

Research Article

Architecture and Societal Problems: Development of Rehab Facility for Drug Addicts Reintegration

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Article Info	Abstract
Article History	Drug abuse problems in recent times have become an issue of grave concern and worrisome globally, with similar consequences for society. The paper emphasized the role of architecture in facilitating a therapeutic process for drug addicts in rehabilitation centre design as one of the solutions to this problem. Architectural spaces undoubtedly affect and influence the actions and attitudes of users. The study aims to integrate therapeutic techniques in rehabilitation centre design with enhanced spatial efficiency for holistic patient treatment to integrate them back into society. The methodology of the study is both theoretical and practical, involving a literature review, appraisal of case studies; observations, use of interviews and architectural design principles to formulate and produce a design model for a rehab centre in Calabar, Nigeria. Findings revealed that there are no known well-designed centres to rehabilitate victims of drug addiction in Calabar, Nigeria. The few centres available function as detention and discriminating spaces. The study concludes that rehab centres that focus on the therapeutic healing principles approach, which deals with patients' mental, psychological, social and spiritual needs, should be developed in Calabar and other cities in Nigeria for swift rehabilitation of addicts.
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1. Introduction

Architecture as a field of study encompasses all aspects of life and human endeavours. It is one of the core instruments for solving most of society's problems, including the recently aggravated challenges of juvenile drug addictions. Architectural spaces undoubtedly affect and influence the actions and attitudes of those who use the spaces, including healing; hence the great American Architect Philip Johnson once declared that 'all architecture is about shelter, all great architecture involves the design of spaces that contains, cuddles, exalts or stimulates the persons in that space'. Similarly, buildings that are a product of architectural design create spaces that shape the inhabitants within them. Therefore, in discussing the challenges of individuals, especially persons with drug abuse problems, their temporary social containment, so to speak, must not look or feel anything like an exclusion [1, 2].

Accordingly, Theonye defined drug abuse as the application of drugs for purposes other than for which they are produced. It is also seen as the improper use of drugs to the degree that the consequences are detrimental to the user or society due to behaviour that strays from accepted norms [3]. Some of these drugs being abused are agents that act on the central nervous system to engender significant effects on mood, social feelings and behaviour that result in mental impairment in the addicts [4, 5].

Rehabilitation is “a set of interventions intended to optimize functioning and reduce incapacity in individuals with health conditions in interaction with their environment” [6]. Rehabilitation aid people of all ages, including children, youths, adult or elderly persons, to be fully independent in carrying out normal daily life activities as well as helping them to engage meaningfully in work, recreation and life functions [7]. Similarly, rehabilitation centres are considered mental health facilities, with typical treatment programmes usually lasting between 4 to 8 weeks. However, inpatients in mental health facilities are more susceptible to self-harm and aggression, requiring special attention [8].

The drug abuse problem is not peculiar to Calabar, Cross River State, or Nigeria alone but is a global concern. According to a United Nations report, nearly every country in the world is affected by one or more drug abuse by its citizens [9]. Drug addiction and abuse pose a grave threat to the socio-economic, health, security and peace of society and the entire nation [10]. However, statistics show that in Nigeria, one in seven persons aged 15-64 years had used a drug (other than tobacco and alcohol) called psychoactive substance in the past year, with the prevalence rate of any drug use put at an estimated 14.4 per cent, corresponding to 14.3 million people for non-medical purposes. The youths are the worst hit by drug abuse as their potential to promote and give growth to society, economic balance, political stability and social justice are jeopardized [11].

Statistics from the Federal Psychiatric Hospital, Calabar and the National Bureau of Statistics records revealed that over 80% of male admission, either as a fresh case or in a relapsed state, is related to substance abuse. Two-thirds of people who used drugs reported having serious problems such as missing school or work, becoming less productive at work/school or neglecting their family or children [11, 12]. Observations also revealed that many teenagers and youths in the Calabar metropolis who are cultists and non-cultists smoke and sniff hard drugs, which they call ‘stone’—a stimulant that pushes them to anti-social practices like violence, rape, stealing and kidnapping. Sometimes in broad daylight, youths are seen in small groups

sharing lighters to ignite their Indian hemp and cigarettes in public view without fear and remorse, thus creating a sense of insecurity in lives and property in the city.

