Abstract

The provision of professional pharmacy services has been heralded as the professional and the economic future of pharmacy. There are different phases involved in a service creation including service design, impact evaluation, implementation and sustainability. The two first phases have been subject to extensive research. In the last years the principles of Implementation science have been applied in pharmacy to study the initial uptake and integration of evidence-based services into routine practice. However, little attention has been paid to the sustainability of those services, during which there is a continued use of the service previously implemented to achieve and sustain long-term outcomes. The objective of this commentary is to describe the differences and common characteristics between the implementation and the sustainability phase and to propose a definition for pharmacy. A literature search was performed. Four critical elements were identified: 1. The aim of the implementation phase is to incorporate new services into practice, the sustainability phase´s aim is to make the services routine to achieve and sustain long-term benefits 2. At the implementation phase planned activities are used as a process to integrate the new service, at the sustainability phase there is a continuous improvement of the service 3. The implementation phase occurs during the period of time between the adoption of a service and its integration. Some authors suggest the sustainability phase is a concomitant phase with the implementation phase and others suggest it is independent 4.There is a lack of consensus regarding the duration of each phase. The following definition of sustainability for pharmacy services is proposed: "Sustainability is a phase in the process of a professional pharmacy service, in which the service previously integrated into practice during the implementation phase is routinized and institutionalized over time to achieve and sustain the expected service outcomes". An agreement on a definition will facilitate an understanding of when the profession has reached this ultimate goal.

Community pharmacy;

Pharmacist.

The next phase in professional services research: From Implementation to Sustainability.

Phases in the creation of professional services: from the service design until its final sustainability.

Over the last decade community pharmacy has experienced major changes as the role of community pharmacists is evolving from a product to a service or patient orientation. As part of this change, new and innovative professional services aimed at improving medicines use and patient outcomes have been designed and implemented across many countries. [1]

As with other health care related disciplines, the process involved in the creation of innovative services encompasses different phases - service design, evaluation of its impact, implementation into routine practice and finally sustainability.[2]   At the design phase is important to define the target population, the context in which the new service is going to be implemented, the objectives of the new service, its methodology and the outcomes and expected benefits. In the design phase a review of previous literature should be conducted to retrieve all the theories previously studied to create a theoretical model of the service process. In addition identifying information about similar services already implemented is crucial to retrieve the characteristics and methodologies previously used and build up the new service based on evidence. Co-design with stakeholders becomes a critical step. Once the service is designed a pilot study is conducted to assess its feasibility. Through this pilot study the new service is evaluated and the key outcomes of the services tested and estimated. Furthermore a process evaluation is carried out to determine the components of the service which produce positive outcomes or the components which prevent the service success. At the impact phase there is an assessment of the service's effectiveness in terms of patient and economic outcomes. [3, 4]These two phases have been subject to extensive research, resulting in an increasing body of evidence supporting the impact of professional pharmacy services.[5] At the implementation phase, many of these innovations have either failed or taken an inordinate time to be implemented into practice. This phenomenon, common across disciplines, has led to the development and use of new theories and methods aimed at incorporating research findings into practice, the primary focus of implementation science.[6] Implementation science has been defined as the "scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services".[7]

Implementation science is a core discipline in health services research due to its key role in the use of theories, models and frameworks to implement effective and sustainable services on a large scale. Until recently implementation research has not been a research area of common interest in pharmacy. Following the implementation stage is the sustainability phase, which is becoming increasingly important for funders and implementers of the service. At this phase there is a continuous use and sustainment of the services previously implemented at the implementation phase. The sustainability phase consolidates the new service and as a consequence produces long-term outcomes. Interestingly sustainability research does not yet appear to be on pharmacy researchers' agenda.

Common terms used in the literature.

