Research Paper
Use of Soft Systems Methodology for Implementing Clinical Practice Guidelines in a General Hospital

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ABSTRACT

Background: It is challenging to implement evidence-based care and update and improve health care policy. Adhering to evidence-based Clinical Practice Guidelines (CPGs) serves as a guide for making decisions based on the best evidence and making an attempt to improve the quality of patient care and outcomes. Despite the need for implementing CPGs in Iranian hospitals, the concept and implementation method of CPGs are not clear yet. This action research aims to propose the soft systems methodology (SSM) to facilitate the implementation of CPGs in a general hospital in Iran.

Methods: We employed the SSM to conceptualize the situation for the implementation of CPGs. Semi-structured in-depth interviews and group discussions with different stakeholders were used to define the purposeful activity model. The SSM tools and techniques were used to identify the main areas of change and select necessary measures to facilitate the implementation of CPGs. Flexible qualitative methods for data collection and analysis were utilized throughout the study.

Results: Applying SSM for implementing CPGs could generate knowledge by recognizing hyper-complexity in healthcare setting, adopting an attitude of inquiry, and fostering dynamic changes in diverse and numerous worldviews of professionals in the accommodation process. This knowledge can provide a model for the successful implementation of CPGs at a macro-system level and facilitate the persuasion process for its implementation at the mesosystem level. More importantly, adopting SSM can create iterative learning loops over time and, thus, help the clinical microsystems face future healthcare complexities.

Conclusion: The application of systems thinking approaches, especially SSM is recommended for implementing CPGs and addressing complex issues in healthcare settings and other system levels.

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1. Introduction

Clinical Practice Guidelines (CPGs) can be used to improve the quality of health care, especially when designed to support appropriate or necessary behavioral changes [1]. The Institute of Medicine defined CPGs as statements that propose approaches to optimize patient care by regularly review of evidence and evaluating the advantages and disadvantages of alternative care options, and highlighted the need for a comprehensive approach for their implementation [1, 2]. In Iran, the Standardization and CPGs Development Office in the Ministry of Health and Medical Education has been in charge of developing CPGs and strategies for supporting the use of evidence in clinical decision-making and clinical knowledge management in the health system [3]. Although CPGs are basically developed based on accurate methods and principles and based on an agreement between healthcare providers, they are mostly implemented incompletely due to complexities in technical and specialized processes and people's perspectives in providing clinical care [4]. Barriers to implementing CPGs can be generally categorized as: (a) personal factors such as the executing physician's knowledge and attitude, (b) factors associated with CPGs, i.e. its development, release, and implementation, and (c) external factors such as lack of resources, organizational barriers, heavy workload, and social norms [5].

In Iran, efforts have been made by the Ministry of Health and Medical Education to employ CPGs in hospitals; however, these efforts have yielded very limited practical success. According to the declaration of the first CPG conference held by the Iranian Ministry of Health and Medical Education in January 2017, "Development of these guidelines is just the beginning. Their implementation requires to have a holistic view, avoid bias and know that the behavior changes over time. CPGs can be implemented only in collaboration with the Medical Council, medical centers, medical community, members of the Board of Medical Specialties, and university teachers" (Ministry of Health, Conference on declaring the first guideline to standardize health services, 2017).

According to hospital managers and specialists, there is a limited use of CPGs in Iran. Barriers to implementing CPGs should be investigated practically and based on the evidence-based healthcare, individual skills, and patients' traits. Given the limitations in its implementation due to various problems related to contextual issues, there is a need for a multifaceted, flexible holistic approach to tackle the challenge of implementing CPGs

and improving care. Soft Systems Methodology (SSM) is an approach that has the potential to facilitate the implementation in complex and messy situations. Applied systems thinking emerged in response to diverse problems, major changes and increasing complexity in organizations. Systems thinking are categorized as hard and soft. Goals and missions can be determined and methodologies be proposed to optimize the approaches in hard systems thinking though definable problems. On the other hand, soft systems thinking problems are complex, problematic, ambiguous, and ill-defined, with different sociopolitical and human components [6-8]. In SSM, making hasty efforts to frame a problem as a "system" and an early application of optimizing models can distort the real situation; these approaches employ certain models to inquire into a situation, learn from it, and reach an accommodation among different players to improve the situation [9]. The present study aims to propose SSM to facilitate the implementation of CPGs in a general hospital in eastern Iran.

