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From user perception to architecture

Improving arrival and waiting spaces in primary healthcare centres

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Abstract: This research paper examines primary healthcare facilities in Montenegro, focusing on outpatient spaces - arrival infrastructure, outside spaces, and inside spaces. In Montenegro, primary health centres provide 80-85% of all health care services and are designed to serve patients within the defined local community. In these facilities, the maintainer of primary care is a chosen doctor (GP), a person most familiar with the patient's conditions and social background. Despite the personal service healthcare centres provide, the architectural expressions of the built facilities do not reflect the intimate nature or personalisation of this service. By examining the user experience and doing field research, we identified several shortcomings in these facilities' exterior and interior quality. Data was gathered through a questionnaire involving users and field research, encompassing large, medium, and small-sized healthcare centres. Participants initially expressed neutral perceptions of existing elements, but when given the opportunity to choose, they became more inclined to suggest improvements. The field study identified rather negative architectural aspects, including inconsistencies in performance across the facilities. The design primarily serves the functional requirements determined by the current capacity, whereas considerations regarding aesthetics and the users' comfort are often neglected. The findings highlight the need to align architectural design with user preferences, emphasising the significance of user-centric healthcare facility design in Montenegro and similar environments.

Keywords: healthcare system, primary healthcare centres, outpatient spaces, personalisation, architectural report, Montenegro.

1. Introduction

Montenegro provides healthcare services on three levels. The first level is primary healthcare, provided by a general practitioner (GP) called a 'chosen doctor' or a team of doctors in the health centre. The secondary healthcare level provides special clinics and hospital wards; the tertiary level supports it with sub-specialist clinics (Montenegro Ministry of Health, 2015). The majority of healthcare providers are public entities. The healthcare institutions can be in a standalone building or a designated space within a residential or mixed-use building with a separate entrance and exit. The official gazette of Montenegro from 2008 stated that all spaces for conducting healthcare activities must form a single unit and be completely physically separated from any other residential or office spaces (Službeni list Crne Gore, 2008).

The Master Plan for the Development of the Health System for the Years 2015–2020 highlights the importance of primary care in enhancing population health and bringing down medical expenses (Montenegro Ministry of Health, 2015). The primary point of a patient's access to the healthcare system is the chosen doctor (Mosca et al., 2022). However, primary care is not being used to its full potential (World Health Organization, 2020).

In Montenegro, there are 18 primary health care facilities, which provide both primary care services and additional services offered by support facilities. Supporting services include diagnostic and prevention centres, home visits and patient transport units, centres for lung diseases and tuberculosis, mental health centres, centres for children with special needs, daycare centres, and primary-level physical therapy units. In daily service delivery, primary care settings differ from hospital inpatient settings, where patients are cared for continuously and frequently for longer periods. In contrast, in primary service, patients receive treatment almost immediately. Many health problems can be resolved entirely in primary care, and patients who require secondary care services are first evaluated there (Morgan et al., 2021). However, even for diseases that may receive treatment in primary care, the current Montenegrin primary-care model and the chosen doctors' payment structures encourage referrals to specialist services. This model contrasts with the government's goal, which has existed since 2005, of organising primary care to address up to 80-85% of the population's healthcare needs (Government of Montenegro, 2022a).

Mechanic (2004) states that choosing a personal doctor and care settings, continuous care, and effective communication contribute to trust in healthcare quality. He points out that central to patients' trust is how doctors communicate and whether they seem caring. Primary healthcare satisfaction could result from good practice organisation or good personal relations with the GP (Gabbott & Hogg, 2010). Neighbourhoods with more primary care physicians tend to have healthier patients, as greater access to primary care is associated with better health outcomes. The primary care physician can influence unhealthy behaviours to prevent diseases thanks to this trusting relationship (Krist et al., 2016). Ideally, individuals should connect with a primary care physician when they are healthy.

Besides the quality of health services, the architectural design of healthcare facilities also impacts patient satisfaction. The atmosphere created by the physical environment can predict patients' satisfaction, their intention to return, and their willingness to recommend a healthcare provider to others(Hutton & Richardson, 1995). Evidence suggests that factors under the control of architects can significantly affect patient satisfaction and influence the quality of life, treatment times, medication levels, displayed aggression, sleep patterns, and compliance with regimes, among other factors (Lawson, 2010).

1.1. Objectives

The dominance of research on inpatient facility environments and the lack of studies on outpatient or primary care facilities in the healthcare design literature is noticeable (Watson et al., 2016). There are significant gaps in the literature regarding the types of outpatient or primary care buildings and visitors' viewpoints within the social spaces of healthcare environments. Research about user perspectives in these settings has been done separately for patients (Jovanović et al., 2022) and staff (Oandasan et al., 2009) or discussed from a combination of both (Huisman et al., 2012).

There is currently not much research regarding the social context of healthcare buildings and their design aspects in Montenegro. While surveys have measured the users' satisfaction with

services, none addressed the space quality for these services. This paper's analysis starts with areas of arrival where users get their first impression of the facility. The research deals with the users' impression of arrival and waiting within the facility and examines whether some design elements are perceived differently. By collecting data from patients, staff, and accompanying persons, this study can contribute to users' satisfaction databases with aspects that consider satisfaction with the physical appearance of the facilities. Hospital clinical practices mainly focus on treating the illness rather than on a patient's social, spiritual, and psychological needs (Dilani, 2008). Healthcare facilities should provide a therapeutic atmosphere where overall design contributes to the healing process rather than simply being a place to carry out the treatment (Phiri, 2014). Quality healthcare architecture must overcome profitability problems within the public sector to overcome these shortcomings and perform thorough research for the most favourable outcomes.

