GARDENS FOR HEALTH AT PUBLIC HEALTHCARE INSTITUTIONS IN THE ENGLISH-SPEAKING CARIBBEAN – USES AND IMPLEMENTATION IN JAMAICA AND TRINIDAD AND TOBAGO

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1. ABSTRACT

The high incidence of non-communicable diseases and mental illness in the English-speaking Caribbean indicate that many persons in the region are not in good health as defined by the World Health Organization. Based on the long-recognised beneficial effects of interaction with nature on human health and increasing confirmation by research findings, nature-based therapies, such as horticultural therapy, are being included as treatment interventions to address human health and wellbeing. Gardens facilitate contact with nature and healthcare institutions are including them in the landscape to facilitate healing by supporting therapeutic services or by other means, to provide fresh nutritious food and to contribute to healthy hospital environments that are conducive to planetary and human health. In the Caribbean, little information is known about gardens at public healthcare institutions which are the main providers of health services. Therefore, a preliminary study was undertaken in Jamaica and Trinidad and Tobago to the determine the presence of gardens at a few public institutions, their uses and the factors that influence their implementation. The results and recommendations are reported in this paper.

INTRODUCTION

The World Health Organization (WHO) defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 2020). Many persons in the English-speaking Caribbean are not achieving an acceptable level of wellness because of ill health (Pan American Health Organization (PAHO), 2021). The non-communicable diseases (NCDs) are the overall leading cause of death, with the five most prevalent causes being heart disease, stroke, diabetes mellitus, kidney diseases and prostate cancer, in that order, while hypertension, Alzheimer and other dementias, chronic obstructive pulmonary disease, breast and colon cancer are also among the top ten causes of death.

PAHO reports also indicate the prevalence of mental illness. Mental, neurological and substance use disorders account for 22.2 % of the total burden of disease in the Latin American and Caribbean region measured in Disability-adjusted Life Years (DALYs), which summarizes the disease burden. The most common are unipolar depressive disorders and those attributable to excessive alcohol consumption (PAHO, 2017). The 12- month prevalence rate for dementia of 8.5% in the 60 years and over age group, was reported as the highest in the world and cause for concern because people are living longer. Suicide, a major possible

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outcome of mental illness, is also a serious concern in the non-Latin Caribbean where the rates have been the highest in the Americas from 2000 to 2022 (PAHO, 2021). In 2019, Guyana had the highest suicide rate in the Americas with 40.8 per 100,000, and Trinidad and Tobago was the 2nd ranked in the non-Latin Caribbean with 8.5 per 100,000.

Ancient civilizations it was recognised that being in or interacting with natural or semi-natural environments was beneficial to human health (Davis, 1998). From medieval times to the 19th century, hospital design in the western Europe and North America provided opportunity for patients to view or interact with nature as an integral part of the treatment programme (Marcus, 2007; Winterbottom and Wagenfeld, 2015). In most western countries, this feature was lost in the modern, multi-storied hospitals of the 20th century which were designed for high levels of sanitation and functional efficiency. Use of medication and advanced medical technology became the sole therapeutic approaches, especially for physical illness, with little recognition of the additional stress these sterile environments posed on patients, their families and staff (Ulrich, 2002). Therefore, many modern hospitals do not offer their clients an environment that reflects the WHO's (2020) holistic definition of health.

Research findings are increasingly confirming improvement in physical, mental, emotional and social health and well-being in response to nature-based interventions. Studies on the effects of different views on post-surgery outcomes of patients showed that those that saw trees or ornamental plans had fewer minor post-surgery complications, had less pain, required less post-operative analgesics, received more positive medical evaluations from hospital staff, had more positive physiological responses, were more satisfied with their rooms and had shorter hospital stays than the patients who viewed a wall of a brick building or no plants (Ulrich, 1984; Park, 2006). The difference in outcomes was attributed to the effect of nature on reducing stress in patients with a view of trees (Ulrich, 1984). An important outcome of the growing body of evidence of the benefits of nature on health and healing is that the prescribing of interventions that increase clients' contact or interaction with nature, referred to as 'green prescribing', is emerging as a trans-disciplinary approach for reducing non-communicable diseases (Robinson et al., 2020). Another significant outcome is the return of gardens to the environments of general hospitals and health institutions providing specialist care, for example, for children, trauma, Alzheimer, and cancer (Marcus, 2007; Nieberler-Walker et al., 2023; Zhu and Sarah, 2024). These healing gardens, including restorative, rehabilitative or therapeutic gardens, are established in both outdoor and indoor spaces to promote the health and well-being of patients, their families and visitors, staff and even the wider community in which the hospitals are located (Living Future, 2025). Besides the positive impact of restoration from stress offered by these gardens on patients' clinical outcomes, other benefits to the hospitals include increased job satisfaction among staff and reduced hospital costs due to lower expenditure on medication and shorter hospitalization periods (Nieberler-Walker, 2023; Ulrich, 2002).

