RESEARCH

Impact of a Management Course for Pharmacists on Their Behaviors and the Health System’s Capacity

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Objective. This research aims at understanding the impact of a continuing education course for pharmacists, called Pharmaceutical Service and Access to Medicine Management (PSAMM), which focused on the development of management competences in a public health system.

Methods. Data collection happened through individual interviews with pharmacists who work in the Brazilian public health system, focus groups, and records of researchers’ observations. The analysis was based on models of learning and training evaluation theory.

Results. The results show evidence of outcomes in all levels: proximal outcomes on students’ knowledge, skills, and attitudes; behavioral changes; and programmatic outcomes in the organization and management of the health services, promoting the recognition and integration of the pharmaceutical division in the health departments in municipalities and states. The inputs (course’s content, structure, and in-service hands-on activities) were directly linked to the outcomes reported by the participants, overcoming some of the barriers to using knowledge and skills on the workplace.

Conclusion. The offer of a well-structured course with active methodologies of practical intervention such as the PSAMM has a positive impact on pharmacists’ behavior and contributes to the capacity building of organizations in which they operate.

Keywords: continuing education, management, training evaluation, impact, pharmacist

INTRODUCTION

Management education and training is essential in building health management capacity. It will continue playing an important role in the future, supporting health systems to meet specific and sustainable health-related objectives. However, there are shortcomings in the training of professionals in management positions, especially in complex health systems. Health systems lack people with the managerial competences that match their responsibilities.

The literature discusses various management competences, such as those related to people, relationships, rules and policies, and decision making processes. To make sure that health managers have the appropriate competences, the WHO proposes integrated actions. These include the definition of expected competences, setting of trainings, assessment of the trainings, and the establishment of an accreditation system. However, there is still a management competence gap in the health system as it has been vastly reported.

The International Pharmaceutical Federation defined four competency clusters of professional competences desired for pharmacists; management competences constitute one of these clusters. They pertain to the management of teams, supply chains, services, budgets, and procurements. Communication, leadership, and interprofessional collaboration are some of the other competency domains established by the Federation. Nevertheless, the literature mostly focuses on leadership training for and competences of physicians, nurses, and public health specialists.

In Brazil, the management competences are crucial for pharmacists working in the public health system (Sistema Único de Saúde - SUS). The SUS offers access to health services, including access to medicines, to all the population; the services are integrally financed by public funds. About 70% of all the healthcare procedures in the country (in primary care, specialized care, and hospitals) are performed in public health facilities. Unlike other health systems, in the SUS the medicines are selected, acquired, distributed, and dispensed in public health centers. Pharmacists are responsible for managing the supply chain of medicines and pharmaceutical services in about 90% of the pharmaceutical divisions of the health departments in the 5,570 municipalities. This requires complex, multilevel, and intersectoral actions which respond to about 16% of the costs of the health system.

The Brazilian Ministry of Health requested to a public founded university a specialization course to train pharmacists working in the SUS. The course was called Pharmaceutical Service and Access to Medicine Management (PSAMM) and took place between 2010 and 2016. PSAMM's desired learning outcomes were to develop management competencies in pharmaceutical services, including social engagement, professional autonomy, and commitment to...
achieve the best results to the National Pharmaceutical Policy and the health system as a whole. The course was the first large scale training for pharmacists offered by the government.

The course was free of charge and used a blended approach, including e-learning and in-service training activities. The course was offered to pharmacists of all the regions of the country. The 2,500 pharmacists that became students in this course worked in 1,068 (19.1%) of the 5,570 Brazilian municipalities.

The students were linked to 31 regional centers created for the course, in 17 states. These regional centers were established in partnership with 20 universities. 132 tutors were selected to work in these centers. All the tutors were pharmacists from the same geographic region of the centers with experience in public health and were trained in tutoring and e-learning methods. They were hired by the University and supervised by the professors. Each tutor was responsible for mentoring 25 students per class for 14 months.

The workload of the course was of 375 hours, including both online and in-service hands-on activities. Other asynchronous activities used were forums, questionnaires, directed studies, and reports. There were three or four face-to-face meetings, in which students took part in pedagogical activities, had their learning assessed, and presented their Capstone Projects.

