

Hospital at Home: A New Model of Healthcare Services Innovation - Case Study of Hakim Saadane Hospital, Biskra City, Algeria

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Abstract This study aims to discuss the Hospital at Home service (HAH) as an innovative service offered by Biskra Hospital "Hakim Saadane", a public healthcare institution in Algeria. In addition to the document analysis submitted by the department of the HAH, an interview was conducted with the department head and the medical staff to analyze and describe the main requirements to implement this innovative tool to provide high-quality and less-cost healthcare services for the benefit of patients especially old people and those who have chronic diseases. It also aims at identifying the obstacles faced by the medical staff to implement the HAH in their daily program, and the way to improve it through introducing new digital tools. The study concluded the existence of an increasing interest in this service according to the enormous number of patients in need of HAH service. However, there are a remarkable shortcoming regarding the necessary tools and equipment, in addition to the lack of adequacy of the medical staff. Numerous patients have difficulties consulting their doctors in hospitals and clinics due to many reasons, such as inability to move, chronic diseases, and overcrowding in hospitals...etc. Therefore, it becomes a necessity to rethink offering alternatives to hospital care through innovating new services that allow the patient to obtain required healthcare at home to avoid complications while moving to hospitals and clinics.

Keywords Healthcare, Healthcare Service Innovation, Hospital at Home, Algeria, Biskra

1. Introduction

Owing to the relationship between the health sector and human capital, it is one of the most important sectors that attract governments' attention worldwide.

A successful society that has a significant impact on economic progress is a symbol of growth [1]. This leads to working continuously to provide innovative healthcare services with high quality by introducing improvements in hospitals and clinics by the application of process data, adhering to industrial quality management procedures, and making consistent attempts to employ more optimum functionalities [2].

Innovation is generally defined as «the successful use of new ideas » and «the action of introducing a new product into the market» [3].

In the services field, innovation is defined as being independent of service, as mentioned by Ostrom, A.L., et al. [4]: "By developing novel, enhanced services, procedures, and service business models, breakthroughs in services benefit customers, employees, business owners,

alliance partners, and communities" [5]. In the field of healthcare, "innovation" means the introduction of new therapies, drugs, or medical devices. In addition, it has been expanded to various areas, such as data analysis, consumer behavior, provider incentives, and process improvement in care delivery [6]. It can take the form of novel treatments, work-related practices that enhance quality, and novel information systems [7]. However, many healthcare institutions attempt today to introduce E-Healthcare and artificial intelligence - as a type of smart healthcare system that tries to replace the old hospital system where lots of approvals are needed to start the medical service depending on where healthcare occurs [8], to improve the conditions to supply services and shorten the stay in serving clients in better conditions.

To support the health fields, such as healthcare services, health surveillance, health literature, health education, information, and communication technologies (ICTs), knowledge and research must be used in a secure and economical manner [9].

In order to achieve the long-term goals of improving quality, safety, outcomes, efficiency, and cost, innovative ideas, concepts, services, processes, or products have been presented to the healthcare industry [10].

Hospitals are a crucial part of the healthcare system. It is necessary to increase the level of care, safety and quality provided there [11]. However, there are a notable factor that make acute care hospitals not suitable for patients: * Acute care hospitals may bring much harm to elder people who frequently receive lower-than-expected care due to negative outcomes, including delirium, hospital-acquired infections, and other iatrogenic effects [12]. The inability

of many patients, especially old people, and those who have chronic diseases to move to hospitals and clinics. * The overcrowding in hospitals, where patients may not have an opportunity to be hospitalized regularly.

Furthermore, as the number of old people increases, and hospitals provide more high-technology critical care [13], alternative systems are developed to provide treatment of acute medical illness.

In this context, many innovations that aim to improve service quality and ensure good health conditions for patients have appeared in the healthcare field. Here, health practitioners work to provide patients with appropriate hospital-level hospitalization in their homes as a substitute.

