

**EVIDENCE REGARDING THE HEMODIALYSIS CLINIC ENVIRONMENT: THE
PATIENT EXPERIENCE LIVED IN SPATIAL-TEMPORAL CONTEXT****AS EVIDÊNCIAS DO AMBIENTE DAS CLÍNICAS DE HEMODIÁLISE: A
EXPERIÊNCIA DO PACIENTE VIVENCIADA NO CONTEXTO ESPAÇO-
TEMPORAL****EVIDENCIA DEL ENTORNO DE LA CLÍNICA DE HEMODIÁLISIS: LA
EXPERIENCIA DEL PACIENTE VIVIDA EN EL CONTEXTO ESPACIOTEMPORAL**

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ABSTRACT

This paper aims to understand hemodialysis (HD) patients and discuss ways that current architectural and interior design of HD units influence patient experience and personal preferences even when not related to the clinical, functional, or operational aspects of treatment. Several factors have contributed to the prevailing demand for HD in Brazil such as food, aging, gender and genetics. In recent decades, underlying diseases such as hypertension, diabetic mellitus, smoking, factors of chronic renal diseases as well as education as a relevant element for the perception of the worsening and deterioration of health conditions have been considered the major culprits. The person-environment relation in HD treatment centers should have been investigated much sooner from the architectural and design perspective. This research used a five-step methodology: Identify the evidence from the research; Systematic review of the literature; Access the qualities of the environment; Collect data and monitor developments; synthesize and analysis data. We later realized that the kind of specific approach we were using here is not so often used in the architecture and design areas. By observing the results, we perceived that the specifics of patients undergoing treatment or professional teams were not considered within their different contexts. Hence, the humanization in health care, the way preconized by the

National Program for Humanization of the Health Ministry, is by no means correlated to anything other than its generic character.

Keywords: hemodialysis; environment; healthcare; patient experience; architecture; design.

RESUMO

Este artigo visa compreender os pacientes em hemodiálise (HD) e discutir como o projeto arquitetônico e de interiores atual das unidades de HD influencia a experiência e as preferências pessoais dos pacientes, mesmo quando não relacionado aos aspectos clínicos, funcionais ou operacionais do tratamento. Diversos fatores contribuem para a demanda crescente por HD no Brasil, tais como hábitos alimentares, envelhecimento, gênero e genética. Nas últimas décadas, doenças de base como hipertensão e diabetes mellitus, o tabagismo e fatores associados a doenças renais crônicas, bem como o nível de escolaridade (elemento relevante para a percepção da piora e deterioração das condições de saúde), têm sido apontados como as principais causas. A relação pessoa-ambiente nos centros de tratamento de HD deveria ter sido investigada muito antes sob a perspectiva da arquitetura e do design. Esta pesquisa utilizou uma metodologia de cinco etapas: identificação de evidências da pesquisa; revisão sistemática da literatura; avaliação das qualidades do ambiente; coleta de dados e monitoramento de desdobramentos; e síntese e análise dos dados. Posteriormente, constatamos que a abordagem específica aqui utilizada não é comum nas áreas de arquitetura e design. Ao analisar os resultados, percebemos que as particularidades dos pacientes em tratamento e das equipes profissionais não foram consideradas em seus respectivos contextos. Assim, a humanização na assistência à saúde, nos moldes preconizados pelo Programa Nacional de Humanização do Ministério da Saúde, não apresenta qualquer correlação que vá além de seu caráter genérico.

Palavras-chave: hemodiálise; ambiente; saúde; experiência do paciente; arquitetura; design.

RESUMEN

Este artículo tiene como objetivo comprender a los pacientes de hemodiálisis (HD) y analizar cómo el diseño arquitectónico y de interiores actual de las unidades de HD influye en la experiencia y las preferencias personales de los pacientes, incluso en aspectos no relacionados con las dimensiones clínicas, funcionales u operativas del tratamiento. Diversos factores contribuyen a la creciente demanda de HD en Brasil, como los hábitos alimenticios, la edad, el género y la genética. En las últimas décadas, se han identificado como principales causas enfermedades subyacentes como la hipertensión y la diabetes mellitus, el tabaquismo y factores asociados a la enfermedad renal crónica, así como el nivel educativo (un elemento relevante para la percepción del empeoramiento y deterioro de la salud). La relación persona-ambiente en los centros de tratamiento de HD debería haberse investigado mucho antes desde la perspectiva de la arquitectura y el diseño. Esta investigación empleó una metodología de cinco pasos: identificación de la evidencia de investigación; revisión sistemática de la literatura; evaluación de las cualidades ambientales; recopilación de datos y seguimiento de los desarrollos; y síntesis y análisis de datos. Posteriormente, se constató que el enfoque específico utilizado aquí no es común en los campos de la arquitectura y el diseño. Tras analizar los resultados, constatamos que las particularidades de los pacientes en tratamiento y de los equipos profesionales no se consideraron en sus respectivos contextos. Por lo tanto, la humanización en la atención sanitaria, tal como la promueve el Programa Nacional de Humanización del Ministerio de Salud, no muestra ninguna correlación más allá de su carácter genérico.

