

The balconies as an archetype of well-being: a critical literature review

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Abstract

Purpose – The Covid-19 pandemic highlighted the contradictions inherent to balconies. Despite the attention given to these architectural elements on that moment, there is a knowledge gap concerning the preferences and expectations of the inhabitants in relation to them. For this reason, this paper aims to conduct a critical literature review of the publications about the inhabitants' perceptions of balconies in order to identify the most relevant criteria to consider during the design process.

Design/methodology/approach – The analysis was based on the post-occupancy evaluation (POE) criteria (technical, functional and behavioural).

Findings – The results highlighted the relevance of the behavioural criteria for the valorisation of the balconies by the inhabitants and presented indications to the research about these liminal spaces and the design practice of housing buildings.

Originality/value – According to the authors' best knowledge, this study represents the more holistic study of the kind.

Keywords Balcony, Residential buildings, Perception, Inhabitants' preferences, Survey methodologies, Well-being, Post-occupancy evaluation (POE)

Paper type Literature review

1. Introduction

The recent Covid-19 pandemic highlighted the relevance of the balconies as an archetype of well-being. However, at the same time the pandemic emphasised the contradictions inherent to this architectural element (Aydin and Sayar, 2020; Peters and Halleran, 2020). If on the one hand, the pandemic crisis stressed the collective desire to have a private outdoor space in dwellings; on the one hand, it also accentuated the global and cross-cultural practice of closing or eliminating balconies to increase the indoor living area.

This dichotomy between the valorisation of balconies and the desire to adapt increase uncertainty in the design process, and the doubts about most adequate balcony solution for

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residential buildings. At the same time, previous studies showed that the adaptations made to balcony spaces have a great impact on the overall indoor environment of dwellings (Ribeiro *et al.*, 2020, 2023) and, consequentially, create uncertainty about the performance of project solution (Pereira, 2018).

There are several articles that refer to the historical relevance of balconies for the well-being of residents in the Mediterranean context (Aronis, 2009; Ek *et al.*, 2020; Zacka, 2020), although no research has been identified concerning the current appreciation of balconies in today's reality. And, despite the attention given to the balcony on the scientific community before and after the Covid-19 pandemic, there is a knowledge gap regarding the preferences and expectations of the inhabitants in relation to these liminal spaces, which are neither indoor nor outdoor. Therefore, it is relevant to understand what are the main preference trends in relation to balcony spaces and how can the perceptions and the behaviour of the inhabitants be understood in order to adequate their design to each reality and context and provide suitable, precise and sustainable solutions.

For this reason, the aim of this paper is to do a critical literature review of the publications about the inhabitants' perceptions of balconies in order to identify the most relevant criteria to consider during the design process to adequate the balcony solutions to the inhabitants' preferences and expectations.

In this paper, after an overview of the main trends concerning the appreciation of balconies in housing design (section 3.1), the inhabitants' perceptions of the balconies are systematised (section 3.2). In sequence, the results were discussed were identified the most important criteria to consider in the balcony design (section 5.1). Finally, the research methodologies used in the literature to investigate the inhabitants' perception, behaviour and preferences were compared and debated (section 5.2).

2. Materials and methods

This literature review focuses on cross-disciplinary studies that have been published in the last decades. A search was conducted in Scopus and Web of Science for articles, books and conferences in the English language in the following fields: article title, abstract and keywords. The operator "AND" was used for different combinations of keywords related to architectonic characteristics of balconies: "balcony", "in-between space", "transitional space", and key terms related to the preference and perceptions of the inhabitant: "inhabitants' preferences", "perception", "expectations", "Post-Occupancy Evaluation", "well-being".

The 122 papers returned by the databases were merged in the EndNote Library to eliminate the duplicates automatically. After the selection throughout the abstract reading, 46 peer-reviewed papers were analysed in-depth by reading the full text.

However, since there are limited publications on inhabitants' preferences for balconies, newspaper opinion articles and artistic projects were also included in order to discuss the results in relation to the Portuguese context and the reality of South Europe.

The methodology had three main phases: (1) review of the literature according to trends in inhabitants' balcony preferences; (2) identification of the inhabitants' main perceptions and behaviours according to balcony design on each of the post-occupancy evaluation performance criteria, (3) identification of the assessment methodologies used in the literature.

In order to systematise the literature it was used the post-occupancy evaluation (POE) criteria proposed by Preiser *et al.* (2015) regarding users' satisfaction with building performance, which are divided into technical, functional and behavioural. These criteria have been widely applied in recent POE projects on the perception of occupants during the last decade (Hassanain *et al.*, 2021; Mustafa, 2017), and according to Aydin and Sayar (2020) they could be described and adapted to balcony research as follows:

- (1) **technical criteria** – level of satisfaction with the background environment, which includes the performance of the surroundings, environmental control systems and the assemblage of the building materials. For the assessment of the balcony element, the technical criteria can be listed as the materials, the morphology (railing, ceiling, floor, walls) and the acoustic, pollution and lighting conditions.
- (2) **functional criteria** – level of satisfaction with the functional performance of the space, which includes the adequate spatial capacity for daily activities, responsiveness to changes over time, efficiency of communication and circulation and the physiological needs of the building occupants. For the evaluation of the balcony element, the functional criteria can be defined as the profile of the user, the use of the space and its dimensions and shape.
- (3) **behavioural criteria** – level of satisfaction with the relationship between occupants' activities and the physical environment, which includes how the psychological and sociological well-being of the building occupants is affected by the building design. For the assessment of the balcony element, behavioural criteria could be described as privacy, interaction with the surroundings and the relationships created by the environmental and cultural context.