Different terms have been used to refer to sustainability, an important and usually missing phase in health services research. Terms such as "routinization", "institutionalization", "continuance","durability", "discontinuation" and "maintenance" are commonly used in the literature.[8] In addition several authors have used the term maintenance to refer to the stage at which sustainability is achieved.[9, 10] It seems that researchers are using diverse terminology to refer to similar concepts, which can often lead to confusion and misinterpretation. This situation may be explained by a lack of consensus and heterogeneous data. To our knowledge, there is not an agreed definition for sustainability in health services research.

Objective

The objective of this paper is therefore to describe the main differences and common characteristics between the implementation and the sustainability phase in order to gain a better understanding of this phase of health services research. Furthermore, we propose a definition for pharmacy, to assist researchers and practitioners to identify and research the key elements.

Method

To initiate the debate a literature search of papers in the journal implementation science was screened with no time restrictions to retrieve terms and definitions used to describe the sustainability and implementation in health services research. This journal was selected due to its exclusive focus in this area. The key terms used in the search were: "Implementation phase of health care services" OR "Sustainability phase of health care services". If a paper used a definition from a second paper, the latest was cited. All duplicated definitions were removed.

Definitions: Implementation and sustainability

Twenty-nine sustainability and twenty-three implementations definitions were included. The key concepts were literally extracted from each definition allowing the identification of the main differences and common characteristics between the implementation and sustainability phase. In order to organise the concepts retrieved they were thematically assigned to four categories (table 1), which are described below:

1. *Aim: objectives of the phases.*

The aim of the implementation phase is to incorporate new or evidence based-services into practice, achieving at the same time their expected benefits, proven during the evaluation phase in the target population. A key concept during the implementation phase is the "fidelity", understood as the extent to which the service is delivered as intended. The aim of the sustainability phase is to make the services previously implemented routine to achieve and maintain long-term benefits.

2. *Process: performance of each phase.*

At the implementation phase planned strategies and activities are used as a process to integrate the new service. These interventions are targeted at promoting the development of the knowledge and skills needed by all the stakeholders for the integration and appropriate delivery and use of the new service. In the sustainability phase there is a maintenance, institutionalization and continuous improvement of the methods, strategies and core components of the service implemented during the implementation phase.

3. *Point in time: start of each phase.*

The implementation phase occurs during the period of time between the adoption of a service and its integration into practice. There are several ideas about the point in time in which the sustainability phase begins. Some authors have suggested that the implementation and the sustainability phase could be seen as concomitant phases.[11] However, other authors consider the sustainability phase as an independent phase, starting at the point in time at which the implementation phase is over, being the last phase in the process of health services research.[12] Furthermore other believes that the beginning of the sustainability phased is related with the end of the initial external funding.[13]

4. Duration: length of each phase.

There is a lack of consensus regarding the duration of each phase. While some authors have suggested the implementation phase should last around one year, others do not provide a specific length. A similar lack of consensus applies to the sustainability phase. Although most authors suggest there is not a defined duration for this phase, some suggest it should last more than a year.

Additionally when new practices or services are being introduced, there will be instances in which old methods of working would be eliminated. This phenomenon is referred to as de-implementation. Essentially what is occurring is that elements of old practices, particularly those not providing any benefits, are eliminated, or are replaced with alternatives which best fits patient needs. [14]

Defining sustainability for pharmacy services and identifying key concepts inside it.

Based on the sustainability definitions retrieved and on their underlining concepts, the following definition of sustainability for pharmacy services is proposed for debate:

 "Sustainability is a phase in the process of a professional pharmacy service, in which the service previously integrated into practice during the implementation phase is routinized and institutionalized over time to achieve and sustain the expected service outcomes". However, if one deleted the pharmacy specific terminology, it would provide an opportunity for this definition to be used in other disciplines in health services research.

Based on the proposed definition the following key concepts can be identified:

(1) Routinization (adapted from Slaghuis et al[15]): understood as the sustenance of the pharmacy's routine for the service provision through the continuous improvement of the service protocol and service components. This involves following the service protocol for the correct delivery of the service, the continuation and improvement of the service based on the experience acquired through its provision, and lastly the monitoring and feedback on performance.

