Understanding the Implementation of a Complex Intervention Aiming to Change a Health Professional Role: A Conceptual Framework for Implementation Evaluation

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This paper proposes a conceptual framework for understanding the implementation process of a complex intervention concerned with professional role change. The proposed framework holds that the intervention must address three interacting systems (*socio-cultural*, *educational* and *disciplinary*) through which a health professional role evolves. Each system is operationalized by four dimensions (*values*, *methods*, *actors* and *targets*). As for the implementation, the framework posits that it can be analyzed, by depicting the barriers and facilitators located within the dimensions of the three interacting systems and within the intervention involved in the process through using the "menu of constructs" approach suggested by the Consolidated Framework for Implementation Research (CFIR). The implications of this framework, on theoretical research and practical levels, are reviewed.

Keywords: Evaluation; Implementation; Framework; Change; Health Professional Role; Midwifery

Introduction

Professional role change has been the focus of many policy initiatives in a context of rising social pressures, new technologies, higher demands of care and health needs. It has been considered as a viable strategy to address health resource shortages, and to support the move from fragmented care provision to models that provide continuity of care and accessibility to optimal health care (Laurant et al., 2010; McKenna, Keeney, & Hasson, 2009). Many types of changes in professional roles have been put forward such as enhancement, substitution, delegation, and introducing a new type of professional (Laurant et al., 2010; Sibbald, Shen, & McBride, 2004). Thus, enhancing roles and proliferation of new roles in many disciplines (e.g. nursing, midwifery) are occurring in health care systems throughout the world (Kislov, Nelson, de Normanville, Kelly, & Payne, 2012; McKenna et al., 2008). For instance, we are witnessing lately considerable growth in implementing initiatives for expanding professional roles such as nurse practitioner role and even creating new roles such as consultant midwifery roles across many countries (UK, Australia, Quebec) (Sangster-Gormley, Martin-Misener, Downe-Wamboldt, & DiCenso, 2011).

Professional role does not operate in a vacuum, but in systems that modulate this role (Dubois & Singh, 2009; Hatem-Asmar, Fraser, & Blais, 2002; Laurant et al., 2010). Thus, changing a health professional role refers to a complex process involving interdependent changes occurring within a variety of systems (Hatem-Asmar, 1997; Laurant et al., 2010; Nancarrow, Moran, Wiseman, Pighills, & Murphy, 2012). For instance,

professional education has to be enhanced and training programs have to be reviewed. With regard to society, public acceptance of professional authority, and cultural credibility of the new role have to be gained and client support has to be mobilized. Concerning the organization of the profession, legal and regulatory actions, professional associations have to be adapted to accommodate role change (Hatem, 2008; Kronus, 1987; Laurant et al., 2010; Turner, 1990).

Given that issues surrounding health professions are conceived as being fundamentally systemic in nature, this requires accordingly that interventions aiming to change a health professional role need to address the relevant systems. Nevertheless, successful implementation of such interventions depends upon whether contextual conditions are favorable for change. Given the complexity of the implementation process, researchers are called upon to conduct implementation focused-evaluation, measure the extent of real-time implementation and identify potential influences of contextual factors on the progress of implementation efforts (Champagne, Brousselle, Hartz, Contandriopoulos, & Denis, 2011; Damschroder et al., 2009).

Therefore, understanding the implementation process requires a comprehensive evaluative framework adapted to the context in which the intervention is being introduced, and in our case the systems concerned with professional role change. Such framework helps to better understand the challenges that come into play for facilitating or impeding the implementation of change.

The present paper argues and justifies the relevance of a comprehensive conceptual framework to analyze the imple-

mentation of a complex intervention aiming to change a health professional role. It is organized as follows: first, we begin by explaining how we conceptualize a health professional role change; we then, present implications of our conceptual thinking for designing interventions aiming to change a health professional role. This is followed by presenting the relevance of using implementation focused-evaluation and by describing our proposed conceptual framework laying the two theoretical perspectives that guided the development of the framework:

1) Hatem-Asmar conceptual model to identify the context in which the implementation takes place; 2) and the meta-theoretical Consolidated Framework for Implementation Research (CFIR) of Damschroder et al. (2009) as an analytical tool for understanding implementation success or failure. Next, we illustrate the use of the framework through an example in the field of midwifery professional role; and lastly we discuss its implications in the domain of evaluation and the organization of professions.

Conceptualizing a Health Professional Role Change

We advance systems approach as a basis capable of supporting health professional role change. Therefore, in this section, we will explore the following themes: 1) the role of systems approach in addressing the issues that affect a health professional role change; 2) the nature of systems concerned with the professional role change; 3) a conceptual model for health professional role; and the 4) applicability of the model to midwifery role change.

Role of Systems Approach in Addressing the Issues That Affect a Health Professional Role Change

The concept of systems approach consists of comprehending the whole (system) instead of the parts. It concerns examining the linkages and interrelationships between the parts (subsystems) and the whole, and the relation of the whole with its context (Hargreaves, 2010; Parsons, 2007; Trochim, Cabrera, Milstein, Gallagher, & Leischow, 2006). Exploring the change process thru a systemic lens requires focusing on the interactions between system parts and with external environment as well as on coherence and alignment of the system's components with the desired impact (Foster-Fishman, Nowell, & Yang, 2007; Supovitz & Taylor, 2005). Systems approach places emphasis on problem solving and can be seen as a second order change (Ison, Maiteny, & Carr, 1997) which requires attention to the underlying root causes of a problem and involves radical changes (Gash & Orlikowski, 1991). Shifting the focus from parts to wholes is a fundamental issue and this is why systems approaches appear so relevant to changing a health professional role.