Beyond providing access to nature, healing gardens facilitate the integration of horticultural therapy in the treatment regimens for patients at hospitals. Horticulture is the science and practice of cultivating ornamental and edible plants and consists of all cultural activities from propagation to harvesting and postharvest handling. Professionals within the field have been

refining the definition of horticultural therapy to distinguish it from the benefits of only being in a garden or engaging in horticultural activity or other forms of therapeutic interventions involving nature. According to the American Horticultural Therapy Association (2017), horticultural therapy consists of horticultural activities that are conducted by clients diagnosed with a health disorder, within the context of a treatment, rehabilitation or vocational plan and facilitated by a registered horticultural therapist. This definition covers the therapeutic model of horticultural therapy that is most applicable in healthcare settings.

Horticultural therapy is practised in a range of settings, including clinical, rehabilitative and residential settings, usually, in a designated, indoor or outdoor space that is designed to facilitate the activities. Using a whole-person, strength-based approach to achieve maximum functioning, horticultural therapy has been applied for recovery from physical illness and trauma, as well as, for the treatment of mental illness which impair the patient's quality of life and well-being Irish and Young, 2019). Research evidence showed that this intervention reduced the symptoms of depression and anxiety in clients with mental disorders and could potentially improve emotional well-being, social functioning, physical health and opportunities for vocational training (Clatworthy, Hinds and Camic, 2013). It was suggested that it might be applied on a long-term basis to enhance recovery and facilitate social inclusion and, was recommended for use in both in-patient and out-patient settings. Research findings showed that patients derived these benefits from passive or active therapeutic activities undertaken in hospital gardens, therefore, inclusion of green spaces in hospital design has been recommended for increased consideration to facilitate these activities (Henderson-Wilson and Weerasuriya, 2017).

Greater emphasis is being placed on research to provide a basis for evidence-based practice which can promote acceptance and more widespread use of horticultural therapy (Kreski, 2019). This is particularly important to encourage adoption of horticultural therapy by more healthcare institutions where administrators' concern for managing costs may be a hindrance to establishing hospital gardens unless they are convinced of the benefits that they offer.

Hospital gardens that are safe, accessible and can accommodate horticultural activities to support treatment goals of patients with diagnosed illness or disabilities can be used as clinical spaces for horticultural therapy practice (Haller and Kennedy, 2019). Based on a review of literature on therapeutic hospital gardens (THGs), Nieberler-Walker et al., 2023) derived a working definition of THGs as purposefully designed and well-integrated gardens within the hospital grounds or hospital building that medically, spatially, and culturally support patient care and visitor and staff well-being.

Hospital gardens may also be used to deliver therapeutic horticulture to persons without a diagnosis such as hospital staff and visitors. Therapeutic horticulture is facilitated by a registered horticultural therapist or other professional with training in the use of horticulture, and involves client participation in horticultural activities as a therapeutic modality to support programme goals. Clients improve their well-being though active or passive engagement in plant or plant-related activities (American Horticultural Therapy Association, 2017). However, healing gardens are not limited to THGs but also include other types of gardens that positively impact health and well-being because they are specifically designed to facilitate various ways

in which users may choose to experience nature to enhance their well-being, for example, by passive interaction through walking, sitting or meditating (Haller and Kennedy, 2019.

Hospital gardens can produce food for the hospital kitchens to promote good health through food and nutrition initiatives for patients and staff, as well as, lower the hospital's expenditure on food. Fresh, healthy and tasty food benefits patients by providing some normalcy to the hospital experience and promotes faster healing and recovery resulting in shorter hospital stays and enhanced patients' satisfaction. The hospital also benefits financially because the readmission of properly nourished patients 30 days after discharge is lower (Murphy, 2017). Food production by hospital gardens may be incorporated into horticultural therapy programmes, for example, harvested produce can be used to teach cancer survivors how to prepare healthy meals (Murphy, 2017).