2. Methods

Given that the CPG implementation is a complex problem, this study applies SSM as a guiding methodology based on its power to address complex situations [10, 11]. SSM has been reported as the most theoretically-informed and widely used systems approach in practice [9, 12]. Moreover, it is known as the optimal methodology for developing and implementing interventions in different settings and levels of health systems [13, 14]. As the foundations of SSM, "conflicting worldviews" and "people's purposeful actions" play key roles in finding a way to tackle problematic situations. SSM constitutes a process that acts through learning one's way to purposeful improvement [15-17]. Therefore, in this study, implementing CPGs is considered as a purposeful activity model derived from SSM (Figure 1) to achieve the practical goal of CPGs in the selected hospital.

Conceptual framework

This study considers the CPGs implementation as a complex problematic situation with conflicting perspectives. These perspectives are assumed to constantly created by thoughts, dialogues and actions of individuals. Implementing CPGs in the selected hospital involves a set of purposeful actions that are performed in collaboration with experts and through interactions with different stakeholders to reach an accommodation among the owners.

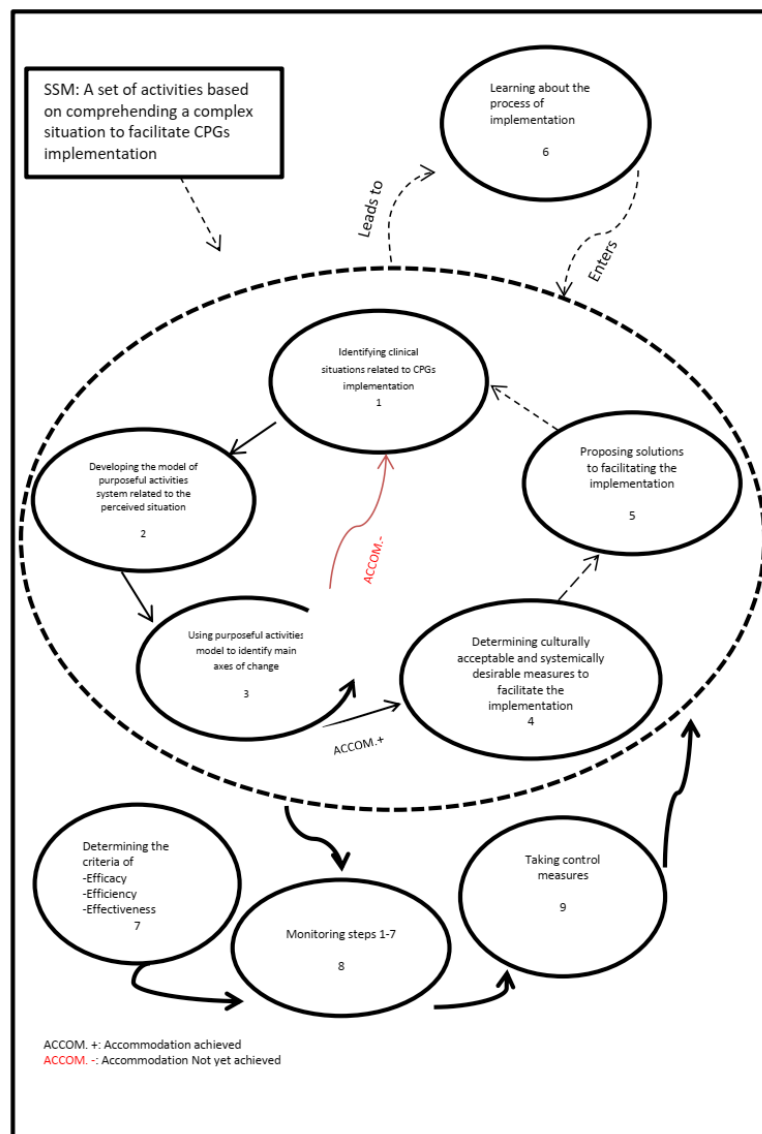The present study began in April 2019 and will continue until systematically-desirable changes in imple-

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Figure 1. The purposeful activity model derived from SSM

menting CPGs are achieved. These changes should be feasible for individuals/ stakeholders with different backgrounds, culture and policies. In other words, the study process helps different individuals with different worldviews reach an accommodation and find changes which are acceptable to them.