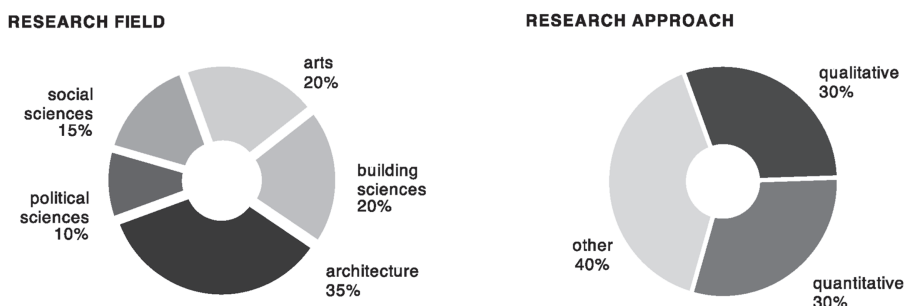
These post-occupancy evaluation criteria are relevant to understanding the main special features of the project that contribute to the inhabitants' satisfaction with the balcony spaces. Thus, the large amount of data collected from the literature review has been systematised according to the contribution of each study to understanding the influence of these post-occupancy evaluation criteria on the preferences and perceptions of the inhabitants.

3. Results and discussion

3.1 An overview of balcony research

The analysis of the literature, shown in [Figure 1](#), demonstrated that inhabitants' preferences regarding balconies is a multidisciplinary subject approached by different fields of research, and using both quantitative and qualitative research methods. Despite the extensive research carried out on the impacts of balcony adaptations on indoor environmental conditions ([Ribeiro et al., 2020, 2023](#)), less research has been done on the reasons for the residents' desire to have a balcony or to close it and incorporate the space into the indoor living area.

The geographic incidence of the studies and artistic projects on the inhabitants' preferences regarding balconies is displayed in the map in [Figure 2](#). The maps demonstrate a strong incidence of published studies across the Mediterranean, reflecting the present



Source(s): Figure created by the authors'

Figure 1.
Background of the
studies

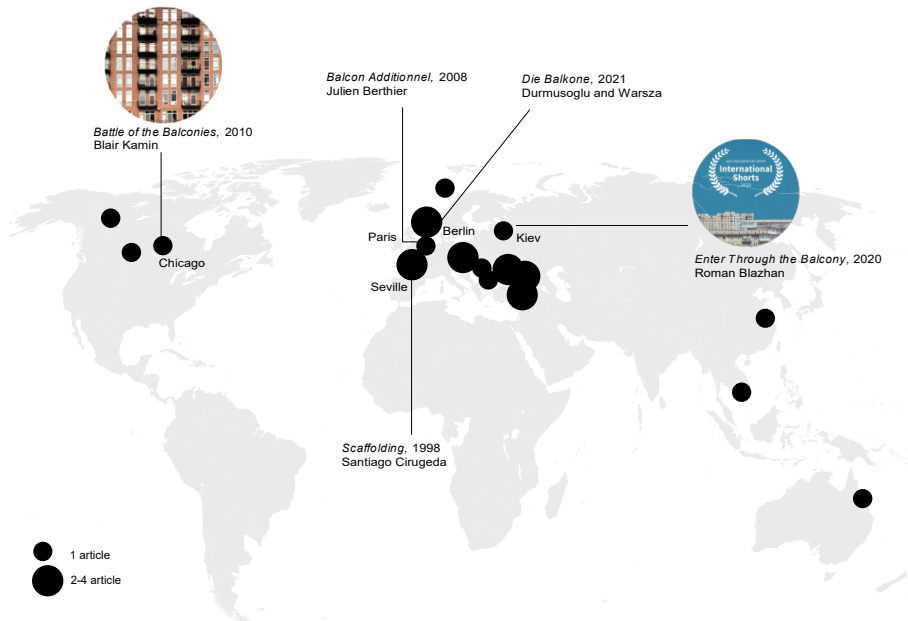


Figure 2.
Geographic incidence
of studies and artistic
projects about
inhabitants'
preferences

Source(s): Figure created by the authors'

discussion about the importance of the Mediterranean balcony for community well-being. These studies, which are displayed on the map, vary between the extreme valorisation of balconies and the inhabitants' needs to adapt it and no discussion between these two dichotomous trends was found.

Regarding the extreme valorisation of balcony spaces, research focusing on the preferences of inhabitants in the Norwegian context found that direct access to a balcony and the ability of balcony doors to let in air and sound from the outside is crucial for residents' well-being (Wågå *et al.*, 2016). Similar results were found in a study conducted in Germany in which access to a private balcony is identified by housing market specialists as one of the most significant elements in dwellings to improve liveability in compact cities (Kotulla *et al.*, 2019). This trend has been well-studied in subtropical climates. In high-density cities with subtropical climates, such as Brisbane, balconies have been verified to play an important role in residents' perceptions of liveability (Kennedy *et al.*, 2015). Moreover, the lack of a balcony or useable private outdoor space was considered an omission in good apartment design.

Likewise, a study using a sample of transactions in a private housing estate in Hong Kong concludes that large balconies with a landscaped view increase the value of a property by 24%, while a small balcony increases the value by around 4%, regardless of the quality of the view and security concerns on the lower stories (Wing Chau *et al.*, 2004). This trend is supported by the local government of Hong Kong which, since 2001, has encouraged the introduction of "green features" of balconies in building developments by excluding them from the gross floor area (GFA) (Chan and Chow, 2010). Confirming this trend, a post-occupancy survey in a typical multi-storey hostel in Kuala Lumpur, Malaysia, found that students living in rooms with projected balconies were more satisfied with their overall indoor conditions than those without (Dahlan *et al.*, 2009).