A systems approach moving away from silo thinking and analyzing the multiple facets of a health profession situation has been advocated by a number of sociologists. Freidson (1970) has emphasized that redesigning a formal curriculum of training and supporting the profession by licensure and legal exclusive right to work, will not assure its survival unless considering "the profession service orientation which is a public imputation by which leaders have persuaded society to grant and support its autonomy" (Friedson, 1970: p. 82). According to the author, conditions which are causal in producing profes-

sional autonomy are the societal, political, legal, educational and inter occupational which set the general limits of the work and grant an occupation the professional status of self-regulative autonomy. This is also echoed in Turner's view (Turner, 1990) who suggests that conditions necessary to complete the change process involve a more generalized public acceptance of professional authority. Similarly, Kronus (1987) points out that conditions conducive to the successful expansion of role boundaries depend not only on the development of training facilities but upon mobilized client support and role's credibility among the society at large. To summarize briefly, a health professional role's change is deeply grounded, not just in the education system, but within the current position of the profession in the society at large and also as regards to the disciplinary characteristics of the profession mainly its organization thru regulation which defines the scope of practice and also shapes inter-professional relationships.

Nature of Systems Concerned with the Professional Role Issue

Understanding the type of system and its general characteristics in which the addressed problem is embedded is crucial for choosing the frame of reference that is appropriate for system investigation. In this context, systems refer to Human Social Activity Systems (HSAS) exhibiting the following characteristics: being open systems, depending on their external interaction (with their environment) as well as on their internal interactions (within-system), and governed by balancing and reinforcing feedback mechanisms (Banathy & Jenlink, 2004; Senge, 1990). They are composed of subsystems capable of making transformations of inputs to produce outputs for use by other subsystems, and characterized by alignment (Hummelbrunner, 2011). For example, systemic change efforts in midwifery role have been the focus of attention of many international organizations calling for a fundamental change in reinforcing professional role as a key to quality health services. These calls seek not only a change in the educational activities but a deep change in many systems such as political system, society, and the organization of the discipline itself through establishing regulation, midwifery models of care, etc. (Brodie, 2002; Homer et al., 2009; United Nations Population Fund, 2010). Consequently, it is presumed that such perspective has tremendous implications on improving maternal health according to the strategies aiming to attain Millennium Development Goals 4 & 5[1] (World Health Organization, 2002). As a result, professional role change in the health sphere cannot be examined without considering the systems that modulate the role. As we seek to understand the systems view to professional role change, it will be helpful to introduce a conceptual framework which explains the underpinnings of this view.

Paradigmatic Conceptual Model for Health Professional Role

The nature of instigations to role change fit into the triadic conceptual model of paradigms developed by Hatem-Asmar (1997, 2002). The authors highlight the importance of taking into account three systems (socio-cultural, educational, disciplinary) as a whole system for addressing a health professional role change. The authors consider those three systems, includ-

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[1]MDG4: to reduce child mortality; MDG5: to improve maternal health.

ing their dimensions, to have an interactional relationship within which a professional role evolves, acknowledging the complex nature of developing an educational program for health professionals. The authors adopted Bertrand and Valois (1982) model who demonstrated the need to consider the mutually reinforcing links between educational and socio-cultural paradigms, based on their systemic nature, while developing an educational program intended for school students and for technicians; choosing an educational paradigm depends on the dominant socio-cultural paradigm and its corresponding type of society. As stated by these authors, education in any society is a reflection of the collective beliefs, values and needs of that society which are manifested in terms of the educational goals; these goals shape the content of the educational program and make it relevant to the aspirations of the society. Thus, society and education are considered as open social systems, representing one for the other the external energy used to regenerate the system (Rousseau, Desmet, & Paradis, 1989). The characteristics of these systems embrace: i) *the environment* within which this system operates; ii) *the relevant structures* so called elements within a system to bring about the desired change; iii) *the operator* that represents numerous actors whose functions relate to handling the variables of action; iv) *the variables of action* allowing the operator to process the transformation from input to output (methods); and finally; v) *the essential variables* which consist of criteria for measuring the success of the mission assigned to the educational institution (goals). Bertrand and Valois (1982) also demonstrated that the relation between the socio-cultural paradigms and the educational institutions, through various logics—the cybernetic logic of causality, the logic of systemic approach and the self-determination of the socio-cultural systems, is bidirectional. Relying on this relation, they stipulated that the socio-cultural paradigm guides the educational one. However, despite the dominance of the socio-cultural paradigm, the educational institution has the capacity to be self-determinate, to choose an educational paradigm different from that imposed by the dominant socio-cultural paradigm and thus to produce changes through fulfilling three main functions: *creation, adaptation and reproduction*.

Hatem-Asmar et al. (2002) shed light on the limitations of this thinking when applied to a health profession and emphasize the need for a third paradigm called the disciplinary paradigm which considers the characteristics pertaining to the profession itself. Similarly, they demonstrate the systemic nature of a health profession to make explicit its interaction with the other two systems (socio-cultural and educational) by referring to the characteristics of a system. As a result, they hypothesized that a health profession presents the following main characteristics of a system: i) *the environment* that is the context in which the professional as part of the system operates; ii) *the system* that comprises the structures to make the desired change (e.g. the governmental bodies concerned by the legalization of the profession and its subsequent implementation); iii) *the operator* whose function relates to handling the variables of action (e.g. practitioners, educators); iv) *the variables of action* (means) consisting of the health care services provided by health professionals to patients and their families; and finally v) the *key variables* corresponding to the targets considered as the expected impact of the professional practice on population's health. Based on this rationale which demonstrates the linkages between these three paradigms that have the systemic characteristics, this conceptual approach considers three systems to

have an interactional relationship explained by the fact that any change in a single system does not remain isolated but can influence the two other systems.