However, in Calabar, Cross River State and other cities in Nigeria, there are no known well-developed centres to rehabilitate these victims of drug addiction. The few centres available are either converted buildings or were created without taking cognizance of healing principles guiding therapeutic centres, but rather focusing mostly on a detention approach instead of medication and mind abstinence from drugs, thereby neglecting the patients' mental, psychological, social and spiritual needs, which are the most important elements that help in achieving effective treatment. For this reason, successful treatment of drug addiction is accomplished when the mindset of the addicts lets go of destructive thoughts that form anger, grief and pain, which result in hindrance in the healing process; however, this can be achieved through the provision of the supportive, contributive, curative and therapeutic environment [13].

Consequently, one of the solutions to the drug abuse problem is the space-manipulation-focus approach which is the design of a temporary social containment to reflect a sense of exclusiveness. A facility such as a drug addicts rehabilitation centre should be an environment that embraces the addicts through effective building spaces and therapeutic environment, inner and outer spaces that provides them with the means of understanding what went wrong and how to work through the group towards building their own strength to surmount physical and psychological obstacles on the road to recovery.

Therefore, this study is aimed at creating the needed architectural solution through the design of a therapeutic rehabilitation facility that effectively contributes to the healing process and recovery of drug addicts in Calabar, Cross River State, Nigeria, in order to reintegrate addicts back into society for normal living. The architectural design will address concerns regarding the rehabilitation facility's satisfaction, safety, and functionality, thereby creating a solution to this menace to society.

The environment and design of a place undoubtedly influence the mood and psychology of human beings, including patients in rehab facilities. This is because nature-infused space design promotes both the mental and physical wellbeing of users and creates environments suited to their purpose [14]. Therefore, contact with natural elements in the planning and design of spaces, including landscaping that introduces nature into an architectural design as the hallmark of therapeutic design, stimulates health, good humour, relaxation, reduced anxiety and stress-free mood as well as eliminates wearisome scene [15, 16].

2. Literature Review

Architecture is multidisciplinary, and it is a profession of the past, present and future, thus making it dynamic and a problem-solving discipline, including offering solutions to the present-day challenge of drug addicts' rehabilitation. The solutions from architecture offer in this regard are designing and creating spaces in health institutions. This is because, in present-day design, healthcare facilities such as general hospitals and psychiatric and rehabilitation facilities are now expected to meet a complex combination of aesthetics, environmental, physical, social and symbolic requirements [17]. Studies have shown that it is not just any architectural design that stimulates healing, but a well-thought-out design with therapeutic elements, as the structural environment can promote wellbeing, reduce infections, prevent falls and positively influence patients [18].

Today's architectural designs of health facilities have to incorporate therapeutic functions and properties, influencing a new architectural approach called 'evidence-based design'. Thus, evidence-based design is the process that involves making accurate smart and careful decisions about the design of a building based on the present best evidence from practice and research. Consequently, an evidence-based design approach in healthcare facilities utilizes knowledge of the therapeutic impact of certain physical attributes of designed spaces on patients, practitioners and visitors as the guiding basis of their designs [19].

One of the successes of evidence-based design is that it has revitalized some of the lost qualities of structure layout, such as the 'nature feel' in hospitals, thus making hospital facilities 'healing setting' for their patients. Studies on hospital design emphasize four fundamental aspects of hospital structures regarded as components of a therapeutic environment: natural light, natural ventilation (fresh air), landscape elements and a quiet environment [20]. Therefore, architecture exploits the power of natural light, colour and art in therapeutic settings to stimulate specific emotional response which promotes healing. For instance, Chrysikou analyzing the effects of colours in buildings opined that colours go beyond their aesthetic properties and affect people emotionally and psychologically because it stimulates the nervous system [21].

Similarly, natural light affects the psychological and physiological health of building occupants, promotes comfort, reduces stress/anxiety, increases happiness, and facilitates the quick recovery of rehab patients [22]. In contrast, artworks aid in the recovery of patients by helping to relieve pains and landscaping (trees and greenery) reduces stress, improves cognitive functions, creativity and well-being, and expedites

healing [23]. These and other benefits of therapeutic design describe the architecture of healing which forms the roles architecture plays in recovering patients in rehabilitation centres.

