

SWOT-TOWS analysis to improve home health waste management during the COVID-19 pandemic

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Short Report

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Abstract

Home health services are of great concern, as infectious diseases can be transmitted not only to residents but also to home health care workers. Worldwide, there are few studies related to home health waste management. Before the COVID-19 pandemic, a survey on waste management from home health care services was carried out between October and December 2019. In the survey, all 67 stakeholders (health teams and caregivers/patients) involved in home health care services in the municipality of Caruaru (Brazil) were interviewed. The collected data showed that the home health care and waste management practices identified during field visits would be severely impacted by the pandemic. In this context, a SWOT analysis and TOWS matrix were employed in the analysis of home health care practices; in this work, those practices include care provided by health teams and patient caregivers, encompassing the handling of waste resulting from health care. The results show the need to promote strategies to improve home health care services to preserve the health of professionals and patients in the pandemic and post-pandemic periods. In this context, care related to the transmission of COVID-19 has been ratified, generating additional actions for the proper management of health waste.

Main Text

Home health care service (HHCS) is recognized by health systems as a resource for assisting patients with difficulties in accessing health care service environments. Prevention, rehabilitation and health care are increasingly provided by in-home professionals due to the aging population, the increase in chronic degenerative diseases and the number of people in need of continuous care (Olsen et al. 2019; Ritchie and Leff 2018). HHCS reduces the congestion of hospitals, promotes greater turnover of occupied beds and improves patients' quality of life (Di Mascolo et al. 2017). However, during the COVID-19 pandemic, the traditional provision of the service needs to be reformulated to protect health professionals, patients and their families.

The high transmissibility of COVID-19, especially at the onset of symptoms, suggests that generalized social distance measures are the most effective method of prevention (Cheng et al. 2020). Anyway, further research is still required to understand the form of transmission of this illness among humans (Rastogi et al. 2020). However, one of the characteristics of the HHCS is the placement of health teams in homes, following a route in which several families are visited in the same day. Even with the use of new personal protective equipment (PPE), the approach of teams and visiting routes must be rethought to avoid contagion between patients and teams, changing all the regular functions of HHCS. In developing countries, these changes will result in additional costs to already precarious HHCSs that suffer from a lack of medicines, materials and PPE as well as inadequate waste management. In countries such as South Africa, Ghana and Botswana, waste from HHCS is discarded along with ordinary household waste, burned or buried (Kang'Ethe 2008; Udofia et al. 2017; Zikhathile and Atagana 2018).

Before the COVID-19 pandemic, a survey on HHCS waste management was carried out between October and December 2019 in the municipality of Caruaru (Brazil). In addition to waste management, the

researchers also addressed the investigation of HHCS work routines and procedures of the teams and patient caregivers through interviews and the application of structured questionnaires to all stakeholders involved. During the analysis of the results, amid the habit changes imposed by the pandemic of COVID-19, the authors realized that the practices of care and waste management identified in the field visits have been severely impacted, and modifications will be necessary. In this context, this work is intended to identify ways and means of converting the possible threats presented by the pandemic into opportunities – transforming weaknesses into strengths—in relation to HHCS practices. The practices considered in this work include home care provided by municipal health teams and patient caregivers and the handling of waste resulting from home care.

The HHCS addressed in this research is a public service provided by the Government and available in all Brazilian states, totaling 1,157 home care and support teams (MS 2020a).

In Brazil, there are only two studies on home health waste management Alves et al. (2012) and Siqueira and Consoni (2008), both in Portuguese.

Structure and operation of home health care services in Caruaru

The municipality of Caruaru (Fig. 1) has an area of 920,610 km² and an estimated population of 361,118 (IBGE 2019). The municipality has three HHCS units, as shown in Fig. 1. HHCSs are responsible for patient care in urban and rural areas and adjacent districts. Each HHCS (HHCS 1, HHCS 2 and HHCS 3) has a multiprofessional team formed by a doctor, a nurse, a physiotherapist and three nursing technicians.

