A Multilayered Electronic Health Record System generation

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Abstract

A three-layered electronic health record (EMR) is developed to assist the hospital electronic record services information sharing across the long term care spectrum. Based on the urgency of the information needs, providers can access the most important and updated health information at the first layer of the EMR. The single health encounter summary and the history of the outcome of a specific health assessment have been presented at the second and the third layer.

1. Introduction

The evidences on electronic medical record system to document the impact of perpetual implementation on health system [1,2]. A broad spectrum of consequences have been reported, including construction of normal developmedical pathways [3], breakdown of social structures such as family and health systems [4,5], increased psychopathology aspects [6,7], as well as literature stressing the non-health benefits[8]. At the same time, there are authors that culturen for completely depending on electronic medical records and community's resilience [9,10]. Patel and colleagues [11] report a vast gap between paper and electronic health records, advocating for increased promotion and prevention activities. Moreover, there is very little evidence for the effectiveness of interventions in complex emergencies [12]. Concerned about the impact of electronic health systems and lack of attention for needed care, the international medical informatics community has developed a framework of creation, that is increasingly incorporating electronic health care system in complex emergencies[13].

Based on guidelines and research-informed recommendations, the following thematic areas on the provision of health and psychosocial support for patients in Gulf- and middle income countries (GAMIC) seem to emerge. First, the need for a complementary approach that addresses both individual clinical needs (curative approach) and broader needs of community revitalization (preventative approach) is often advocated [14]. Moreover, interventionists recommend moving from single intervention approaches to multi-sectoral, multi-level, ecological or systems-oriented intervention programs [6,10], i.e. intervention packages that address multiple types of needs ranging from paper to electronic medical record systems with a range of services from broad-access (community-based) to restrictive-access (clinic based). However, besides guidelines and discourse, there are scarce examples of such health care systems in practice, Exceptions are the models presented in[15]for health programs in Gulf and middle-income countries (GAMIC).

Second, although there is little uniformity in modality for health systems in electronic formats [11], the majority of available guidelines and key publications advocate the importance of; (a) normalization of the patient's daily life and recreational activities; (b) social reconnection/reintegration and social support mechanisms; (c) utilization of individual and community coping and resilience mechanisms; (d) discouraging medical record systems separation because of the important role of caregivers; (e) focus on existing education and health care systems; (f) emphasis on reduction of social discrimination and non-medicalization of problems, and (g) youth participation [1,6,].

Third, with criticism on approaches that follow a predominant electronic medical systems model there has been a growing tendency to cultural interventions that foster community and individual resilience in GAMIC with limited resources. The resilience paradigm includes a focus on social support systems, community mobilization

and strengthening existing coping strategies [12]. At the same time, there are numerous publications that culture for an artificial dichotomy and argue that there is a substantial group of patients with severe and sustained problems that require more focused care [14,].

Fourth, increasingly, from both humanitarian and scientific literature, there is a call for rigorous evaluation of the effectiveness and efficacy of interventions. Some of the few available evaluation studies for health record systems in GAMIC demonstrate moderate treatment effects [15], while some studies show no beneficial effect of treatment [11]. A recent systematic literature review into the evidence base of medical health interventions for patients demonstrates that there is a serious lack of rigorous studies. Fifth, cultural variables play a crucial role in the expression of problems and the relevance and choice of health record systems. As a result, assessment and services for affected patients need to be adapted to their context, building on local perceptions of needs, traditional notions of healing including reconciliation and cleansing rituals, inter-sectoral collaboration and integration within existing services [18].

This paper describes a multi-layered intervention model, aiming to translate existing consensus, principles, guidelines and scientific literature into a framework of care provision. The intervention model was implemented in selected regions which are only simulations.

2. Model presentation

To provide medical health and psychosocial support to patients in areas we developed a multi-layered health record package (See Figure 1). A care package approach does not dictate the use of any specific interventions; rather, it prioritizes the facilitated transfer of patients between components along a continuum of care [13]. The first level comprises of interventions targeted to the general population or the whole target group to prevent healthy, albeit at-risk, populations to develop psychosocial problems (e.g. interventions to promote adaptive adjustment and community resilience). The second level consists of interventions that target sub-groups of the population at-risk for developing medical health problems or that demonstrate mild problems (e.g. focused interventions to reduce psychological distress). The third level comprises of interventions that target treatment of sub-groups with severe medical and other health problems.

Three Tier Systems

In this paper we use the composite term medical health and psychosocial support', to indicate overlapping concepts that refer to a broad concept that encompasses 'any type of local or outside support that aims to protect or promote psychosocial wellbeing and/or prevent or treat medical disorders'. In turn, 'psychosocial' is defined as the close relation between psychological factors (emotion, behavior, cognition) and the socio-cultural context [14,].