In this paper, we studied the issues related to Hospital at Home as an innovative service offered by "Biskra Hospital Hakim Saadane", to describe the required conditions to provide it and to highlight the main challenges faced by practitioners to implement this service. Moreover, we aimed to evaluate the HaH model in the studied institution from the viewpoint of the staff who provided this care.

2. Literature Review

2.1. Innovation in Healthcare Institutions

Innovation has become a last resort and an arduous process for organizations facing competition. It is a critical resource when competing [14]. A large number of definitions were given to the innovation by authors, but till now there is no consensus on the concept. Here are some definitions:

Table 1. Innovation definitions

AUTHORS	DEFINITIONS
Schumpeter (1934)	Designing and introducing a new product or alterations to an existing product. <ul style="list-style-type: none"> • New production processes. • Detection of new markets • Designing and introducing novel supply spots through the application of raw materials
Simmonds (1986)	Innovations are new concepts that lead to entirely new goods and services, contemporary applications for pre-existing goods, new markets for pre-existing goods, or new marketing strategies.
Van de Ven (1986)	Innovation involves designing, applying, and implementing new ideas.
Damanpour (1999)	The development and adoption of new ideas by a company.
Covin & Slevin (1991), Knox (2002), Lumpkin & Dess (1996)	Innovation is a process that provides an organization, suppliers and customers with additional value and some innovation, such as developing new procedures, solutions, products and services, and new forms of marketing.
Nohria & Gulati (1996)	Innovation is anything that the business unit manager considers new in terms of policy, structure, method, process, product or market opportunity.
Brunet (2015)	Innovation in healthcare is embodied as a form of transformation and continuous improvement of individual and collective performance
Christopher J Kelly A & Antony J Young B (2017)	Innovation can be defined as invention + adoption + diffusion. It may be a completely new way of delivering care or an item, service or concept in medicine that provides specific advantages over the status quo. The two most important characteristics of successful innovations are that they are both desirable and usable.
Leighann Kimble & M. Rashad Massoud. (2017)	Innovation in healthcare refers to recent improvements in the medical industry to facilitate problem-solving.
Sanjay Singh & Yogita Aggarwal. (2022).	Innovation can be defined as the activation of the creative spirit with a promotional and/or collective motive, by implementing into practice new adaptive solutions that create value, leverage new technology or inventions, and support competitive advantage and economic growth,
Manohar, et al (2023)	New product and service development includes innovation activity that can occur at any product level. (Basic / Expected / Enhanced).

Source: [15], [16], [17], [18], [19].

The UNESCO Institute for Statistics [20] claims that there are four types of innovation: product, process, marketing, and organizational. Hospital at home is situated in the organizational innovation, designed as an organizational change.

Healthcare innovation has two primary dimension categories: organization and physician acceptance. The former include improving clinical outcomes, proficiency, achievement, the elder society, staff shortages, patient satisfaction, revenue growth, patient safety, increasing efficiency, and lowering costs. Physician acceptance contains corporate culture, regulatory acceptance, and partnerships and collaborations dimensions [21].

In a recent study, Suebsakul Tonjang, and Natcha Thawesaengskulthai [22] argued that a combination of total quality management and innovation management is very significant for innovation development in healthcare services. These two conceptual frameworks had never been associated with explaining innovation in healthcare institutions.

2.2. Healthcare Innovation through Hospital at Home

First, a healthcare innovation project can be successful if it is managed effectively and aligns with the healthcare quality context [23].

These researchers suggested a brand-new conceptual framework comprising the leader, planning, support, operation, tools, analysis method, improvement, as well as internal and external contexts of the environment.

Home Health Care or HAH was first introduced in the late 1950s in Bayonne and Paris. This was primarily for cancer patients who needed palliative care. Following a pilot study in Baltimore in 1999, Dr. Bruce Leff and his associates from the Johns Hopkins School of Medicine further developed and implemented this concept in 1995 [24].