During the course, students performed an in-service training activity called Operative Plan, based on the principles of Strategic Situational Planning (SSP) by Carlos Matus. In this activity, the pharmacists were directed to apply management concepts, practices, and tools to the diagnosis of services, identification of problems, and establishment of goals. Then, they developed a participatory planning for solving problems in their real-life workplace. The pedagogical and theoretical instruments guided students to a technical, political, economic, and social analysis of the work processes, involving other professionals, managers, and patients. The development of the plan required the organization of workshops as well as the mobilization of multiple resources. Their Capstone Project was reporting on and analyzing the development of the Operative Plan.

Assessing the impact and efficacy of the actions of continuing education (CE) in health as a part of the continued efforts of health system’s capacity building is crucial. However, such task has proven to be a challenge. The assessment of educational strategies in health must comprehend not only the evaluation of knowledge, skills, and attitudes, but also the evaluation of behavioral changes in the professional practice as well as the concrete outcomes in the health services. Impact assessment is understood as the assessment of long-term outcomes that can be attributed to a given intervention, in which the measurement of impact does not happen immediately after the educational intervention and the skills provided by this intervention are kept over time.

The PSAMM aimed at improving the management capacity of pharmaceutical services in the public health system. Taking into consideration the regional diversity of the Brazilian municipalities and a significant decentralization process of the management and organization of services, it is to be expected that the impact of an educational intervention such as PSAMM is felt in different ways in the target audience (pharmacists) and in the health services. This article aims at describing and understanding what impacts can be achieved through an education course (the PSAMM course) on the development of management competences in the public health system; it does so from the perspective of pharmacists who work in the public health system and were students in the course.

METHODS

Data Collection happened through individual interviews, focus groups, and records of researchers’ observations about the characteristics of the interviewees’ municipalities and workplaces. It happened between the months of August and October of 2018 (on average, three years after the pharmacists had finished the course) in 10 states across the country. The criterion for the selection of the states for the data collection was the density of resident students. The interviews took place in the state capitals and, whenever possible, in one smaller municipality in each state.

In each state, 10 students were selected for the focus groups and three to be individually interviewed. The students were randomly selected from the list of students from each state. They were assigned to the interviews or to the focus groups according to their availability to participate in the given activity. The students were contacted by phone and e-mail. Whenever necessary, new students were randomly selected and contacted until the desired sample number was achieved.

The focus groups helped identify the regional specificities, which were important in informing the interviews and the visits to the workplaces. Guiding questions were used to address topics like the pharmacists’ experience with the training process in the context of working in SUS as well as the impact of the course for them and for the health services.

There were 10 focus groups in the capital cities that lasted for around 1 hour and 30 minutes each. Each focus group had an average attendance of six participants. The focus groups were led by the researchers. Some participants were invited to be interviewed individually to deepen some themes if during the focus group the need for such action became evident.

The in-depth interviews took place in the pharmacists’ workplaces after written informed consent had been given. In order to inform the investigation, researchers analyzed the interviewee’s Operation Plan documents and
Capstone Project before each interview. A semi-structured interview script allowed for the interviewee to relate their experiences. Interviewers used the script to keep the interviews focused while also allowing for free and spontaneous answers. The interviews addressed topics such as the choice of attending the course, the activities and classes in the course, and the identification of changes in professional practices and work processes due to the course. 31 interviews were conducted in 14 municipalities.

All focus groups and interviews were recorded and later transcribed. To safeguard participants’ identities, they were identified in the individual interviews by the letter E – for “interview”, in Portuguese – followed by the acronym for their geographical region (EN – interview conducted in the North region, ENE – Northeast, ECO – Center-West, ES – South, ESE – Southeast). Focus groups were identified as GF – for “focus group”, in Portuguese – followed by a number to differentiate the ten groups, eg, GF1.

Two researchers reviewed all notes from the field, transcribed audio-recordings, and read these materials repeatedly before generating an initial codebook. This allowed the researchers to gain a holistic understanding of the data. They increased their familiarity with the manifest content as well as with the latent one. Inductive and deductive approaches were used to conduct content and thematic analyses: identification of all relevant concepts and themes; indexation of highlighted excerpts by theme and correlation with others; rearrangement of the highlighted excerpts, taking into account their contexts and specificities, in a coherent and understandable flow; mapping of the concepts, scope, and nature of the studied phenomenon; attempt to associate themes in order to build an explanation for the findings, connecting them to a theoretical framework. The construction of the general categories is based on the framework presented in Figure 1; the themes were identified inductively from the analyzed material.