A paradigmatic example of the transformative power of this kind of space is the addition of balconies in the conversion of industrial buildings into residential ones on the riverfront of Chicago. In the last decades of the 20th century, numerous vacant industrial buildings were rehabilitated and converted into housing through morphological interventions that included the addition of balconies and the creation of loggias. This practice became a common trend and was spread to other parts of the city with easy-to-apply prefabricated balcony solutions. This demand for balconies in rehabilitation interventions and new high buildings created a local paradigm that has been denominated the *Battle of the Balconies* (Kamin, 2010).

Some artists and activists have highlighted this subject in recent decades by using balconies as the main element in their interventions. The Spanish artist and architect Santiago Cirugeda (1998), in the intervention *Scaffolding*, included in the project *Urban Prescriptions*, subverted the current legislation on the use of temporary scaffolding and created a prototype of a simple application to extend a balcony of 4 m on a housing building in Seville. Ten years later, the French artist Julien Berthier (2008), in his project *Balcon Additionnel*, created a service for the instant installation of “Hausmanian-style balconies on all kinds of buildings”.

On the other hand, although the desire to close or eliminate the balcony is not well researched, the literature shows that this is a generalised and global trend and that some governments around the world recently changed their legislation to give into the wishes of the inhabitants. That is the case for the authorities of Tel-Aviv which, after a long period of tension with residents, promulgated a special zoning regulation in 1978 that explicitly allows for the closing of balconies and sets down regulations regarding manners of closure (Aronis, 2009). In the same line, but almost 30 years later, in 2004, the Lebanese Parliament amended the construction law, allowing the enclosure of balconies with transparent curtain walls (Saleh, 2015; Zacka, 2020).

Similarly, in response to the large number of balconies that had been closed with an external window, the South Korean government modified the building code in 2005 to allow balconies to be used as living spaces (Kim *et al.*, 2011; Song and Choi, 2012). Motivated by the same practice, in 2012, Vancouver municipal authorities regulated the possibilities of balcony enclosure in new buildings limiting the area of glazed balconies to 4% of the total building area (Avermaete and Koolhaas, 2014).

Some local artists and filmmakers have also pictured and explored these informal interventions on balconies in different contexts. Hanoi painter Nguyen Manh Hung explored the traditional mesh and corrugated metal extensions that are attached to the balconies of most apartment units in Hanoi and other Asian cities (Phuong and Groves, 2011). In a distinct context, the Kiev-based filmmaker, Roman Blazhan (2020), created the short documentary *Enter Through the Balcony*, which depicts the phenomenon of informal interventions in balconies in Ukrainian architecture (called *Ukrainian Makeshift*), as a symbol of the freedom of expression and ownership that became sharper across the former Eastern Bloc after 1991.

An analysis of the research dates (Figure 3) demonstrates that approximately 70% of the articles found in the literature on inhabitants' preferences in relation to balconies were published between the first month of 2020, the beginning of the Covid-19 pandemic crisis and the end of 2021, when the number of studies began to decrease. In the course of this pandemic crisis, which affected the global population in an unprecedented way, news and opinion articles emerged in the public discussion about the increasing use of balconies and the relevance of including a balcony in the design of dwellings (Grigoriadou, 2020; Zacka, 2020).

With streets and squares empty, collective life was expressed on balconies through shared music and supportive demonstrations in various cities around the world. In contrast to the dystopia of the evacuated public spaces, balconies in Italy were full of people interacting with each other, singing and playing music, a hopeful image that soon became common in other cities around the Mediterranean (Fidler, 2020; Kearney, 2020). In Spain and Portugal, the population expressed their gratitude to the health professionals by cheering on the balconies at the same time for several consecutive days (Pescada, 2020).

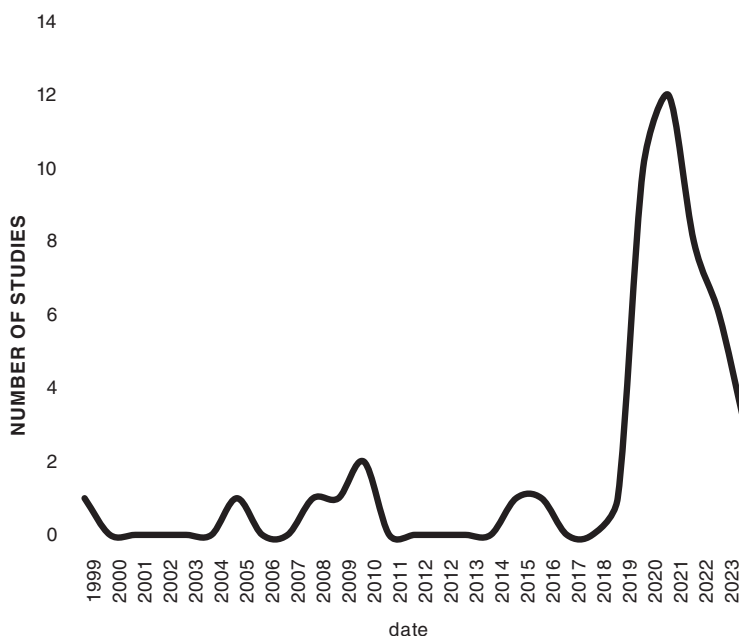


Figure 3.
Evolution of the
number of studies

This trend extended to other cities, and in Berlin, in order to contribute to the reactivation of the collective space during the first weeks of confinement, the art project *Die Balkone* turned the balconies of the Prenzlauer Berg neighbourhood into art exhibition venues to combat the feeling of isolation and the need for intimacy and interpersonal contact (Durmusoglu and Warsza, 2021).

The recent pandemic has also brought up some issues related to the relevance of balconies for community welfare. Almost a century after the democratic ideals that drove the construction of mass housing complexes in Europe between the wars, the participatory and democratic role of balconies has returned to architectural discourse (Origoni and Origoni, 2020) and the disparity in the access to private outdoor space in dwellings has become sharper in urban contexts where balconies can be an amenity reserved for privileged housing complexes (Maxwell, 2020; Zacka, 2020).