All care given to a person in his or her home, as well as all the different payer sources are typically included in home care services. The term "home care" is a catch-all phrase that refers to the full range of assistance, supplies, and tools offered through different local, state, and federal insurance and private funding options [25].

Home care is often considered a complicated issue. As argued by Bricon- Souf N et al. [26], it has been regarded as a complex system having four categories: "**COMMUNITY**: politicians, patients, hospitals, board of directors; **CONTROL**: managers of hospitals, of home care organizations; **CURE**: acute hospitals, physicians, community of physicians; and **CARE**: nurses, other professionals, and a strong collaboration needed between, but also within each of these sectors" [27].

We should mention that there are two forms of home care which are *Hospital at Home* and *Nursing at Home* (**Figure 1**).

The first activity offers patients with serious, acute, or chronic illnesses an alternative to traditional hospitalization by enabling them to stay at home. The majority of the work is done by nurses, and patients need frequent visits and intensive medical care (**which is the topic of our article**).

The second activity involves simpler pieces of work that are frequently carried out by assistant nurses. Patients in this interaction tend to be elderly or disabled people who require assistance with simple daily care like washing, dressing, and getting out of bed [28].

In the next points, we will discuss the first type “hospital at home” as an innovative service offered as a substitution to hospital care.

This service provides care in the patient's home which [29]:

- (1) mitigates the stay of patients at hospital; this contributes to decreasing hospitalization costs and lessening the crowd in hospitals.
- (2) offers similar care as the care provided in hospitals.
- (3) is suitable in clinical settings; compared with patients in a hospital setting, patients in HaH had better clinical outcomes. HaH unit provides an integrated, flexible, easy-to-scale platform that can be cost-effectively adapted to high-demand situations [30] and
- (4) is not commonly offered by the community: where it is not available in all societies and medical systems.

HaH models have been welcomed worldwide by introducing HAH in certain circumstances as the following [31]:

- Home treatment under the supervision of the medical staff may be cost-effective for patients who require sustained antibiotic therapy, such as those with osteomyelitis, endocarditis, or spinal tuberculosis.
- Acute hospital bed occupancy can be reduced by prolonging the period of hospital care for postoperative patients so that it can be provided at home by skilled nurses, community nursing staff, or dependent health staff with coordinated home care visits. Hospital-at-home programs can be classified into two categories: admission avoidance and sooner-than-expected discharge hospital-at-home.

Admission avoidance hospital-at-home, by offering acute or subacute care for circumstances where hospital admission is required for patients for limited stay, prevents hospitalization [32]. In the former, admission avoidance at home, upon the assessment of patients in the (Emergency Department), they are sent home where they get routine visits after being given the required prescription drugs and additional care (like oxygen therapy) from a medical professional [33].

Patients in the Early Discharge Program are referred at home and admitted to the hospital after evaluation in the Emergency Department to begin the first phase of treatment. Before the exacerbation subsides, these patients can leave the hospital program at home. After the resolution of the exacerbation, the patient leaves the program, and home visits are discontinued (Ibid). Discharge from the hospital sooner than the planned procedure delivers hands-on care by medical professionals at home for a circumstance that necessitates immediate admission to the hospital aiming to completely (Home Hospitalization) or partially (Early Discharge) replace traditional hospitalization [34], [35]