2. Literature Review

Hospital clinical practices mainly focus on treating the illness rather than on a patient's social, spiritual, and psychological needs (Dilani, 2008). Lawson (2010) emphasises the importance of the patient's experience and the need to create healing places rather than machines for treatment. Healthcare facilities should provide a therapeutic atmosphere where overall design contributes to the healing process rather than simply being a place to carry out the treatment (Phiri, 2014). To achieve these objectives, it is important to prioritise quality healthcare architectural design, regardless of profitability concerns and public sector financing challenges.

2.1. Public sector issues and lack of evidence-based research

Since medicine sometimes neglects the significance of the physical environment in patient well-being, architecture lacks a profound tradition of study for healthcare facilities. This oversight makes the research process in healthcare settings especially demanding (Devlin & Arneill, 2003). The starting research point of these facilities can be evidence-based design (EBD), which is done during the design process. It is followed by building performance evaluation (BPE), based on analysing post-occupancy evaluation (POE) after the facility is in use.

Problems associated with sponsors' and clients' funding scenarios persist, as the amount of funding can determine greater design options and higher-quality building execution(Verderber et al., 2014). The public sector typically has fewer design opportunities than private clients, as public procurements prioritise the cost-effective provision of products and services for public use over profit (Palaneeswaran et al., 2003). Radulović, the director of the Clinical Center of Montenegro, stated that the budget plan 2021 allowed the planning and execution of four new healthcare capacities within the existing healthcare complex. The State Audit Institution announced the construction of these facilities in 2011 through official reports. However, until 2021, there was no allocated funding for them, so the realisation could not occur (Clinical Center of Montenegro, 2022). In July of 2022, the construction work started for the mental health clinics (Government of Montenegro, 2022c), while work on two facilities for infectious diseases and dermatovenerology clinics began in October of the same year (Government of Montenegro, 2022b).

Nevertheless, no regulations ensure the building design quality of healthcare facilities in Montenegro. Research may provide answers regarding the effects of design on the users' health and mood, improve the importance of the design profession, provide a better return on

investment, and—possibly most importantly—create optimal healthcare environments for patients, families, and staff. Still, in the case of publicly funded buildings, most design guidelines tend to focus on compliance with several minimum standards. Public-sector guidance concentrates on the issue from the staff and treatment perspective, often leaving the patient-focused impressions behind (Zborowsky & Bunker-Hellmich, 2010).

Joseph et al. (2014) describe EBD as a three-step process. First, the design activity employs research to make decisions and evaluate their impacts. Second, a key component of the EBD process is emphasising research rather than relying solely on anecdotal evidence or best practices. Lastly, it centres all design decisions made throughout the design process on the needs of patients, staff, technology, and organisational outcomes. Another issue to be addressed is the exclusion of POE from conventional architectural education, possibly with the help of professional pressure (Hadjri & Crozier, 2009).

According to Alfonsi et al. (2014)., understanding EBD results should be a 'mandatory step' for any designer working on a healthcare building design. Still, it has not yet been widely applied to healthcare design globally. EBD is currently widely utilised and included in the process by many healthcare designers in the US. However, in Montenegro, it is still not required by regulations.

The crucial part of EBD is assessing how design decisions affect outcomes. Research linking healthcare facility design to patient, staff, and family outcomes is becoming more widely available (Joseph et al., 2014). Much of the research available in EBD is done through case studies since it can be challenging to generalise healthcare design case studies beyond the individual setting where they happen. Each healthcare system, independent of its scale, has its organisational structure combining social layers that sometimes operate independently, like nursing and physician culture or administrative vision. Ensuring that organizations are comparable for unbiased research or identifying similar organizations to study is a challenging task, according to Zborowsky and Bunker-Hellmich(2010).

Evaluating the building's design after it has been built and occupied, the last phase in the EBD process is crucial because it adds to the body of knowledge and completes the innovation cycle. Post-occupancy evaluations (POE) have always prioritised gathering user opinions and input regarding building performance. Research regarding POE has lately concentrated on a building's technological performance (Budaiwi et al., 2022; Eijkelenboom & Bluyssen, 2020; Garcés et al., 2022). By measuring patient clinical outcomes, along with user satisfaction with the built environment, the EBD method could strongly influence the performance of healthcare facilities.

To reflect the quality of a building's design and output, Preiser et al. (2009) put users at the centre of the design of a building by utilising the term performance, which is less ambiguous and simpler to measure. They used building performance evaluation (BPE) to measure if the facility effectively meets a performance target. Post-occupancy evaluation (POE) is considered a sub-process of BPE by them. It is described as 'the act of evaluating buildings systematically and rigorously after they have been built and occupied for some time' (Preiser et al., 2015).

While researchers frequently discuss EBD, practitioners who play a significant role in forming the built environment must also get involved to achieve a positive turn in creating buildings. Unfortunately, most new healthcare facilities in Montenegro do not implement these methodologies. According to Lawson (2010), designs must improve remarkably to achieve a better standard of care. It is important to highlight the role of architects engaging in POE of the completed building despite this approach demanding a systematic assessment and investment of resources and time (Samah et al., 2013). In conclusion, POE is a helpful tool for enhancing

structures, raising user comfort levels, and controlling expenditures. However, the cost, defending professional territory, time commitment, and skill requirements are still barriers to the broad implementation of POE (Vischer, 2002).

2.2. Design aspects and components

In healthcare architecture, a notable transformation occurs as architects prioritise humanist values and design principles, focusing on patients' social and psychosocial requirements while enhancing their experience within the facilities (Lyon, 2017). Architectural factors like the building's composition scale, daylighting, colour palette, wayfinding amenities, staff, patient circulation patterns, aesthetic ambience, and overall suitability for disseminating healthcare are frequently overlooked (Samah et al., 2013). Understandably, the primary concerns regarding healthcare services are measuring health outcomes, worker morale, productivity, and care quality. However, recognising how the physical environment performs in the architectural aspects can help strengthen their relationship.