Palabras clave: hemodiálisis; ambiente; salud; experiencia del paciente; arquitectura; diseño.

1 INTRODUCTION

Human existence and social interactions inherently unfold within natural or built environments (Rasmussen, 1986). In healthcare settings, architecture and design play

a determinant role in shaping patient experience, particularly for individuals undergoing long-term hemodialysis (HD) treatment. Because they are part of the daily routine of patients undergoing treatment, we want to analyze the ways in which the space is symbolic and is significant to the social context of this community. Understands that falls under the studies of this microsystem and its human-ecologic relationship (Steiner, 2016).

In this context, HD units are supposed to be technically adequate, functionally organized and destined places for a specific group of a rational, scientific and contemporary society to perform health care treatment. When viewed from a general context of how human beings act, such clinics and their HD units are similar to other built environments, because they serve as a response to the normal operational mode of changing the natural world (In this case the working of the human body) in favor of people's, groups' and the society's visions (Laraia, 2003). However, one should ensure that such actions are driven by, at least, two distinct interests: the need to maintain life and the activities desired by the group, as a community, or as individuals (Malinowski, 1976). Based on this understanding, we aimed at asking and discussing with HD patients about the forms which interior architectural and design of HD centers symbolize and mean to them in a quest to point out what is directly functional to the rational and scientific logic of renal replacement therapy (RRT).

2 THEORETICAL FRAMEWORK

The conceptual notion of geographic territory (Haesbaert, 2019) was used as well as that of nanoterritory scale (Souza, 2018). As such, it allowed differentiating the physical surfaces (material) of the environment from the social organization environment of the place as well as differentiating those two from the subjective description of the individuals. Hence it enabled us to work from macro to microscale. With this we were able to achieve a variety of ecological-environmental classifications and adopt Bronfenbrenner (1977) model that works with bidirectional relations from macro to microsystem. But we shall only observe the context of closest proximity and autonomy between people, in other words, microsystem defined by the nanoterritory of the HD center. For the clinic space, as a health care ecosystem and the group of RRT, we decided to use three categories for place, namely the place, environment and ambience. However, the concept of the sense of place is vague (Najafi; Shariff, 2011).

But it brings about different approach possibilities in a multidisciplinary way (Peng; Strijker; Wu, 2020). Keeping in mind the differences in terminology of the areas of knowledge, the term approximation, they deal with human actions and relations that involve (a) space and place and (b) within the social interactions context of the person or group individuality. For example: (1) Rezeanu (2014), classifies habitation into three kinds: the “physical home”, the “subjective home” and the “personal home”, where he seeks objectivity and subjectivity in the context of the life of elderly. These categories are used to formulate systems, classify and distinguish objective and subjective aspects for the patients in a HD center; (2) Sattar Zadeh and Asl (2015) organize the structure of a space to study architecture in Iran keeping in mind the sense of place based on cognitive perception factors of the physical space.

The place, according to Cassirer (2011) is the shape of the space and the material used for the unfinished object (geometry and esthetics of the room; construction systems; comfort; installations; equipment etc.), that exist “prior” to the user’s perception. The environment described by Campos de Carvalho, Cavalcante e Nóbrega (2017), is a multidimensional concept based on four assumptions: to be bidirectional in the person-environment context; the dimension variables are interdependent; they are not neutral, that is, they are not value free, given that they interact with people and the society, create expectations, contribute to controls and behavior, place people (socially, culturally and emotionally), contribute to identifying a being in the world, among other characteristics; are unique in the “physical environment”. In short, the environment is a context that aggregates value to a place, that can be objectively described, such as work organizations and functional activities (protocols of procedures and responsibilities; establishing work and assistance groups; service flows; organization of layout; kind of population and others) forms of interactions; hierarchies and skills. Ambience could be understood as the extension of being, and as Thibaud (2018) described it, covers human ecology, praxeology and is phenomenological. It is considered by the author to be a sensitive and subjective individual phenomenon. The subject imposes a private mental impression of the place. From this set classifying the ambience, we sought observable means through important symbols present in the HD center. Taken from the descriptions of RRT patients from the perspective of “multilocal” and “multivocal” as described by Aucoin (2017). From our perspective, multilocal expresses the poly systemic nature to

understand the places and their environments. Multivocal brings multiple possibilities of describing of worlds as ambiances.

Renal replacement therapy takes place on armchair. The subject is connected to a HD machine for four hours three times a week. The patient's life, except in rare cases and the possibility of a transplant, would depend on this activity.

The paper considers two types of observation related to RRT patients. The first aspect relates to epidemiology and—although not explored in depth in this research—falls strictly within the health field: the Natural History of Disease (NHD). In this case the query is based on evidence and is part of the health disease process (Rouquayrol; Goldbaun, 2003; Teixeira; Paim; Vilasôas, 2000). It presents a minimum conventional workflow composed of stages: pre-disease, diagnoses, treatment and prognostics. The second is transversal to the NDH, these are environmental and human factors of social and cultural order (issues related to social, economic, political, habits, behaviors, myths). The World Health Organization (WHO) identifies three environmental aspects that are determinants of individual health: (1) socioeconomic; (2) physical; (3) characteristics and relationships of people (Who, 2019). Independent from these factors, it is common sense that they appear and act in a multiple combined manner, they permeate and affect daily life, and as a consequence the quality of life. Frequent factors of what is considered human environment are: resources and income; education; physical environment; social support network (family, community and state support); genetics; Access to health services (prevention assistance network, effective care and cure when necessary) and gender differences.