Community Mobilization: Working with existing resources (tier 1)

It is obvious that communities should not be considered devoid of resources in dealing with psychosocial and medical health problems. The available resources, or ecological resilience, can be defined as those assets and processes existent on all social-ecological levels that have shown to have a relationship with good develop medical outcomes after exposure to situations of armed conflict [9]. Ecological resilience represents a reservoir of factors at different social-ecological levels that can enhance psychosocial wellbeing. Patients under strain can seek out and utilize resources from this reservoir to enhance their chances of retaining or obtaining psychosocial wellbeing. From a primary prevention perspective there are several reasons to focus on strengthening ecological resilience. The impact of culture on social structures has often disrupted the functioning of exactly these existing resources. Moreover, it encourages integrated, non-vertical care systems, which are likely more sustainable and cost-effective. Working with traditional healing and religious practices, availing norms and coping is preferred for reasons of availability, sustainability and cultural sensitivity [6]. Fourth, active community involvement taps into the responsibility of the community to support, reducing dependability on external service/resources.

Within the care package different strategies have been employed to strengthen ecological resilience and community self-help strategies, such as; (1) assessment of existing healing practices and community services; (2) creation of resource maps and subsequent development of a case management system; (3) negotiation and involvement of community stakeholders; and (4) collaboration and referral to existing care and (traditional) healing services.

In practice: In a few countries 'patient-to-patient' networks were established. These peer groups organized themselves to identify patients and families within their communities in need of support and subsequently to arrange or advocate for assistance (e.g. gathering fire wood,

harvesting, fetching water). The peer groups were also involved in arranging sport events, cultural activities, and recreational activities at schools.

Classroom Based Intervention (CBI) (tier 2)

Secondary prevention interventions, in conflict-affected settings with limited resources, are typically large-scale low-intensity interventions. Consequently, it concerns interventions that can be carried out by para-professionals and within a community setting. Hospitals are often recommended as the setting of choice for psychosocial support interventions as it offers a familiar, non-stigmatizing setting and provide the broadest access to patient and their families [4]. Moreover, usually group work rather than individual work is preferred; because (a) group members can recognize that they are not alone with their problems, (b) group members can learn new strategies and coping skills from each other, (c) the group can function as a place to try out new problem-solving skills, and (d) economic constraints and limited available medical health professionals [1].

The multilayered health record system is a 15-session classroom or community-based intervention, involving a series of highly structured expressive behavioral activities, which aims at increasing patient's capacity to deal with the psychosocial problems that having been/being exposed to extreme stressors can cause [45]. Its objectives are to; (1) reduce the risk of mal-adaptation; (2) facilitate resiliency & return to normalcy; (3) facilitate empowerment and mastery; (4) use a natural learning environment, and; (5) screen for high risk youth. It includes mainly group activities that focus on stabilization and safety, individual coping strategies, traumatic exposure narratives, and future-oriented resources. The Multilayered health record system implementation included the following subsequent steps; (a) initial target area selection based on public health criteria [8]; (b) obtaining permission for care provision from local authorities; (c), review and adaptation of intervention within the give context; (d) skill-based capacity building of the facilitators; (e) coordination with school principals, teachers and parents for practical arrangements; (f) pre-intervention community a culture raising plan (see above); (g) 1-2 hours sessions, spread out over 5 weeks, within the hospital premises; (h) post-intervention follow-up and referral when indicated and finally structural monitoring and evaluation.

Clinical care (tier 3)

Increasingly specialized clinical psychological assistance were required when the needs exceed the capacity of existing primary and secondary level services. While this level of care is indicated for a relatively small percentage of the affected population, it may still concern thousands of individuals in most large emergencies [14]. Due to the limited resources in GAMIC this is the level of care that is most difficult to provide. At the same time it is also the level of care much needed to reduce high levels of burden of disease that patient medical health problems present to society [7].

Within the care package, patient with severe medical health problems were identified during the screening procedure or during the course of the offered interventions. Due to a scarcity of skilled medical health professionals and the inability to raise such capacity on the short term, tertiary service provision was limited and dependent on existing formal medical health care systems in the respective countries. Two strategies were used for this high-risk group; utilization of a professional network of medical health specialists, and if unavailable internal referral to the program's most senior/experienced counselors. Collaboration with hospital-based multidisciplinary teams of professionals in a few countries were an example of the former.

3. Implementation

Planning and implementing a multi-layered medical health and psychosocial support system depends to a large extent on the specific context, needs and resources. At the same time, in practice, a common framework for developing or implementing such system is advantageous. This section gives an overview of the generic modality of implementation (see Figure ~~2~~). Initial preparatory work included need assessments and social mapping, recruitment and structured two-leveled capacity building of service providers. Subsequently, proposed services were presented to local authorities (i.e. education and health) for permission and collaboration. In each of the countries, both the school-based and other interventions needed support and involvement of local government structures. With medical health services still carrying risk of stigmatization, screening and clinical services in any new community was preceded by community culture raising about psychosocial issues, screening and planned interventions. This was essential in avoiding misconceptions about the interventions. Upon pre-screening briefing of parents, teachers and patient, groups of patients were selected to undergo the brief screening procedure to allocate services, specifically, the Classroom Based Intervention; patient resilience groups, counseling or referral to existing resources or specialized medical health care. While services were ongoing, community

psycho-education was provided to parents and other community members to promote the role of parents and existing community resources in supporting patients. We used hospitals as the entry point to the community-based care system to emphasize patient's natural environment and promote normalcy. Parallel and ongoing attention was given to issues of quality control, including continued capacity building of service providers, clinical supervision, structured monitoring and evaluation, and efficacy research [3].