NVIVO 10 was used to manage the data during the coding process and help organize themes. The highlighted excerpts per category were indexed and, considering their contexts and specificities, selected to exemplify each category.

The design of this study considers the impact assessment of an educational strategy as the assessment of the long-term outcomes that can be attributed to a given intervention. It was based on models from Kirkpatrick’s learning and training evaluation theory, Coons and Hanson’s evaluation hierarchy in CE, and Mutale e collaborators.

By the end of the course, the pharmacist was expected to have acquired: knowledge about management and pharmaceutical policy; self-confidence in developing management functions; motivation to work; and improved skills and behaviors that increase the managerial capacity of pharmaceutical divisions. These changes in knowledge, skills, and attitudes (level 2 in Kirkpatrick’s and Coons and Hanson’s models) express the impact in the subject targeted by the intervention. This subject, imbued with these changes, is ready to act strategically and express behavioral changes in practical ways (level 3 in Kirkpatrick’s and Coons and Hanson’s models), which will impact the service. When there is behavioral change, the subject is competent to develop the praxis, promoting transformations in their reality and in the outcomes of the service (level 4 in Kirkpatrick’s and Coons and Hanson’s models) (Figure 1).

The analysis’ themes in each level were identified according to indicatives from the reference literature on management and management competences as well as the results obtained from the field research. The bedrock of the field results were the subjects’ observations and perceptions about the training and its impact in the service (deductive and inductive analysis).

This study obtained permission from the Ethics Committee in Research with Human Beings (CAAE: 46912815.0.0000.0121). All the participants of the research signed a Free Informed Consent Term.

RESULTS

There were 31 interviews and 10 focus groups. The participants were 65 women (78.3%) and 18 men (21.7%). Six participants both gave an individual interview and participated in a focus group. The participants’ profile is presented in Table 1.

The sample’s profile presented in Table 1 is similar to the profile of the 2,500 students in the course: 77% were women, 67.6% of the students were between 25 and 39 years old at the time of finishing the course, 75.3% worked in the municipal sphere, and 77.5% were employees. The 10 states selected for the research had the highest concentration of students in the course (70%).

More than 80% of the sample of pharmacists remains in the same workplace about three years after the conclusion of the course.

The structuring of results is presented in four categories: inputs (Table 2), proximal outcomes (Table 3), behavioral outcomes (Table 4) and programmatic outcomes (Table 5), according to the framework presented in Figure 1 and the identified major themes that emerged from interviews and focus groups.

The main characteristics of the PSAMM course (program inputs), according to the former students, are presented in Table 2. Eight themes emerged: course theme, quality of the teaching materials, gratuitousness, didactic-pedagogical project, infrastructure (mentorship, regional centers), course organization adapted to the regional needs, reliability of the providing institution, and offer of the course in the e-learning modality.
The PSAMM course was not compulsory but a choice of the professionals, sometimes stimulated by their bosses. The students report that the search for the course was motivated, in particular, by the theme and the reliability of the providing institution, as presented in Table 2.

The e-learning modality is pointed out as strategic for CE, as it allows for departures from the workplace for a very short period, thus guaranteeing the continuity of services. The PSAMM course, because it was mostly distance learning, provided interiorization of training by reaching 19% of Brazilian municipalities.

The public funding of CE is acknowledged by the students as an important factor for their professional qualification. The hands-on activities, such as the Operative Plan, were highlighted by students as they allowed for an in loco exercise involving the other actors of the service. They also granted the opportunity of a practical application of the knowledge acquired in the course.

The proximal outcomes are presented in Table 3, in seven themes: knowledge gain, increase in confidence, communication capacity, negotiation capacity, acknowledgement of the importance of interprofessional collaboration, leadership capacity, and change in the understanding of the role of the manager and of management.