The model further acknowledges the four inter-dimensions relationships within each system which means between: 1) the axiology/values (beliefs, legal, moral grounding); 2) the methodology (organizational procedures used to represent a problem and its solutions); 3) the ontology/actors (persons or entities physically and mentally involved in the process); and finally, 4) the teleology/targets (intentions, ultimate goals and solutions) (Hatem-Asmar et al., 2002).

As a conclusion, changing a health professional role involves profound changes in the socio-cultural and disciplinary systems that interact with the educational one.

Applying the Conceptual Model to Midwifery Role Change

We seek to demonstrate how this model can be applied empirically in the field of midwifery professional role change. According to the systems change approach, leveraging change in a single system will not lead to the desired outcome unless coupled with changes occurring in other parts of the system; what counts are the properties that emerge from a whole rather than the parts (Checkland, 1999). Consequently, a broader view allows one to see the evolution of a health professional role as an emergent property of the synergistic relationships among the socio-cultural, educational, and disciplinary systems and among each system's dimensions which constitutes "a functioning whole" (Laszlo & Krippner, 1998; Trochim et al., 2006: p. 539). Therefore, producing a fully qualified midwife fit to practice, according to the needs of society in an enabling environment, is determined by a multi-conceptual faceted systems interacting in synergy where no single system's influence dominates. It is considered as a second order change involving a radical rupture with past frames (Gash & Orlikowski, 1991). In the case of midwifery, such a change has been triggered by various international calls to develop an autonomous, self-regulated midwifery workforce capable of fulfilling the woman-centered philosophical midwifery mandate which promotes a human rights-based approach to reduce maternal mortality (United Nations Population Fund, 2011; World Health Organization, 2011b).

Relying on Hatem-Asmar model, we will illustrate in the following section how the characteristics of human social activity systems (HSAS) under investigation can be applied to the midwifery domain. The following characteristics are discussed: transformation, alignment and feedback.

Transformation: Systems transform inputs, flowing from the external environment and from subsystems, into outputs, in order to sustain the life of the system (Banathy & Jenlink, 2004; Hummelbrunner, 2011). In the case of midwifery, the educational system processes inputs coming from the larger society, represented for instance by the potential candidate who is seeking to be enrolled in the midwifery education program, who enters the educational system and then undergoes the educational transformation process (e.g. methods of learning) to become a qualified midwife. Thereafter, she enters again in the disciplinary system in which her professional qualifications are put into practice under the specific regulatory conditions in order to perform properly and autonomously. Those services are considered as inputs for the socio-cultural system that is, if

used adequately, contribute to improving the performance of health systems (e.g. continuity of maternal care) and ultimately women's health. Quality reproductive health services will aid to increase the demand of midwifery services which in turn will help to enhance awareness of the importance of these services and consequently, improve the midwifery image and gain widespread legitimacy from the public. This will have a potential appealing effect on pursuing a career in midwifery and on enrollment of new candidates in the midwifery education.

Alignment: Contribution to improving maternal outcomes thru strengthening midwifery professional role will not occur unless improvement is set up concurrently in the socio-cultural, educational and disciplinary systems. For the intervention to succeed, it must align each of these three systems: indeed, the midwifery educational program should reflect the values of the society and be consistent with the social needs. Those values should then be incorporated into the language of the legislation, regulation, and standards of practice governing the redesigned professional role (World Health Organization, 2011b). Delivering health services must also be grounded in the philosophy underpinning the educational foundation for practice (a philosophy that promotes a non-interventionist approach) (United Nations Population Fund, 2011).

A case example outlining the re-emergence of midwifery profession in Quebec can serve for giving further insight into analysis of systems alignment. In the late 1980's, the social feminism movement, demanding for control over natural childbirth and the political commitment to promote maternal health, have led to the legalization and the implementation of the midwifery profession following the favorable results of the evaluation of midwifery practice in Quebec (Blais & Joubert, 2000). This was the drive for establishing a student-centered education program that aimed to develop the necessary competencies to provide women-centered care and also to align midwifery education with the philosophy of the profession (Hatem-Asmar, 1997; Hatem-Asmar & Fraser, 2004). It also led to setting up a supportive legislative and regulatory environment governing midwifery education and practice. Nevertheless, many challenges to the integration of midwives into the health care system were documented during the evaluation phase such as: i) lack of knowledge about the practice of midwifery on the part of other health care providers; ii) deficiencies in the legal and organizational structure of the pilot-projects; iii) competition over professional territories; and iv) gaps between the midwives' and other providers' professional cultures (Collin et al., 2000). Till date, integration of midwives into the Quebec's healthcare system remains difficult to achieve, due to deficient interdisciplinary collaboration with other maternity care providers resulting from the medical profession's opposition to midwifery care in some cases. In this example, a mismatch is evident between the educational system on the one hand and the socio-cultural and disciplinary systems on the other hand. Negative interaction and misalignment between the three systems remain as midwives are currently being educated according to the midwifery philosophy of care (*values*) but are still experiencing in the practice settings difficult collaborative relationships (*methods*) with physicians and nurses which restrain them from putting their competencies into practice in hospitals settings limiting therefore their practice to birthing homes (Collin et al., 2000). Challenges to successful integration is still giving rise to adverse consequences for outcomes, thus affecting the continuity of care, and putting mothers and babies at

risk (*outcomes*) (Klein, 2002).