Hospital gardens contribute significantly to the greening of hospital environments (Enache-Pommer, 2008). As part of the built environment, hospital buildings can negatively impact environmental and, ultimately, human health. This has spurred interest in the development of green hospitals to minimize their contribution to environmental degradation (ChÍas and Abad, 2017). The WHO advocates for adoption of green building design by hospitals so that they are built to respond to local climatic conditions and to optimize reduced energy and resource demand (WHO and Healthcare Without Harm, 2008). In addition to building design, the inclusion of natural elements as gardens and water features are among the strategies being used to increase sustainable use of natural resources, provide clean air, encourage biodiversity, and to implement other measures to support environmental conservation and mitigate the adverse effects of climate change (Enache-Pommer, 2008; ChÍas and Abad, 2017; Bharara et al., 2018; Mala et al., 2019). Healing gardens may also be integrated in green hospitals as at the Sambhavna Trust Clinic in Bhopal, India where they produce plants used in ayurvedic medicine (Bharara et al., 2018).

The foregoing description of the roles of hospital gardens is based primarily on studies conducted in North America and Western Europe, but similar gardens have also been reported in healthcare facilities in Australia and in the developed countries in Asia, for example, Singapore, where the outstanding hospital gardens have contributed to the award-winning reputation of the Khoo Teck Puat Hospital (Living Future, 2025). In contrast, there are landscaped spaces at hospitals in many developing countries but very few reports on their use in therapy, for their therapeutic benefits or for the development of green hospitals. However, interest is developing as in Nigeria, where the suitability of trees for amenity purposes at hospitals and users perception of the therapeutic benefits of hospital green spaces has been studied (Isaac and Ademorin, 2012; Obi-George et al. 2023).

The dearth of published literature on the use of gardens for health in the developing countries of the Caribbean may suggest that persons with health challenges, visitors and staff at healthcare institutions in this region have limited access, if any, to health benefits that may be derived from gardens at such institutions. Sustainable Development Goal 3 focusses on ensuring health and well-being for all at all ages and includes physical health and mental health. As the main healthcare providers in the region, public hospitals are expected to play a leading role in improving the health of the communities that they serve. One important

strategy would be incorporating gardens in their landscapes for the multiple benefits they provide directly and indirectly to human health and simultaneously contribute to the achievement of several SDGs to which health and well-being are linked. Therefore, a preliminary study was undertaken in two countries in the English-speaking Caribbean, Jamaica and Trinidad and Tobago to determine the presence and use of gardens for health at selected public hospitals and healthcare institutions and the key factors influencing their implementation.

METHODOLOGY

This preliminary study, which was conducted between 2022 and 2024, was based on five public healthcare institutions, one in Jamaica and the other four in Trinidad and Tobago. The hospitals were selected on the basis of available information on garden initiatives at the institutions (Table 1).

Table 1. Sources of information on garden initiatives at five public hospitals in Jamaica and Trinidad and Tobago

Country	**Institution**	**Sources of initial information**	**Sources of information for the study**
Jamaica	Bellevue Hospital	Ashman, 2023	Visit and interview; online sources; academic and government publications
Trinidad and Tobago	Chacachacare Leprosarium	Paul, 2020	Government publication
	St Ann's Psychiatric Hospital	Trinidad and Tobago Parliament, 2016	Government publication
	Eric Williams Medical Sciences Complex	Guardian Media Newsroom, 2022; Newsday, 2023	Participation in grant proposal writing and visits
	Sangre Grande Hospital	Basdeo et al., 2024	Basdeo et al., 2024

Information was collected through interviews with staff and observations during visits to gardens at the institutions, participation in preparation of a grant application to expand a therapeutic garden, and available, including historical literature. Where attempts to obtain interviews were unsuccessful or visits were not possible, important stakeholders provided additional information (Table 1).

FINDINGS

1.0 History of gardens and gardening at Bellevue Hospital in Jamaica

Bellevue Hospital in Kingston, Jamaica is a public institution that was established since 1861 for the care and custody of mentally ill persons. It was known initially as the Jamaica Lunatic Asylum, then the Jamaica Mental Hospital in 1938 and by its present name since 1946 (Bellevue Hospital, undated). Consistent with the vision of the institution – "Restoring hope, empowering lives," several initiatives have been undertaken and services have been expanded to promote rehabilitation and reintegration. Two initiatives of interest, introduced by Dr Frederick Hickling, the Senior Medical Officer during the 1970s, were advocacy for mental health services being delivered at the community level instead of being centralised and integration of alternative treatment approaches. Examples of community-based services were the Kenneth Royes Rehabilitation Centre, an extension of Bellevue Hospital, established on 7.3 ha in Spanish Town, and the Ebenezer Rehabilitative Centre in Mandeville, both of which offered crop and livestock farming as vocational therapeutic activities (Bellevue Hospital, undated; Ebenezer Rehabilitative Centre, undated). The integration of farming as occupational therapy had been first practised at Bellevue Hospital and included payment of a stipend to clients (Anonymous, 1931; Hickling-Hudson, 2020). These activities were supported by government and corporate funding, as well as, donations by individuals.