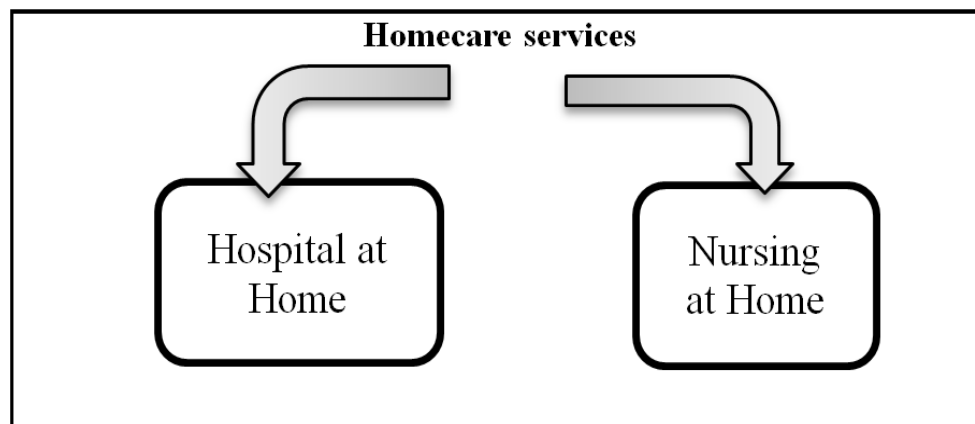


Figure 1. Types of home care services

2.3. Main Characteristics of Hospital at Home

This service is provided using several models and strategies, but all share certain key features as illustrated in table 1:

Table 2. Main Characteristics of hospital at home

Hospital at Home stands out from other community service providers because of the seriousness of the circumstance (such as sepsis or pulmonary embolism).	If necessary, it grants instant access to diagnostic procedures such as endoscopy, radiology, or cardiology.
With the assistance of different levels of medical staff, the medical officer in charge and principal decision-maker is a hospital specialist.	It provides access to various levels of interventions, like intravenous fluids and oxygen.
It does not have the same impact as limiting access to acute specialist care; rather, it covers brief episodes of care. Patients are managed at home but receive treatment similar to the condition in which they were admitted to the hospital.	Multidisciplinary healthcare professionals provide care while adhering to the most recent care standards for serious conditions.
It supports other neighborhood-based health and care programs that encourage patients to stay at home.	

Source: [36].

2.4. Objectives of HAH Implementation

There are many studies that treated HaH topic and showed the predicted advantages of adopting this service. The following paragraphs discuss the main objectives of HaH implementation in terms of patient satisfaction, cost, mortality reduction and overcrowding mitigation in hospitals...etc.

The hospital-at-home (HAH) concept's main goal is to offer the knowledge, tools, and assistance required to provide treatment to patients at home who have a potential need for care in a hospital [37].

Home health care enhances functioning, enables people to live more independently, optimizes patients' well-being, and assists them in avoiding hospital stays or prolonged care facilities by keeping them at home instead [38].

The effectiveness of the Hospital at Home program and comparable hospital care at home programs has been demonstrated in numerous studies. Hospital care at home programs decreased mortality and expenses according to a meta-analysis of 61 randomized controlled trials. In comparison to patients receiving equivalent inpatient care, some hospital care at-home programs have enhanced satisfaction and quality of life. Patients receiving hospital care at home as opposed to those in an inpatient setting. Alternative programs have demonstrated lower instances of readmission, ED (1) revisits, and SNF (2) admissions, in addition, to shorter stays and mitigated expiration. These programs appear to be less expensive than conventional

inpatient care, according to the available evidence [39].

Services for home healthcare have been suggested as a way to lower costs while improving patient comfort. With the help of these services, which track users' health and well-being, assistance can be provided as needed. They specifically collect delicate personal data, which are subsequently interpreted by medical experts to deliver treatment [40].

Additionally, HAH can provide access to home comfort and the ability to maintain independence, as well as more quality sleep and nutrition, a more convenient location to visit with loved ones, an understanding of a faster recovery, and a positive stance on perceived breathlessness [41].

Health authorities' justifications for creating HAH can be classified into two parts [42]:

On the supply side, HAH shortens hospital stays and/or prevents patients from being admitted, which would lower healthcare costs and help alleviate bed shortages in overcrowded hospitals.

Demand-wise, HAH meets patients' needs for care while allowing them to stay at home for extended periods. Besides, care-at-home programs have been motivated by enhanced technology that more readily provides medical care outside a hospital setting.

2.5. Barriers to Implementation

Patients, patient advocacy groups, healthcare organizations, doctors, other healthcare professionals, etc., are among healthcare stakeholders who have a more extensive background in medicine [43], despite the challenges in implementing innovation in healthcare, as Gomez Chaves et al. [44] have indicated that there are three main reasons for these challenges: a miscalculation on the part of the leader, and a malfunction of either the implementation or the program theory.

