

# Designing Drug-addictive Rehabilitation Centre with Digital Technology as the Therapeutic Methods

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**Abstract.** Drugs cause damage to the nation's generation, which affects moral decay and loss of norms in society. Many productive ages have a history as drug-addictive users, and it increases each year. The social environment is one of the main aspects of a person's fall into drug addiction. Drug use impacts physical and psychological dependence, raising individual problems and changing societal behavior. The number of drug-addicted users in Indonesia does not match the number of adequate rehabilitation centers. How to design an interior of a Drugs-addictive Rehabilitation Center with digital technology as a therapy method? Designing a rehabilitation center aims to provide a place as a facility for the recovery process for rehabilitant. *Design thinking* is the method applied in designing the interior of a rehabilitation center for rehabilitants in Surabaya, East Java. A good interior can increase positive emotions that affect the rehabilitant's health, supported by selected colors. The interior conception is to support comfort and safety for rehabilitant during their rehabilitation process, which applies digital technology to therapy methods. Through this research, it is expected that the interior can support the digital technology approach and positively impact reducing drug addiction and increase the creativity of rehabilitants.

## 1 Introduction

The Indonesia National Narcotics Agency (BNN) has data on the ratio of drugs-user in Indonesia is 1:55 or for every 55 people or the population in Indonesia, there is one person in aged 15 to 64 years is using drugs [1]. Drugs addicts are not limited by age, gender, occupation, and economic class. They are influenced by individual aspects, family issue, social environment, and risky behaviour.

Rehabilitation centre is the place for drug addicts that later will be named as rehabilitant to recover themselves for being addictive to drugs through several treatments during the program. In this case, rehabilitation centre needs interior designer to create a facility to rehabilitate that support the treatment activity as the therapy process. Space is a place where human being interacts during their activities. It should accommodate activities and affect productivity optimally for the space users. The aim of this study is to create the space for therapy process that affect both physically and psychologically. Designing an interior for rehabilitation centre needs to consider the behaviour, characteristic of the rehabilitant and the process of the rehabilitation activities and facilities accordance with existing programs.

Nowadays, digital technology has penetrated in all aspect of human daily life. It also happens in therapeutic method which interior designers must adapt to create a conception that appropriate with the needs of digital technology that applied as part of rehabilitation process. It is found that development of digital technology has

been utilized as digital care through the availability of computers, the internet, smart phones, and mobile software applications (*apps*) [2]. Furthermore, there is digital treatments to treat anxiety and insomnia, although most programs are still self-help programs that are used for internal needs with some support. Even though it still not yet common, the use of virtual reality technology has been used in the treatment of anxiety disorders and delusions of persecution [3]. The implementation of therapy still varies in format but usually carried out in regular weekly session. Through digital technology, it can shorten therapy session, can be done more intensively so that overall duration of treatment becomes shorter.

Site visit conducted to three drug-addictive rehabilitation centers in Jakarta to collect data and information regarding the real situation during the therapeutic process and the user activity in the facility. There are: (1). Madani Mental Health in Cipinang, East Jakarta, (2) Natura Addiction Center, Lebak Bulus, South Jakarta and 3). Karisma Recovery Society, Duren Sawit, East Jakarta. How to design an interior of Drugs-addictive Rehabilitation Centre with digital technology as therapy method? This is an interesting topic to develop. Creating interior conception that appropriate for drugs-addictive rehabilitation center to accommodate digital technology as therapeutic method.

## 2 Methods

Design thinking applied in creating an interior conception. This has several stages that starts from: (1). Exploring a

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problem (2). Framing problems in unique ways, (3). Determining possible solutions, (4). Generating unique solutions [4]. The fundamental goals of design thinking are to find innovative solutions to design problems. Focused on design solution instead of analyzing the problem will be the simplest way to create the conception. Then, complete the result to present the idea through 3D drawing perspectives.

The first phase ; exploring the problem, found in the collected data from site visit that has been conducted. Each drug-addictive rehabilitation center has its own characteristic, therapy method, activities that determines facilities that need to be provided in the design. The second phase ; Framing problems in unique way. The digital technology as part of therapy methods is still new. Though it has been found in some countries, it needs further research to find out the benefit of technology in the rehabilitation process. The third phase : Possible solutions, to create space that accommodate the use of digital technology as part of therapy method. The fourth phase ; Generating unique solution. Create a design conception that have the storyline for the whole interior.