The grounds at the Bellevue Hospital were transformed to a setting for delivery of a cultural therapy programme that Hickling introduced with assistance from the staff, including the occupational therapists This programme addressed the needs of the clients and was also aimed at breaking the stigma attached to mental illness. Using bamboo and bagasse (a by-product of the sugarcane plant), staff and clients built outdoor stages on which they presented socio-drama productions on the history of mental health treatment and attitudes to this illness in Jamaica to audiences consisting of other hospital staff and members of the community. In this way, the outdoor environment was used as a garden theatre for conducting therapy that encouraged social interaction and reintegration (Hickling-Hudson, 2020; Hickling and Walcott, 2021).

1.1 Current use of a garden at Bellevue Hospital, Jamaica

The use of the grounds at Bellevue Hospital as a therapeutic space continued to be promoted by the medical staff and administrators with a "rainbow park" and a "duck park" to help patients to connect with nature and relax as a therapeutic intervention. Eventually, in 1922, these spaces were integrated into a larger improved garden, Oo's Park, under the leadership of the Chief Executive Officer and with the support of the corporate sector and individuals (Ashman, 2023; M. Oo and R. Roberts, pers. comm.). This therapeutic garden, close to the entrance of the hospital, was named after Dr Myo Oo, another former Senior Medical Officer at the institution, who held the view that in keeping with the practice at modern hospitals, clients entering the hospital should be presented with a calming environment. The park is attractively landscaped with natural features including trees for shade, colourful shrubs, a pond and a well-kept lawn. Two resident peacocks and a large cage with poultry further enliven the park with their colour, movement and sound. A tree-house, an outdoor library, well-defined pathways, comfortable benches and open spaces also encourage use (Fig. 1a and b).

The main users of Oo's park are the hospital's clients, who are mainly residential. During their scheduled, supervised visits with a mental health nurse, there is group therapy. The clients also have time to sit, read, walk around the garden and experience other forms of individual, passive interaction with the environment. The staff also use the space to relax. The public has free access to the garden and social events are held there. None of the users engage in garden-related activities and all maintenance activity is undertaken by a paid employee. Senior medical staff at the facility indicated that they fully recognised the benefits of access to green spaces to human well-being and were very familiar with client engagement in farming activities, as at the previously mentioned rehabilitation centres, with guidance from a supervisor trained in agriculture. They were unaware of other healthcare institutions with gardens used for therapy in Jamaica. They were also unaware of the use of horticulture-based activity guided by a trained therapist as part of the clients' treatment regime or programme for overall well-being.

2.0 The Chacachacare Leprosarium in Trinidad and Tobago

Before a cure was found, persons diagnosed with this leprosy in Trinidad and Tobago were quarantined, first in a leprosarium on Trinidad and, to reduce the incidence of abscondment and increased rates of infection, on Chacachacare, an island off Trinidad, from 1927. Leprosy is a contagious disease that can cause physical disability due to nerve damage in the eyes, hands and feet (Chen et al., 2021). Under the supervision of nuns, gardening, poultry rearing and yard maintenance were among the activities offered to persons who could work as occupational therapy, and a stipend was provided. A vegetable garden and apiary were established on Chacachacare in 1937 for operation by the inmates. Within one year, the notable improvement in their health, morale and happiness and the increased number of infected persons in Trinidad who volunteered for admission to that facility, were attributed to these outdoor, nurturing activities. Later, a dairy and fruit crop farm was started at the leprosarium on Trinidad to provide an improved food supply and nutrition to inmates on both islands and vocational opportunities (Colonial Report, 1938).

3.0 St. Ann's Psychiatric Hospital, Trinidad and Tobago

The St. Ann's Psychiatric Hospital, administered by the Northwest Regional Health Authority of the Ministry of Health, was formerly the only public institution providing health care for persons with mental illness in Trinidad and Tobago, and while other public general health care institutions throughout the country now share this responsibility, this hospital remains the major mental health care provider. The institution occupies 20 ha in a valley that provides a serene environment just outside Port of Spain, the capital city. Cultivation of vegetables and fruits in the hospital garden is offered as occupational therapy to clients on the Forensic Ward as a part of their treatment programme (Trinidad and Tobago Parliament, 2018). However, this service is not consistently available and the associated facilities are not adequately designed and resourced to meet the requirements for therapeutic use (Government of the Republic of Trinidad and Tobago, 2016). An occupational therapist at the hospital indicated the need for an improved garden facility, as well as, the absence of training in horticulture and was unaware of horticultural therapy as a profession.