The amplification of the inhabitants' perception of the importance of balcony spaces in dwellings during the Covid-19 crisis demonstrates the need for a better understanding of the main perceptions of inhabitants, in order to better adequate the balcony design to their expectations. For this reason, the following section systematises the perceptions of the inhabitants identified in the literature according to the two identified preference trends in relation to balconies:

- (1) the desire for open balcony spaces;
- (2) the desire to adapt or eliminate the balcony spaces.

3.2 The desire for open balconies

Four main criteria have been identified in the literature justifying inhabitants' valorisation of the existence of open balconies: (1) connection with the neighbourhood; (2) connection with nature; (3) sense of openness and the wish for (4) leisure and recreation space. The following text analyses the literature on the balcony design features that conditioned each of these

perceptions and their consequence on satisfaction with the post-occupancy evaluation criteria of balconies.

3.2.1 Connection with the neighbourhood. The communicative nature of balconies has been well studied, and their importance for well-being and a sense of belonging to a community has been widely recognised. In a recent phenomenological study, balconies are included under the umbrella term urban liminal elements, making them urban spaces that are located between the private and the public, and highlighting their nature as an essential communicative element among these two realms (Aronis, 2020). It has been observed that these liminal spaces create opportunities for social interaction from home but also enable hesitation and distance, promoting a reserved form of interaction, joining people who live in close proximity and who may not wish to become intimate around common events and experiences (Zacka, 2021).

The notion of the balcony as a means of communication with the neighbourhood varies depending on context and has evolved over the last decades. Based on the reality of the Mediterranean urban balcony, it is assumed that before the telephone, residents used balconies as a means of communication with friends who lived in adjacent buildings. They came out to the balcony to see if there was light in a friend's house, and children called each other to play on the street from balconies. Moreover, until the late 1960s and 1970s, when television entered homes, the balcony also functioned as an alternative theatre. At that time, people used to sit on the balcony to watch the movement on the street or in the neighbouring balconies. The arrival of television has been cited as a reason for the decline in the use of balconies as a communication space in Mediterranean cities (Aronis, 2009).

In the first weeks of the Covid-19 pandemic lockdown, several articles were published referring to the ability of the Mediterranean urban balcony to preserve the physical and social well-being of the community. Grigoriadou (2020) highlighted that during the lockdown, the balcony was a spiritual yet playful collective tool against the frightful extinction scenario, as it was a hygienically safer place where people could be outside and communicate, worrying less about spreading the virus to the most vulnerable. This idea was also explored by Origoni and Origoni (2020) who acknowledged that during the period of confinement, faced with the impossibility of escaping to the outside, the balcony was a refuge, a privileged liminal space that allowed one to be in touch with the outside and with others while remaining inside the home. Access to a balcony in a dwelling became more valuable, allowing contact with the outside and creating the illusion of being in the public and collective space.

In fact, research that assessed the use and importance of balconies before and during the coronavirus crisis through a questionnaire survey applied to apartment users in Konya city centre, in Turkey, showed that inhabitants spent more hours on their balconies after the beginning of the pandemic (Aydin and Sayar, 2020). These results are corroborated by a study that examined residential spaces during the pandemic through a survey that targeted a group of students in Cyprus, which found that around 57% of the students felt isolated during the lockdown, and approximately 65% mentioned that they found themselves spending more time near the windows and openings facing the outside (Valizadeh and Iranmanesh, 2021). These studies, which claim that the presence of a balcony is critical to the well-being of apartment residents, are in contrast with the results of a pre-pandemic study about residential satisfaction among Nigerian students, which found that balconies were one of the lowest-ranked criteria (non-significant spaces) for satisfaction (Amole, 2009).

In this regard, and aware of the importance of providing solutions for possible future pandemics, the sociologist Richard Sennett (2020) mentioned that it is fundamental to find different types of density in cities, permitting people to communicate and participate in collective life, even when they are temporarily distanced from each other. Due to their liminal nature, several authors have considered it relevant to rethink and explore the design of intermediary spaces, such as terraces, balconies and porches, to create flexibility and

adaptability in housing design to deal with future pandemic crises (Peters and Halleran, 2020; Sennett, 2020; Valizadeh and Iranmanesh, 2021).

3.2.2 Connection with nature. It has been reported that proximity to green spaces (Permentier *et al.*, 2011) and the presence of views of nature from a home significantly contribute to increasing the sense of liveability, well-being and quality of life of the inhabitants (Kaplan, 2001; Sugiyama *et al.*, 2009). Therefore, the ability of balconies to promote connection with nature is of particular relevance in high-density cities, as the urban environment is not considered to have the same quality of green spaces as can be found in suburbs or rural areas (Kennedy *et al.*, 2015; Kotulla *et al.*, 2019).

In this regard, a qualitative study based on data from in-depth interviews with housing market specialists of the North Rhine-Westphalia region in Germany found that the presence of a balcony in dwellings is essential for improving the liveability in compact and high-density cities. It has been argued that the presence of a balcony can alleviate some of the adverse effects of high-density cities by working as a personal “mini garden”. Balconies are considered to provide a place for planting in the apartment, which can compensate for the lack of other vegetation elements in the near environment and provide an area for recreation and a place to take time away from daily routines (Kotulla *et al.*, 2019).

This subject gained particular relevance during the Covid-19 pandemic crisis, as several studies reported that prolonged periods of confinement may pose significant mental health risks in the community, mainly for people living in apartments (Browne *et al.*, 2021). These studies also found that the side effects of isolation may be mitigated by some outdoor activities, such as gardening and exercise (Akbari *et al.*, 2021; Lades *et al.*, 2020).