The term rehabilitation is complex and interpreted to have several meanings; therefore, there is no universally accepted definition. However, the meaning and definitions vary based on health, development, human rights, security or substance abuse matters. For this study, the meaning of rehabilitation will be based on substance abuse. Accordingly, rehabilitation is a “set of interventions designed to optimize functioning in individuals with health conditions in interactions with their environment” [6]. It could also be referred to as ‘services and programmes designed to assist individuals or persons who have experienced trauma or illness that results in an impairment that creates a loss of physical, psychological, social or vocational functions’. “Rehabilitation aims to restore, compensate, prevent or slow deterioration in functioning (sensory, physical, intellectual, mental, cognitive or social) to assist the individuals in reaching their optimal levels” [24, 25].

Therefore one of the benefits of rehabilitation is that it helps to place the persons or individuals at the centre and contributes to people reaching their full potential and participating in society. Thus, the positive impact of rehabilitation is not only on the individuals but also on their families, communities, and economies [6].

However, rehabilitation takes place in an environment, facility, or complex product of architectural design to create the needed spaces where healing occurs. Some centres maintain an open-door policy for voluntary patients, while others are much more restrictive. Several addiction and behavioural specialists work in a drug rehabilitation centre, from physicians who monitor a client's physical health to clinical psychiatrists who address the client's emotional and mental issues during recovery. A drug rehabilitation centre is often located in a secluded area, far removed from outsiders who might provide illegal drugs to clients or disrupt their efforts to recover from an addiction. If permitted, visitors to a drug rehabilitation centre are usually screened for contraband and may have very restricted access to a recovering addict [26].

The setting of a drug rehabilitation centre can vary from institution to institution. Still, the physical grounds and architectural details generally create a peaceful or reflective atmosphere to facilitate a client's recovery. Some centres encourage residents to work on arts and crafts, while others provide alternative treatments such as music, dance or drama therapies. Since many drug addicts have physical and emotional

issues, they are often encouraged to play sports, tend gardens or take a walk around the facility's grounds. In addition, a successful drug rehabilitation centre is prepared to handle any medical emergencies which may arise during treatment sessions, including threats of suicide or harm against other patients or staff [27, 8].

It is important to discuss the following concepts as it relates to how architecture promotes the healing and recovery of drug addicts in rehab centres designed as part of the literature for better understanding. These include:

2.1. Therapeutic Community

A therapeutic community for drug addicts is defined as ‘an environment in which people live together in a controlled and organized way to stimulate change and make possible a drug-free life in the outside society’ [28]. The design and creation of spaces help solve societal problems and do not discriminate against users, providing comfort for all persons. In essence, the therapeutic community should ideally be ‘a society away from society’ for patients who suffer from the stigma of addiction to rediscover and reorganize themselves for a contributory and meaningful lifestyle they lost through drug abuse. Therefore, this type of healing process, aside from its residential philosophy, must be an architectural solution through the design of suitable spaces, thus encouraging a communal setting of active participation, which is a democratic and collaborative care-giving approach rather than becoming a fixed setting that is a restrictive [29].

The therapeutic community should, of a necessity, contain, among others, a ‘therapeutic garden’ which is an outdoor garden space that has been specifically designed to meet the physical, psychological, social and spiritual needs of the people using the garden as well as their caregivers, family members and friends. The focus of the gardens is primarily on incorporating plants and friendly wildlife (i.e. flora and fauna) into the space [1, 29].

In addition, the therapeutic community is only possible where the architectural design emphasizes nature, including natural landscape elements in the interior and exterior spaces and a blend of aesthetics, environmental, physical, social, and symbolic requirements [17]. The community philosophy stresses the need for the patients to become the change within themselves, to sense that even though they live in a treatment community, the environment surrounding them is one in which they feel not part of the problem, but part of the solution on their way to re-learning the social process. It essentially places the healing process

into the hands of addicts themselves in a controlled and voluntary but not institutionalized environment, finding methods that allow them to rebuild their ability to deal independently with their own problems [25-17]. This is why this form of residential therapeutic community involves an internal hierarchy of jobs, progressive responsibilities, and various medical, educational, and vocational services [30, 31].

2.2. Healing Architecture

Healing design, also referred to as 'healing architecture', is defined 'as creating environments that make you feel good [32]. Thus, to a great extent, one can conclude that 'if you feel good, you will 'heal' faster. So, it means that an environment that accentuates the healing process should be 'healthy'. "Healthy-hospital design is a harmonious blend of nature and architecture that promotes health and aids early recovery in sick people [32].