Montenegro does not have a particular architectural guideline regarding the design of healthcare facilities. In August of 2023, the Ministry of Ecology, Spatial Planning and Urbanism announced the international competition for the healthcare centre in Podgorica. Even though this is the newest proposed healthcare building, the guidelines from the competition brief did not include any requirements for the design quality regarding this specific facility category (Ministry of Ecology, 2023).

However, several requirements exist in the general regulations for providing primary care in Montenegro. As stated in the Official Gazette of Montenegro, the yard and access roads around the building must be paved or asphalted, while other areas must be covered with grass; all rooms of the health care facility must be airy and lit with natural light or appropriate artificial light; and the waiting room must contain chairs for patients, a hanger, and a plastic wastebasket (Službeni list Crne Gore, 2008).

Guidelines already implemented in other countries can help broaden the design knowledge. General design guidance for healthcare buildings issued by the UK Government distinguishes policy and regulatory scope, master planning, and building design guidelines (Phiri, 2014). Guidelines mainly deal with the arrival to the facility, both outside and inside. Outside elements include a canopy, bright lighting, a well-lit entrance, directional information, design surface, plants, external seating, and an external appearance that is confident and has a well-cared-for look. Inside elements include light, spacious and airy atmosphere, seating distribution, recognisable reception, easy wayfinding, plants, and high standards to give the organisation a positive image.

The interior environment is the setting that helps create a healing environment and includes elements such as a relaxing atmosphere, general safety, suitable ergonomics, and therapeutic methods (Ghazali & Abbas, 2012). These elements must be adequately organised to avoid confusion and disorientation in the user's perception.

3. Methodology

As noted, few official requirements exist for the architectural design of healthcare facilities in Montenegro. Based on this information, it was hypothesised that the buildings would comply with the regulations but not display additional design qualities. The research consisted of two phases and used a mixed-method approach. The first step was a questionnaire conducted at the biggest

healthcare centre 'Nova Varoš', which used a quantitative methodology. Results from this part served as leads for the second part, which focused on the elements that received the most significant impressions. This part included qualitative analysis field research of three different Podgorica facilities: a large, a medium, and a small-sized facility. The assessment focused on survey elements, including arrival, outside and inside spaces. Data was collected by visiting the chosen healthcare centres, gathering graphical material and making notes on the space design and usage, which were later evaluated.

Ethical approval for the study was obtained from the Primary Health Care Centers of the Capital City in Montenegro and the Budapest University of Technology and Economics before any data collection happened.

Phase I

The questionnaire consisted of 30 questions with a 7-point semantic differential scale and a Likert scale. Questions considered specific personal data, impressions about the arrival at the centre, the outside facility appearance, and the interior waiting zone. Every participant could express further personal experiences outside of the preset questions. The questionnaire was conducted in person, in the healthcare centre 'Nova Varoš', while the online version was distributed to people who could not fill it out on the spot. This principle ensured that all participants had the most recent impression of the examined site.

Age, gender, employment, education, and role in the healthcare centre were part of the collected personal data.

Questions considering elements of the built environment included:

- Arrival spaces included transport means, length of the route, waiting time, parking lot, public transport, and covered areas.
- Outside spaces focused on the overall appearance of the building, entrance, seating places outside, and vegetation around the healthcare facility.
- Inside spaces were the most detailed and considered design of the waiting area, reception, atmosphere, signage, wayfinding, seating area, natural lighting, interior plants, and artwork and decorations.

A total of 41 categories were available for participants to evaluate. Participants could use the 7-point semantic differential scale to express their perception of the elements by placing a mark along a scale that spans between opposing pairs. This mark represented a numerical value, from -3 as entirely negative to +3 as a completely positive adjective. The data from patients, staff, and accompanying people was analysed using Jamovi statistical computer software.

Phase II

Three primary healthcare centres were selected for the detailed qualitative analysis based on the number of registered patients in the facility. Table 1 shows every primary healthcare centre in Podgorica organised by the building characteristics and the patient capacity.

The research included three institutions with a large, a medium, and a small patient count. As previously mentioned, a questionnaire was conducted in the largest facility' Nova Varoš', which has 25807 registered patients, so this institution was automatically selected for further analysis. The medium category included primary healthcare centres ranging from 11714 patients ('Konik') to 16014 ('Stara Varoš'). Even though the 'Stara Varoš' centre was numerically in the middle, it was disregarded as it is physically identical to the Nova Varoš building. For this reason, the 'Zlatica'

centre, which had 13449 patients, was selected. The 'Zabjelo' healthcare centre was chosen as the smallest facility, with 7280 registered patients.

Table 1. Categorisation of facilities by the number of patients (source: Authors, 2023)

Size	Type	Patient number
Large facilities		
Nova Varoš	Individual facility	25807
Blok 5	Individual facility	22849
Medium facilities		
Stara Varoš	Individual facility	16014
Zlatica	Individual facility	13449
Stari Aerodrom	Individual facility	11769
Konik	Individual facility	11714
Small facilities		
Gornja Gorica	In multipurpose building	9373
Studentski centar	In multipurpose building	9202
Zabjelo	In residential building	7280

We visited three institutions, 'Nova Varoš', 'Zlatica' and 'Zabjelo' in February 2023, following the implementation of the initial survey. Photographs, researcher sketches, and notes on impressions were collected. The staff could also describe their impressions in an informal conversation, albeit at the workplace. The focus of the facility visits was on the elements included in the survey. Assessment of the arrival included examining parking facilities, public transportation options, alternative modes of transportation, and pedestrian access. Entrance, overall look, outside seating, covered areas and vegetation were part of the analysed outside spaces. As for interior spaces, the evaluation encompassed the reception area, waiting area, signage, seating arrangements, natural light availability, indoor plants' presence, and artwork display.