According to Geertz (2008) theory, and because he believes that we are entering a new sensitive and existential moment of RRT treatment; we assume that RRT patients shall have a new experience and shall debate with a new social environment. Geertz (op. cit. p.178) believed that the place, the environment and the ambience are symbolic forms that bring about significant sensations. The conditions of these RRT patients are like those of actors who are experiencing a new clinic. To them, it is a new scenario for integration, changes and cultural conflicts (Psychological, organizational, behavior). On one hand, based on this logic, we seek avoiding the prior presumption of negative or positive values the researchers may have relative to HD centers. On the other hand, systematic properties of analysis were adapted based on the answers of the question forms, interviews and observations.

We sought to collect, objectively significant person-environment feeling of the participants about the experience of the HD Center in their lives. In other words, things participants feel, even things not necessarily related to treatment, are useful, that is we argue that design makes valuable contribution in the HD Center; it impacts the patients as well as the healthcare team. We also seek descriptions of experiences and personal feelings of RRT patients. Such as: (1) behavior and actions, (2) main rational thinking, (3) connecting facts and events that were revealed during their RRT among other things. We also used meanings to understand the possibilities of harmony, stability, events to indicate integration or incongruencies of social and human relations in that environment and for those established connections. In practical terms we selected key issues in the RRT patients issues from their description that describe situations such as: I and another; personal memories and the stories behind them; life today and expectations for the future and related universes, desires and feelings, issues of what is comfortable, appreciations and affections, among others.

Architecture and interior design of the HD Center, as any built space, are viewed from the perspective of what they can contribute towards a positive experience of the place. The Idea of a place is understood in the poly systemic context of bidirectional and multidimensional relations of the patient, however, in exclusive spatial microsystem of the HD center. As such, there is room for the intersubjective relations that take place. So, it is a possible set of elements extracted from the sense of space: identity of the place (as a spatial and material, through its history accumulated over time and facts) and the place itself (description of the place by each patient); of dependence (social and personal connections with the place) and appreciation and affection (Subjective and intuitive aspects of the patient) (Speller, 2004; Najafi; Shariffi, 2011).

This study investigates how can architecture and interior design facilitate and help RRT patients have positive perception and feelings. An environment built for a certain purpose, effects and is affected by the interactions with and between users. We understand that daily aspects and human relations that are established in the HD centers individually, technically and socially, can physically integrate conceptions of construction projects in a way that can be proposed by architects and interior designers. During the interviews, we tried to read the actual and abstract environment, in the context of person-person, person-environment and person-society. The assessments we made with users sought identifying, through the responses of RRT

patients, what is considered efficient and effective from a patient's perspective from a health disease point of view prescribed for the construction projects.

The article focuses on three concepts related to the regulatory function and risk reduction through the prevention and the adoption of development control in health surveillance (Costa, 1999, 2003) that are efficiency in surveillance during health procedures; efficacy, as an ethical-professional criteria when adopting safety procedure that should be applied in any HD center and RRT patient (in the case of construction of new clinics, it should be standard for any equivalent center); and effective health care, one that a RRT patient would consider positive beyond the technical aspects of the health disease treatment process, because it involves economic, social, political aspects and the patient's own take of the world. that are related to the reality of the main issue. We also observed that such concepts are part of the fundamental general administration of any institution or production (Koontz, O'Donnell, Weihrich, 1986). When observed from the environmental perspective, one notices the historic importance of procedure, both for the physical, as well as social and mental health of the patients and the society (Rosen, 1994). They worry about the effect on health, on design and construction lines engineering work of art, development and application of technical norms, environmental sciences, such as comfort in constructions, systems and techniques of water supply, among others (Andrade, 1992; Campos, 2002; Leme, 1984)

Guelli (2014), when describing architecture project development in the health care area, pointed out that market strategies and business models are essential to the conception process of a building. He wrote: "A building, as a wrap, a Box, contains a complex set of activities and uses that take place in different environments.... a box with important attributions of excellence". (Guelli, op. cit., p.166). The author indicates, however, that such excellence is the result of a three-factor context: functionality, impact and construction. Such factors add value to the environment, where each has its own elements (innovation, personal satisfaction, suggested quality for the environment, social interaction), that when considered as a set, influence people, for example: positive or negative distractions; environmental comfort or discomfort; privacy and sociability; perception of space (mental map); cozy and emotional support spaces. As such, we try to show evidence that the built spaces could be analyzed : from the physical aspect (architectural needs program, divisions, flows, dimensions); from the innovation level and technologies in place and environment (communication

networks, Wi-Fi constructive materials and techniques, furniture); from the satisfaction for the performance of the structure (thermal, acoustic, and light sustainability) and from the urban location and the interaction with other systems (mesosystem, exosystem and macrosystem).