Speaking on the effect and influence of architectural spaces on occupants and users, Philip Johnson asserted that 'building spaces and what is between them make different lives, influence how we think, feel and even make us behave the way we are'. Many specialists in various fields, including sociologists, therapists and architects, have repeatedly argued about how place and the design of its spaces communicate with the human psyche, affecting how people react to their lives and how they develop. And this might be said to be rather crucial for any individual who requires constant long-term care or needs to recover from physical, social and emotional instability, such as the multi-faceted breakdown and loss of self -brought about by drug addiction [33, 34].

Studies have shown that spaces created by architectural designs facilitate the addict users' healing process, providing a steady rehabilitation process through a therapeutic environment and not just architecture itself [1, 35]. Similarly, there is an asserted that the design and looks of buildings create a positive or negative impact on the patients, workers and visitors, concluding that good, quality design creates a sense of safety, friendliness and warmth, which stimulates the spirit of the patients for quicker recovery as well as motivates staff to be more dedicated and effective [36]

Also, healing architecture involves a multidisciplinary and collaborative approach involving built-environment professionals such as architects, engineers, interior designers, landscape architects, environmental scientists, clinical psychologists and other healthcare professionals who work together to provide the needed care and healing process [32].

2.3. Biophilic Design

Biophilic Design is an innovative way of designing the places where we live, work, and learn. The term ‘biophilia’ literally means ‘love of life or living systems’. Fromme first used it to describe a psychological orientation of being attracted to all that is alive and vital. He uses the term in the same sense when he suggests that biophilia describes “the connections that human beings subconsciously seek with the rest of life.” Together, we will encounter buildings that connect people and nature –hospitals where patients heal faster, schools where children’s test scores are higher, offices where workers are more productive and communities, where people know more of their neighbours and families thrive [37]. Biophilic Design points toward creating healthy and productive habitats for modern humans.

The premise of biophilic design, in addition to “reducing the harm that stems from the built environment, also tends to make the built environment more pleasing and enjoyable. It seeks to avoid and minimize harmful impacts on the natural environment and to provide and restore beneficial contact between people and nature in the built environment [38]. Biophilic design features include natural lighting, natural ventilation, natural materials, views and prospects of nature, and shapes and forms that mimic natural features and processes, thereby preventing harm to both people and nature while facilitating a beneficial link between the two [38].

2.4. Building Form

Form refers to the shape or configuration of a building. Form and space constitute primary elements of architecture. The language of forms in architecture also correlates with the feeling one obtains from space. Thus, form and space give shape and scale to the design process [39].

The architecture of a healing environment can take on the qualities of natural conditions through imitation in form. While rectilinear spaces give a feeling of being constrained and ‘boxed’, the fluidity of an organic space creates no such feeling. It has been argued that right angles from rectangular spaces become superficially harmful and less comforting to the human eye. In contrast, one feels much safer ground with non-rectangular or shape-moderated spaces [40].

However, a combination of elements such as colours, light, textures, living lines and human activity can reinvigorate any forms and spaces with life, thereby maximizing the essentially practical and culturally usual characteristics of rectangles or other shapes to its advantage [36].

2.5. Colour Therapy

The architecture of rehabilitation should always integrate colour into its spaces and designs to evoke and stimulate certain emotional responses and use it as a tool to manipulate and control the experience of space as desired [41]. It has been discovered that architecture and colour can visually stimulate patients and the surrounding society; this can provoke and elevate positive or negative emotions. These emotions are triggered by our mental perceptions of colours about the association of these colours with certain past personal events or cultural beliefs [33, 41].

Colours in architecture provide visual stimuli for the occupant that can elicit positive and negative emotions based on the environment. Whether the emotions one experiences are through acquired knowledge and/or personal history, there is evidence that colours provoke emotions on average in the same way, with few exceptions.

The properties of the colour can also set the tone for spaces, eliciting certain emotions necessary. According to colour therapy, colours can influence many aspects of our lives, including our mood, mental state and energy level. Each colour is thought to be associated with one of seven energy centres, or chakras. If a person is thought to be out of balance or weak, the colour it's associated with is believed to help strengthen it. The concept of colour therapy is based on the fact that our physiologic functions respond predictably to colours [21, 42].