4. Results and Analysis

4.1. Phase I

A total of 52 people participated in the questionnaire. Female respondents formed the majority, 66% of the sample. However, the analysis showed no significant differences in the impression results of the two genders. The majority of the participants (54%) were using a car as the means of transportation to the centre, followed by taking a walk (28%), with the least number of them taking a means of public transport (14%) and a bike (4%). Only 8% needed 30-60 minutes to reach the facility, while 14% took less than five minutes. Most (38%) took 5-15 minutes, followed by 36% whose reach time was 15-30 minutes.

As the sample was too small to obtain generalisable results, the distribution of the responses was irregular for many parameters examined through the questions. Variables with regular distributions are presented in Figure 1.

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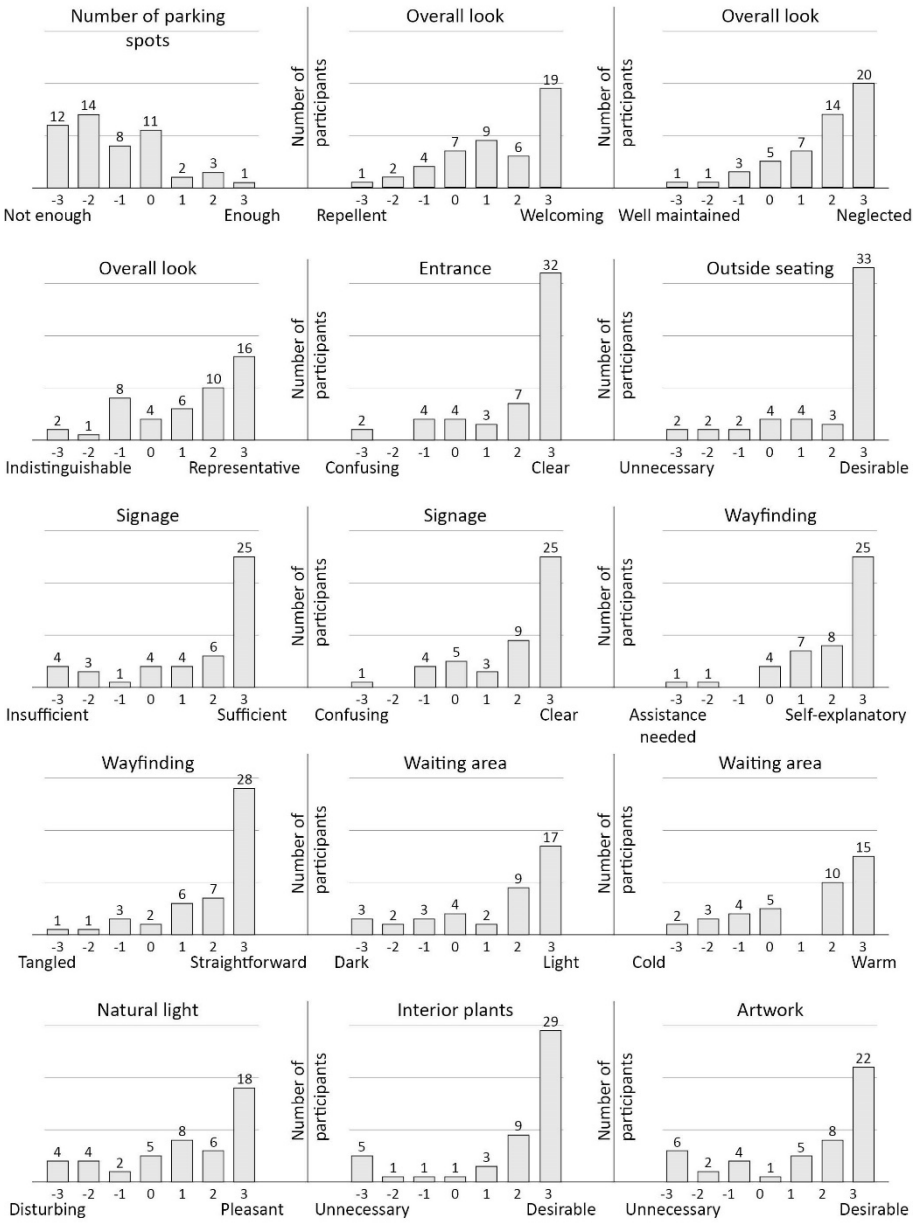
Figure 1. Bar plots with the regular distributions (2023)



As depicted in the bar plots in Figure 1, according to the regular distribution of the answers, the greatest attention was directed towards the exterior appearance, signage, and wayfinding, which constituted the initial contact with the institution and accessing services. Participants only expressed reactions regarding the ambience in light/darkness and cold/warmth within the waiting area and their preference for pleasant natural light, interior plants, and artwork. The phase I results indicate a relatively neutral perception of the remaining categories within the healthcare centre where people spend their time. However, Figure 2 displays a stronger inclination among respondents to suggest improvements in certain elements.

Based on the result, Phase II focused on evaluating the facilities' exterior, firstly, overall look and entrance, which received positive perceptions from Phase I. From the interior spaces, special attention was paid to adequate seating, signage, artwork, and interior plants.