These teams carry out weekly visits, attending four to five patients per day. The services provided include wound dressing, medication administration, collection of material for exams and palliative care.

As the entire sample was available during the time frame of the research, it was possible to interview 100% of the stakeholders (health professionals and caregivers/patients) involved in the HHCS. The number of patients varied depending on the flow of people who are discharged or die. During the survey period, 49 patients were being visited by the HHCS. Table 1 describes the sample universe of research.

One of the criteria for inclusion of patients in HHCSs is the presence of caregivers in the patient's daily activities. In this context, 77.6% of caregivers stated that they work exclusively at home. The majority of caregivers were female (79.6%) and aged over 50 years (55.1%).

Complementary training and working time for each HHCS professional is described in Table 2. Each HHCS had three professionals with university degrees and three technical professionals. All professionals with degrees mentioned specializing in professional practice areas, except for one nurse (HHCS 1). Regarding training in health care waste management, less than 25% of health professionals

(nursing technicians and nurses) had received training within the past 5 years, even though they routinely deal with this type of waste.

Concerning experience in home health care, all professionals had more than 18 months of experience, except for a doctor, a nurse and a nursing technician. The information in Table 2 was especially important in the formulation of the work strategies presented in the following section.

Table 1. Sampling of research participants

Home Health Care System	***** Professionals	Caregivers / Patients	Total
HHCS 1	6	15	21
HHCS 2	6	16	22
HHCS 3	6	18	24
Total	18	49	67

In addition to the questionnaires, the survey was conducted with on -site visits and checks. With the information provided by the respondents, a SWOT analysis and TOWS matrix were employed in the analysis of home health care practices.

Table 2. Complementary training and working time for HHCS professionals

Professional	HHCS1			HHCS2			HHCS3		
	Complementary training	Working time in HHC* (months)	Training in HWM** (within the past 5years)	Complementary training	Working time in HHC* (months)	Training in HWM** (within the past 5years)	Complementary training	Working time in HHC* (months)	Training in HWM** (within the past 5years)
Doctor	Pediatrics	72	No	Master's degree in education	180	No	Occupational medicine, rheumatology and dermatology	2	No
Nurse	-	60	No	Urgency and emergency	4	No	Adult and pediatric emergency, neonatal ICU	24	Yes
Physiotherapist	Dermato-functional physiotherapy	72	No	Manipulative physiotherapy and	22	No	Osteopathy and manual/	19	No
				multiprofessional residency in public health			intensive therapy		
Nursing technician 1	-	84	Yes	-	96	Yes	-	96	No
Nursing technician 2	-	36	No	-	66	No	-	84	No
Nursing technician 3	-	24	Yes	-	6	No	-	72	No

*Home health care

**Health waste management

SWOT analysis and the TOWS matrix

Strengths, weaknesses, opportunities and threats are abbreviated as SWOT. The SWOT analysis technique was used to identify the current internal and external environmental conditions in this context. According to Eheliyagoda (2016), this technique or approach, which originated from the business management field, has been widely applied to a broad array of disciplines. A SWOT analysis of home health waste management related to HHCSs with a focus on COVID-19 helps further our understanding of external and internal conditions these professionals face when developing strategies or action plans.

With the information obtained in the interviews, it was possible to identify four elements that make up the SWOT analysis, as follows:

Strengths: Home health care is complementary to other approaches. HHCS consists of a set of actions to promote health, disease prevention and rehabilitation in households with guaranteed continuous care (MS 2012). The service plays a strategic role in tackling the pandemic by reducing unnecessary hospitalizations and overcrowding in health facilities on an urgent and emergency basis. Although the maximum possible reduction in contact between people is a recommendation of the World Health Organization (WHO 2020), decreasing home visits in this pandemic scenario can result in worsening health of existing users and the need for hospitalization (MS 2020b). Thus, the HHCS, in addition to decreasing the demand for hospital beds for patients with severe symptoms, will also have the role of guiding users on the prevention of contagions, clinical manifestations and general care.