Despite the advantages that may be provided by HAH service, there are some constraints that occur while offering this service. Hospitals have safety conditions for patients in terms of air quality, height of stair risers, design of rooms...etc. while the patient's home may not have the same conditions. So, Home health care providers are unlikely to possess the required resources or necessary training to identify and mitigate patient safety risks in the patient's home [45].

According to the study of Katie Adams [46], there are four obstacles that threaten that objective:

1. Millions of dollars in brand-new inpatient facilities that were recently invested in health systems cannot be recouped if beds are not filled by patients. That's why hospital-at-home initiatives will be postponed.
2. In order to scale existing hospital-at-home programs, two difficult tasks must be accomplished: maintaining safety amid rapid expansion and finding a sufficient number of medical professionals (especially nurses, physician assistants, and technicians) willing to travel to patients' homes.

3. Patients who have poor internet access cannot communicate properly with their treatment team.
4. Alone patients may not be eligible for hospital-at-home initiatives because they will not have sufficient assistance, and patients residing in crowded households might not possess sufficient space or privacy to be eligible.

Managing patients' critical care needs at home is difficult due to a lack of infrastructure facilities, such as life-sustaining and functional hospital equipment (DME) [47].

This model's potential expansion might well be hampered by payment and medical culture. Unless this service is covered by fee-for-service reimbursement, payment will remain a hindrance to the expansion of hospital care provided at home [48].

3. Research Methodology

This study proposes a new conceptual framework pertinent to the application of Hospital at Home as an innovation in Algerian healthcare institutions.

The interviews were elaborated in concordance with the definitions proposed in the managerial literature about innovation in healthcare services. Thus, semi-directive interviews were conducted face-to-face using an interview guide. The studied audience comprised doctors, nurses, and administrative employees. The purpose of these interviews was to understand how the implementation of HAH is presented as an innovative service offered by Biskra Hospital "Hakim Saadan" in Algeria, as a public healthcare institution", and to describe the main requirements to implement this service for providing healthcare services to the patients especially old people and those who have chronic diseases, with high quality and lower costs. Furthermore, the obstacles faced by the medical staff are identified in the HAH implementation in their daily programs, and its improvement through the introduction of new digital tools (see appendixes).

A content analysis seems to be compatible, and regarding the narrowness of the sample, simple manual processing was sufficient. A lexical approach also seemed the most appropriate to apprehend the content of the experiences lived by the interviewees in the hospital.

3.1. Research Findings and Discussion

3.1.1. Case Study Presentation and Procedures

Our case study is the HAH service in Hakim Saadane Hospital – Biskra city, Algeria. The service was founded for the first time at HS Hospital in April 2012. It began as an annex of the intern medicine service. It provides two services: hospital at home and nursing at home. The latter entails fewer complex duties that are frequently performed by assistant nurses but are still managed by doctors who provide hospital-at-home services. This necessitates

assistance with routine daily tasks such as washing, dressing, and getting out of bed. The major objective of this service is to provide care for patients who are mostly elderly or disabled people and are refused by the hospital due to many reasons like overcrowding, elderly patients, the policy of the hospital to service outsourcing...etc, through providing a comprehensive combination of medical, physical, and surgical care intended to meet the physical, social, and emotional needs of people with chronic illnesses or disabilities. (Interview with the head of HAH at Biskra Hospital Dr. Bacha on May 7th,2022)

3.1.2. Procedures of Work in HAH Service of Hakim Saadane Hospital

***Hospital at Home's target population:** According to Dr. Bacha head of the HaH service in Hakim Saadan, HaH service program admits patients who have one or more specified conditions that can be safely treated in a home environment. To participate, patients must live in Biskra city or around it (within 3 miles of Biskra city) and be covered by the system's health plan. They must also meet criteria for hospitalization established by Hakim Saadan hospital, a proprietary tool for determining whether services are medically necessary.