To many students, the course brought technical qualification, not only in management, but also in the fields of pharmaceutical policy and public health. Albeit they work in SUS, many participants were not fully trained on the system’s organization and the pharmaceutical policy and services.

The training provided the pharmacists with an increase in their self-confidence. The participants showed during the data collection their self-confidence as managers due to the acquisition of the theoretical knowledge and practical skills. As they had to engage other actors in the development of the Operative Plan, each pharmacist needed to develop communication skills. They recognized the importance of listening to others, while valuing and acknowledging their experience. The students report a perception of change in their communication capacity.

The evidence shows that the students use the tools and the theoretical knowledge learned in the course in negotiations with managers, the general population, and other actors, such as the local legislative power.

The pharmacists point out that the course promoted the acknowledgement of the importance of the interprofessional collaboration and of the feeling of belonging to the team. They also state they see themselves as leaders after taking the course. The management education brought to the students an understanding of a manager’s expanded role. The results show the course promoted the development of skills that favor the leading of the team and confidence in the decision-making.

The five themes of the analysis of behavioral outcomes are presented in the Table 4: networking, negotiation with hierarchical superiors, interprofessional collaboration, actions integrated with the healthcare network, and actions integrated with social control.

Students presented evidence of change in the work processes due to the acknowledgement of the importance of teamwork. An approximation with the working team, in specific with the nursing team, was observed in the praxis of the service. The betterment of technical procedures, for instance, the composing of a public notice, was a result of the incorporation of other professionals to the processes led by the pharmacists.

Sometimes, to implement the actions proposed in the Operative Plan, the pharmacist had to raise awareness of the managers who were hierarchically superior to them, like the head of health departments. The students report that the course qualified them to do so, which resulted in concrete changes in the health services.

The participation in conferences and the discussion of the pharmaceutical policy with the popular councils of health were pointed as a result of the awareness stemmed from the course.

In the Table 5, the four themes of the analysis of programmatic outcomes are presented: recognition and integration of the pharmaceutical division in the health department, sustainability of the management actions, changes in the process of work identified during the course, and changes in the process of work identified after the course.

The students point out that the management education and the development of the Operative Plan promoted a recognition of the pharmaceutical division by other professionals and service users. The valorization of the service and the results generated by the pharmaceutical policy and services make the implementation of changes in the work process easier.

Factors connected to the sustainability of the management results were identified. For instance, the active participation in the construction of their Municipal Health Plan. There are plenty of changes in the work process directly connected to the course, stemmed from the Operative Plan or other proposed activities.

The inclusion of planning in the pharmaceutical services management is acknowledge by the students as a result of the course that has led to the effective mobilization of resources and to concrete results to the health services.

**DISCUSSION**

The consolidation of the pharmaceutical policy as part of the public health system in Brazil takes place from the years 2000 on. The decentralization of the management of this sector to the municipalities started to be consolidated in 2004. Therefore, this area of knowledge, fundamental for pharmacists working at the SUS, was not established in the framework of competences for the training of pharmacists until this period. The development of knowledge in the field was pointed out by the students as one of the proximal outcomes (Table 3).
Analyzing the themes that emerged from the field findings, which were categorized as proximal and behavioral outcomes (Tables 3 and 4), a very close relationship with the expected competences of a health manager is observed. The experiences and facts reported by participants demonstrate the acquisition of knowledge and development of skills that assist them to perform their roles as managers. This professional, imbued with this knowledge and new skills, already expresses in their report the resulting attitudes and behaviors.

The education in pharmacy has been predominantly of a technical and biological nature, without experiences of interdisciplinary and social practices. During the course, especially the Operative Plan, pharmacists needed to establish dialogue with other actors, such as professionals, managers, and patients, developing new skills in the process. The students' reports point to a change in the understanding of the role of the manager and management. It is very expressive the recurrence in the use of the term "putting out fires" to describe the former function of the pharmacist. There is a change from professionals who were in the service to solve the problems that arose to professionals who now recognize themselves as managers (Table 3). And now, as managers, they start to plan their actions and no longer be guided by the problems.