In this context, a recent literature review focusing on quality of life in urban mid and high-rise housing buildings during the Covid-19 global health crisis found that access to nature through balconies was one of the most mentioned design strategies or principles to be prioritised in the development of post-pandemic healthy apartments (Peters and Halleran, 2020). It has been mentioned that contact with nature and views of nature are restorative experiences that enhance well-being through physiological calming, and improve concentration, mood and inhabitant satisfaction.

Therefore, at a time when people are not able to leave their dwellings as freely as they were accustomed to, and most apartment buildings do not have access to outdoor green spaces and do not have the possibility of integrating new activities, such as daily physical exercise or plant maintenance, balconies can be used to provide contact with nature, and consequently improve mental health and increase inhabitants’ well-being (Akbari *et al.*, 2021; Peters and Halleran, 2020).

3.2.3 Sense of openness. The ability of balconies to make dwellings appear more spacious and create a sense of openness, allowing people to feel less enclosed, has been recognised in several studies. According to some authors, this feature gains particular relevance in small apartments in high-density cities. In this context, where people may feel too confined, balconies are found to play a fundamental role in improving the liveability and well-being in apartments with minimal space (Kotulla *et al.*, 2019) and to have a significant influence on the experience of spaciousness in everyday life functions (Kennedy *et al.*, 2015).

As verified with the previous criteria, this benefit of balconies also became more relevant during the Covid-19 pandemic. During curfew periods, a wide range of activities was brought inside the home, and the home began to integrate living, working and leisure activities, functioning as an office, school and gym. The house became considered both a virus-proof safe place and a suffocating place.

This is why, during moments of confinement, newspaper interviews proliferated in which balconies were referred to as a contemporary bunkers, acting as an emergency exit to take a breath of fresh air or a moment of sunshine (Poon, 2020; Traverso, 2020; Viana, 2020). Valizadeh and Iranmanesh (2021) also highlighted the ability of balconies to liberate

residents from claustrophobia in a recent study that examined residential spaces during the Covid-19 lockdowns.

3.2.4 Leisure and recreation space. In a recent study, Bernardo [Zacka \(2021\)](#) mentioned the role of the Mediterranean balcony as a place to loiter, a place that is designed for leisure and for recreation. Zacka considers the balcony as an “open-minded space”, defined by [Waltzer \(1986\)](#) as a place designed for a variety of uses, where people are prepared to tolerate and even take an interest in things they do not usually do. This understanding is shared by [Aronis \(2020\)](#), who suggests that the liminal nature of balconies enacts an intermediate state or condition that ruptures the social orders of both home and street and frames a blurred in-between zone where playfulness, surprise and unpredictability can occur.

Corroborating this concept, a study that examined the long-term impacts of structural features and physical amenities on the residential satisfaction of tenants in multifamily housing in America found that balconies have a significant positive effect on residents' satisfaction, by allowing residents to be separated from the usual life of the house without leaving the residence ([James, 2007](#)).

Along with this idea, a study focused on the experiences of residents in multi-storey apartment dwellings in Brisbane found that entertaining was the function that more residents attributed to balconies (85%). This research found that residents frequently used their balconies for hobbies and everyday activities, such as reading, relaxing, studying, keeping pets, exercising or just sitting outside ([Kennedy et al., 2015](#)). Along the same line, a study examining how balconies are used and what variables influence the variety and intensity of their use in Wroclaw, Poland, confirmed that a good private outdoor space significantly enhances the capacity of dwellings to accommodate different uses and address different needs ([Smektała and Baborska-Narożny, 2022](#)).

During the Covid-19 pandemic, the activities performed in the balconies did not differ from before, but inhabitants made changes to existent balconies, such as establishing more comfortable seating and introducing plants ([Aydin and Sayar, 2020](#); [Zarrabi et al., 2021](#)), updating the design of balconies to accommodate the newly rediscovered activities ([Duarte et al., 2023](#)). Recommendations for future balcony design have also been proposed, such as the provision of adequate dimension, which should be large enough to fit a table and chairs comfortably ([Aydin and Sayar, 2020](#); [Peters and Halleran, 2020](#); [Zarrabi et al., 2021](#)); and the creation of spaces that could be used year-round ([Peters and Halleran, 2020](#)).

Moreover, some studies mention the potential of balconies to promote flexibility and adaptability that will prepare the space for the new requirements of living ([Valizadeh and Iranmanesh, 2021](#)). Based on the analysis of built examples, a study demonstrated the ability of balconies to support housing adaptability, contribute to facilitating indoor–outdoor integration and division through passive and active closing systems and provide multiple functions to the space ([Peters and Masoudinejad, 2022](#)), such as creating spaces for the new ways of working remotely.

3.3 The desire to adapt or eliminate balconies

Concerning the inhabitants' desire to adapt or eliminate balcony spaces, five main criteria have been identified in the literature as a motivation for this global trend: (1) *a need to increase the indoor space*, (2) *the reduction of outdoor pollution and noise*, (3) *the desire for privacy*, (4) *the need for the appropriation of the façade* and (5) *the feeling of safety*. These motivations are explored in the following review.

3.3.1 Need to increase the indoor space. The desire to increase the indoor living space is the most frequent reason mentioned in the literature for the informal adaptation of balconies ([Hilliaho et al., 2015](#); [Kennedy et al., 2015](#); [Niu, 2004](#); [Saleh, 2015](#); [Zacka, 2020](#)). Some authors refer that the motivation to use the balcony as an extra room, an office, a storage space or a place to do laundry was, in most cases, what led inhabitants to close their balconies ([Kennedy et al., 2015](#); [Niu, 2004](#)).