Feedback: It is considered as the positive or negative response that may facilitate or constrain the intervention from attaining the expected outcomes (World Health Organization, 2009). One example is the humanistic philosophy of care implying new collaborative models of care between care providers in the disciplinary system. If this new vision encounters resistance from physicians, it will then require a reaction in other systems such as making adjustment in the socio-cultural system and establishing new maternal policy initiatives and mechanisms of care in clinical settings for successfully attaining the desired outcomes.

In conclusion, reviewing the type of systems in which the addressed problem is embedded, has implications for the way interventions are designed to solve the problem, implemented and evaluated.

Designing an Intervention Concerned with Health Professional Role

Through the application of the conceptual framework to the case of midwifery profession in Quebec, an attempt has been made to validate it empirically and to demonstrate the theoretical foundations for designing an intervention aiming to change a health professional role. French et al. (2012) among other researchers, advance that the use of theory along with the results of empirical methods research, will allow to assess the barriers of and facilitators for implementation problem and decide upon intervention components in order to build a sound theoretically informed solutions. Therefore, we consider that the model provides a strong theoretical rationale for the design of the intervention, that allows analyzing the multiple facets of the health profession situation (Hatem, 2008).

Consequently, we advance that the intervention will have to consider introducing sets of complementary changes in three systems with the intention of consolidating the whole system as a central unit of change for broad scale improvement of a health professional role in order to maximize the probability of success. Nevertheless, it is important to note that the different components of the intervention will be situationally determined by the problem being addressed and empirically investigated within the local context. Depending on the situation, it should target either solely or conjointly education, the current position and image of the health profession in the society, the legislative framework that governs the profession, the human resources management framework (e.g. working conditions), etc. (World Health Organization, 2003).

Our Experience of Designing a Theory-Based Intervention in the Midwifery Field

Following the international trend to effectively reduce maternal mortality, a multi-systems Action Plan concerning the midwifery professional role has been recently developed in Morocco (Hatem, 2008). The aim of the intervention was to provide fully qualified midwives trained according to the International Confederation of Midwives (ICM) Essential Competencies for Basic Midwifery Practice (Thompson, Fullerton, & Sawyer, 2011) to assist every woman through the reproductive life (United Nations Population Fund, 2010; World Health Organization, 2011a).

To develop the midwifery intervention, the conceptual model of Hatem-Asmar et al. (2002) was adopted using a three-step approach translating thus theory into intervention design:

1) Assessing the current problem concerning the midwifery profession by identifying the barriers and facilitators to the professional role (target of change) that need to be addressed in order to guide the choice of intervention components.

Barriers to, and facilitators of, the profession were identified during the diagnostic phase and linked to each of the three-system's dimensions (values, methods, actors, targets) in an empirical qualitative study conducted through focus group interviews with many stakeholders in Morocco. The results revealed that the midwifery profession's problem is deeply grounded, not just in education, but within the current image and visibility of the profession in the society and in the professional community, and is related also to the legal framework, to the professional scope of practice and conditions of work (Hatem, 2008). It showed clearly that the midwife is trained in a technocratic educational system, which prepares her to practice according to a biomedical disciplinary system in a socio-cultural system that does not consider nor value the human being (Hatem, 2008). In sum, the existing of such midwifery workforce in Morocco was not an appropriate mechanism to the full realization of the potential of the midwife as a key contributor to a safe motherhood process, to advocate the position of women in society and their reproductive health rights, and subsequently to reduce MM (World Health Organization, 2011a).

2) Designing an Action Plan consisting of components intended to overcome the local barriers identified based on the expertise of the consultant but mainly on the potential solutions suggested by the key informants from the Moroccan field (health professionals, midwifery educators, policy decision makers, health programmer, etc.). Selection of components was informed by the list of barriers and facilitators established. For example: within the socio-cultural system, to address the barrier related to the *values* dimension (midwifery image and lack of visibility in the society), social marketing activities were chosen to promote the professional role of the midwife; within the educational system: as regards to barrier related to the traditional educational *method*s for delivering knowledge, increasing material educational resources (anatomic models) to fit with the new competency-based approach were selected.

In sum, the Action Plan was designed to be implemented in the three systems (socio-cultural, educational, disciplinary). It focused on the values, methods, actors and targets of the three systems as a whole. The whole being the interaction of the intervention with the dimensions of the three systems in which the midwife operates.

3) Validation of the proposed intervention through a workshop involving several key persons belonging to the education, political and clinical field. The objective was to explain the theoretical underpinnings of the adopted pathways to change, to check the relevance of the intervention and to readjust it according to the views expressed.

In conclusion, the growth of change efforts in health professional role leads naturally to evaluative attempts of such initiatives which will be covered in the following sections.