2.6. Art Therapy

Rehabilitation centres have also been known to employ the use of artworks as a measure to facilitate the recovery processes of drug-addicted patients. Hence, Nanda, health-care systems and design specialist, asserted that scientific studies show that art can aid patients' recovery, help relieve pains and shorten hospital stays [43]. But the art that is beneficial in this regard is the right art with vivid paintings of landscapes, friendly faces and familiar objects, which assist in lowering patients' blood pressure and heart rate, rather than abstract pictures that can have the opposite effects on patients. Similarly, studies have confirmed that abstract art allows patients to project their own anxieties onto the image. Thus, pictures that portray pleasant images are more soothing. Accordingly, when one is under stress and anxiety, images seen that are ambiguous are interpreted negatively [44].

3. Methodology

The study methodology is basically qualitative case study research approach which includes theory and design features. This involves a review of literature, interviews, personal observations, visitation and appraisal of existing centres and using architectural design principles to formulate and produce a design model for drug rehabilitation. The design of the proposed centre involves processes such as studies on the classification of drug addicts, the attitude and behaviours of addicts, as well as their spatial requirements. In addition, visitation to local existing rehab centres in Nigeria, namely Plateau Rehabilitation Centre, Plateau and Ibrahim Sani Abacha Rehabilitation Centre, Bauchi, was carried out where rehab facilitators such as counsellors, medical personnel, psychiatrists and psychologists were interviewed to get the needed information and for personal observation. Lastly, an appraisal of modern international rehab centres, which include Vejle Psychiatric Hospital, Denmark, VA Palo Alto rehabilitation centre, Latrobe, Westmoreland and Groot Klimmendaal Rehab Centre, Outside forest, Arnhem, Netherlands, was done in order to be conversant with the space requirements and functionality of modern rehab centres.

4. Discussions

The discussion is centred on the design considerations and the design concept/philosophy to produce an architectural framework suitable for the design of a state-of-the-art rehab centre.

4.1. The Specific Design Consideration

There are principles and design considerations peculiar to the design of a rehabilitation centre which may not necessarily be required in other forms of design. The design of a rehab centre requires an understanding of the behavioural psychology of the patients, the space characteristics and the functional requirements of the design for an overall universally acceptable and comfortable centre that will meet the desired results.

Several authors [45, 46, 47, 48] gave some of the basic principles for a rehab centre design as follows:

Salutogenic Design approach: This is a unique design approach that advocates the integration of good circulation, open spaces and healing gardens into a rehab design in order to enhance the patient's manageability, comprehensibility and meaningfulness of life. A salutogenic design approach in architecture is a concept aimed at stimulating the natural recovery of health through psychological stimuli. Aaron Antonovsky proposed the theory to support human health.

Other considerations include the following:

i. Creation of biophilic environment ii. Home away from home approach iii. The layout of furniture to create aesthetically appealing and cosy interior spaces iv. the flexibility of spaces to create a sense of control and Manageability of Patients, v. Open-Air indoor Activity Spaces vi. Create a Sensory Experience by providing a reflexology track, healing gardens and water bodies, among others. vii. Interactive Social Spaces, viii. Modern Technology/Simulation Areas ix. Create Different Activity Areas.

4.2.. Functional Design Features for Stress Reduction in Rehab Centres

One of the major challenges in drug rehabilitation centres is the issue of violence and safety within their environment. This is because drug addicts as mentally-ill inpatients exhibit aggressive and anti-social behaviours. Studies have revealed that 32.4% of psychiatric inpatients engage in aggressive behavior or violence, and 50% of all aggressive incidents in psychiatric units involve physical violence [49, 8]. This is why it is very important to design and create a comforting environment and stress relieving to reduce violence, self-harm and suicide [50].

The design features necessary to achieve the above-stated environment, which should form a part of the designs of the therapeutic rehab centre are as follows:

i. Private Patient Rooms ii. Smaller Ward Patient Group Size iii. Exposure to Daylight
iv. Nature views & accessibility v. Smoking rooms vi. Dayrooms vii. Way-finding;
viii. Safety & Staff Surveillance.