Negotiation is inherent to the role of a manager, especially in the public health service. The Brazilian health policy establishes, in the Constitution of the Federative Republic and other legal marks, that democratically elected popular councils in several spheres of management (federal, state, municipal, and district/local) are participants in the management of the SUS. However, it is a very recurrent practice that health managers do not acknowledge the role of popular councils and do not act in partnership with these players. The situations reported by the students bring about experiences involving negotiation (Table 4 and 5), with both senior managers and social control. This was instigated by the course. It illustrates different attitudes that, considering the principles and organization of SUS, constitute values that improve management capacity and contribute to the development of SUS.

The change in the behavior of pharmacists expressed in Table 4, as managers who negotiate, who establish relationships with other professionals, who work as allies of social control, who expand the scope of action of the pharmaceutical sector to the healthcare network, leads to the understanding that the pharmaceutical division of these institutions is now effectively integrated in the health policy.

The reports of the establishment of planning of the pharmaceutical division officially within the Health Policy of the municipalities express the change in the management of pharmaceutical policy and practices. Such planning was built in an integrated and participatory way and was led by the pharmacists. With the insertion of the area in Health Plan, the management went from "putting out fires" of recurrent problems to planning, executing, and guaranteeing the sustainability of results. As part of the Municipal Plan for the following years, the actions of the pharmaceutical division gain in sustainability, as demonstrated in the Table 5.

Immediate outcomes in health services organization and capacity building of the pharmaceutical division can be exemplified by ENE5. In the Operative Plan, the problem prioritized by the team was the shortage of medicines and the objective was the regular supply. In understanding the problem during the workshops, it was found that sometimes the medicine had already been purchased by the municipality, but it was not available at the health centers because of the logistics of delivery dependent on trucks from the central warehouse. The negotiation with the managers was part of the development of the Plan and resulted in the availability of a car for the pharmacy.

The course provided practical soft tools to face daily challenges. In this case, the problem of the shortage of medicines was solved, impacting on the access to medication by patients in the appropriate time and consequently ensuring the results of health treatments. It is a concrete example of the impact on the health of the patients who depend on the Brazilian health system, which serves more than 70% of the Brazilian population.

Despite examples of important impacts on the practice of services, it was possible to observe that some pharmacists faced great barriers to transfer their training into practice, as some authors have already described. Rouse highlights that the environment must be receptive to transfer knowledge and skills into practice and barriers might be present, such as the lack of opportunity to use one's learning or resistance from peers to the use of new approaches. Thus, the training needs to provide the pharmacist with the resources to overcome these barriers. Such resources include the ability to engage and sensitize other professionals in the service.

The pedagogical strategy adopted for a practical in-service activity allowed the pharmacists to create the environment to use their newly acquired skills. However, the conditions found in each work environment were very diverse. In some of them, the barriers placed against the intervention of pharmacists in the management of the service did not allow the achievement of programmatic results. In these cases, the results were obtained only on the proximal and behavioral spheres. The barriers observed were, in particular, those of a political nature, such as the pharmacists having to leave their workplaces, the lack of support for the implementation of changes in the workflow, and the fragility in the hiring process of pharmacists. It is of essence to remember that the municipal health services are under the direct control of governing authorities who are elected every four years. This makes their administration subjected to political interests and crisis.

The students highlight some characteristics of the course that are important for obtaining the results (Table 2), in specific the theme which was very close to the reality of the services they provide. The infrastructure with regional centers and local tutors allowed the activities to be carried out with the support of professionals working in each
region. With this structure, the course, despite having a single content to be offered throughout the country, allowed for adaptation to local needs.

The execution of the Operative Plan is clearly linked to the outcomes of the course. This in-service hands-on activity created the opportunity of a real life practice of the content learned. The students could also use management and planning tools in the reality of the services in real time during the course (Table 5). The execution of the Plan in stages allowed the student to act in the service and then reflect upon their actions with the support of the instruments and the tutor.

Participants report that they were already conceptually familiar with the SSP. Some had already received training on it. However, it was the pedagogical strategy chosen for a mandatory activity of an intervention in the service, with real-time and long-term tutoring, that provided the development of management skills in the pharmacists in a lasting way. This finding strongly agrees with the authors that highlight the importance of hands-on activities in CE and indicates the core condition for training professionals in management capacity.