Figure 2. Elements to be improved (2023)

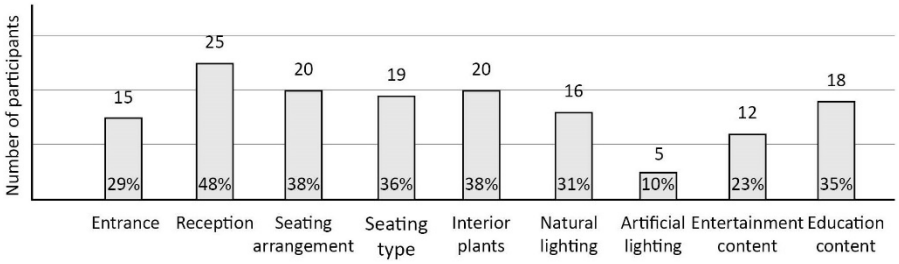
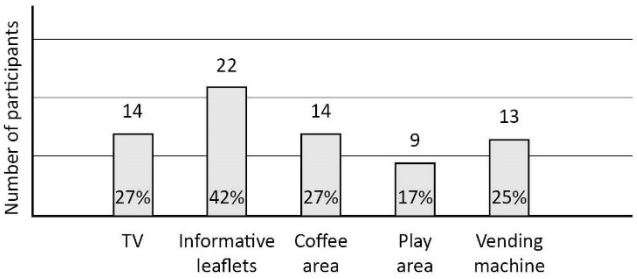


Figure 3. Elements to be included (source: Authors, 2023)



The reception area garnered the highest impressions; nearly half of the participants desired improvements. The seating type and arrangement, along with the presence of interior plants, ranked closely behind in terms of user preferences. Education content, natural lighting, and the entrance zone received between 29% and 35% of participants who wished for enhancements. In contrast, only 12 participants voted for improvements in the entertainment content, while a mere five indicated a desire for better artificial lighting, as per the questionnaire results.

In addition, participants were allowed to select elements they would like to have in the centre, regardless of whether they already existed. Of the respondents, 22 expressed a desire for informative leaflets, while 14 participants preferred a TV and coffee area. Furthermore, 13 respondents wished for the inclusion of a vending machine, whereas only nine participants selected a play area as their choice (Figure 3).

4.2. Phase II

4.2.1. Healthcare centre 'Nova Varoš' (A)

Healthcare 'A' is a freestanding, ground floor + one floor (GF+1) facility in the inner city core (Figure 4). In the immediate vicinity, residential buildings range from GF+0 to GF+3 floors, and public facilities include an elementary school and a theatre. The building faces a secondary road, providing access to all entrances. River Ribnica flows behind the building, although there is no established connection between them.

Arrival: Access to the building is possible for vehicular and pedestrian traffic from several directions, and there are two public transport bus stations within a radius of 250 m. The surrounding environment is not designed to accommodate cycling and other alternative modes of transportation.

Figure 4. Exterior of the health centre 'Nova Varoš' (source: Authors, 2023)

Although the Phase I results indicate general dissatisfaction, more vacant parking spots were observed during visits to the facility at different periods of the day. The dominance of drivers in the questionnaire (54%) shows a slight bias towards the preferences of this group. The location has many parking spaces with different parking systems; however, no part is designated exclusively for health centre users.

Outside spaces: The building's front facade is nearly symmetrical and features two identical entrances with ramps for individuals with reduced mobility. The only covered external spaces are in front of the entrance zones, a few meters from the facade. Two wooden benches are placed in front of the facility, while three additional benches, also used by the patients, are located 30 m from the entrance. A board with the institution name, function and logo is next to the entries.

Previously, the right main entry servedadult patients, and the other for minors. However, because of the adult patient overload, the paediatrician's workplace was eventually relocated to the first floor, eliminating the distinction in the entrance hierarchy. Typically, accompanying people or patients who arrived during a break occupied the outside benches. Just over half of the respondents (52%) feel that the number of places to sit outside is insufficient, while a significant majority (85%) consider it desirable.

Several perennial evergreen and deciduous species make up the vegetation in the immediate surroundings of the building, which existed before the facility's construction. Pedestrian pavements consist of monolithic concrete slabs cast on-site without design ambitions. The additional green areas are not specially designed for the health centre, so unpaved regions do not have proper landscaping.

Inside spaces: After entering the facility through either door, the visitor encompasses the wider corridor-like space, which serves as the waiting zone beside the communication (Figure 5). The reception is not in direct sight from the entrance point but is visible only after a few meters inside the building. The floorplan is symmetrical, with an even distribution of doctors' rooms on the sides and the reception and injection department in the middle (Figure 6). Signage is present in large numbers, with signs and descriptions on every door.

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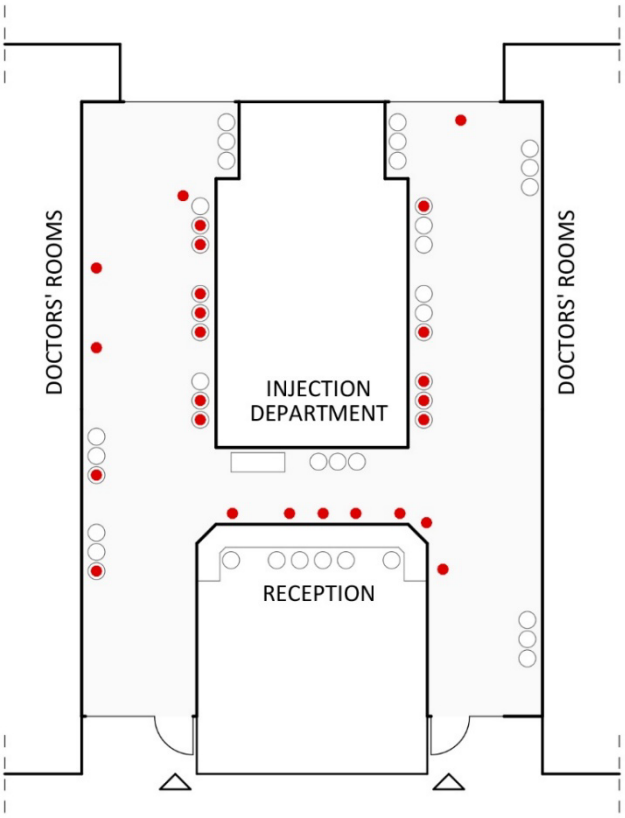
Figure 5. Reception and waiting area of the health centre 'Nova Varoš' (source:Authors, 2023)