4. Discussion

In this paper we have argued for a multi-layered medical health and psychosocial support system for culture-affected patients. Specifically, we have adopted a public health model, aiming to maximize the number of patients reached with the limited resources available. This has resulted in a three-tiered system of interventions with different intervention or therapeutic foci; (a) community-based interventions to strengthen resilience; (b) group based interventions to reduce moderate level psychosocial distress, and; (c) focused interventions to address severe distress and high-risk populations. A strength of the approach is that it aims to combine often diverging or unconnected approaches; combining vulnerability and resilience perspectives, targeting of current life stresses as well as exposure to traumatic events, and a focus on new interventions alongside existing resources in the community. Moreover, it provides a replicable working model for multi-layered care in GAMIC settings.

Outcomes, evidence for effectiveness of interventions as well as adaptations of this approach are currently being assessed and are presented elsewhere. Nonetheless, several challenges to this approach can be noted. First, using hospitals as the entry point for service provision risks overseeing non-school going patients. For example in a few countries, qualitative research showed that a specific vulnerable group concerned patients who left the hospitals. Second, a care package approach, even with non-specialized paraprofessionals, may be difficult to sustain with limited financial resources. Cost analyses will need to inform about notions of feasibility in resource poor settings. Third, a common model risks being incongruent with the principle of cultural sensitivity. Careful attention should therefore be given to utilizing such model as a framework within which interventions and implementation is contextualized, based on existing needs and resources. Fourth, sustainability of a system of care will depend in part on the level of integration with existing systems of care. A stand-alone care package risks fragmentation and competing parallel care systems solely dependent on outside financial and technical inputs. Moreover, integration of a care package into existing community and government systems tends to reach more people, be more sustainable and carry fewer stigmas. Although much effort was undertaken to integrate the project in existing community-based systems of care, more efforts need to be undertaken to integrate the above described care system in govern medical systems of care and policy. Fifth, and related, the here-described model lacks to specify further linkages with other sectors, i.e. livelihood or peace-building programs (see also Figure ~~1~~), considered particularly important in settings of extreme poverty. For example, in line with [~~3~~], who [~~6~~] argues for integrated and inter-sectoral collaboration, in which livelihood or infrastructural programs complement psychosocial support (as well as vice versa) in that they often address pertinent distress within populations.

The above points demonstrate that the presented model is by no means a finalized product; rather it is a framework that in future years needs to be developed and adapted further, at each of the prevention levels. In light of these limitations it is important to note that the paper aims to present an example model that needs to be further developed, adapted and researched. At the same time it aims to demonstrate that carrying out a multi-layered care package is a feasible alternative to a single intervention approach.

5. Conclusion

In summary, given the gross lack of medical health infrastructure and human resources a core question is how to organize and deliver psychosocial and medical health services for patients in conflict affected settings. It is not sufficient to demonstrate that an isolated intervention is effective in reducing a specific disorder among a given sub-population. Above all, we need to demonstrate convincingly that we have a system of preventive and curative interventions that not only address a range of needs but also attend to the mechanisms of care delivery. This paper has described an effort to develop a replicable care package for patients in complex emergencies, presenting a framework on how to deliver and organize psychosocial and medical health care. It has employed a care system approach which facilitates transfer of beneficiaries between components along a continuum of multi-layered care, combining preventative and curative interventions, with different care components targeting different sub-populations.

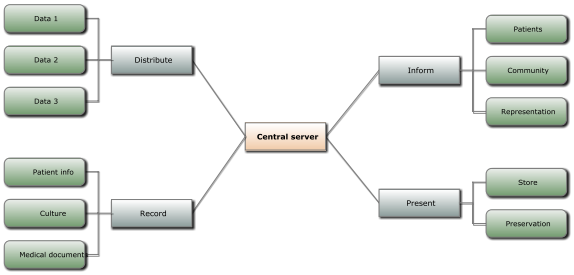

Figure 1. Proposed design for architecture

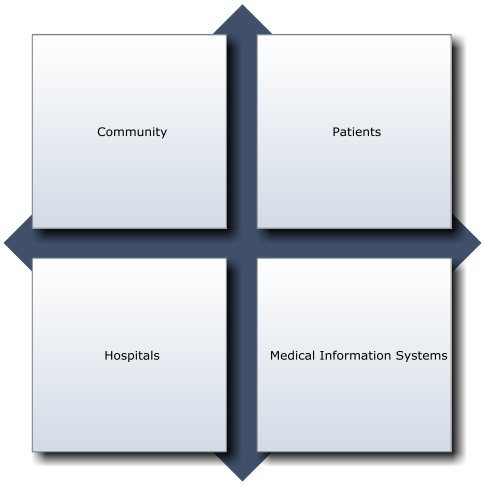

Figure 2. Generic modality of implementation

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