(2) Institutionalization (adapted from Slaghuis et al[15]):represents the gradual adaptation of the pharmacy's context, structures and processes, to the provision of the service. It implies delivering, monitoring and updating the skills required to deliver and sustain service provision, the availability of materials and resources needed and finally regular reporting on the quality of service delivery.

Within the concepts of *Institutionalization* and *Routinization* lies the "construct" of adaptation. It has been suggested that even within the sustainability phase there is a continued adaptation of the service. Chambers et al suggest[16, 17] that there is a continuous change in the service, contextualised by the setting in which the service is delivered. There is a belief that these changes may hinder the provision of the service itself, particularly if the changes do not provide the expected benefits. This intern will affect its long-term sustainability. To avoid the negative impact of this adaptation, one would need to frequently assess the various elements of the service in the different settings. If these adaptations are significant, then there would be the need to test their impact in the service effectiveness. The type of adaptations could include the core components of the service itself, the setting in which the service is provided, the service providers, or the funding mechanisms.

We believe we should reach a consensus on a definition of sustainability of professional services in order to ensure a service's long-term survival. Moreover, sustainability core outcome set should be established, to allow it's monitoring and assessed on a regular basis. Despite the fact that some tools have been designed and validated to measure the sustainability of services and practices in other settings, to our knowledge no tool has yet been created for pharmacy services. In the future, valid and reliable tools should be developed[18], taking into account the key concepts included in the proposed definition. This would allow national and international comparisons of service sustainability and continuous quality improvement of professional pharmacy services.

Conclusion

The pharmacy profession has decided that the future role of the pharmacists, irrespective of practice setting, will predominantly be as a service provider. These services will be directed to improve patient centre care. The profession, in many countries, has started the process of change through professional development, impact research and seeking remuneration for the provision of these new services. The key challenge up to this time has been the implementation of these services into universal practice. The next challenge, already upon us, is once implementation has occurred how these services are sustainable i.e. to maintain and improve patient care over time and benefits to providers accrue. However it is important that the profession can claim when these patient orientated pharmacy services have matured and have been fully integrated into the pharmacists' routine practice. An agreement on a definition of the sustainability of a professional pharmacy services in a community pharmacy setting will facilitate the understanding and recognition when the profession has reached this ultimate goal. Furthermore having a specific definition to refer to this important phase will promote the research in this area and as a result more accurate information,

necessary for the achievement of long-term professional pharmacist services, will be available. In future research a specific tool for the assessment of the sustainability of the professional pharmacist's services is needed. This tool would provide empirical data which would help researches to replicate and improve future services implemented at the community pharmacy.

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Table 1.Common characteristics and differences between the implementation and the sustainability phase.