### 3 Discussions

Drug addiction is a complex disease, characterized by an irresistible and uncontrollable urge to pursue drug, and this caused to continue using drugs despite being aware of the risks involved. This condition often becomes chronic with cures and relapses, although prolonged abstinence is also commonly found. Rehabilitation of drug addiction is a process of treatment to heal from addiction, and the duration of participating in rehabilitation program is also accounted for period time served [5].

#### 3.1 Drug-addictive Rehabilitation Center

Nowadays, rehabilitation room has less institutional feel than years ago. For luxury rehabilitation center, the facility is designed more like a resort hotel than a rehabilitation facility. This is for rehabilitants do not feel pressured while carrying out the therapeutic process in a series of activities that must be undertaken during the rehabilitation period. It is shown from the web survey that has been conducted to several rehabilitation center in Ashefa Griya Pusaka – Jakarta, Indonesia: The Balance – Mallorca, Spain and Crossroad Center – Antigua, Latin America.

The bedroom of rehabilitation center in Crossroad Center-Antigua, has a spacious area with thematic colours, good ventilation with natural lighting illuminates the bedroom as shown below in fig. 1 means two activities can be held in the same area, thus creating space efficiency and open circulation.

Shown below in fig. 2 is the dining area of rehabilitation center in Mallorca, Spain. The shape of kitchen counter has a simple modern style, that creates spacious kitchen. Open kitchen system applied in the design, which means two activities can be held in the same area, thus creating space efficiency and open circulation.



**Fig. 1.** The bedroom in rehabilitation center at Crossroad Center-Antigua, Latin America [6]

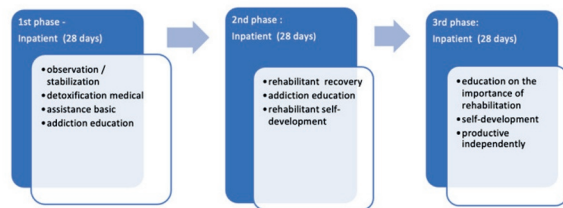


**Fig. 2.** Open kitchen space in rehabilitation center at Balance, Mallorca, Spain [7]

The treatment for drug addiction can include a behavioral therapy, medications, or combination of both [8]. Rehabilitants must take these treatments during the rehabilitation program, there are: (1). Medical rehabilitation helps rehabilitants to recover and obtain maximum medical, psychological, and social treatment, (2). Inpatient is a phase of rehabilitant receives medical services by professional health workers and under full supervision, as well as to get comfortable treatment room while participating the program, (3). Wellness and holistic program that designed to build immunity through activities that involve physical and emotional activities, for example: Zumba, yoga, massage, reflexology, and recreation. Recreation involves physical, emotional, and social activities that achieved through sports, play and travel. Based on the previous research conducted by Tingran Zhang, in 2020, it is also found that an environment-friendly rehabilitation method has exercises, and it has attracted attention as one of treatment for drug addiction [9], this becomes one of the reasons that gym was designed as one of facilities for the rehabilitants. The above activities require space as a facility to make rehabilitant gets a well treatment towards recovery and no longer addicted to drugs.

A drug-addict rehabilitation center has its own characteristic in user classification. There are administration staff, doctors, nurse, cleaning services and the rehabilitant. Generally, before going further to third phase, it is necessary to gather information about the activity program that held in the rehabilitation center. This is to determine the requirement of space area, facilities

and space programming continue with zoning, grouping and lay out study. The fig. 3, is a rehabilitant flow for drug-addictive rehabilitation center. It requires 3x28 days for each activity.



**Fig.3.** Diagram of inpatient rehabilitant program in rehabilitation center [10] (Admin Ashefa, 2023)

Designing an interior for drug-addictive rehabilitation center should remain the need of functionality. To fulfill the physical, psychological, and social activities, every room has specific activities that required standard facilities. Among all the rooms that require design, recreation room has opportunity to have more flexible design, supported using technology-based recreational facilities that found in previous research.

### 3.2 Technology

The use of technology is to support the facility that supposed to meet rehabilitant needs both in terms of services and the program. It is also known that many drug-addicted individuals also have other mental disorders [11]. In designing a rehabilitation center, interior designers need to know the various uses of technology that can be used in therapeutic process. This is to fulfill the design of space related to the implementation of activities that supports the rehabilitation therapy process. There are several digital technology that have been developed in various program that integrates with therapy process:

- Teletherapy applied as online therapy or e-therapy using a digital platforms that enables therapist to conduct remote sessions with rehabilitants. It is overcoming geographical barriers and improving accessibility. It can involve conferencing, chat-based platforms and also virtual reality environments. It is a feasible and effective alternative to in-person services for reducing depressive symptoms [12].
- Mobile application. Although this is not related to space design, technology development in terms of mobile applications can integrate in therapeutic process. Mobile apps can provide tools for mood tracking, guided meditation, stress reduction, cognitive behavioral therapy and other therapeutic techniques. Through this application it also can be used as a reminder of therapy sessions or medication management. It support psychological or mental health interventions that includes mobile devices [13]
- Augmented Reality (AR), known as technology that technology that relates directly via computer-generated content on the internet to the real world. The

medical sector use of AR technology is when carrying out pre-operative examinations, such as CT or MRI scan. It gives the big picture by capturing more details regarding patient's anatomy. The use of AR in for rehabilitant is for recreation and recovery of brain stimulation. Through this stimulation method rehabilitant is expected to get memory before using drugs. It is hoped that rehabilitants can be more optimistic in going through this rehabilitation period.

- Virtual Reality (VR), a technology that implements a virtual dimension with the real world. People who use VR can see and feel directly like a real object and able to feel the situation directly. VR technology is currently being used for rehabilitation of drug-addicts. It has been implemented by Chinese rehabilitation center. The devise could use as lie detector to find out whether rehabilitant lies about drug addiction. The VR system utilizes instrument that monitor eyeball movement, body temperature and heart rate. It is installed in the VR headset to see the respond of the rehabilitant when watching VR images and videos with drugs issue. Furthermore, the eyeball monitors can also help rehabilitation staff assess the accuracy of drug addiction self-reports, since naturally rehabilitants who finish the program sometimes lie to speed up their rehabilitation program [14]. There are three components to use VR: (1). Computer, (2). Head Mounted Display (HDM) and (3). Marker.

Nevertheless, it is important to know while digital technology has potential to improve the therapy, it is not meant to substitute the expertise of trained therapist. The integration of digital technology should always be guided by ethical consideration, privacy concerns and specific needs of each individual.

Apart from supporting the therapy process, technology development in terms of material or other equipment that support interior design, it also plays an important role in security and safety aspect of the rehabilitant in the rehabilitation center. Here are several material and equipment that will be applied in the design:

- Metamaterial acoustic, this material can precipitate sound up to 94% by reflecting frequencies back to the source. This renewable technology can capture reflecting small disturbances in air using mathematical modelling and 3D printing. This invention also appropriate for designing a rehabilitation center to maintain privacy and provide quietness of the room while carrying out therapy [15].
- Motion sensor detection device functions as alarm a room controller. This device can also be converted as CCTV system in the room. It can monitor the movement of rehabilitant for security and safety purposes.
- Sensor alarm, installed practically in various places. The advantage of this alarm does not require cables for its operation. This sensor can detect when someone opens a window and inform the connected smartphone. This device will secure against attempts by rehabilitant who try to escape.



Based on discussion above, digital technology that can accommodate the rehabilitation program is the VR technology.

It is found that rehabilitants have difficulties in receiving sensory stimulation. The five human senses play important role to stimulate each function to the body. In designing a space, sensory approach can be applied through different materials, textures, colors, and location to appeal all five human senses and promote relaxation [16]. This concept expected to make the rehabilitants feel safe, calm, comfortable and reduce the social anxiety that comes with new places. It also recommends that selected materials, textures, accessories, and function is also found in a home design to give friendly atmosphere and holistic experience to the rehabilitant [17]. The sensory approach applied to interior design aims to awaken the five human senses which are expected to build awareness and presence during rehabilitant participating the program. It emphasizes sense of comfort which then translated as a storyline in interior design of drug-addictive rehabilitation center.

### 3.3. Design Implementation

Design statement is a concept obtained by using keywords related to design project through mind mapping. The collected data can be developed as reference that create one statement that represent the idea of entire process. There

Key words that represent the project: The user, the treatment, and the psychological effect for the soul. *Nuraga Asa Raga* is a *sanskrit* language that represents a desire to share feeling with one another for a hope that aims to restore body and soul.

*Nuraga* has a meaning of sharing feeling and having sense of sympathy. *Asa* means a hope, that refers to hope of being able to heal from drug-addiction. *Jiwa* means body and soul.

Next stage in design process, creating an image board that represent the user of the facilities, it determines the mood that needs to be translated in colors, shape and material that will apply in the design. The interior image represents the mood that has a warm, calm, and unified in tranquility. The shape inspired by visualization of praying fist that reflects strong, tight, and irregularly knotted.