Weaknesses: Among the factors that contribute to the malfunctioning of health services, a lack of training is one of the most relevant. Insufficient knowledge can lead to inappropriate practices, increasing the risk of dangers and negative consequences in the short, medium and long terms (Ikeda 2014). Despite the legal obligation of training and capacity-building for teams providing health services (ANVISA 2018), more than 75% of HHCS professionals reported that they had not received training on health waste management in the last 5 years. In all HHCS, only one nurse and just over half of the nursing technicians had received training in health waste management within the past 5 years. About 40% of HHCS professionals stated that they do not advise caregivers on the management of health waste management. Regarding management practices, only sharp wastes are segregated, packed in rigid collectors and taken by teams of health professionals for joint disposal with health waste from municipal health establishments. The same practice was observed by Alves et al. (2012) at HHCS in Goiania (Brazil). Other chemical and biological wastes are not separated by health professionals or caregivers and are disposed of together with household common waste. Although hospitals are the main producers of health waste, HHCSs generate a quantity of potentially hazardous waste that, without proper management, can contribute to the risks of infections for family members and urban cleaning workers.

Opportunities: In view of the evidence related to transmissibility and mortality caused by COVID-19, a set of surveillance, preparation, management and protection measures are being carried out with the intention of reducing the risk of contamination (Adams and Walls 2020). Proper management of waste potentially contaminated by the virus is an important step in minimizing risks. In Brazil, the handling and disposal of waste with the potential presence of biological agents that may present a risk of infection are regulated by National Health Surveillance Agency (ANVISA 2018) and National Environment Council (CONAMA 2005). The COVID-19 pandemic has presented an opportunity to discuss short- and long-term changes in waste management practices worldwide (Kalina and Tilley 2020), especially in developing countries, where waste management strategies are precarious. This opportunity can result in better management of the waste generated in home health care in current and future periods. The four elements (strengths, weaknesses, opportunities and threats) are presented systematically in Table 3.

Threats: Most patients who receive HHCS are elderly and have chronic diseases; they are vulnerable to contamination or complications due to pre-existing conditions, according to the pandemic risk groups (WHO 2020). The transmission cycle of COVID-19 is short, and some studies suggest that transmission can happen even before the onset of symptoms (Bai et al. 2020; Cheng et al. 2020). Home care teams visit more than one residence per day, and caregiver-patient-health professional contact can be considered a route of transmission. Transmission may occur through direct contact between them, the continuous use of work instruments (medical record, thermometer, stethoscope) or contact with contaminated surfaces and residues, considering the time the virus remains on surfaces (MS 2020b).

Table 3. SWOT analysis of waste management in home health care services

Strengths	Weaknesses
S1: Strategic role in tackling the pandemic.	W1: Lack of training and guidance for health professionals and users regarding the risks inherent to the pandemic.
S2: Potential to suppress the demand for hospital beds for patients with acute complications from contamination by the virus.	W2: Lack of training and guidance for health professionals and users regarding health waste risks.
S3: Source of guidance for users regarding the prevention of contagions, clinical manifestations and general care.	W2: Lack of training and deficiencies in the management of health waste.
Opportunities	Threats
O1: Greater visibility of practices adopted by HHCSs with consequences for the management of health waste (possible collection of potentially hazardous waste for disposal with health waste generated in the municipality).	T1: Frequent visits to various homes can be a route of contamination between the home care service team and the user (caregiver / patient) and vice versa.
O2: Possibility of expanding the range of health care services provided by HHCS.	T2: Improper handling of potentially hazardous waste can be a route of contamination.
	T3: Lack of resources for the collection of other

According to Jasiulewicz-Kaczmarek (2016), the TOWS (threat, opportunity, weakness and strength) matrix developed by Weihrich (1982) is a commonly cited tool for structuring strategy generation. The TOWS analysis is a conceptual strategic planning model allowing for flexible formulation of an organization's strategic directions by considering future opportunities and threats and seeking to optimize the use of the organization's strengths to minimize its weaknesses. A TOWS analysis matrix was constructed to determine possible strategies that can be adopted to manage health waste generated in HHCS in the current period and after the threat of COVID-19 has subsided (Table 4).