4.3. Analysis of the Proposed Design: Concept and Philosophy

The project is designed principally to function as a rehabilitation centre with a core mandate of giving the patients and other users a pleasant and comforting experience. The design philosophy is nature-based architecture, flexibility and sustainability, offering an unconventional approach to designing healthcare institutions. The composition of the centre includes indoor and outdoor physical activities and relates to nature as part of the healing process. This concept is tailored along similar concepts used in the designs of both Groot Klimmendaal Rehab Centre and the new psychiatric hospital Danish city of Vejle [51, 52].

Interior Features

The interior features are made up of elements that invigorate the mood of the patients, especially in the spaces where they stay much longer, like their rooms. These elements, including greenery, linkage

between the interior spaces to the outside of the natural environment, natural ventilation and daylighting of interior spaces complemented by artificial sources, help to facilitate healing. However, other features such as colours and natural artwork on interior walls also help correct the patients' mood, as in figure 1 below. The rehab centre design focuses on the importance of light's healing capacity on patients by using natural and artificial light. In addition, colour therapy is integrated throughout the building for soothing recovery, elimination of depression, good sleep support and preservation of a natural circadian rhythm for staff and patients.



Figure 1. Interior with colour and artwork



Figure 2. The exterior of a courtyard with nature

Source: Author's work

External features

The different units of the centre were orderly arranged at the central core of the facility, adopting a flexible design approach. The accommodation unit was arranged at the periphery of the centre, then the offices, the sporting facilities, the restaurant and the theatre. Trees and shrubs are lined up on the site, and many kinds of grass are also present, forming part of the building with defined landscaping features. However, open spaces for relaxation and recreation are incorporated with designated healing or meditative gardens. The centre has a defined parking space for visitors; vehicles are parked at a specified space, as shown in the layout plan in Figure 3. The design emphasizes the importance of physical activities through its multi-purpose sports hall and wellness centre, as well as nature's importance through its layout and multiple courtyards, which also invite ample daylight inside the buildings.

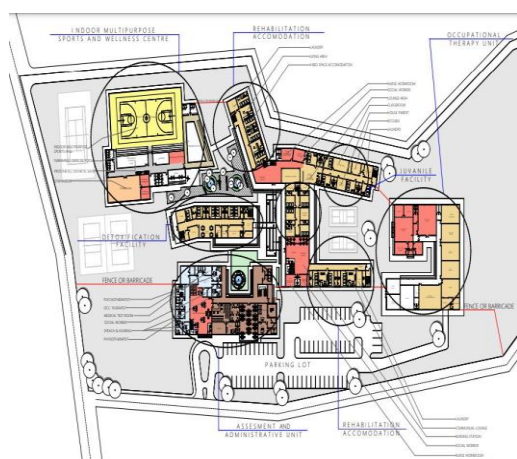


Figure 3. Site Layout Analysis



Figure 4. Site plan [Source: Author's work]



Figures 5 & 6. 3-D Exterior view of the Rehab Centre [Source: Author's work]

5. Conclusion

The study discussed the challenges posed by drug abuse and addiction in our society today and how architecture as a discipline can help solve the problem through the planning and design of both indoor and outdoor spaces in rehab centres in order to facilitate the healing process and reintegration of addicts back to the society for meaning living. It shows how spaces could be manipulated in harmony with natural elements such as daylight, fresh air (natural ventilation), plants, greenery and water body to stimulate comfort, and good mood, reduce stress and ultimately improve wellbeing and healing of drug addicts in society. Thus, the proposed rehabilitation centre caters to patients with mental illness and addiction problems, offering treatment to reintegrate them into society. The rehab centre will be an outpatient/inpatient facility with medical and psychological services to adapt to a patient's specific needs. The studies employed various methods, including interviews, visits to some selected rehab centres and appraising existing well designed

centres to help design the proposed rehab centre to achieve the centre's purpose. From the analysis of the studies carried out, it is clear that the design of a rehab centre must consider the attitude and behaviours of the addicts and the stages of their treatment leading to full recovery and final reintegration. The modern techniques and principles used in the design of rehabilitation centres which enhance the lives of the addicts and make them more submissive to treatment, were employed. Also, the centre incorporates some supportive recreational therapy facilities that enhance relaxation and social interaction, thus making it a world-class rehab centre that is accommodative, curative, educating and reintegrating.

Declaration of Competing Interest The author declares that he has no conflict of interest.

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