The reception desk is attached to the side walls and has one longer approaching side. Six workplaces and seats are provided for the staff, while archive papers are directly behind them. The reception area is double-height and does not have direct natural light, while the artificial light is dim and diffused. The desk height is around 120 cm, which makes it maladjusted for wheelchair users and children.

Figure 6. Sketch from the field research, facility A (source: Authors, 2023)



Distance from the openings and central position make the reception area dark, especially in gloomy weather conditions. The outdated design troubles patients: they cannot maintain the correct queue, and the area gets crowded during busy periods. There is no division between the counters, so several patients approach one worker simultaneously. Usually, more staff are needed, but they must stand behind due to the lack of workspace.

The waiting zone contains 36 seating places, most placed across the GPs' room doors. Natural light comes from the entrance doors and windows on the opposite side at the end of the building. Artwork is present in several framed photographs with nature motifs behind the seating, but no interior plants exist. The area also contains trash bins, vending machines, informative posters, and advertising displays.

Patients occupied each seat during busy periods, while some were broken at the time of the visit. Despite accessible seats, several patients stood in front of the doctors' rooms. The users' mistrust that the doctor calls patients in order leads to this situation. Three questionnaire participants included the display with patients' calling order as a desired element. The waiting room atmosphere was rated as bright, and the natural light was highly pleasant. Spaces at the end of the ground floor are well-lit, which is not the case for the waiting area further from the windows.

4.2.2. Healthcare centre 'Zlatica' (B)

Healthcare centre 'B' is also a freestanding one-floor facility in the city's suburban area. We find the forest-like park and two open football fields on the southwest side. On the northeast are individual residential houses of a maximum of two storeys and a primary school. The main five-lane road passes next to the building, connecting Podgorica and northern cities. This health centre is the newest one, constructed in 2018. (Figure 7).

Arrival: The primary road access for vehicular traffic is via the main road, while the additional secondary streets exist within the residential area. Pedestrian traffic is possible along the traffic streets through the sidewalks. There are two bus stations within a 550 m radius, while the surrounding area is not appropriate for cycling and other modes of transportation.

Figure 7. Exterior of the health centre 'Zlatica'(source: Authors, 2023)

The facility has pavement for pedestrians on the perimeter, but some streets within the neighbourhood have just asphalted areas dedicated to vehicles. This situation affects safety and is particularly uncomfortable when these areas become flooded in unfavourable weather conditions.

Parking with 24 spots dedicated to users is next to the building and is the only one in the vicinity. During the visit, around half of the free spaces were observed. Cars were parked on the street in front of the building, but it is unsure whether they were from the health centre. This situation is commonly frequent in many suburban residential neighbourhoods.

Outside spaces: The building has a representative door from the primary roadside with the canopy. A sign with the official name and logo is on the wall beside it. However, this is not a usable door and can be misleading for first-time users, mainly because no additional sign suggests the entrances are on the opposite side.

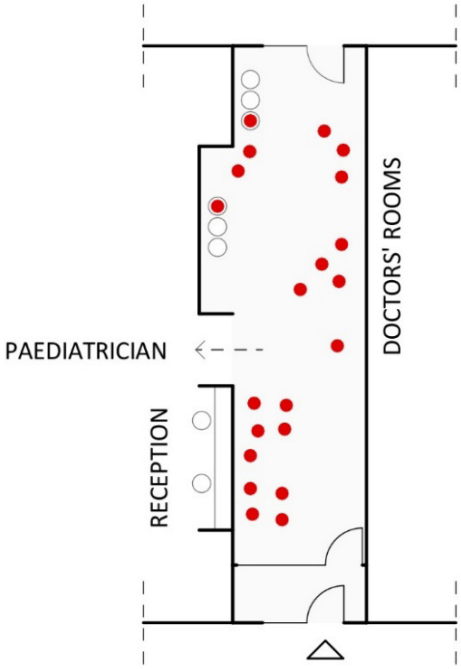
Two main entrances are at the backside – one for the adults and one for the minors. Both have a board with the institution name, function and logo attached. Besides the health centre, the facility accommodates a pharmacy and the post office on the same side. Two meters wide protrudes through the entire length, efficiently protecting the users who sit or stand outside. Ground floor elevation is around 30 cm, and access ramps for individuals with reduced mobility exist along three sides. Two benches exist before the entrances, mainly used for short waiting periods.

Vehicle traffic prevents any physical connection between the park and the centre. While waiting in front of the building, a significant part of the vegetation was visible, and the atmosphere was pleasantly quiet. The landscape design, except on the primary entrance, included shorter vegetation, such as rosemary shrubs, younger trees, and grass surfaces.

Inside spaces: The interior situation is similar to facility A's corridor-like entrance space (Figure 8). The reception is visible from the entrance to the left side, with the upper level's high counter and glass separation.