The Relevance of an Implementation-Focused Evaluation

Evaluation approaches serve a number of purposes which can be developmental, formative, summative, or focused on monitoring and accountability. Evaluation designs, adopting forma-tive approaches, are more likely to be of greater value at the early phase of an innovation cycle (Patton, 2002, 2008). Implementation of interventions has been reported to present many challenges: it does not occur in a vacuum, it is sensitive to local context and it can fail because of unforeseen contextual barriers. There is general agreement among researchers that interventions cannot be treated as black boxes independent of their social, political, educational and professional contexts (Champagne et al., 2011; Love, 2004). As such, a good understanding of the potential interactions between the intervention and the context in which the intervention is implemented proves to be crucial.

Process evaluation is particularly well suited for understanding how the intervention outspreads under the specific context conditions, for capturing information in real time and for keeping consequently the iterative developmental process (Ho & Schwen, 2006; Hummelbrunner, 2011; Pettigrew, Woodman, & Cameron, 2001). It allows to generate lessons in order to fine-tune the intervention to make effective adjustments as implementation progresses, and increases thus the likelihood of changing a factor from a barrier to a driver (Champagne et al., 2011; Love, 2004; Patton, 1997; Varkey, Horne, & Bennet, 2008). Besides, implementation information plays a critical role in the accurate interpretation of evaluation outcomes, since it can help in understanding how those outcomes are reached (Damschroder et al., 2009; May et al., 2007). As such it provides many advantages to implementation success and long-term sustainability (Stetler et al., 2006).

The Conceptual Framework: A Comprehensive Evaluation Framework for Health Professional Role Change

Theory Basis for the Proposed Framework

Understanding the implementation of an intervention aiming to change a health professional role requires a framework that examines the congruence of the intervention with the context, and how the salient components of the intervention are unfolding within the boundaries of three complex human activity systems: 1) socio-cultural; 2) educational; and 3) disciplinary systems.

We propose a conceptual framework that incorporates insights from Hatem-Asmar et al. (2002) model discussed earlier, and from the meta-theoretical framework developed by Damschroder et al. (2009) to carry out implementation analysis. In the following, we provide our rationale for choosing these models and outline the theoretical principles supporting our conceptual framework.

Hatem-Asmar Model: Hatem-Asmar (1997) argue that it is unlikely that problems related to the health professional role be correctly diagnosed and addressed without adopting the interacting three systems approach, precisely because problems often lie in the three systems in which evolves a health professional role. In our case, the context, defined according to implementation research as the "environment or setting in which the proposed change is to be implemented" (Kitson, Harvey, & McCormack, 1998), is a multiple systems environment. It serves as the basis of our Evaluation Framework which is more suitable for illustrating what a professional role's intervention should target and how it should be evaluated. Therefore, our framework builds on the work of Hatem-Asmar et al. (2002) to identify the context through which the intervention proceeds

which is represented by the three interacting systems (the socio-cultural, educational, disciplinary systems). The added value to using the three systems is: i) mapping the broad-based change; ii) providing a structure to examine the context of implementing the intervention to change a health professional role; iii) and considering relationships within, between dimensions across the systems and the intervention to be evaluated capturing thus the dynamic nature of the implementation process.

To track the implementation process and the interaction of the systems with the intervention involved in the change process through the lens of implementation theories, we used the meta-theoretical framework developed by Damschroder et al. (2009) which can provide the analytical lens needed to explore the phenomenon under study.

The Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009): The CFIR is grounded in implementation theories and can be applied for exploring a wide variety of interventions in the health care settings across multiple contexts (Ilott, Gerrish, Booth, & Field, 2012). It provides a comprehensive taxonomy of orienting constructs that have been drawn from a synthesis of nineteen theories (e.g. dissemination, innovation, organizational change) and can be used to guide formative evaluation and to understand the complexity of implementation. The CFIR offers a typology of constructs classified in five key domains, without specifying causal relationships between them, that are critical to successful implementation. These domains are identified as:

1) The characteristics of individuals involved with the implementation process represented by five constructs (e.g., knowledge, self-efficacy, stage of change, personal attributes, identification with organization, etc.);

2) The outer setting which refers to the broad environment in which implementation occurs, and includes the political, social and economic context, involving four constructs (e.g., external policy and incentives, patient needs and resources);

3) The inner setting comprises five constructs concerned with features of the organization (e.g., structural characteristics, culture, networks and communication, readiness for implementation, etc.);

4) The characteristics of the intervention influencing implementation which consider eight constructs that must be taken into account (e.g., intervention source, evidence strength and quality, relative advantage, adaptability, complexity); and finally,

5) The process of implementation which is the active change process embracing four essential constructs (planning, engaging, executing, reflecting, evaluating).

The five domains offer a comprehensive view that considers importantly both the intervention and the implementation (Damschroder & Hagedorn, 2011; Ilott et al., 2012).

The CFIR can serve as a foundational framework to organize qualitative findings related to the influencing context (Damschroder & Hagedorn, 2011). Consequently, the CFIR will not be applied as a predetermined conceptual framework. It will be used as an analytical tool to frame the observed barriers and facilitators through its menu of constructs, along the four dimensions of each of the three systems framework, and how they interact to influence implementation across the systems.

Using an inductive approach, the CFIR will help us to: "map" the emergent themes from the synthesized data to constructs in the CFIR without forcing data into predetermined codes; and to clarify the constructs at play in facilitating or

hampering the implementation.

Applying themes at the construct/sub-construct level will be done for all domains. Nevertheless, constructs of two domains (Inner and Outer Settings) will be applied to the dimensions of the three systems and will not be classified under Inner and Outer Settings domains as in our case there is no single set Inner Setting versus Outer Setting due to the complex nature of the interrelated systems under study.