3.1 The Arima Rehabilitation Centre, is a residential facility for clients who are out-patients of the St Ann's Psychiatric Hospital. Clients are offered occupational therapy with a vocational emphasis as a part of the rehabilitation programme and 6.5 ha of land is available for gardening. As the facility was reported to be underutilised and the clients, elderly and unable to garden, an intake of new clients, who were able to participate and a teacher, qualified to impart the vocational skills to clients, were recommended (Government of the Republic of Trinidad and Tobago, 2016).

4.0 The Eric Williams Medical Sciences Complex (EWMSC) – the Psychiatry Unit

The EWMSC, which is administered by the North Central Regional Health Authority (NCRHA), offers a wide range of clinical services, houses specialist hospitals for women, children, dentistry and veterinary medicine, and also serves as a teaching hospital for the Faculty of Medical Sciences of The University of the West Indies (UWI). The EWMSC is prominently located at the intersection of two major transportation roadways that run east to west and parallel to each other in north Trinidad and a highway that runs to central and south Trinidad. It is laid out in an extensive green space, but as at other hospitals in Trinidad and Tobago, in-patients are confined to the wards with no opportunity for outdoor activities. Since about 2020 during the COVID 19 pandemic, the Psychiatry Unit at the EWMSC, headed by UWI staff, initiated a garden to provide the therapeutic benefits of horticulture primarily to in-patients at the unit, and the therapy was also offered to out-patients (Guardian Media Newsroom, 2022). The garden was intended to allow for relaxation, as well as, engagement in productive activity, through which patients would increase physical exercise and experience improved mood, attention span, self-esteem and socialization. A 93 sq. m space was allocated for the garden in close proximity to the in-patient ward and office of the Psychiatric Unit to allow easy access by patients and staff. It was a flat, grassed, open area that has been used intermittently, since 2021, for border plantings and small beds of a few short-term vegetables, medicinal and seasonal plants (Fig. 2a and b).

The initial garden was started with voluntary assistance from staff of the unit and a former patient with a strong interest in plants, but it could not be maintained consistently or further developed without some key inputs. Besides development of the physical facility, appropriately-trained staff was required for planning suitable horticultural activities for patients and for garden maintenance with possible assistance from volunteers. Therefore, with input from a horticulturist and a landscape architect, between 2022 and 2023, a proposal was developed for a well-designed and fit-for-purpose, pilot therapeutic garden as part of the treatment regimen for both in-patients and out-patients, to promote health and well-being among staff, visitors and, ultimately, the national community. It was expected that the funding needs would have been met externally by the corporate sector and private individuals because the initiative was a worthy cause.

However, there were more immediate, core requirements for implementation that required attention. The administrative and management responsibilities of the two main stakeholders for this project, the NCRHA and the UWI, had to be formalized because the arrangement had implications for access to both external and internal funding. Also, a designated and committed in-house team was required for its overall guidance and management as the input

of the member of the UWI staff who had the vision for this garden was seriously constrained by other work-related responsibilities. A team approach was also needed to rationalize the use of the space allocated for the garden that had been identified by both stakeholders. The traditional traversing of the space by NCRHA vehicles to collect waste from the upper wards was not compatible with the intended use for a garden. There was no input to this initiative from the Health Services Unit (HSU) on the UWI, St Augustine Campus which had established a healing garden in 2016 to serve the health and wellness needs of students and staff at the campus (Moore, 2019). That garden had been implemented with the assistance of volunteers from governmental and private institutions, including a horticultural club that continued to contribute to its maintenance.

4.1 The North Central Regional Health Authority,

In 1921, during the COVID 19 pandemic, the administration of the NCRHA launched the Agri-Wellness Initiative to support the Ministry of Health's efforts to promote healthier lifestyles, to combat NCDs and to encourage citizens to develop healthier behaviours and pursue wellness (Newsday, 2023). A mixed fruit crop orchard and beds of various food crops were established to supply the hospital's kitchen with produce to reduce food costs and provide more nutritious, organically grown meals for in-patients. Staff were involved in the planting and in harvesting the crops. It was envisaged that clients from the Psychiatric Unit would also be involved in gardening as part of their treatment regime (Newsday, 2023), however, information on whether such collaboration has materialised was unavailable. Since the initial plantings, the author observed expanded vegetable crop production during visits in 2024 (Fig. 3). PAHO contributed to wellness initiatives at the institution by donating a wellness bench.