Figure 8. Reception and waiting area of the health centre 'Zlatica' (source: Authors, 2023)

Figure 9. Sketch from the field research, facility B (source: Authors, 2023)



This position created crowds, as waiting for the reception or the doctor's appointment and passing through were mixing in busy times. No division between the counters also disturbs the order of receiving patients. The reception staff uses two chairs behind the desk, but this number is insufficient. They expressed the need for more workspace, as the services almost always need four members, and the lack of space makes the other two people assist from behind.

The ground floor for the waiting zone is symmetrical, so adults and children have the exact proportions and design, with the reception and additional rooms in the middle. An open corridor above reception connects paediatrician and adult GP waiting rooms, and anybody could pass—this distribution of space and no physical boundaries created noise between different areas. Staff pointed out that this uninsulated zone caused discomfort on both sides.

Like facility A, the building has numerous signage featuring signs and descriptions on every door.

The waiting zone accommodates six seating places, all of them located across the doctor's rooms. Only two people used the seat at the visit time; two were standing next to them, eight waited closer to the doctor's room door, and nine patients were waiting in front of the reception (Figure 9). The space size seemed insufficient for a comfortable atmosphere, especially in the reception area closest to the entrance.

Natural light mostly comes from the entrance door. On the opposite side is another door, previously mentioned as an unused entrance, next to the main road. Distance from one light source and coverage of the other makes the space quite dark during the daytime.

The artwork was similar to the previous facility, with natural motives behind the seating, but in a notably smaller quantity. Two potted plants were present in the area around the reception. Staff confirmed bringing the plants to make the space more comfortable and cheerful.

4.2.3. Healthcare centre 'Zabjelo' (C)

Healthcare centre 'C' is the only analysed facility integrated into a residential building. It is positioned on the raised ground floor, with seven more storeys above (Figure 10). The

surrounding area is mainly residential, mixed with multistorey collective housing and up to two-story private housing. Kindergarten and two elementary schools are near the facility.

Arrival: Vehicular and pedestrian traffic can access the facility from the multiple secondary streets. The busy main road is 100 m from the entrance, but the green buffer zones soothe the noise. Two public transport bus stations are within a radius of 350 m. Neither here is the surrounding adjusted to alternative modes of transportation.

The parking zone is located after the secondary street. The area seems adequate for accommodating users' needs, but since there are no divisions of zones, it can get crowded in busy periods of the day since residents use it primarily.

Outside spaces: Three almost identical door elements represent the healthcare facility within the residential building and are distinguishable by blue louvres. Their design is in order with the existing facade rhythm, with the PVC joinery of the newer date. A plate with the institution's name, function and logo is present above the entrance door, which makes it clear. The main entrance is not covered with any element, while the balconies above serve as a canopy for the facility's sides.

Monolithic concrete tiles cast in the site make the pavement in the front, while the material of the access stairs is marble. Uneven paving with cracks and unstable stair surfaces makes the approach uncomfortable and unsafe. This neglect diminishes the overall representation of the facility. Access for people with reduced mobility is difficult due to the lack of appropriate ramps or platforms.

Nearby the facility, there are three wooden benches, all in neglected condition. None of them face the facility and are not dedicated to the users expressly, so residents use it more often in good weather conditions. Patients were seen waiting outside the door or sitting on the concrete pavement during the break.

Figure 10. Exterior of the health centre 'Zabjelo' (source: Authors, 2023)

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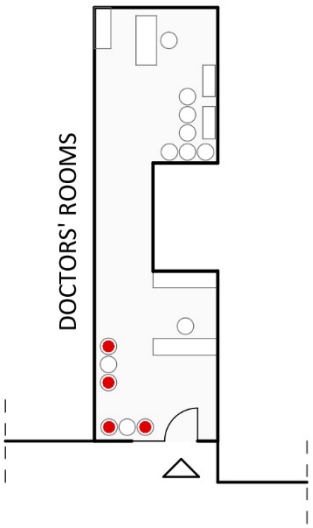
Extensive vegetation exists on the site, with primarily evergreen perennial species. The greenery makes a comfortable and cosy neighbourhood atmosphere. Landscape design lacks, with unkempt grass areas and untrimmed branches and plants that sometimes obstruct passage.

Inside spaces: The reception desk is right before the entrance, where patients directly enquire about their visit (Figure 11).

The desk resembles an office desk, with one side mounted to the wall. The counter's height is also around 120 cm, with no additional separation of the staff from the patients. The middle corridor divides two waiting zones for two doctors in the shift. Specifically, each has a nurse's desk, so there are two receptions in the facility for each GP. The other reception also has an office desk and no additional barriers (Figure 12).

Figure 11. Reception and waiting area of the health centre 'Zabjelo' (source: Authors, 2023)

Figure 12. Sketch from the field research, facility C (source: Authors, 2023)



The receptions are small, but the crowd is rare, so it does not get busy. However, during the pandemic, patients were told to wait outside and were called inside individually according to the queue.

The facility has information sheets on the walls and doors, marking each function. However, in this space, many advertising materials are assigned.

The chairs are in use but are rarely busy since only a few patients have appointments at a similar time. Distribution and overlapping in the farther waiting zone make two seats unusable. The groups cause the problem of insufficient space to accommodate this specific type of seat.

There is no natural light besides the sufficient glass surface on the existing door. Staff confirmed that the louvres never function due to technical issues. This inconvenience makes the need for artificial light constant and lowers the comfort of the workplace. Artwork and plants were not present in any form in the interior.

4.2.4. Overall facilities performance

After the data collection, facility elements performance was categorised in three groups: + Positive; + - Neutral; - negative and displayed in Table 2.