From the process prism of someone who is developing the proposal: the need to conduct a conventional investigation of the place (Physical, legal, environmental conditions); and the need to systematically collect activities of daily life of patients (procedure, habits, behavior). Both appear to be possible issues for object analysis from architectural and also design aspects. Tafuri (1988) points out that for whoever designs the concept of a building, the architectural form and urbanism make up a huge set of physical, social cultural and personal relations. On the other hand, and in the social and anthropological sense, Rapport (1990), indicates that architecture is a cross of cultural directives and social activities and affirms that it is improbable for architectural projects to attend all human needs. He also adds that it will always be limited, just as the places and environments are finished with adaptations within a horizon. In architecture theory, it is common sense that the meaning–significant reading is an inseparable part of the language of the place and that within this universe there are relations between people (Solis, 2009). This takes place by reading the building that is given (physical and especially, sociocultural and technologically). Solis (op. cit.) points out that the perception of the environment is a sensitive and subjective reference. It is set by personal assessments of experiencing the architectural object. Also, there are relations and stimuli from environmental systems that are present (Moser, 2018).

Finally, the objectives of the research, the interpersonal relations of HD centers, take place in a live scenario interactive with the human conviviality established by the constructed space. Physical, social, technical, economic, cultural as well as other elements are found in these places. The architecture and interior design present three issues for the same place: the evaluation of the architectonic structures; the impression of TSR patients and subjectivity of the interviewees. The first issue is understanding the jargon needed to create and compose the built environment: (1) Physical-material object – where several measurable aspects of the space are included, such as geometry and dimensions, layout, additional physical installations, finishing furniture and (2) abstract natural object – result of the environmental conditions of the place, (noise levels, light, temperature) and the operational organization and movements

(flows). The second issue is of a different kind, it is the values that GO through identifying and relating, beliefs, social and cultural upbringing, pleasure and pain, losses, desires, personal concepts, symbolic nature of things, among others. The third issue is a subjective object, resulting from human complexity (stories, memories, biological nature) that involve the other two issues.

3 METHODOLOGY

The kind research is exploratory, given that researches related to the interior of HD centers as life scenarios that effect RRT patients are few and mostly with inconclusive results; descriptive, since it includes data mining and structured question forms and semi structured interviews, of the essential teams and RRT patients and the analyses is qualitative and quantitative because it investigates, collects, accesses and discusses the person in a bidirectional interaction such as the place, the environment and the ambiance according subjective and objective aspects. As to the physical-material, abstract-natural and subjective elements, the investigation methodology was a cross-sectional study of users of architecture and design to understand how the population undergoing treatment relates to the HD Center environment.

The research divided the users into two subgroups that would fill out a questionnaire and/or are interviewed: external and internal users. The external users that were included are individuals that were not selected randomly, but rather specifically from a population of patients with chronic kidney disease (CKD) and undertaking hemodialysis. The group totaled 516 patients (100%) of which 278 (55.6%): clinic 1 (n=148), clinic 2 (n=85), and clinic 3 (n=45). The internal users were health care personnel who were directly or indirectly present in the HD centers, whether intermittently (ex.: doctors) or in set work shifts (ex.: patient care technicians).

The profile of the external users in the HD centers researched is based on surveys of gender, age, education level, weight, addiction to tabaco and prevalence of pre-existing conditions. We also assessed the users satisfaction relative to the space, the environment and the ambiance. This level of satisfaction was assessed using two categories of questions (queries). One is about the built environment (ex.: environmental comfort level and level of lighting, temperature, noise; layout and the feeling of the room and equipment used). The other was related to the way the patient was hospitalized with people and health care team (shuttle from home to the HD clinic;

check-in service prior to the HD session and interactions with the health care team in the HD Center during the sessions). The answers to the questions were classified according to the Likert rating scale, which varied from two to five levels, depending on the purpose, and was used to access the answers. Children and teenagers, peritoneal dialysis, eminent elevated risk and death patients as well as patients who, at the time, were in no condition to answer the questionnaire were excluded from the sample. The research also included: (1) patients of both genders; (2) ages between 18 and 70+; (3) of different social and cultural levels (level of instruction, income class, social-economic level) and (4) residents of the southeast macroregion of the State Secretary for Health.

Descriptive statistics were used to investigate the sample numerically and the participants were distributed based on predetermined variables. Analytical results were subsequently illustrated through tables and graphs to represent the population. Cross-tabulations (contingency tables) enabled multi-variable comparisons, while non-parametric Chi-square (χ^2) tests of assessed statistical associations between variables. The frequency (f) shows the number of times a certain patient was evaluated in each situation including hospital charts.

Quantitative data were processed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics (frequencies, percentages, means) summarized demographic and environmental variables. Non-parametric Chi-Square (χ^2) tests of independence were conducted to examine associations between categorical environmental variables and patient satisfaction levels. Statistical significance was set at $p < 0.05$ with a 95% confidence interval.