As limitations, it can be pointed out that the study design did not include a comparison group; quantitative indicators were not used for the impact analysis on services, and the results are obtained only from reports of facts by the pharmacists themselves and observations from the field researchers. The complexity of the examined outcomes makes it difficult to isolate the direct impacts of the course and other factors related to the students and the institutions. However, the force of the facts reported indicates the possibility of extrapolating the conclusions to the impacts on the services offered to the population.

CONCLUSION

The evidence suggests that the attending the course resulted in increased knowledge, skills, and individual motivation, with reports from participants showing greater confidence in management practices due to the use of pedagogical strategies tailored to organizational contexts.

Pharmacists’ management training generated impacts on health services. It is evident from the results presented that the level of impact generated in the services is related to the pedagogical strategies adopted in the training process. However, the level of impact generated in the services is diverse in the pharmacist and in the services, due to political issues and significant regional differences.

The tutored in-service activities allowed for proximity to the local realities, overcoming some of the barriers to using knowledge and skills on the job pointed out by Rouse. The development of skills related to negotiation, communication, leadership, and attitudinal changes are evident. They demanded from the students the identification and understanding of real problems of the services. These activities promoted, in some cases, immediate impacts on services through the development of the Operative Plan itself, as well as post training impacts, with the incorporation of SSP into health services.

The offer of well-structured courses with active methodologies of practical intervention in health services such as the PSAMM have a positive impact on pharmacists’ competencies and in the management capacity and can contribute to the capacity building of organizations in which pharmacists operate. The impact can be observed in concrete and lasting changes in services related to the promotion of access to and rational use of drugs.

Considering that the impact of CE found by this research was of varied levels in professionals and services, it is important to advance the studies on the topic and develop methods that can shed a light on what are the contextual and educational conditions that favor a bigger or smaller impact of CE on pharmacists and health services.

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| Variable                                                                 | Profile   |
|------------------------------------------------------------------------|-----------|
| Gender (n; %)                                                          |           |
| Female                                                                 | 65 (78.3) |
| Male                                                                   | 18 (21.7) |
| Age range (n; %)                                                       |           |
| 30-39                                                                  | 25 (30.1) |
| 40-49                                                                  | 32 (38.6) |
| 50-59                                                                  | 22 (26.5) |
| 60 and above                                                           | 4 (4.8)   |
| Governmental sphere (work) (n; %)                                      |           |
| Municipal                                                              | 48 (57.8) |
| State                                                                  | 24 (28.9) |
| Other                                                                  | 11 (13.3) |
| Labor relationship (n; %)                                              |           |
| Government Employee (with job stability)                               | 66 (79.6) |
| Outsourced                                                             | 8 (9.6)   |
| Other                                                                  | 9 (10.8)  |
| Continuance in the workplace after finishing the course (n; %)         |           |
| Yes                                                                    | 69 (83.1) |
| No                                                                     | 14 (16.9) |
Table 2. Analysis of PSAMM Course Program Inputs from the Students’ Perspective

| Program inputs                       | Quotes                                                                                                                                 |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Course theme                         | "A management education focused on pharmaceutical management, focused on the reality of SUS, is a theme that was not discussed in any form in my pharmacy undergraduate course" [GF09]  |
|                                      | "The best part of the course, that which I could take away and use in my daily practice was the management competences that I use today working with a group of 130 people." [ESE4]  |
| Quality of the teaching materials    | "I liked the teaching material very much. It is a material that I use to this day, to study, to teach classes. I’ve used it many times. That’s a point that I consider extremely positive in the course." [GF09]  |
|                                      | "I think that the course material is of very high-quality. The written materials, the videos produced, the interviews, really of very high level." [ES1]  |
| Gratuitousness                       | "Many classmates did not have a specialization degree and the main complaint was paying for it, because the salaries were very low." [GF06]  |
|                                      | "For the first time in my life, I would have a qualification without having to spend money, in the field in which I worked." [ENE9]  |
| Didactic-pedagogical project         | "If it was only theoretical [the course] wouldn’t have accomplished the goals as it did. For theoretical content you can learn in any specialization course." [ENE10]  |
|                                      | "Some of the tools that we came across in the course I already knew of, but I was only able to apply them and use them in real life in this course." [GF05]  |
|                                      | "As the course went on, I did the same, implementing that that we had been discussing in the modules of the course." [ENE7]  |
|                                      | "It pushed us to build a way, make a diagnosis, discuss with all stakeholders, design proposals, revise proposals, listen. Apply the management tools." [ENE6]  |
| Infrastructure (mentorship, regional centers) | "We had very good support here in our town. The tutors and regional coordinators would help us when we had difficulties." [EN5]  |
| Course organization adapted to the regional needs | "And I thought the most interesting thing was that you had this act of care with the students [providing the materials in a DVD/flash drive], understanding the situation we live in with the difficulty to access the internet." [GF01]  |
|                                      | "I was supervising in indigenous villages. The internet was a big nuisance." [GF01]  |
| Reliability of the providing institution | "I couldn’t miss the opportunity of taking a specialization by the Ministry of Health and the Federal University of Santa Catarina." [ENE9]  |
| Offer of the course in the e-learning modality | “Wherever I had idle time, I would open my computer and study right there.” (ECO5)  |
|                                      | “You have family, job, sometimes more than one job, you have to organize your schedule.” (GF04)  |
|                                      | "It’s necessary to have discipline, being a mother is a complex thing to manage. I would tuck the boy in and then I would study." [ENE8]  |