Table 2 Facilities performance along the analysed aspects (source: Authors, 2023)

Facilities	A - 'Nova Varoš'	B - 'Zlatica'	C - 'Zabjelo'
Arrival			
Parking	-	+	+ -
Public transportation	+ -	+ -	+ -
Alternative transportation	-	-	-
Pedestrian access	+ -	+ -	-
Outside spaces			
Entrance	+ -	+ -	-
Overall look	+ -	+ -	-
Outside Seating	+ -	+ -	-
Covered areas	+ -	+	-
Vegetation	+ -	-	+
Inside spaces			
Reception	-	-	-
Waiting area	+ -	-	-
Signage	+	+	+
Seating	+ -	+ -	-
Natural light	+	-	-
Indoor plants	-	-	-
Artwork	+ -	+ -	-

Elements marked as positive were sufficient in quantity and well-designed to perform their function. Neutral elements existed on site and had certain qualities but showed flaws such as insufficient quantity, malfunction, poor design, position or service issues. Negative elements were either nonexistent, in insufficient quantity, poorly designed or completely malfunctioning.

Alternative modes of transportation, reception and indoor plants performed negatively in all three facilities. On the other hand, signage was adequately present in each place. Inconsistency is noticeable, as each building performed differently considering the remaining elements. Overall, large facility 'A' showed the best, while the small facility 'C' recorded the lowest performance level.

5. Discussion

Kearns et al. (2020) suggested that the receptionist and waiting room play crucial roles in shaping a person's transition into becoming a patient. By analysing Phase I, we got the impressions from the patients and compared them from the architect's perspective through field research in Phase II.

The previously mentioned situation in Montenegro showed that no communication was made with the healthcare users regarding architectural preferences, followed by the problems of more profound design studies and financial sources. Phase I results suggest that patients first cared about services and comfort rather than the general look of the building and spaces.

Vehicle infrastructure in facilities A and C was incompetent due to the lack of division, especially for the centre users. On the other hand, facility B had sufficient parking lots but had problems regarding the pedestrian approach.

Entrances were ranked positive and clear by most of the participants, suggesting their proper functioning. Field research showed that none of the facilities carried the architectural value of the welcoming outlook of the entrance. However, information sheets and signage that were present in a large number possibly played a role in understanding the services in the facility. Even boards with irrelevant information can be helpful for the patients and staff to navigate the facility (Pati et al., 2015).

Patients did notice the lack of indoor plants and artwork and marked both as desirable. In a similar study, participants sometimes identified green indoor plants as providing positive distractions (Ayas et al., 2008). Additionally, artwork can be calming and further help with navigating the facility.

Even though the users in facility A complimented natural light, it was critical in B and C, with the need for artificial light during a major part of the day. Research shows that some users like it when the waiting room has features connecting it to the outside world and that waiting areas with open views or access to the outdoors are highly valued (Kearns et al., 2020). The authors explained that many patients feel obligated to remain in the waiting room to secure their spot and avoid missing appointments.

A similar situation was observed inside all three facilities. Patients usually stood before the GPs' doors and waited for their turn, even though seats were nearby. Several participants mentioned that providing queue numbers would diminish this feeling of missing an appointment or being called in proper order.

The study's findings may be limited by the relatively small sample size of respondents who participated in Phase I, which could impact the generalizability of the results to a broader population. Additionally, examined healthcare centres may undergo renovations, repositioning, or closure over time. These changes could influence the study's conclusions, as the spaces and services offered at these centres may differ from those initially assessed.

6. Conclusions

The research detailed in the paper highlighted numerous planning, organisational, and operating deficiencies that hinder the humane design of primary healthcare infrastructure.

The results from Phase I and Phase II showed a discrepancy between the current architectural design and the relative indifference of the users who participated in the questionnaire. The resigned way in which people in need of healing relate to the architectural quality of the facilities presents a cultural flaw arising from the history of political systems and is partly a consequence of the designers' modesty. The basis of development and progress is an extensive education, where all groups involved in implementation and use must participate.

In order to learn the potential healing effects of the environment, reference pilot projects are necessary, where all users themself can experience the benefits of a purposefully designed healing environment.

In most countries, instead of the overregulated, unmotivated state organisations, private investors create these reference facilities, which can only be afforded by a small class of those in need, slowing down the qualitative development of the infrastructure in primary care. We propose several suggestions regarding the architectural decisions and qualities that are not present in the current guidelines:

- Arrival infrastructure should be adequate and comfortable for as many types of transportation as possible.
- Adequate parking for different vehicles should be provided and separated only for healthcare centre users.
- The facility outlook should be designed according to evidence-based design principles and implement local architectural values and the already established international guidelines.
- Natural light, vegetation, and artwork create a more comfortable atmosphere in the waiting room and are desired by the patients. Natural light should be provided as much as possible in every room that serves patients and staff.
- The reception area should be improved in consultation with the users to make the workflow easier and more comfortable for patients and staff. Additionally, user privacy could be more protected with the proper reception design.
- Healthcare centres could implement digital communication systems so patients can trust the institution and feel relaxed in the waiting room.

The Post Occupancy Evaluation is necessary because even though some features malfunctioned or were missing, they needed to be adequately solved according to the existing national regulations. Implementation of POE in the future could be done by gathering regular feedback from users and employees and reviewing facilities once they’re in use.

While certain recommendations may appear standard, they have not been implemented in most national healthcare facilities. Therefore, the research reveals a consistent disconnect between user needs and actual design practices. To address this inconsistency, architects, healthcare administrators, and policymakers must establish a collaborative approach.

Future research directions may involve developing evidence-based design guidelines specifically for healthcare facilities in Montenegro and similar contexts. Such guidelines would provide architects with a systematic framework for integrating user-centered principles by establishing continuous improvement in healthcare infrastructure. Thus, this research could present a starting point for evaluating and enhancing healthcare facility design quality in the future.

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