Subjects and data collection

Purposeful sampling was performed to select the subjects and stakeholders for deep interviews. The inclusion criteria for the subjects were a related knowledge and skill and willingness to participate in the study. The eligible subjects consisted of hospital managers, heads of clinical and educational departments, matrons, physicians, supervisors, nurses of different wards, and personnel of paraclinical and information technology depart-

ments. Group discussions based on the conditions of the participants were conducted to increase their participation. Given the application of SSM for solving complex problems with different stakeholders, behavioral patterns, and cultural traits, data were collected by using an online tool, observing current activities in the selected hospital, conducting semi-structured interviews with the participants, and holding group discussions.

In the first step, after obtaining permission from the hospital authorities, the researcher visited the hospital to observe its current activities, collect data about providing clinical care by the hospital staff, and identify the status of clinical care delivery based on CPGs. Each observation session lasted for about two hours. Short field notes were also taken during the observations. Self-

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reports were also recorded during each observation and then transcribed immediately.

Semi-structured interviews were then conducted with the main stakeholders in the second step to understand the "problem", draw the "rich picture", present the "root definition" and ultimately create the "relevant purposeful activity models". Interviews were conducted after determining the time and place. The interviews were recorded and transcribed and the notes were taken during and after the interviews to collect the data. Each interview lasted for about one hour and begins by asking comprehensive and simple questions regarding the use of CPGs in providing health services. Prior to the interview, all participants were given information about the study objectives and data collection methods, and were assured of the confidentiality of their information and voluntary participation. Then, they signed informed consent forms.

The SSM's purposeful activity model was used in the third step to construct the discussion and identify the main axes of change. According to the type and process of the study, the current activities in the selected hospital, and the recommendations of the hospital authorities, matrons and ward managers, a different group of participants was selected at this stage for group discussions excluding those already interviewed. After selecting the group members, meetings were held to identify the main axes of change, determine the aspects through which the problem should be assessed, develop the purposeful activity model, label the existing problem-related subsystems, and prepare for reaching an accommodation among the stakeholders regarding the use of CPGs. Accurate plans were used to hold group discussion sessions based on the study guideline after inviting the participants. Conversations were recorded and notes were taken during and after the meetings. In each session, comprehensive and simple topics with a focus on the study objectives were discussed. Each group discussion session lasted for about 90 minutes. The recorded conversations were labeled and transcribed immediately. The inclusion criteria for the group discussion members were awareness of the problematic situation and willingness to participate.

In the final step, group discussion sessions were held using all data collected in the previous steps to specify the feasible and desirable changes and help the individuals involved in the problem and the analysts reach an accommodation about a conceptual model. This model was then compared with the real world, and the analysts and individuals exchanged ideas to determine the

"changes" required for tackling the problematic situation to implement CPGs.

Data analysis

A qualitative content analysis was performed on the data obtained in the first step (observation). Their meanings and themes were extracted after the initial descriptive synthesis. Prolonged engagement was used by repeatedly reading the notes and transcribing the texts to help the researcher establish an in-depth connection with the collected data, written field notes, and collected documents. A qualitative content analysis was conducted on the data collected in the second step (semi-structured interviews) and the themes were extracted and interpreted. The problem conditions were therefore shown and a rich picture was drawn. A relational or semantic analysis was conducted on the themes extracted from the third step (group discussions) which can help identify the main axes of change required for facilitating the implementation of CPGs. This analysis also helps achieve the "purposeful activity model", label the existing problems, create a "root definition", and ultimately propose a "conceptual model".