SUS: Brazilian Public Health System (Sistema Único de Saúde - SUS)
| Theme                                                                 | Quotes                                                                                                                                                                                                 |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Knowledge gaining                                                    | “The question of the integrative and complementary practices, for instance, things that I didn’t know were available in the SUS. I didn’t know and I worked in the SUS. Because of the course I started to identify this demand in the service.” [ESE1]  
“What it brought to me was the knowledge of the laws and what tools I had to work with. It was empowering.” [ECO4] |
| Increase in Confidence                                               | “This course brought me greater confidence to debate, discuss with the technical team. This course brought me confidence to offer a trustworthy solution.” [GF10]  
“Having a specialization in pharmaceutical management qualifies you to even discuss with the bosses. I have a management education. He [the boss] knows that I am better qualified.” [GF10] |
| Communication capacity                                               | “The Operative Plan made me see how important it is to learn to listen. Listening to people was the highlight in the construction of the Operative Plan.” [ENE7]  
“We begin to see other possibilities, to listen to others. In management, it is too easy to make a decision disconnected from reality, but when we go to the service and look at the factual reality, we notice the need to put ourselves, at least a little, in other people’s shoes.” [ENE8] |
| Negotiation capacity                                                 | “Here, as it is a very small municipality, I have easy access to the city councilors, to the mayor and I am part of the health council. The course opened my eyes to where we need to go.” [ES5]  
“This was for me the greatest merit of the course, it was teaching me what to do with the information that I have and that we can convince and we can show to [the management].” [GF01] |
| Acknowledgement of the importance of interprofessional collaboration  | “Today we work like this, involving other actors of the service in the management. It’s no use for me to have a brilliant idea if I’m the only one who believes in it, right?” [ESE1]  
“They [professionals of the health units] showed me a reality that I, when I was there in the secretary, hadn’t seen, I didn’t know it for I was alone.” [ECO4] |
| Leadership capacity                                                  | “I stopped being the boss to effectively be their manager, helping them, showing that I was there to make everybody’s work process better.” [GF08]  
“I went from being the pharmacy girl to effectively being the pharmacy service manager.” [GF08] |
| Change in the understanding of the role of the manager and of management | “We stopped putting out fires on a daily bases to effectively become a work of management, of planning, in which you, according to the scenario in front of you, starts to program, plan, and look ahead in that scenario.” [ESE5]  
“We do not discuss only pharmaceutical services and medicines anymore; we discuss a networked of the pharmaceutical sector.” [ENE5]  
“I didn’t see myself as a manager, I was a person putting out fires, without any idea of how to solve things and without anybody to share the burden. We have always worked a lot. The course was a landmark in my workflow.” [GF10] |