1. AIM		2. PROCESS		3. POINT IN TIME.		4. DURATION	
Implementation	Sustainability	Implementation	Sustainability	Implementation	Sustainability	Implementation	Sustainability
• Intervention implemented as intended.[19] • Fidelity of the evidence-based practice as implemented in routine care.[20] • To mainstream an innovation within an organization.[21] • To put into practice an activity or program of known dimensions.[22] • Program ideas are put into full practice within the target organization or community.[23] • To get evidence-based findings and related products into use.[24] • ''Fidelity'' to the various elements of an intervention's protocol, including Consistency of delivery as intended and the time and Cost of the intervention.[25] • Putting to use or integrating innovations within a setting.[12] • To successfully and sustainably apply with high fidelity an intervention of known efficacy.[26] • Bringing a practice or practices into action.[27] • Putting to use or integrating evidence-based interventions within a setting. [12] • Average, percent and extent to which core elements are implemented as intended. [28] • Sustained improvements to care, patient outcomes, and service delivery, which are driven by and embedded in organizational strategy. [29] • Intervention is implemented into the organization and delivered to the persons concerns.[30] • To put an intervention into practice.[31] • Aiming to be given a structural place in the patient's life and professional practice.[32]	• To deliver an appropriate level of benefits.[33] • To function effectively with a minimum of external input.[34] • Maintenance of health benefits from a program.[35] • To maintain service coverage.[36] • Capacity of a project to continue to deliver its intended benefits.[37] • Production of health outputs and outcomes at optimized efficiency with uninterrupted inputs.[38] • The ability of a project to function effectively, for the foreseeable future.[39] • Ensuring an adaptive prevention system and a sustainable innovation that can be integrated into ongoing operations to benefit diverse stakeholders. [40] • The capacity of programs to continuously respond to community issues.[41] • Making an innovation routine until it reaches obsolescence.[21] • Innovations are integrated into routine practices and organizational structures. [20] • Achieving positive outcomes at each of the patient, practitioner, and system level. [20] • Extending benefits of interventions.[42] • Capability of being maintained at a certain rate or level.[43] • Evidence-based intervention can deliver their intended benefits.[12] • Achievement of desirable program and population outcome.[8] • Interventions components are active long enough to produce the desired effect on individual patients.[44] • Maintain programming and its benefits.[45]	• Targeted Stakeholders become increasingly skilful, consistent, and committed in their use of an intervention.[46] • Active and planned efforts.[21] • Set of activities designed.[22] • Method or technique to facilitate change.[47] • Effective change interventions.[24] • To exploratory use of the innovation.[48] • Ongoing planning, training, coaching, and use of strategies. [49] • Orchestrated (active, planned) effort to make evidence-based changes.[29] • Fidelity to study/program protocol and adaptations made to intervention during study/program.[50] • Activities to improve knowledge skills and facilitation of change process.[51] • Planned and deliberately initiated effort.[31] • Any planned process and systematic introduction of guidelines, healthcare innovations or health behaviour.[32] • Strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings.[52]	• Continuing control of a health program. [36]. • Institutionalization of a program within an organization. [35] • Capacity building in the recipient community. [35] • To mobilise and allocate sufficient and appropriate resources (manpower, technology, information and finance) for activities that meet individual or public health needs and demands.[53] • High treatment coverage, integrated into available health care services, with strong community ownership using resources mobilised by the community and government.[39] • The program components developed and implemented in earlier stages are maintained.[23] • Continuation of all or part of the program.[13] • New working methods, performance enhancements and continuous improvements are maintained. [54] • Changes (practice and outcomes) based on evidence that continue.[24] • Continued use of core elements of the intervention and persistence of improved performance.[55] • Performance of all activities at the same or higher level than at the time of initial Implementation.[56] • Maintaining strategies.[49] • A newly implemented treatment is maintained or institutionalized within a service setting.[57] • Continued used of program components and activities.[8] • Evidence-informed practices continuous use in organizations.[58] • Maintain programming.[45] • Improvements are maintained, new ways of working become routine, surrounding systems are transformed in support, and the innovation may even be developed.[59]	• Between an organizational decision to adopt an intervention and the routine use of that intervention.[46] • Between making an adoption commitment and the time that an innovation becomes part of the organizational routine.[60]	• After major financial, managerial, and technical assistance from an external donor is terminated. [33] • After the initial funding or other impetus is removed.[23] • After initial external funding ends.[13] • After external support from the donor agency is terminated.[12] • After initial funding or other impetus is removed.[8] • After their adoption and implementation has been completed.[58] • After the active implementation phase is completed at each site.[61] • Emerges from and succeeds innovation implementation.[59]	• Often may require a year or more.[23]	• Over a long period of time.[37] • Over time. [34, 45] • Extended period of time. [12] • Period appropriate to a given context.[33, 54] • Long enough to produce desire effect.[44] • Period of time appropriate to a given situation.[59]

*All the concepts were extracted literally from their definition.