This approach mapping the data to a theory-driven conceptual framework has been advocated by MacFarlane and O'Reilly-de Brún (2011) to qualitatively evaluate general practitioners' uptake of the language interpreting service in the Republic of Ireland.

We consider that these two models are well positioned to understand the context at play for successfully implementing and reaching the outcomes of an intervention, to synthesize our findings and to draw conclusions from our analysis.

Nevertheless, designing a framework requires steps such as: 1) defining the phenomenon of interest (the context of implementation represented by the interaction of the three systems with the intervention) that are the domain of the investigation; and 2) suggesting possible ways to operationalize it (Seidman, 1988: p. 5) to illuminate thus the scope of the evaluation.

We have already demonstrated that the three systems are considered as human social activity system (HSAS) made of dimensions that interact effectively and efficiently internally and externally. Referring to Checkland (1981), "HSAS are structured sets of people who make up the system, coupled with a collection of activities such as processing information, making plans", etc. (as cited in Banathy, 1996: p. 14). Ackoff and Emery (1972) also characterized HSAS as purposeful systems and goal-oriented that select goals as well as the means to pursue them (as cited in Banathy, 1996: p. 14). Actions are carried out according to the values, and in case of misalignment between system components, significant challenges emerge. As well, Banathy defines a HSAS as: "An assembly of people who select and carry out activities-individually and collectively—that will enable them to attain a collectively identified purpose" (Banathy, 1996). Through focusing on the three systems, such framework widens the scope of analysis by emphasizing the whole context within which the intervention is supposed to work thus, to change a health professional role.

Description of the Conceptual Framework

The framework depicted in **Figure 1** highlights three spheres:

The first sphere corresponds to the context of the intervention comprising three lozenges that represent the three systems (with their four interrelated dimensions) that are interacting with each other's and with the intervention which lies at the centre of the three systems to bring about the desired change. These systems serve as a foundation for understanding the implementation process from a holistic perspective.

Implementing the intervention is influenced by the interrelated dimensions of the three interacting systems and by the characteristics of the intervention itself. These systems represented by a lozenge are: I) *the socio-cultural system*; II) *the educational system*; and III) *the disciplinary system*.

As for the middle sphere, it corresponds to the extent of coherence, degree of alignment (synergy) or misalignment (antagonism), among the various dimensions of systems, and the intervention which form the central focus of the evaluative
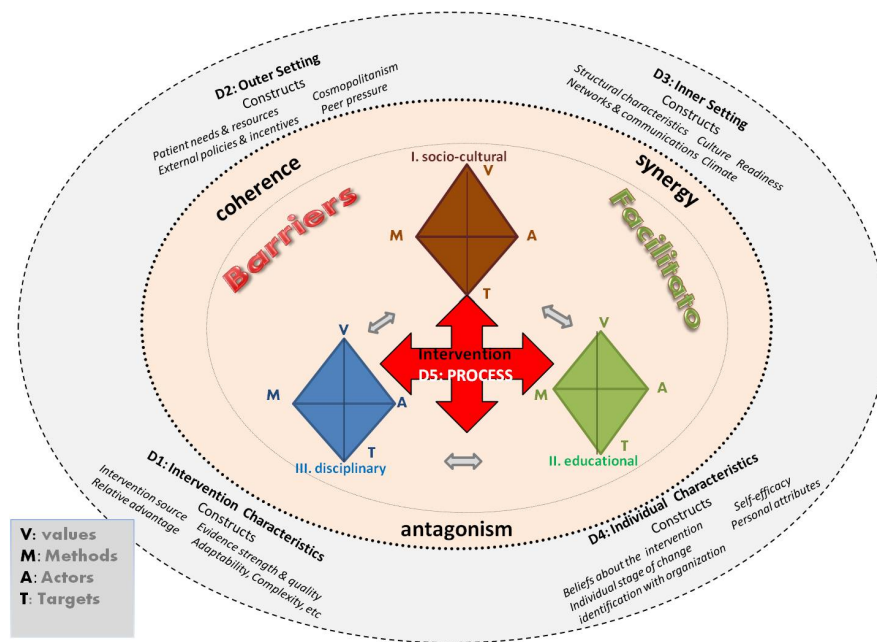
Figure 1.
Proposed conceptual framework to evaluate the implementation of a complex intervention aiming to change a health professional role.

framework.

Those two spheres are surrounded by an external one which represents the analytical conceptual lens through which we can map the themes, using an inductive approach, on to the CIFR constructs of the five domains : 1) characteristics of the intervention, 2) the outer setting; 3) the inner setting; and, 4) the characteristics of individuals.

The fifth (5) domain passes across the centre of the three spheres and corresponds to the process by which implementation is executed.

Bi-directional arrows express the inter-relatedness of the three systems and symbolize their interaction with the intervention. Each lozenge includes interrelated dimensions derived from the system conceptualization of Hatem-Asmar within which potential facilitators or barriers to the implementation process could lie.

The development of a framework requires that we: 1) present the three systems; and 2) define and describe their dimensions.

***Systems and Core Dimensions*:** Drawing on Hatem-Asmar model, each empirical HSAS is conceptualized as made of a set of four interrelated dimensions: values, system methods, actors, and targets. The three lozenges representing the three systems are the following:

I) *Socio-cultural lozenge*. It represents the larger societal system, encompassing political (governmental bodies—e.g. the ministry of health), and social systems at large (civil society, e.g. women). It concerns the values and expectations of society, laws and regulations (Hatem-Asmar et al., 2002). It may include influencing factors exerting the broadest level of influence on the implementation process (e.g. the social and political setting) (Damschroder et al., 2009).