Table 4. TOWS matrix and strategy determination process

	Strengths	Weaknesses
Opportunities	How do I use these strengths to take advantage of these opportunities?	How do I capitalize on my opportunities to overcome the weaknesses or minimize the weaknesses that prevent me from taking advantage of these opportunities?
Threats	How do I use my strengths to reduce the impact of threats?	How do I address the weaknesses that will make these threats a reality?
SWOT matrix	Strengths (S)	Weaknesses (W)
Opportunities (O)	S*O strategies	W*O strategies
Threats (T)	S*T strategies	W*T strategies

Source: Adapted from Aboud and Sahinli (2019).

After this analysis, suitable strategies can assist the municipality and local authorities to strengthen strategies and plans, provide implementation support for these plans and monitor achievement management processes. These four strategies are detailed below:

Offensive strategy (S*O) aims to increase and perfect strengths to promote the proper use of opportunities, allowing them to become competitive advantages. The following offensive strategies have been identified: (i) train professionals to carry out the collection and safe transportation of home health care waste to appropriate disposal sites, (ii) reverse logistics of home health care waste generated by health professionals and caregivers and (iii) implement periodic training programs in health waste management for all HHCS professionals.

Confrontation strategy (S*T) consists of the development of confrontation strategies that use a company's strengths to reduce threats. The following confrontation strategies have been identified: (i) orientate and educate residents about combating COVID-19 through good personal hygiene and environmental practices as well as the use of masks by all residents of the visited residence, (ii) restrict social contact to prevent the spread of the disease and increased risks in the most vulnerable patients and (iii) use of telemedicine, regularized on an exceptional basis, by doctors and nurses in remote care (telephone contact or video call) for non-priority patients during the pandemic (CFM 2020; COFEN 2020).

Reinforcement strategy (W*O) aims to analyze and overcome weaknesses to take advantage of opportunities. The following reinforcement strategy has been identified: (i) manage and limit the number of patients seen at home by health teams. This management can be carried out by rotating professionals and/or limiting the number of people involved in attendance and daily care, leaving this function to be exclusive to one caregiver.

Defense strategy (W*T) aims to develop defensive actions to protect professionals and patients involved in care, reducing the impact of threats. The following defense reinforcement strategies have been

identified: (i) provide financial and material resources necessary to segregate, properly pack (signed containers) and transport potentially hazardous waste from home procedures, (ii) avoid physical contact with family members, caregivers, furniture and surfaces of the visited house as much as possible, (iii) ensure the use and exchange of PPE (masks, gloves, eye protection, hat, lab coat, etc.) by health professionals at the time of the visit and between visits, in addition to keeping the work instruments sanitized and (iv) seek greater involvement of municipal decision makers in the correct management of waste.

Final considerations

Using the SWOT and TOWS tools, this study illustrated the need to promote strategies to improve home health care services, emphasizing strengths and opportunities and minimizing weaknesses and threats. Actions to preserve the health and safety of professionals and patients are even more necessary during the pandemic. Care measures regarding transmission of COVID-19 were highlighted in this context, generating further potential actions in addition to those aimed at the care of waste generated through these services. Knowing the role that HHCS plays in people's quality of life and the sustainability of the public health system in Brazil, especially in this pandemic period, new measures regarding health care waste management and practices must be taken to preserve the health and safety of professionals, families and patients. Strategies such as (i) guidance and awareness of professionals and the community served about waste management and contagion prevention, (ii) greater availability of financial and material resources for the services and (iii) greater participation by the public authorities in waste management during the pandemic and post-pandemic periods were some of the strategies identified to improve the provision of health care services at home.

The lack of training and proper management of home health waste reflects that the authorities were not yet sufficiently aware of the magnitude of the problem, even before the COVID-19 pandemic. Generally, home health waste management requires awareness, commitment and skills of all stakeholders (health care workers, caregivers, patients and authorities) in their respective area of expertise.

