managed. We conducted a systematized review to determine how these changes are managed with all of this in mind. More precisely, the purpose of this study was to investigate change management in healthcare providers and medical education to identify and categorize the strategies, barriers, and other important issues related to change and management. As a result, in addressing each research question, we classified the papers based on their foci. As demonstrated in the literature, there are six classifications of articles.

The 1st category consisted of papers that report using a model for change management, of which the Kotter model was dominant. This model of change management has 8 steps consisting of creating a sense of urgency, building a powerful guide coalition, developing a strategic vision, communicating the vision, empowering action, creating short-term wins, integrating improvements, make more changes, and finally making change stick (11-14, 17, 20). It should be considered that since every organization and person are different and have strengths and weaknesses of their own, no single change management model can be considered ideal or

recommended for every situation. Depending on the requirements, scope, and application for any specific project or organization, a change management model may be chosen.

The 2nd category is comprised of research projects in which key factors in change management have been discussed, and all of them are illustrated in the related Table. However, the most important factor is considering resistance to change and having solutions for dealing with it. In this regard, papers have significant points. For instance, the prospect of overwork and unfamiliarity with change have been cited as effective factors in resistance, and adequate resources and user-friendly technologies are recommendations for coping with it (25). Other recommendations are listening to and empathizing with individuals who resist and providing participation opportunities (19, 27). Also, consultation and attracting participation emerged as another important key factor, lack of which causes a decrease in the sense of ownership and weakens teamwork (42). Additionally, Palmer and colleagues in their study explain an explanatory theoretical model of change and emphasize participation as a crucial factor in change implementation (32). Further, leadership and the importance of its role and presence and awareness were a key point. The leader's support of change, his/her ability to articulate the purpose of change, possession of a champion for change efforts are all needed (25). A good leader discovers opportunities for change, plans for change, and reflects on the effectiveness of actions. Guidance, motivation, standardization, open communication, active listening to opinions, attitudes and ideas, re-evaluation of facts, beliefs and positions, encouragement of feedback, integration of efforts, promotion and maintenance of effective performance, delegation of authority are all the duties of a leader (27). So, the most important point is that individuals should acquainted with desired change and its process, additionally, leader have critical role in

control the resistance to change.

In the third category, change management strategies were listed and explained. According to the context and situation, different strategies can be used. Among all strategies, there are common activities which must be considered; they include assessing need and readiness for change at the first step (28, 29), creating project management and responsive teams or stakeholder committee (29, 33), making a profit of participation (29, 32), removing obstacles, and getting regular feedback (31, 33). Readiness for change is categorized independently, which is explained in Table 5 as the 4th category. The concept of organizational preparedness to change has been extensively researched. It has been evaluated from a variety of angles although these are typically restricted to one or a small number of factors that could have an impact on it. There is a lack of thorough analyses of organizations domains that must be controlled cooperatively to implement change successfully.

The 5th category discusses facilitators and barriers. In this regard, support, trust, passion, and clear expectations are important in implementing change. Also, people need to have a common vision and recognize the need for change. Sharing tasks ensures that change is a team effort, and all these activities make change management easier. A clear support structure contributes to successful change. The existence of open culture is still a facilitator because it values everyone's opinions and enables people to take a much more flexible approach to change. On the other hand, behavior change is difficult because it needs a change in the personal routine which must be worked on consciously and we should spend time and effort; therefore, it is one of the obstacles to change. Lack of participation and consensus makes individuals less inclined to accept change. The hierarchy between the trainees and the staff and their dependence on the supervisors make the trainees refrain from expressing their opinions for fear of a negative impact on their evaluation or even their future career. All these messages are mentioned in the Bank's study (42). For a successful change program, leaders should perform a baseline assessment to identify the impediments to change and address them.

To Harrison-Blount and colleagues, change barriers to organizational change include poor performance organization, failure of previous change initiatives, and lack of access to information and support. Barriers regarding awareness include personal performance, personal habits and traditions and preferences, outdated skills, ignorance of how to accept change, lack

of access to new evidence, fear and uncertainty, inadequate training, and lack of motivation. The patient, as a user, can also prevent change in clinical settings. For example, the demand for the care of a particular type, and the influence of the media on thoughts, perceptions and beliefs about proper care can all be barriers to change (44).

The 6th category is about examples of change implementation in medical contexts. In 2017, digitalization in health care at the British National Health Service NHS was implemented, which had failed due to lack of change management (45). In the same year, an innovative system that linked the physicians' budget distribution to quality and performance goals and increased the work value was accomplished (48), and a paper describes the implementation of health information technology (electronic health record) to improve the quality of care (49). In 2018, a comprehensive change management package (choosing wisely initiative guidelines) by reducing its use of CBC and EKG as routine physical examination screening was implemented and described in the paper (46). Another study (47) discussed the lessons learned from the implementation and sustainability of a program for anxiety screening and evaluation, which included the importance of change management strategy. However, the examples are beyond, but in this review, we reached these points that clarified some issues.

The biggest limitation in this review was the sanctions that prevented access to all databases. Therefore, the incompleteness of the collected research is a drawback of this study. The strength of this work, however, was the comprehensive evaluation of the retrieved publications.

Conclusion

The purpose of this research was to search, select, and analyze exciting literature on change and change management in medical education and other medical contexts. We narrowed our initial search results from 498 to 40 articles which focused on change and change management. Final selected articles were categorized concisely. In most cases, resistance to change was observed and several ways for resolves had merged. Hence, resistance to change and how to cope with it is the first and most important factor that must be considered in all change situations. Further, awareness of change management principles and utilization of available models and approaches can pave the way for managing change.

Authors' contribution

Z.S designed the study. E.K. wrote the search strategy. E.K. and M.A. screened and categorized

the finding articles, drafted the manuscript. Z.S. revised the manuscript critically and approved. All authors read and approved the final manuscript. All authors agreed to be accountable for all aspects of the work and ensured that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

Conflict of Interest: None declared.

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