5.0 Sangre Grande Hospital

At the Sangre Grande Hospital which is administered by the Eastern Regional Health Authority, a Healthy Hospital Initiative was started in 2019 to create an environmentally sustainable health system and to improve the physical and mental health of staff and clients (Basdeo et al., 2024). The activities undertaken included establishing green spaces for beautification, a kitchen garden, recycling bins and exercise sessions for staff. Additionally, team members have received training from PAHO on smart hospitals, and have collaborated with EarthMedic for Planetary Health, a local NGO, as well as, with the Faculty of Engineering, UWI. The NGO addresses mitigation of the negative impact of climate change on human health and healthcare systems through environmental health measures such as urban greening (J. Hospedales, EarthMedic, pers. comm.). Collaboration with the Faculty of Engineering involved research on the use of renewable energy for a sustainable, clean water supply and for the hospital's operations. The hospital plans to add a hydroponics unit and to use the PAHO training to assess the disaster resilience and carbon footprint of the hospital (Basdeo et al., 2024). Through the proposed outreach to encourage other community-based health facilities to embark on similar projects, the hospital is playing a leading role in making clear the connections between healthy environments, sustainable, climate-resilient communities and human health. While there was no specific mention of horticulture as therapy in this project, the therapeutic benefits of green spaces and gardening for the hospital's clients, staff or the wider community are implied.

The project was implemented by a team consisting of a senior doctor and both clinical and non-clinical staff (Basdeo et al., 2024). The team conducted a successful fundraising event to support future projects, in collaboration with an NGO, Friends of the Hospital. Nevertheless, the initiative was challenged by issues that included incompatibility between existing infrastructure and the location of green areas. Limited staff participation and ownership of the project created excessive demand on the team for funding and maintenance of the plants which suffered due to core work commitments.

DISCUSSION

The fore-going descriptions of garden-based and gardening activities at the public health institutions in Jamaica and Trinidad and Tobago provide some insight to the status of the use of gardens in health care that has not been documented previously for the English-speaking Caribbean. In both countries there is a history of using crop and livestock production activities as occupational therapy in residential public healthcare settings for persons with physical or mental illness which was similar to the early use of farm activities as occupation to distract patients from thinking about their illness (Davis, 1998). Outdoor, farm-based activities allowed direct interaction with nature and resulted in improved physical, emotional and nutritional health of participating patients (Colonial Report, 1938). Although the patients had diagnosed conditions, the vegetable and fruit gardens at the Chachachacare leprosarium during the 1930s may not completed align with current definitions of therapeutic hospital gardens because neither their design nor the horticultural activities conducted in them specifically addressed formally stated treatment goals (Haller and Kennedy, 2019; Nieberler-Walker et al., 2023). Additionally, it is unlikely that the supervisory staff would have been trained in occupational therapy as this was still a very new field of health care (Davis, 1998). Nevertheless, these gardens were healing gardens that may be considered as an early type of therapeutic garden because patients derived a range of therapeutic benefits including improved mood, physical exercise, and improved quality of life through occupation with gardening for food and nutritional purposes.

At Bellevue Hospital and the rehabilitation centres in both countries, the more recent use of gardens and farming activities as occupational therapy was integrated with rehabilitative treatment goals for persons diagnosed with mental illness. Furthermore, both in-patients and out-patients at the respective institutions were provided with vocational skills by staff trained in agriculture to facilitate reintegration of discharged patients to resume their lives in the society, which supported Hickling's advocacy for decentralised mental health care and shorter hospital stays (Hickling and Walcott, 2021). This suggests that with adequate resources, the healing gardens at these institutions were therapeutic in nature (Haller and Kennedy, 2019; Nieberler-Walker et al., 2023). Unavailability of appropriate resources seems to have limited the use of the garden at the St Ann's Psychiatric Hospital for restoration for in-patients, but it may still provide some therapeutic benefits.

Since 2020, four gardens for health were attempted or established at three public hospitals in this study, with one healing garden at each institution. The initiative at the Psychiatric Unit

at the EWMSC clearly aimed to serve therapeutic and social functions for patients, staff and visitors, through both active and passive interaction in the garden, whereas Oo's Park was being used only passively by patients, staff and the public with restoration being the apparent purpose for the long-term, resident in-patients. Within the larger healthy hospital goal at the Sangre Grande Hospital, the green spaces and gardens seemed to be intended for passive use by staff and clients as well as to create a healthy and sustainable hospital environment. During the study, these healing gardens all provided health benefits, but without the input of professionals with training in horticulture or other nature-based therapies, none were therapeutic hospital gardens, but with appropriate staff, the garden started by the Psychiatric Unit at the EWMSC and Oo's Park have the potential to serve this purpose. The orchard and kitchen garden established at the EWMSC by the NCRHA were geared primarily to improve the nutritional content of the meals offered by the hospital's kitchen, which would also benefit patient health (Murphy, 2017), but it was not a healing garden at the time. Regardless of the use of the gardens, it was clear that at these institutions there was awareness that interaction with nature, whether passive or active, was beneficial to human health.