The article discusses specifically HD centers and was approved by the Human Research Ethics Committee of Plataforma Brazil, the ethical committee for research using humans under the Certificate of Submission for Ethical Review No. 89481318.1.0000.5133.

4 RESULT AND DISCUSSION

Brazilian citizens have the right to health care guaranteed by the constitution. It's organized around four pillars: it is universal; it is hierarchical (primary, secondary, and tertiary care); responsibility is shared among the federal entities (Federal Government, states, and municipalities); and it involves social oversight exercised by organized entities (professional associations, groups). To manage the healthcare in

Brazil the Unified Health System (SUS – Sistema Único de Saúde”) was established by a federal Law in 1990. The SUS was modeled after European public healthcare frameworks, drawing primarily from the National Health System (NHS) in England. Another element related to the context of this research, the National Sanitary Agency (Anvisa – “Agência Nacional de Vigilância Sanitária”) was founded in 1998 Its role is to establish norms for several health processes, including characteristics of the infrastructure architecture. Different from other countries where, for example, in the USA, private and federal institutions work together (Facility Guidelines Institute – FGI, 2021). The operation of the three HD clinics that are part of this research was approved by the Health Secretary of the State of Minas Gerais (SES-MG – “Secretaria de Saúde de Minas Gerais”). Towards this purpose, they had to be official centers of SUS; authorized for the procedure by Anvisa and also attend the requirements of Class Councils (of medicine, nursing and others). They are also linked to RRT assistance networks organized by SUS and SES-MG, where the city of Juiz de Fora, Minas Gerais is one of the reference centers for treatment.

Any architectural project for essential health care establishment shall attend: ANVISA Directive Resolution (RDC – “Resolução da Diretoria Colegiada”) No. 50/2002 and the Standard Operation Procedure (POP – “Protocolo Operacional Padrão”).

POP is executed by each institution and for each service rendered. It defines each treatment approach based on the technique and the technology of each professional team. Other legal instruments such as: Municipal Legislation, Norms and ordinances (fire prevention and fighting, Brazilian Association of Technical Norms – ABNT, Ministry of Labor) are not discussed in this paper. However, there is a set of specific RDC that deal with HD centers: RDC No. 50/2002, RDC No. 154/2004, RDC No. 33/2008 and RDC No. 11/2014. Which respectively deal with construction, attributions of the dialysis service, dialysis water treatment, and best practices of dialysis services. Other important Anvisa resolutions include RDC No. 222/2018, which deals with management of health care residues, and RDC No. 189/2003, which deals with analysis procedure of architectural projects within what is observed in RDC No. 50/2002.

These documents exist beforehand or are issued concomitantly during the development of the environmental Project, independent from the architectural Project of the clinics. In this sense, because they are mandatory, they are decisive for the feasibility study and the program of health care establishments needs. These

documents are tools of spatial layout where the following is highlighted: (1) minimum dimensions are given; (2) flow of services is established as well as; (3) quality and kind of equipment, furniture and (4) the administrative, social, professional and behavioral organization are determined. Which in turn determines the installation functional, physical needs of the architecture of the buildings. Within this context, there is no impediment against the building design professional, whether architect or interior designer, to establish other conceptions that could be incorporated into the Project for reasons other than those of health organizations. Hence, esthetics, environmental comfort, choice of building material, are other competences that develop the construction project.

We assume that the health process determines the need for more clinics and that it presents essential factors. Hence, in Geertz (2008) understanding of human culture for different societies, and especially in the current scenario, health process is a reference and shall be present in the architectural conception. Also, he reflects the logical technical-scientific approach used in HD centers. There is a significant determinant that is intrinsic and symbolic for architectural projects. Hence the failure of kidneys, that leads to the loss of renal functions and hemodialysis, not only follows clinical deterioration in health, but also with life consequences for RRT patients. So, the legal approach of the health care system imposes that health care provides efficiency and efficacy, because it guarantees safety and requires adequate places. However, effectiveness isn't guaranteed for the simple fact that it attends exclusively to the health requirements.

The built environment is a given, including the conception and the execution of the architectural and interior design projects of an HD center. During the interview, in addition to systematic observations with the interviewees of the research, collected environmental data that proved to be significant, that were treated as relevant observational discoveries about the quality of the location, and environment, and or ambience, for the RRT patients. This also was considered for the behavioral aspects, habits, personal and or collective values, among others, in dealing with people during in loco visits and interviews.

They were approved for their infrastructure, as for the service rendering by the Sanitary Authorities of the Health Secretary of the state of Minas Gerais. These clinics have been providing procedure for RRT patients for between one and 30 years. The

study covered three HD centers surveying documentation and in loco visits. The clinics are reference of SUS and Health Ministry of Brazil for RRT in the region.

The survey investigated three clinics that have similar HD room structure but with different service periods (1976, 2009 e 2006). It is important to mention that the urban issues were not covered by the survey. However, one could notice that the localization of all three-hold certain congruences. This distribution is primarily characterized by the close proximity of all units to the primary referral hospital. As a consequence, they are close one to each other. One should mention that, according to the norms, they can be physically, organizationally and environmentally independent from the hospitals.