II) *Educational lozenge*. According to Hatem-Asmar et al. (2002), it corresponds to the underlying approaches and principle prevailing in this system; educational methods for optimizing the preparation of health professionals and attain the training goals.

III) *Disciplinary lozenge*. It represents the disciplinary system which is inherent to the characteristics pertaining to the profession. It outlines the values of its members, methods and practical approaches used; the organisation of health professions including relationships with other professional groups; and finally the goals of developing their role.

Since the three systems are made of set of dimensions that work together and with the intervention for the overall objective (change of a health professional role), we need to define the underlying dimensions at play. An empirical human social activity system can be described as having values that guide activities in which actors are involved, to attain goals—that are directly or indirectly perceived to have influence on the implementation process. Within each system, influences among dimensions are bi-directional. We will address those concepts for gaining insight into empirical systems in practice.

1) *Values*. Refer to the rules and legal grounding of each system that steer their methods. Values drive the behaviour of the system actors; According to Senge (1990), mental models reflect the beliefs, values that we personally hold, and underlie our reasons for doing things the way we do.

2) *Methods*. This dimension refers to organizational procedures used to represent a problem and its solutions. Systems enact different methods to attain their targets such as communication and coordination activities within and across systems, organization and distribution of resources across institutions involved in the implementation process (Tseng & Seidman, 2007). Methods must be congruent with the values prevailing in the system in order to attain the target (Hatem-Asmar et al., 2002).

3) *Actors*. They refer to the heterogeneous groups of actors intervening at multiple levels and involved in the process. Actors are characterized by their attitudes, skills, motivation needed to facilitate or constrain the change (Damschroder et al.,

2009; Grol, 1997). For example, policymakers, women are key contributors to the functioning of the socio-cultural system whereas academic directors and students play a crucial role in the educational system. Actors in the disciplinary system are the health professionals from various disciplines.

4) *Targets*. It's about the intentions, purposes, and ultimate goals of a system.

The Intervention: Given the contribution of intervention characteristics to implementation success, we will consider in our framework the perceptions of the different participants to identify the key attributes of the intervention that might facilitate or impede its implementation. In order to do so, an inductive investigative approach is adopted and analysis is guided by the framework developed by Damschroder et al. (2009).

In sum, we propose a comprehensive framework that includes a holistic view of the three systems interacting with the intervention, that can assist in understanding the numerous potentially relevant factors influencing the implementation through the "menu of constructs" approach identified in the CFIR.

Interactions between the Systems and the Intervention: Centre Piece of the Framework: The theory underpinning our framework would allow to conduct an evaluation and to search for the extent of coherence, degree of alignment (synergy) or misalignment (antagonism), among the various dimensions of each system, and the intervention (e.g. between the values, methods, etc. of the educational institutions, the clinical settings and the intervention). Building upon these interactions, it is possible to identify the barriers and facilitators associated with the intervention's success and challenges. We consider that the greatest contribution to enhancing implementation may lie in these interactions which form the central focus of the evaluative framework.

Such results could inform the development of activities that are tailored to address these barriers for more effective implementation and moreover to realize the full benefits of role change.

A Pattern for Understanding the Evaluation Conceptual Framework: Review of a Jordanian Study on Barriers to Developing Midwifery as a Primary Healthcare Strategy

To further explain our framework, we will use as an example a study on barriers to and facilitators for developing midwifery primary healthcare practice and will lay out an explanation of how the findings can be looked at using our framework. We will draw also a hypothetical situation (implementing an intervention such as a competency-based education program) in order to exemplify how the dimensions within these three systems and the intervention through the lens of the CFIR framework might facilitate or impede the implementation process. The case example concerns the results of an action research led by Shaban, Barclay, Lock, and Homer (2012) across three regions of Jordan to identify the barriers to developing midwifery as a primary healthcare strategy. Five main barriers were reported: 1) a lack of professional recognition; 2) a lack of recognition and status for midwifery within society; 3) high levels of stress and workload; 4) medical domination of health services; and 5) problems with the quality of midwifery education. Referring to our framework, we can explain how these findings can be looked at in terms of the systems dimensions of the in-

ternal sphere. For example, the findings, regarding the poor image and lack of recognition of midwifery within society, pertain within our framework to social representations defined by key elements (*beliefs*, *opinions*) (Abric, 1994) which are related to the *values* dimension of the socio-cultural system. High levels of stress and workload are classified as part of the *methodology* of the disciplinary system, because they reflect that practicing midwives are working in stressful environments. As for the medical domination of health services, these reflect the prevailing interactions between the disciplines which concerns the *methodology* dimension of the disciplinary system. Concerning midwifery education, major issues related to the quality of clinical placements, the competency of educators and the level of supervision of midwifery students were highlighted. The competency of educators is one of the characteristics of *actors* in the educational system. As for the clinical placements and the level of supervision of midwifery students, these pertain to the *methodology* as they are about the resources and the actions taken in the educational system to improve midwives' training.