Limited written and oral information on implementation of gardens for health at the public institutions in this study was available. However, the following observations on the experiences, especially since 2020, may be useful to the development of the current and future initiatives:

1. Vision for the hospital garden – Usually one or a few members of staff had the vision for the garden in response to a need. Examples in this study include the longstanding need for effective, efficient and humane approaches to mental health care; more holistic treatment regimens that recognised the relationship between mental health and interaction with nature; leadership in linking healthy environments to human health; linking food and nutrition with human health. Transmission of the vision was necessary to garner stakeholders' support and to develop a committed team for implementation. This was best seen at Bellevue Hospital where advocacy for removal of the stigma against mental illness and for decentralised mental health care was sustained by successive administrations and also communicated externally resulting in the rehabilitation centres and Oo's Park. Sharing the vision is important for building support among internal and external stakeholders and for developing committed teams for implementation and management.

2. Planning the garden – A limitation to garden implementation was that space allocation for gardens for health may not have been planned when the hospital was designed and built. Planned access to land could reduce conflicts for use of space as encountered at the Sangre Grande Hospital and by the Psychiatric Unit at the EWMSC. The different types of gardens that have emerged indicate that the objectives of the garden should also be clear and resource requirements identified. An adequate area of suitable, properly located land, with potential for expansion, was an important resource for the establishment of Oo's Park.

3. Support by the hospital administration – Improved and early communication with hospital administrators about the range of benefits that can be derived from hospital gardens and gardening is critical for their support and successful implementation as achieved at Oo's Park. Such support will minimise challenges posed by legal requirements, existing physical structures, workplace procedures and even, institutional resistance. With collaboration among staff, green spaces and gardens can meet different objectives that are not mutually exclusive or competing within public healthcare institutions, but complementary as they all aim ultimately to achieve better health outcomes and well-being for their clients, staff and the national community. Hospital administrators are better placed to secure commitment from different levels of leadership to collaborate to achieve the benefits of hospital gardens and to formulate effective strategies for their successful implementation, efficacy and sustainability. Strong promotional effort may be required where awareness is non-existent or very limited at this level. Successful pilot activities by an initial team, with support from knowledgeable volunteers and relevant NGOs, may be an important approach to convince the administrative leadership about the possibilities.

4. Information sharing - There appeared to be little or no information sharing among the institutions in Trinidad and Tobago, even where there were common elements, for example, kitchen gardens at the EWMSC and at the Sangre Grande Hospital. Greater sharing among the institutions about their efforts and experiences could contribute significantly to the achievement of their specific goals as well as to overall goal of a healthier national community.

5. Staffing – Inadequate staffing to plan and supervise patients' activities, to provide vocational training or to perform maintenance tasks, has threatened the sustainability of gardens at healthcare institutions in Trinidad and Tobago from the early days of the leprosarium on Chacachacare. None of the institutions had staff trained in agriculture or horticulture; this input seems to have been available at the leprosarium only in the late 1930s. This deficiency is critical to address garden-related tasks that are not within the responsibilities or competencies of current hospital staff.

6. Funding – Since 2020, attempts at garden establishment in both countries have relied more on private funding by corporate and private citizens for small initiatives than on government funding, except where the hospital administration had a direct interest in the garden, as in the case of the NCRHA. Increased public awareness of the goals and outcomes of pilot projects and properly prepared project proposals can enhance opportunities for funding better designed and equipped, as well as, bigger projects. Many individuals readily identify with health, wellness and environmental management and are willing to contribute as evidenced by Oo's Park and the healing garden at the UWI, St. Augustine Campus. Corporate citizens are also increasingly supporting green projects because they are related to sustainability and the need to demonstrate compliance with the environment, social and governance framework that is aligned to the SDGs.