The survey subdivided the clinic into two groups of users to answer the questions and or be interviewed: external and internal users. Internal users are professionals and helpers that are directly or indirectly present in the premises of the units, intermittently (ex. Doctors) or during service shifts (nursing technicians). These professionals are structurally aligned with institutional workflows to ensure comprehensive clinical operations, encompassing social, technical, laboratory, and routine care services. Within this human context we could observe at least interesting points. The patients on one side have the common need for dialysis to keep them alive. However, one can observe a diverse profile of the people, given the difference between them ranging from gender to habits. On the other hand, the expertise of the team that renders services in the clinic is also heterogeneous, but from another perspective of the group. They are diverse in their careers and activities ranging from doctors to generators.

Based on observation and the objectives of the research, both groups are significant for the ambience in the construction of the clinic. We point this out because, in this human context, whether because of the legislation that rules health care establishments; or because of construction norms, among others. Within the same logic, we can add that the environments of HD units, even though related to human-institutional nature that rules these places, are still pre-established by the need to comply with the POP, because of the institutional organization of labor class organization (hierarchy of activities, function and competences), or to prevent activity due to NDH logic in RRT and consequently knowhow of the health disease process.

External users were excluded from research, those not related to the treatment, such as individuals who accompany the RRT patients. Also, patients under the age of

eighteen and above the age of seventy were excluded from being unable to answer the questionnaire as well as all who refused to sign the consent term of the research.

The in loco survey showed that the space of two of the three clinics were designed directly for the purpose of becoming HD clinics, one of which being designed as a therapeutic-hospital ward and the other is isolated and is part of a multiple use building. The third clinic is located in an isolated adapted space, next to a traumatology hospital but still close to the reference hospital.

Clinics have sanitary licenses issued by the Health Secretary of State (attending ANVISA and Ministry of Health norms). In practical terms, the layout of the HD room proves the spatial aspects described. We observed a direct influence on the layout of equipment for the workstations according to RDC no 50/2002 requirements, observing the similarities in all HD units studied.

We also would like to call the attention that the clinics are of different sizes, were built at different times by different architects, however, have equipment complying with RDC and the professional orientations (POP) which determines that the professional team have view of all hemodialysis chairs. This also shows that even though the POPs focus on professional conduct, above all they do not aim at the subjective quality of the people whether internal or external users, but rather because these are procedures that have to be executed in a hemodialysis room, determining certain aspects of the place.

Assessing HD units is as complex as accessing architecture, even when we do not consider the construction as a whole, but rather Just enough for the sake of argumentation in this research. HD room ambiance through use of materials and functionality gives away some data that is part of the problem. It is worth mentioning that architecture is defined here as the available space, however we could observe the construction, use and experience between the interior and exterior, in as much as the square and a street differ significantly from a room and a corridor in a home (Netto, 1984).

Architecture can promote good feelings onto its inhabitants (Steemers, 2020). For this reason one should work with Five factors: connectivity, as in adaptability, being agreeable and feeling at home; Keeping the person busy, including giving him Access to equipment and physical activity; Cognitively stimulate/challenge the person, such as giving him positive distractions, be it through multiple possibilities of the place, observing the landscape or interactions and the presence of artworks, for example;

Encourage new learning, whether through interactions with the place, positive distraction and layout organization of the environment; Encourage positive relations within the environment/space (Baker; Steemers, 2019). Analyzing these factors provides evidence to inform essential design requirements, ultimately fostering enhanced environmental quality and user well-being. This approach aligns with Evidence-Based Design (EBD) in healthcare, a branch of user-centered design where spatial configuration is informed by Healing Environments and Healing Spaces theories (DuBose *et al.*, 2018).

The sample used in the research is that of Hemodialysis, that is when specific equipment filters the blood doing the job a kidney does. There are other people undergoing treatments in the HD center whose data was not included in this study because they were undertaking different treatments for example: Continuous Ambulatory Peritoneal Dialysis (CAPD), that is run at the patient's residence with programmed changes by a specific equipment for infusion and drainage of the solution, however without getting in contact with the patient's blood. The sample that responded to the questionnaire showed a 95% level of confidence, calculated using Chi-square (χ^2) for all data presented in this paper. The result reached reflects the prevailing international results that indicate that the male population and the population of elderly are at the highest physical risk, as well as the level of education in sociocultural terms (Freitas, *et. al.*, 2013). Other studies (Arking, 2008; Modesto, 2006) indicate that in other mammals as in humans, aging leads to significant changes in kidney behavior, independent from cultural behavioral factors and quality of life.

In numbers, the field survey showed that 56% are men and 44% are women. Age indifferent from gender was 51% above 60 years old, respectively: 25.5% over 70 years old, 14% between 65 and 69 years old and 11.9% between 60 and 64 years old.