As mentioned above, the HAH service of HS hospital is an annex of the intern medicine service, so the patient should be admitted first in this service. After his partial healing when he can continue his treatment at home, the HAH service starts its program by opening the patient's file including all the information: age, residence, disease, nature of treatment, date of entrance and leaving from the hospital, the type of treatment to be followed at home offered by HAH...etc.

To ensure that the needs of the patients are met, many medical and paramedical experts are employed along with secretaries, logisticians, HR and quality managers, accountants, and financial officers, in charge of managing administrative activities as illustrated in table 3:

Table 3. Sample features

Nature of the task	Number
Responsible physician (a doctor)	01
General practitioner	01
Nurses	03
Occupational Therapist	01
Psychologists	02
Secretary	01
Driver	01
Team number	10

Source: HaH service, Hakim Saadan Hospital, Biskra city

For the best organization of the work, taking into account the geographical distribution of patients, the HAH team made a geographical division of Biskra city where the patients of the same area can be visited on the same day.

According to the responsible physician, each patient might be visited twice a week.

3.1.3. Facts and Challenges Related to HAH Activity:

3.1.3.1. Key Program Features

According to the statistics allocated from the HAH documents, we noticed an increase in the number of patients and visits during the examined period (Table 4), with a decrease in HAH activity in 2020/2021 due to the Covid-19- pandemic where there was a focus on Covid,19, treatment out of the basis of HAH activity.

Regarding the categories of patients (Table5), we noticed that the most treated category by HAH service team is the mostly elderly or disabled people, which is the target category of the HAH in basis.

- **Clinical Characteristics of Hospital at Home Patients:**
Hakim Saadan hospital- Biskra city:

Just a list of diseases that can be treated in HAH service, including Bedsore consultation, Changing the urinary catheter, Kinesthetic rehabilitation, Ascites puncture, PERF, Changing the stomach tube, Changing the bladder catheter, Bladder wash, and Wound care.

3.1.3.2. Challenges

The experience of HAH, as a pioneering experience, has opened a debate on numerous research and practical problems. It represented a real step towards innovation and the renewal of medical practices for treating patients, providing them with quality care, reducing costs, and

ensuring better follow up. For example, the number of medical vehicles, assistants and the level of technology used, ranked second among the culture of both society and patients and their acceptance of this new type of service.

According to Dr. Bacha the head of HaH service in Hakim Saadan hospital, there are many obstacles that are faced by HaH team such as: * physicians in the community and hospital emergency departments support the concept of HaH in principle but are hesitant to take care of patients at home. *Physicians are worried about the efficiency of care delivered. * There is a lack of understanding on how to launch a hospital-at-home program because of the newness of the model.

*In addition, the most serious obstacle that the HaH team faces is patient safety. In other words, in the home setting, there are particular risks to patient safety that include environmental risks as those related to infection control, physical layout, home infrastructure, social factors, and unsanitary conditions. Others include difficulties with caregiver communication systems and handoffs, lack of family education to provide care at home, the challenge of striking a balance between patient autonomy and risk, the various needs of patients receiving home-based care, and the absence of ongoing health tracking.

* Furthermore, some families find it embarrassing to admit strangers to their homes and discover parts of their personal life, which is becoming more acute with increasing rates of need and poverty. The respondents also pointed out the insufficient protection and professional security for them, given the weakness of the laws that govern this new activity.