Some authors mention that in contexts such as some Australian and Asian cities, these adaptations are emphasised on back façades, usually associated with private life and domestic utilities (Kennedy *et al.*, 2015; Niu, 2004). However, in contrast, studies focusing on some Mediterranean contexts referred that in cities such as Beirut, Tel-Aviv, Valletta or Izmir, these adaptations are a generalised phenomenon, not only on the back façades but also on the front ones, which have deeply modified the image of these cities (Aronis, 2009; Ek *et al.*, 2020; Privitera *et al.*, 2014; Zacka, 2021). Ek *et al.* (2020) have suggested that these transformations are often associated with low and middle-income dwellings; however, there is a lack of evidence for this hypothesis in the literature.

In some cases, this motivation to increase the indoor space leads to the total incorporation of the balcony into the apartment. As warned by Aronis (2009), with this operation, the balcony becomes a more useful domestic space than it ever was before, although most of its former uses are greatly reduced. Ek *et al.* (2020) also advises that, with this transformation, dwellers may gain extra space or an extra living room, but in this way, “a room for dreams was excluded from home”.

3.3.2 Reduction of outdoor pollution and noise. In some high-density cities, such as in the Asian context, where pollution and noise limit the use of balconies and deteriorate indoor conditions, it has been suggested by several authors that one of the motivations of the inhabitants for closing balconies is reducing exposure to noise and pollution (Kennedy *et al.*, 2015; Kim and Kim, 2007).

Although these reasons may be less relevant in Mediterranean cities, they were also some of the reasons pointed out in the literature (Ek *et al.*, 2020; Zacka, 2021). In a study focused on the Turkish city of Izmir, it was observed that as the scale of the street gets larger and turns into a boulevard with more traffic, more inhabitants prefer to cover balconies with permanent glazing systems to protect themselves from the unpleasant conditions of the outdoor space (Ek *et al.*, 2020).

In peculiar climate conditions, such as in Galicia, where there is a lack of protection from the Atlantic winds and reduced solar radiation, it is noted that the improvement of the indoor conditions is the main reason for closing balconies (Privitera *et al.*, 2014). Nevertheless, the literature suggests that the improvement of the thermal conditions is not usually the main motivator for the informal adaptation of balconies. Hilliaho *et al.* (2015) mentioned that in Finland, most people were not aware of the possible energy savings of closing balconies with glass, so this was not the primary justification for the adaptations done to balconies by inhabitants.

3.3.3 Desire for privacy. In a study about residents' privacy and comfort in multi-storey apartment buildings in Brisbane, Kennedy *et al.* (2015) found that privacy was an important consideration for 77% of the inhabitants. In this regard, some residents expressed a preference for their balcony to face the street rather than a communal courtyard, in order to keep a certain degree of anonymity and not feel obliged to interact with neighbours. This feature is confirmed by a research in Poland that verified that balconies that are exposed to the public are less frequently used than those facing a courtyard or a green space (Smektała and Baborska-Narożny, 2022). In these contexts, the desire for privacy leads only to a preference for less exposed balconies, and contributes significantly to increase the functionality of the balcony.

In other cultures, however, the desire for privacy considered to be the main reason for the non-use of balconies and their subsequent modification. A study that explores the changes in the use of balconies in Tel-Aviv shows that the residents' desire for closed balconies, emphasised in the 1930s, was a reaction to the lack of privacy in some parts of the city, where balconies were so near to each other that there was almost no boundary between the home and the street (Aronis, 2009). This desire for privacy, led to the promulgation of a regulation in 1978 that allowed balconies to be closed ever since. Aronis mentions nowadays, the

tenants of Tel-Aviv scarcely use the few balconies that are still open and these are largely deserted.

This tendency is even more stark in some predominantly Muslim countries where, since the Ottoman period (1,517), closed balconies (*mashrabiya*) have been built to allow inhabitants to enjoy the fresh breeze and light while ensuring the mandatory principles of privacy (Fathy, 1986). According to several researchers, this requirement of privacy in Islamic culture is still conditioning the use of balconies nowadays. A study carried out in Iran observed that balconies are rarely used as a place to sit and relax due to cultural reasons (Babaei *et al.*, 2016), and another showed that, in some religious Muslim homes in Libya, the windows are always covered with heavy curtains and women are still not allowed to sit on balconies (Aronis, 2009).

Nevertheless, some researchers found that the desire for privacy and the relationship between individuals and their neighbours has changed since the pandemic crisis began (Bassetti, 2020; Elzein and Elsemariy, 2022; Peters and Halleran, 2020). A recent ethnographic study conducted during the Italian lockdown in Parma observed how the inhabitants tried to maximise the opportunities to interact with each other through balconies (Bassetti, 2020). Another conducted in Iran confirmed that 31% of the inhabitants had begun a connection with their neighbours across balconies during the pandemic (Molaei *et al.*, 2022).

3.3.4 Need for the appropriation of the façade. Several studies suggest that the need for appropriation of the house and the search for an individual expression are reasons that lead inhabitants to modify the design of balconies. Due to their liminal condition, balconies are defined as a place where inhabitants can easily express their identity to the outside.

Zacka (2021) mentions that most city dwellers live in apartments they did not design and are surrounded by façades they cannot change. Therefore, it is on balconies that they can significantly invest in choosing and displaying furniture, decorative ornament here is a genuine need to decorate the balconies, fill them with objects and even close them in order to create a “place” and a “sense of home”.

Enclosed balconies have been understood as an inconvenient element, and different governments have tried to keep balconies open to preserve the aesthetics and the openness of the streets (Aronis, 2009; Ek *et al.*, 2020). However, the way in which this informality is accepted is deepened by the social and economic context where this informality occurs (Kwak, 2021), and various critics appreciate the image created by inhabitants' self-expression in the appropriation of the balcony space. In the Lebanese context, Zacka (2021) remarked that these small acts of appropriation repeated tens of thousands of times throughout the urban fabric enliven the façades and provide an outlet for creative expression.