The survey revealed that 4% of the sample were illiterate, 41% had incomplete and 5% had completed fundamental Education I (primary schooling) (up to 5th grade); 10% had incomplete and 3% complete Fundamental II education (middle school) (6th to 9th grades); 16% had incomplete and 11% complete middle education (high school); 10% had university. The results extracted from education are quite significant since 60% of the population has no or little education. This fact represents key component for the understanding of base line diseases and the recognition of the importance of prevention and long-term treatments. Also 60.4% are nonsmokers, another factor that follows is the tendency of the Brazilian population in general (Brasil, 2019).

Most of the patients commute to the HD Center using public transport (41.7%); by Van (6.1%); Taxi/uber (5.8%) and private vehicle (23.7%) as well as other means. 95.3% of the patients attend three weekly sessions that take an average of 4 hrs. each with a morning, afternoon and evening sessions distribution of 36.3%, 42.4% and 20.9%, respectively. The numbers indicate that the HD center should have a safe and accessible by public transportation because of the number of people sick patients who undertake night treatments.

One should observe that all three HD Centers are located on two of the main transportation axes of the city with easy access to the reference hospitals in the area. Hence, we can infer that the population researched in this survey is similar to the national population of RRT patients in terms of sociocultural values and is similar to the international RRT patients in terms of disease.

The results are guided by the adaptation of Urie Bronfenbrenner bioecological model (1977). According to Moser (2018), this model presents bidirectional movement/relations between patients and environment, that can be analyzed through attitudes, perceptions and behaviors. The environment is a multidimensional concept that includes the concrete physical environment in which we live, which is divided into four systems.

The patient is bound to his own phenomenon of consistency and changes along his life – his chronology (age, Personal and social perspectives, habits, desire, education); as well as his upbringing and relations with family (Emotional, physical and economic support); professional relationships in the clinic (procedure, expenses, complaints) and his sensitivity to his peers the RRT patients in the HD room (friendships). Hence, the interviewee who responded to the questionnaire is limited by the career.

By analogy with Saramago (2008), when we seek conceptualizing the phatic space, which here translates into HD room, we can point out that RRT patients go through a complex moment of his life and existence. The subjects of this research are not only considered from a scientific point of view, but that is also, the body as object of treatment, because it would carry little beyond healthcare. We, as Bronfenbrenner (1996), understand that the patient carries around the pressure imposed by time and the historic context. In this view, when interpreting the environment, one should consider the state of mind present at the construction of things and involve the continuous sequence of experiences throughout life. Living in these terms is a difficult

encounter, that is, to put in doubt/check the reason and life while in the HD room, which, I suppose, brings out the question in peoples mind: Why am I here, whom am I here for? Yet still, this situation, from a personal perspective, is also related to the experiences of others, where the person is not alone in that place and condition. As such, the room is full of different meanings and feelings, which brings about a uniqueness of personal and social interpretations, of RRT patients.

Baudrillard (2002), from another standpoint, points out the contextual readings of the forms and layouts and the things inside the architectonic objects. To him they have a pre-established discourse, a social-temporal reading beyond the subject, present in the place that hosts, and works independently from the subject. This endows the research interviews and the formularies a possible relation of space-language analysis, through the understanding of the things that are then identified as (rational) and feeling (subjective) of the people. The spatial thing, in the context of what this publication proposes, is hindered by what represents the operational terms (technical and scientific reasons), the Professional workings of the clinic, where the operability independent of the individual view, and of what it means to be in RRT, the spiritual being (reason for the feelings). Together, these two sides lead to the understanding of the humanization of the HD room environment.

After selecting a few excerpts from the interviews and questionnaires, as well as from the individual observation of the interviewee, during the process of mining for perceptions and personal experiences, we sought to identify the person-environment within the following contexts: The presence of the interviewed in the room, his sense of belonging and relation, interior and exterior, time spent and losses, personal space. With this we seek to show how RRT patients connect to the place, and how they actively work.

5 CONCLUSION

Although the individual subjectivity is present, a HD center is not a common interior place nor is it a private space, that is, the same as observed in habitations. The relations that are established there have a specific purpose and are molded by the third-party characters of service rendering and are organized to attend healthcare services. For this purpose, we observed that the interior presents technical and social organization where the relations within the group are at times technical and the others

interpersonal. As to the RRT patients, there are significant cultural and behavioral differences (religion, educational background, gender, age among others). However, in relation to the physical nature of the human body, some data can be pointed out: the thermic sensation of cold, irritation in relation to the level of light and the position of the armchair relative of natural and artificial light, the need to change the environment.

There is a predominant vision in healthcare spatial layout of HD units. However, an alert should be made that preparing architectural and/or interior design project based on hedonistic vision, placing RRT patient at the center, would be life-threatening. In case, the desire of the RRT patients is the sole drive of the project, a significant part of the reality imposed by the health-ailment process of HD would be compromised.