SUS: Brazilian Public Health System (Sistema Único de Saúde - SUS)
**Table 4. Analysis of PSAMM Course Behavioral Outcomes from the Students' Perspective**

| Theme                                | Quotes                                                                                                                                                                                                 |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Networking                           | "I met other people. I exchanged clinical protocols with pharmacists of other municipalities." [ENE10] \  
                                         | "To this day I keep in touch with some classmates from the course. We have a WhatsApp group; we answer each other’s questions." [ECO3]                                                                 |
| Negotiation with hierarchical superiors | "The course provided the tools to negotiate with any management that comes to power. We will never have a perfect management so sometimes we survive, and sometimes we present the proposals that we have in store." [GF01] \  
                                         | "To better negotiate with the suppliers, I needed access to the City Hall’s financial system. So, I negotiate the permission to access with the health department and the management secretary.” [ECO3] |
| Interprofessional collaboration       | "We are pharmacists, and we work with nutrition, and we had never consider looking for a nutritionist to write the proper description of a product in an auction notice. So, we established a partnership with the nutritionists of the companies that already took part in the process to help us with the reference terms.” [ECO3] |
| Actions integrated with the healthcare network | "It was created a service of patient orientation with the social workers and an algorithm that guides them to have an idea where to send the patients. If it is a primary care demand, for instance, they send the patient to the municipal sphere institution, if the demand is for a specialist, they send patients to the unities where the access is organized." [ENE2] |
| Actions integrated with social control | "Motivated by the course, we went to a health conference where we introduced a guideline of pharmaceutical policy and services and two participants were elected health counselors. The course motivated this interaction, this participation in the management processes. " [GF07] \  
                                         | "I ended up working a lot with social control. Today we have the recommendation of the participation of a pharmacist in the local social control. The only thing that didn’t allow us to go back light-years was the social control.” [ESE1] \  
                                         | "Participating in public audiences, participating in the Municipal Health Plan, participating in committees, all of this came after the course.” [ES3] |
| Theme                                                                 | Quotes                                                                                                                                                                                                                       |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recognition and integration of the pharmaceutical division in the health department | "We used to go to the administrative meetings but when there was a more technical meeting sometimes the pharmacy was forgotten. So, we make them remember us and started to be more informed of the routines of the unit, of how things worked the interaction with the other professionals improved very much and this was also a benefit to us. To the service." [ESE4]  
"There would be a power shortage in the unit, nobody would inform the pharmacy sector and we would lose the insulin supply. Not anymore, today, the technicians always inform us if there will be a power shortage because they know that our sector is fundamental." [ENE8]  
"The nurses come to the pharmacists much more than before. We used to be known as “bureaucratic”. Today, we are seen as partners. And this has brought results, today we have a pharmacist in all working hours of the hospital." [EN4] |
| Sustainability of the management actions                              | "We elaborated a part of the Municipal Health Plan focused on the pharmaceutical policy. We got all sectors to participate in the construction of the Municipal Health Plan and to be engaged in the execution of what was in the Plan. This brought visibility and autonomy to the area." [ENE7]  
"We have recently completed our municipal planning using the methodology we learned in the Operative Plan. We sat down with the whole team, building the planning, so that the chapter of pharmaceutical policy was built in the Municipal Health Plan." [ENE5] |
| Changes in the process of work identified during the course           | "I think 80/90% of the problems we had that were due to lack of knowledge were solved. Only that which depends on the manager, the financial department, the health council has not been solved. But everything that depended on the pharmacy sector, we’ve got 100% solved." [EC03]  
"We did not have a Pharmacy and Therapeutics Commission. With what I learned in the course, I set up the commission. I invited doctors and nurses, everybody participated." [ES3]  
"In the past we didn’t have a stock in the unit for the patient who started to use insulin. As a result of the Operative Plan, we changed the process and now the patient who is diagnosed today has immediate access to the medication." [ENE8] |
| Changes in the process of work identified after the course            | "We applied the Operative Plan methodology years later in the management for building the computerized management system of the pharmaceutical division and the services. Being trained in a methodology helps you wherever you are." [ESE1]  
"I used the SSP techniques that I learned to computerize the entire execution of specialized attention services. Our planning was all computerized." [ECO5]  
"With all the data and planning of the pharmacy sector, we were able to convince the manager that the pharmacy sector needs the car to deliver the medicines. So, if I need to make some delivery somewhere, a medicine that was missing, I have a car available all week." [ENE5] |

SSP: Strategic Situational Planning
Figure 1.