In Portugal, the urbanist Teresa Craveiro mentioned that the typical balconies enclosed with glass (*marquises*) that spread in the urban context, primarily associated with the kitchen area or the creation of extra space for study and storage, were a process of inhabitants' appropriation of the house (Henriques and Barros, 2011). In the same text it is referred that the adaptation of balconies introduces diversity, organicity and plasticity into the uninspired design of buildings constructs, plants and curtains. Zacka defines the balcony as every inhabitant's vitrine onto the street. Aronis (2009) agrees that in the Portuguese suburban areas of the late 20th century.

3.3.5 Feeling of safety. Concerns with a feeling of safety are also one of the motivations for closing of balconies that is referred in the literature. A study in two cities in the south-eastern part of Poland found that the balconies of the buildings analysed in the study were closed by inhabitants mainly for utilitarian and safety reasons. One of the motivations for this adaptation of the balconies was to separate the space from the external environment and increase security against burglary or bird intruders (Grudzińska, 2021).

A remarkable example of the consequences of security concerns can be found in the suspended balconies fixed to the core construction of the buildings of Hanoi, Macao and other

Asian cities. Locally called tiger cages (*chuong cop*) because of their resemblance to the steel-framed cages for tigers, this traditional mesh of corrugated metal has been attached to the balconies of most apartment units for security purposes (Phuong and Groves, 2011). These mainly illegal extended structures of steel bars transform balconies into intensively crammed places that serve a variety of domestic purposes, such as laundry, planting, pet keeping and storage and contribute to increasing security inside dwellings (Koh, 2004).

3.4 Balcony POE criteria

The literature review demonstrated that the inhabitants’ perceptions influence their preference for different balcony boundary systems. In order to investigate the main factors that condition the inhabitants’ preferences, the perceptions identified in the literature were allocated to the previously defined performance criteria of Post-Occupancy Evaluation (POE) of balconies (technical, functional and behavioural), as is systematised in Table 1.

The systematisation of the inhabitants’ perceptions shows that the technical criteria is the only one where perceptions that condition both preference trends were not found. For the functional and behavioural criteria, perceptions were found that justified both the desire for open balconies and the desire to adapt or eliminate them.

The highest number of perceptions found in the literature can be classified in the behavioural criteria for balconies. The importance of the behavioural criteria for the valorisation of open balconies has increased with the Covid-19 pandemic, as illustrated in Figure 4, which shows the number of times that perceptions related to each POE criteria have been mentioned in the literature, before and after the beginning of the pandemic crisis. In opposition, the number of references to the technical and functional criteria of balconies decreased in that moment.

3.5 Assessment methods for inhabitants’ preferences

The relationship between environment and behaviour (E-B) has been investigated by designers to adequate projects to users’ needs and expectations and to evaluate the

POE criteria	Desire for open balconies	Desire to adapt Or eliminate the balcony spaces
<i>technical criteria</i>	-	<i>reduction of outdoor pollution and noise</i> – protects from the unpleasant conditions of outdoor space <i>feeling of safety</i> – increases the protection from burglary or bird-intruders
<i>functional criteria</i>	<i>leisure and recreation space</i> – provides a place for recreation, allows residents to separate from their indoor everyday living	<i>need to increase the indoor space</i> – adds an extra room to the dwelling
<i>behavioural criteria</i>	<i>connection with the neighbourhood</i> – increases the well-being and the sense of belonging to a community <i>connection with nature</i> – increases the sense of liveability, alleviates some of the effects of density cities and provides restorative experiences <i>sense of openness</i> – improves the liveability of small dwellings and reduces the feeling of claustrophobia (excessive closure)	<i>desire for privacy</i> – preference for intimacy in the domestic space <i>need for the appropriation of the façade</i> – desire to adapt the balcony to create a sense of home

Table 1.
Summary of
inhabitants’
perceptions assigned
to the POE criteria

Source(s): Table created by the authors’

suitability of past design decisions (Zeisel, 2006). There is a consensus in the literature that the research approaches applied in the environment-behaviour field can be quantitative (QUAN) or qualitative (QUAL), and the information obtained can be categorised as objective or subjective data (Guerra-Santin and Tweed, 2015; Zeisel, 2006). These two approaches generate different and complementary data and are often combined in the design of research strategies (QUAN + QUAL) (Berg and Lune, 2012; Creswell and Clark, 2017).

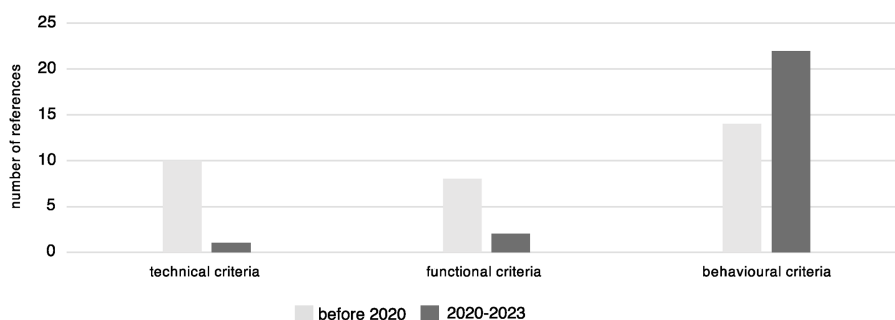
Quantitative approaches (QUAN) refer to counting and measuring reality, and seek to find relationships between information that can be represented in a numerical form. In contrast, qualitative approaches (QUAL) refer to concepts of meaning, definitions and characteristics and seek to explain experience (Berg and Lune, 2012); these could be of different types such as qualitative inquiry, narrative, phenomenology, ground theory, ethnography and case study (Creswell, 2016). Several methods have been proposed in the literature such as direct observation, focused interviews, questionnaires and archives, which could be selected and combined according to each study (Guerra-Santin and Tweed, 2015; Laurel, 2003; Zeisel, 2006).