The cross-section survey targeted the regional population. Because it is descriptive in nature, it brought data that showed the relevance of the study for architecture and interior design of HD units. Also, because of its qualitative nature, it was possible to investigate the as built environment for its architecture objectively and subjectively. In general, and in the exploratory Field, we can say with 95% certainty, that the population in RRT has a significant cause-effect and that the results are circumstantial with the nature of the place, but the chronological time of the individuals is uncontrollable variable of the persistence of the feelings relative to the environment. This is important because, different from other healthcare sectors, the tendency is of duration of treatment extended into years. To achieve results, we surveyed and analyzed numeric data per gender, age, level of education, addiction to tobacco, commuting and number of days of treatment and distribution of it a week of the target population. The physiological description for chronic kidney disease (CKD) prevalence reflects the international population and the sociocultural description reflects the national population.

We worked on three objects, the physical-material; the abstract-natural and the subjective. The first two were analyzed in tandem by the RDC and POP normative elements. We observed the first has a prescriptive character in relation to infrastructure of health care establishments. The second aims at technical-professional procedure and interpersonal relations (technical professional level), person-society (technical-professional and sociocultural level). Both elements are mechanistic, in theory, that is, they are scientific and universal when considering people, not giving margin for individual approaches, in the sense of being subjective. However, both are

determinants for the technical-projection and construction of the environment of the HD units investigated in this study, even more than the subjective object. This is possible, as seen in the layout of the units, because there are a sense of logic, process and movement and flow of work that determines the efficiency and efficacy in the development of the RRT. This Said, in a preestablished order, for professional assistance, the RDC and the POP, including here other prescriptive possibilities (administration, maintenance) act to guarantee the life in its physical parameters and thus, they obey a basic priority scale, when compared to the subjective object.

However, if there were a metric that does not consider subjectivity, we would have lost the human nature so important to the individual, which can have repercussions on the mental health of the RRT patient. We concluded that the scenario of a HD room constitutes the ambience of that place, and for the patients, it is holistic (not dissociating the elements, one from the others), because it doesn't seem possible to indicate that the academic rational, as is being done here, allows pointing out that the subject can distinguish the technical aspect, a Professional approach, or the anguish imposed upon him, for any reason in that place. For example, the person-person relation with the health care team leads the patient to position himself differently creating a non-foreseen personal space for someone bound to an armchair and a machine. Another example in the person-environment relation, is the TV, which serve as an equipment that creates a perception of time, however in practical terms is inefficient (with no practical function of watching TV programs).

We observed that the population reflects the reality of a RRT, there are, within this context, sustainable academic aspects of person-environment relation. From the result one concludes that there are three objects of pertinence to healthcare environments. The effectiveness of the health care establishments is related to the balance of attending three object elements, not only of function, but as well as the lived spatial experiences of individuals whose primary presence in the place is not directly tied to core clinical or therapeutic care. We noticed that the first objects, because they are palpable and measurable, tangible as scientific techniques, are focused and have more direction to the professionals, whether architects, designers, engineers or healthcare professionals. They also include aspects of social issues and visions, such as the contemporary reference of time of HD service, which can be observed in the installation of the infrastructure, as in the productive work process of the clinics. However, one should be alerted to the need to think of the health care establishments

projects as more than norms, because the built environment is not only the physical space. The humanization, so much emphasized for health in its different strands, in architecture cannot neglect by not attending the internal users, the needs of flows and processes, because in thesis, this is what guarantees the quality of life, naturally, in whatever is possible within the scientific knowledge and technological resources and reflect the physical, mental and social well-being, knowing the chances of persistence and evolution of the disease in time. However, one should not limit the issue of humanization to the Professional problem, because the production of an architectural Project consists of creating an environment for all and a positive “ambience”.

As observed, architecture constitutes a shelter for the man who inhabits the world and is not limited by the limits of construction. For this reason, the prescriptions considered in an architectural healthcare facility Project are fundamental for the evaluation of quality, efficiency and efficacy of the constructions, but alone are not capable of determining the effectiveness of a human environment. For this purpose, the investigation leads to the need to adopt a complex incorporation into the architectonic and environment design concept of the building the presence of an individual, in conflict with himself and with the society in the relations of a RRT patient (person-environment, person-person and person society). Under the alert of evidence found in studies.

The research in HD units shows that humanization in healthcare requires observing the sectors and locations with a different eye, because every population assisted, is in general organized by level of specialization in health that, consequently, entail composition of differentiated environments, that cause their own context and particularities of experiences of the people and correlated sociocultural groups. Attending to the diversity of spaces people and situation through an architectural or design Project is not an easy task. However, considering that places and their environments are important for the perceptions and feelings of people the answer to the question is long due: How is architecture a vehicle to promote this? It may sound surprising but attending the technical and scientific instructions is an important start, because the objective characteristic of these solves part of the problem, since it discusses, at least mental health, that the treatment of the body shall not be unassisted because of the conditions and devices. It is the architecture and design professional's duty to then seek means that would lead them to understand the correlations of these objective orientations together with the other aspects necessary for the development

of environment of the Project to be developed. This can be achieved using traditional means (publications in technical-professional, scientific and academic journals or on web sites), but we suggest in loco explorations of different places with similar healthcare services, and most important, it would require the Project design Professional to understand the importance of putting the several users (internal and external) within the context of developing of the Project to systematically consider the accessing the characteristics of the existential phenomena of the people within healthcare of the people and the designed place.

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