To illustrate the interaction of the three systems, we stipulate that any undertaking for the dimensions of the socio-cultural system provides a feedback to the dimensions of the educational or and disciplinary systems and vice versa. According to the results of a study conducted by the same authors on midwifery education in Jordan (Shaban & Leap, 2011), the midwifery education curriculum reflects a medical model, with an emphasis on illness and intervention rather than preparation for the internationally defined full role of the midwife. Based on the results of the two Jordanian studies, we can stipulate that values in the socio-cultural system (*social representations about midwifery's image*) and in the educational (*prevailing philosophy of medical model*) and *methods* in the disciplinary systems (*medical domination of health services*) are viewed as dimensions that interact negatively constraining thereby midwives in Jordan to be positioned as primary maternal providers for women.

We can draw a hypothetical situation and try to explore what would be the barriers or facilitators according to the constructs of the CFIR (the external sphere of our framework) across the three interacting systems and the intervention if we attempt to implement an intervention such as a competency-based education (CBE) program. We stipulate that a midwifery program must be based on a "humanistic" philosophy in order to prepare a competent midwife capable of empowering women and promoting health reproductive care (World Health Organization, 2011c). Nevertheless, implementation might be constrained by the existing socio-cultural and disciplinary systems that are not aligned with the intervention focusing only on the educational system. Transferring the new midwifery competencies according to the humanistic educational philosophy into practice field (disciplinary system) would be constrained by the prevailing biomedical culture of the professional groups in this system (*values-culture*) that support functioning within professional hierarchies; and also the ongoing hierarchical medical work relationships instead of collaborative teamwork (*methods-networks*) in the clinical settings among professionals. Moreover, we argue that actors (*actors-attitudes*) might be source of resistance as they are not trained to practice according to the new philosophy, and also due to issues of territoriality. In sum, practicing within the fractured maternity care which operates under the medical system might not allow midwives to apply

the skills acquired during the training, to their job settings.

Regarding the barriers related to the CBE program, if new competencies are introduced (e.g. newborn life saving skills) according to the international guidelines without approval of the medical profession (*Intervention source*), attitudes of resistance will result in rejecting the new program as it might be not congruent with their beliefs.

Based on the forgoing discussion, we can refer to the middle sphere of our framework and state that *values* in the educational system are misaligned with the *values*, *methods and characteristics of actors and targets* within the disciplinary system; and the intervention is not aligned with the *values* of the professional groups in the disciplinary system. Therefore, misalignment between the two systems and the intervention might constrain the implementation process of an intervention focusing on one system and not considering the whole change and might be an impediment to providing a fully qualified midwife fit to practice as a primary care provider.

We also stipulate that if there is a strong political will to enhance the midwife's autonomy in Jordan in order to promote primary health care, compatible change across the three systems in order to align them towards reaching the outcome must be initiated. Therefore, we assume that an "existential" socio-cultural system based on perspective that values the women-centered approach should be enhanced in Jordan. The current "technocratic" educational system and "biomedical-based" disciplinary system promoting risk-pregnancy practices should also be replaced by a "humanistic" educational system and a "health-based" disciplinary system in order to be aligned with the "existential" socio-cultural system (Hatem-Asmar et al., 2002). Therefore, any intervention focusing exclusively on one system only provides a part of the equation as each system is a vital dimension to enable the entire system to attain the goal.

Based on this example, we have demonstrated the utility of our framework to depict the barriers and or facilitators within and across the three interacting systems with the intervention to facilitate the change process.

Implications

The present article makes valuable contributions to the field of the evaluation of professions and is innovative in three ways: *Firstly*, the model is the first to adopt holistic perspective to analyze the implementation of a health profession intervention acknowledging i) the complexity of the process needed to change a health professional role; ii) the requisite to take into account the interaction between the three systems and the intervention if an intervention is to be fruitful in improving a health profession and achieving better health outcomes.

Secondly, the model aims to provide a conceptual tool for research design, analysis and interpretation for studies related to workforce innovation's implementation. Indeed, with the aim of meeting health needs of countries, we propose our framework as a conceptual map to gain a rich understanding to analysis of changes to a health professional role. We speculate that it might also apply to a professional role in general.

Our assumption is rooted in the statements made by Abbott (1988), that educational institution provides only recognition of the knowledge and competencies relevant to the profession without guaranteeing its right to practice or its position in society. In the light of these assumptions, we presume that the ultimate goals of any occupational group that strives to achieve are

to: i) obtain public recognition and acceptance of the professional status; ii) gain a legislative and regulatory authority for the role; iii) establish codes of ethics and high standards of practice; iv) receive an education centered on evidence-based competencies to improve the individual performance; and finally, v) carry on activities in a motivating practice setting according to a well delineate code of practice. Relying on these professional needs, we stipulate that our framework might have potentially profound implications for professions across a range of disciplines. It offers a useful frame reference to: guide diagnostic assessment, design and implement interventions and finally evaluate implementation progress of interventions aiming to change a professional role.

Thirdly, a final insight of relevance is that the information gathered from an evaluation is crucial for evaluators, policy-makers, health professionals, educators to identify where difficulties in implementation lie so that it can be alleviated in order to make prompt adjustments. The framework can also serve to judge the appropriateness of an intervention designed to change a health professional role.

Conclusion

This paper has provided an innovative-evaluative framework for investigating an intervention aiming to change a health professional role. We argued that the evaluation must focus on examining the coherence of the intervention with the three interacting systems (socio-cultural, educational, and disciplinary) within which it unfolds in order to provide valuable information and to avoid failures in further implementation efforts. Most importantly, the framework is a resource for program planners seeking to roll out an intervention throughout many countries facing high demands for role change and also researchers undertaking evaluations of such interventions.

Acknowledgements

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