Declarations

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The authors confirm that the need for consent was waived by the approving ethics committee.

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Figures

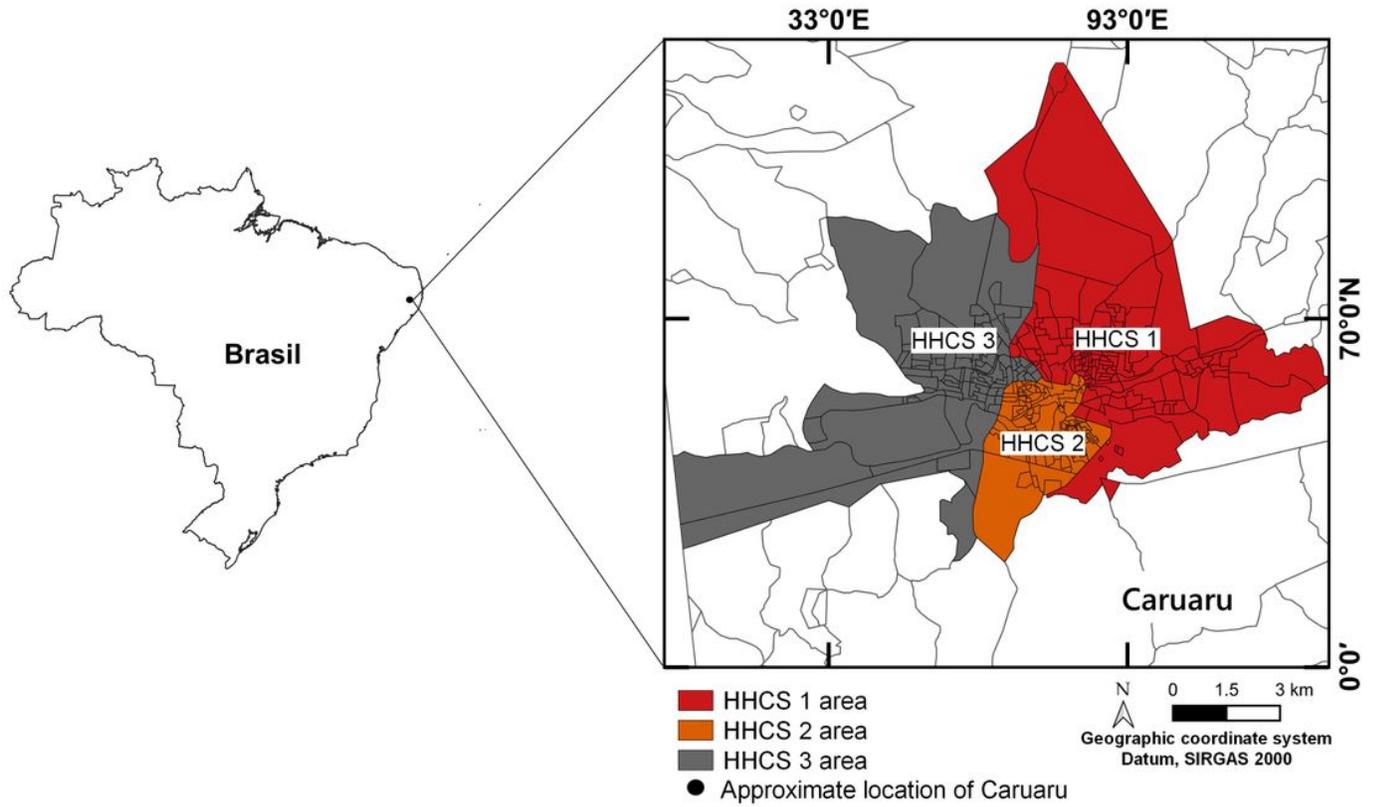


Figure 1

Location of the municipality of Caruaru and distribution of HHCSs