Table 4. Activity of HAH, Hakim Saadane Hospital, Biskra

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Number of Patients	187	218	182	159	202	256	178	114	146
Number of visits	540	615	734	503	931	1465	1049	904	868
Visits/ Number	4	4	4	4	5	6	6	5	5

Source: HaH service- Hakim Saadan Hospital-Biskra city

Table 5. Distribution of patients by age in HAH service– Hakim Saadane Hospital- Biskra (2013-2021)

AGE CATEGORY	2013	2014	2015	2016	2017	2018	2019	2020	2021
20 years old	03	01	0	01	01	02	00	00	2
20-40	29	21	3	21	12	45	10	3	22
41-60	54	41	27	31	28	48	20	18	25
61-80	51	67	72	38	55	61	53	38	41
80 years old	50	88	80	68	106	100	95	55	56

Source: HaH service, Hakim Saadan Hospital, Biskra city

4. Conclusion

As hospitals are a vital part of safe and effective care in the healthcare system and the main location where acute medical care is provided, it is crucial to improve safe and effective care there and it is the channel where efficient medical care can be provided. However, there should be other alternatives to provide care for patients who cannot visit hospitals because of their critical health situation, or the overcrowding of hospitals.

Hospital at Home is the most appropriate alternative to acute care hospitals. It is a short-term, focused intervention that delivers efficient hospital care at the same level offered by hospitals.

In the presented paper, we tried to discuss the most common issues related to HAH in Biskra Hospital. The study demonstrated a rise in interest in HAH with more treated cases, especially during Covid-19 pandemic, with a limited list of diseases that can be treated including Bedsore consultation, Changing the urinary catheter, Kinesthetic rehabilitation, Ascites puncture, PERF, Changing the stomach tube, Changing the bladder catheter, Bladder wash, and Wound care. Despite the importance of HAH in Biskra hospital and the increased interest from the staff, they come across some hindrances mainly in the patient safety, the insufficient protection and professional security for the staff, the acceptance of patients' families to receive the staff at home, and the lack of required equipment, as well as the payment for the services provided.

Hence, there are many challenges to be held to improve

this service. We can mention them as follows:

- This model needs an adequate command chain to avoid any communication misunderstanding.
- HaH programs must be designed to enhance technical assistance including clinical, financial, and other aspects to facilitate the adoption of hospital-at-home care by health systems in the programs.
- Taking into account the geographical considerations, the area to be served needs to be broad enough to capture a good range of patients and serve the hospital.
- Because of the specialized and urgent nature of the work, it is necessary to have a workforce that governs a serious safe management of patients at home.
- The focus should be on staff, structure, and training through providing all required equipment and offering training programs for the benefit of the staff, especially to use technological tools in communication and applying this program.
- Hospital at home service providers as well as patients must recognize the importance and necessity of this service for both to feel confident in engaging with the program.

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Appendixes

Table. Social & demographic characteristics of the interviewees

Rank	Mal	Female	Σ	%	Age	Experience	Time / Minutes
Responsible physician (a doctor)	1	-	01	11	≥ 40	10-18	20-30
General practitioner	1	-	01	11	25-35	04-12	15-20
Nurses	1	2	03	33.5	≥25	03-08	10-15
Occupational Therapist	-	1	01	11	≥25	05-12	5-10
Psychologists	-	2	02	22.5	≥25	05-12	5-10
Secretary	-	1	01	11	≥25	05-12	5-10
Σ	03	06	09	100	-	-	-

Source: The authors.

1. Interview guide: The Matrix of themes and sub-themes

	Themes	Sub-themes
01	The nature of services at Hospital	The notion of service at Hospital Services and economics costs Human & Social considerations
02	How to implement a HAH?	Definition and composition of HAT system. Mission and governance
03	Healthcare innovation through Hospital at Home	How does the HAH represent innovative way? The benefits of HAH for both patients and Hospital.
04	Requirements Versus obstacles	The nature of obstacles (Financial, social, and cultural)

Source: The authors.

2. Answers of interviewers: The Occurrence matrix

Items Classification	Ranking in order of importance	Groups of Variables
Health care services	(1)	Healthcare services and the importance of economic and social considerations
Economic considerations	(2)	
Barriers to implementation	(4)	
Human & Social considerations	(3)	
Financial issues	(5)	
Geographical considerations	(3)	Healthcare innovation
Innovation source	(2)	
Healthcare Improvement	(1)	

Source: The authors.

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