Natural colors with texture and organic shape in layers are the inspiration for the design. Visually, *Nuraga Asa Raga* sharing the warmth of each other's feeling and exchanging ideas to achieve the goal. As seen in fig. 5, the backdrop in the lobby has a texture surface that creates natural atmosphere, supported by solid wood material on the reception desk.

The application of solid wood as an exposed material on the ceiling can make the room warm and seem elongated. A log wood can be a solution when providing gaps in each ceiling so that users are not focused on the base of the ceiling. Wooden material can provide a soothing and warm effect. The symmetrical wooden pattern visualizes the eye going in a straight direction. Each room has a continuous design, translating the same conception to adjust the function of each space.



Fig. 4. Lobby Design in 3D perspective drawing [18]

Shown in fig 5, it is an AR-VR playroom designed as one of therapy and relaxation room. Overall, this place has a grayish-white wall finished and accents on one side of the dusty pink wall paint. There are many user activities while using the AR-VR playroom, therefore the room need to have a natural atmosphere so that users are not excessively stimulated by the color of the room. Most of the room equipped with CCTV that has motion sensor detection device functions as room controller alarm.



Fig. 5. AR-VR playroom in 3D perspective drawing [18]



Fig. 6. Bedroom for rehabilitant in 3D perspective drawing [18].

Fig 6. Above shows the bedroom for rehabilitant, it applied natural color with one side in pistachio color wall paint for the back of headboard area. The green color is expected to provide tranquility for rehabilitants to rest. Furniture in the bedroom focused on the main purpose as the sleeping area, and not to provide more space to keep other objects that are not needed or harmful. The bedroom has a sensor alarm, to detect the window when opened

intentionally. This device will secure against attempts by rehabilitant who try to escape.

Fig.7. Below is a discussion room and group consultation room. The room still has natural color with one side have blue paint for the accent. This color has the meaning of trust, so it is hoped that rehabilitants are in a mood that believes that this therapy process will get good results for themselves and their families. In terms of color psychology, each color has influential effect on human mood and emotion. Under natural light colors can alter psychological state from unhappiness to happiness, from mental confusion to mental clarity, and intelligence, and for fear to confidence [19]. Colour can visualize a shape or feeling that affect the perspective of the viewer. Earth tone colour creates a warmth, calmness and pleasing the eye. This tone inspired by element and every detail in nature. The impression built from this facility is warmth and harmony. Several accent colors are found in one side of the room. It creates color compositions in each room, as well as can be an identity according to the function of the space.



**Fig. 7.** Group consultation and discussion area in 3D perspective drawing [18]

Designing an interior for drug-addictive rehabilitation center can have several positive impacts such as: 1) To create a safe and supportive environment through a well-designed rehabilitation center. The furniture plan, facilities and security measures can help to minimize triggers and temptations, and conducive space to heal and recover, 2). A thoughtful design elements can contribute to a therapeutic atmosphere support with natural light, earthy tone colors, comfortable space, nature-inspired surroundings that promote relaxation, reduce anxiety, and enhance the overall well-being of individuals undergoing rehabilitation, 3). An integrated technology into the design can enhance the rehabilitation process specifically in AR-VR playroom. It also includes audio visual equipments, interactive tools, electronic health record system, and telehealth capabilities to provide remote support and follow-up care, 4). Community and social spaces can build relationship, and engage in recreational activities. It can foster a sense of community and support. Through this spaces, it promotes peer interaction, reduce feelings of isolation and provide opportunities for rehabilitant to develop healthy social connections, 5). Transitional living areas within the rehabilitation center can stimulate real-life settings that

help individuals transition from structured environment to independent living that allows individuals to practice and develop essential life. By harnessing the power of digital technology, interior design of drug-addictive rehabilitation center can be more dynamic, interactive and created to specific needs of individuals in recovery. It also enhances the design process, improves collaboration, and creates immersive environments that promotes healing and well-being process.

## 4 Conclusion

Based on the discussion above, interior facilities in drug-addictive rehabilitation center requires rooms that can support recovery both physical and mental of the rehabilitant by placing therapy rooms, consultation room, AR-VR room, art room and fitness area. The application of technological aspects in the interior design of rehabilitation centers is carried out on: Therapy rooms that use AR-VR technology as a therapeutic method, as well as other room that has devices to support the safety and security of rehabilitants. The application of the concept of *Nuraga Asa Raga* is also translated in natural color in this area, so that the rehabilitants are not excessively stimulated by the color of the room. A relaxing atmosphere is displayed with the use of sofas for other rehabilitants who want to take turns using AR-VR, and therapists who are assisting in recording the results of observations in rehabilitation. It is hoped that rehabilitants do not feel pressured during the therapy process.

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