A qualitative content analysis was conducted on all the data collected in the fourth step to identify feasible and desirable changes. After performing a descriptive synthesis, the meanings and themes were also extracted. When individuals and analysts reached an agreement about the conceptual model, the themes were used to compare this model with the real world. The exchanged ideas in the fourth step, its findings, the themes extracted from the previous steps, and the findings obtained from the literature review were descriptively synthesized to help the participants present propositions and agree on the changes required for improving the problematic situation and facilitating the implementation of CPGs. These changes were structural, procedural or behavioral.

3. Results

Implementing CPGs in the selected hospital in Iran, like in other parts of the world, is affected by many factors. Knowing "what should be done, why and how" is challenging. The development process and the methods for using CPGs have been evolved over time. To reap the benefits of CPGs, their developers and stakeholders are required to revise the publication, implementation and clinical application of these guidelines. Given that CPGs should be applied by those who did not originally developed the guidelines, certain methods seems necessary for CPGs implementation, certain methods seems necessary for their implementation. Despite the use of dif-

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ferent strategies to implement CPGs, there is no strong evidence for their in-field application; however, existing evidence suggests a systematic implementation can promote the application of CPGs [18].

4. Dissection

Implementing evidence-based care and updating and improving healthcare practices are challenging issues given the complexity of healthcare delivery and the significant effect of context on the efforts made for implementation and improvement. Flexible multi-dimensional methods of change such as SSM are therefore required for addressing these complexities [19]. Given the high complexity of healthcare caused by the presence of professionals with a diverse range of dynamic interactive worldviews and purposeful individualistic roles, the authors believe that using SSM can be effective in implementing CPGs, elucidating these complexities and addressing the role of technical mechanisms and cultural and political issues in providing clinical care. This methodology is an evolved approach for tackling complex problems [15, 16].

The present study could help gain an in-depth understanding of the definition and method of implementing CPGs in a general hospital based on systems thinking and SSM and using action research. All complex attitudes, structures, processes and relationships were addressed in the context of CPG implementation in the selected hospital. The purposeful activity model related to CPGs implementation was explained and the main axes of change (intervention) were identified to determine the measures required for implementing CPGs. The present findings can be published with a focus on "understanding the context and complexity of the effective factors in implementing CPGs". The authors believe that adopting an attitude of inquiry and dynamically changing the diverse and numerous worldviews of professionals in the accommodation process, which was achieved using SSM, can help produce the knowledge that serves as a model for implementing CPGs for healthcare providers at the macro-system level [20]. Moreover, the results of this study can also be used at the mesosystem level to facilitate the process of persuading to comply with CPGs and provide benefits for professional healthcare providers. They can, therefore, improve the quality of clinical decisions and support quality improvement activities using the learning they gain from utilizing this methodology [21, 22]. More importantly, adopting SSM can enable clinical microsystems to face future healthcare complexities by creating iterative learning loops over time.

To our knowledge, this is the first study that use SSM to facilitate the implementation of CPGs in the health sys-

tem of Iran. The limitations and challenges of this study included the issues related to the organizational culture, sources of power, different backgrounds and attitudes, local facilities, and patient preferences; however, the authors' experience in qualitative research and the use of a flexible methodology could help overcome these challenges.

5. Conclusion

Applied systems thinking has emerged in response to diverse problems, major changes, and increasing complexity in the organizations. While "hard systems thinking "has evolved to help achieve defined goals and optimization in more complex situations, "soft systems thinking "is appropriate for demystifying and improving more ambiguous and wicked problems. The systems thinking approaches, especially SSM can be used for implementing CPGs in a hospital and addressing complexity in healthcare settings.

Ethical Considerations

Compliance with ethical guidelines

The Research Ethics Committee of Islamic Azad University of Semnan Branch approved the study (Code: IR.IAU.SMNAN.REC.1398.005). The study objectives and methods were explained to the participants; they were free to leave the study at any time and were assured of the confidentiality of their information. They signed a written informed consent form.

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Authors' contributions

Conceptualization: Ali Soltani and Abdoljavad Khajavi; Methodology: All authors; Writing – original draft: Ali Soltani; Writing – review & editing: Ali Heyrani, Ali Fakhr-Movahedi, and AK. All authors read and approved the final manuscript.

Conflict of interest

The authors declared no conflict of interest.

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