7. Unawareness of horticultural therapy – The roles of doctors, nurses, occupational therapists and staff with training in agriculture in the implementation of hospital gardens were recognised but awareness of the therapeutic use of horticulture to address specific disabilities or of horticultural therapy as a discipline with trained professionals was absent. This is seen as a major limitation. Professionals in this field can serve on teams to achieve the goals of therapeutic, vocational and social programmes for clients. They can also contribute to the implementation issues identified above because of their in-depth knowledge and understanding of programme management for successful outcomes and of the requirements for facilities such as gardens that support such outcomes (Vanderneut, 2019). Unawareness of professionals in horticultural therapy in both countries most likely reflects the newness of the discipline, which explains the lack of recognition of the need for their services in the planning and implementation of healing gardens within the settings of public health care institutions.

CONCLUSION

Gardens have been present at healthcare facilities in Jamaica and Trinidad and Tobago at least since the early 20th century. At the institutions in this study, healing gardens facilitated interaction with nature primarily by patients in residential care, who, either through active gardening or passive engagement, derived therapeutic benefits, improved quality of life and vocational skills for reintegration into society. While healing gardens established since 2020 are intended mainly for passive interaction with nature, the supply of fresh, nutritious food to hospital kitchens and healthy hospital environments are additional services that hospital gardens are expected to provide. The need for vision sharing to develop committed teams, garden planning, strong administrative support, information-sharing among institutions and availability of staff with appropriate training in horticulture were among the key factors affecting the implementation and sustainability of the gardens. There was no awareness of horticultural therapy as a discipline or profession and of its potential to contribute to successful implementation of gardens at healthcare institutions. Two surveys are recommended, including one on gardens at a larger number of healthcare institutions in the Caribbean and another on the knowledge, attitudes and practice of horticultural therapy among relevant stakeholders in the region. The objective of the latter study will be to provide baseline information to determine suitable strategies for promoting the profession.

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FIGURES

Figure 1 a. Seating for passive interaction at Oo's Park, Bellevue Hospital, Jamaica

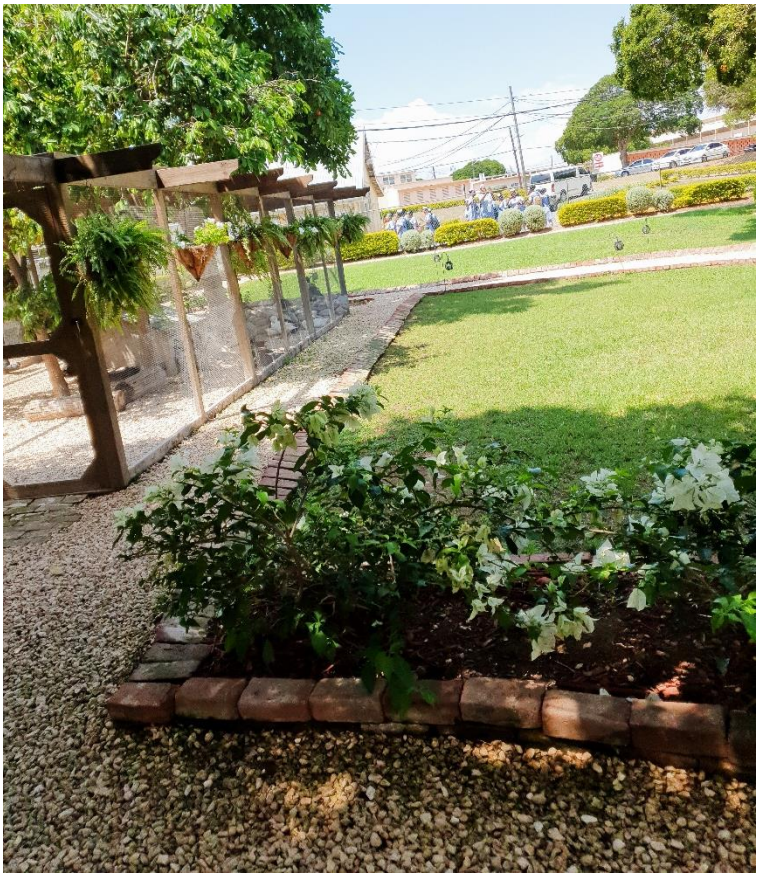

Fig. 1b. All weather walkway for easy access to the aviary at Oo's Park, Bellevue Hospital, Jamaica

Fig. 2a – Garden at the Psychiatric Unit, EWMSC in Trinidad and Tobago – Area allocated for the therapeutic garden

Fig. 2b. The Psychiatric Unit garden, EWMSC in Trinidad and Tobago - Harvested sorrel (*Hibiscus sabdariffa*) plants

Fig. 3 a Garden at the EWMSC in Trinidad and Tobago - Vegetable crops and corn planted

Fig. 3b Garden at the EWMSC in Trinidad and Tobago - Coconut trees in the orchard

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