The most relevant studies about inhabitants' preferences and behaviour concerning balcony spaces use qualitative and quantitative research strategies, and their methodologies are identified and summarised in Table 2.

Regarding the quantitative research about the inhabitants' preferences for balconies, the questionnaires were categorised into sections, from general background data, building data and the characterisation of feelings, configurations, problems, the inadequacies of buildings or lifestyle information. These studies, which yield a large amount of data, resorted to statistical analysis through the Statistical Programme for Social Sciences (SPSS) (Aydin and Sayar, 2020; Choi *et al.*, 2014; Kennedy *et al.*, 2015; Valizadeh and Iranmanesh, 2021; Xue *et al.*, 2016a, b).

In the study carried out by Kennedy *et al.* (2015) about privacy and comfort in multi-storey apartment buildings, the quantitative survey is also combined with a qualitative approach through semi-structured interviews that are focused on inhabitants' preferences concerning their dwellings and the neighbourhood, and their perceptions of privacy and social interactions.

Some studies maintain that the qualitative approach is better able to address the depth and complexity of the research issues. Wågø *et al.* (2016) investigated the impact of views, daylight and access to fresh air in four Norwegian low-energy housing projects on the inhabitants' well-being, by using a qualitative approach combining ethnographic methods such as observation and in-depth interviews based on a semi-structured guide. Likewise, Kotulla *et al.* (2019) in a study that aimed to identify important elements of the built environment for improving compact-city liveability, claim that the qualitative approach provides more in-depth information than can be obtained from quantitative surveys.



Source(s): Figure created by the authors'

Figure 4.
References of
inhabitants'
perceptions in each
POE criteria before and
after Covid-19
pandemic

Table 2.
Summary of methods
for assessing
inhabitants’
preferences for
balconies

Research approach	Data gathering method	Subject	Ref.
<i>quantitative approach (QUAN)</i>	sample of transactions in a private housing estate questionnaire	the effect of balconies on the prices of residential properties prioritization of indoor comfort perceptions	Wing Chau <i>et al.</i> (2004) Dahlan <i>et al.</i> (2009) Choi <i>et al.</i> (2014)
	questionnaire (2,755 participants)	connection between the presence of balconies in home design and child health	
	questionnaire (340 participants)	effects of balconies on luminous comfort	Xue <i>et al.</i> (2016a, b)
	questionnaire (160 participants)	the use and importance of balconies before and during the pandemic	Aydin and Sayar (2020)
	questionnaire (88 students)	change in residential spaces during Covid-19 lockdown	Valizadeh and Iranmanesh (2021) Wågø <i>et al.</i> (2016)
<i>qualitative approach (QUAL)</i>	observation 23 in-depth interviews 11 in-depth interviews with housing market specialists phenomenological study	perception of well-being in dwellings liveability of compact high-density cities the liminal space as a space for communication	Kotulla <i>et al.</i> (2019) Aronis (2020)
	ethnographic study	social interaction during the pandemic crisis	Bassetti (2020)
<i>mixed methods (QUAN + QUAL)</i>	questionnaire (636 participants) +24 interviews	experiences of privacy and comfort, and perceptions of balcony design	Kennedy <i>et al.</i> (2015)
Source(s): Table created by the authors'			

In the qualitative studies that utilized the in-depth interview, the number of interviews varies considerably. In fact, no consensus has been found in the literature regarding the ideal number of interviews necessary to validate a qualitative study. According to [Guest *et al.* \(2006\)](#), the term “data saturation” often arose in the qualitative review guidelines as a criterion for having reached an adequate sample size. Nevertheless, the authors mention that the literature provides no description of how saturation might be determined, and no practical guidelines for estimating sample sizes of interviews. A study developed by these authors involving sixty in-depth interviews found that the researchers were able to develop meaningful themes and useful interpretations after six interviews ([Creswell, 2016](#); [Guest *et al.*, 2006](#)). These findings are in line with previous research, which recommends between five and twenty-five interviews for phenomenological research ([Creswell, 2016](#)).

The literature demonstrates that a qualitative approach might be the most appropriate way to investigate how to adequate the balcony design to the inhabitants’ expectations. Moreover, there is consensus that qualitative research methods, while applied to fewer subjects, could lead to a deeper understanding of the building performance evaluation if there is a precise and clear way to demonstrate the credibility and validity of their procedures ([Berg and Lune, 2012](#); [Creswell and Miller, 2000](#); [Guerra-Santin and Tweed, 2015](#)).

4. Conclusions

The literature review regarding inhabitants’ perceptions of balconies included studies from multiple disciplinary fields that, in some way, addressed the relationship between

people and these in-between spaces. These studies focus on distinct realities and contexts, but even so, some main findings emerged. The analysis of the results demonstrates that the three previously identified performance criteria of the post-occupancy evaluation (technical, functional and behavioural) influence the inhabitants' preference trends regarding the balcony boundary system. Consequently, they also affect the decisions made during the design process of housing projects and have led to changes in legislation in some countries.

This literature analysis showed that the perceptions related to the technical criteria of balconies, such as outdoor pollution and noise and the feeling of safety, are often mentioned as reasons for the inhabitants to adapt or eliminate balcony spaces. However, although it is recognised that the presence of balconies contributes to improving the overall indoor environmental quality of dwellings, this feature is not mentioned as a technical criterion that contributes to the inhabitants' valorisation of open balconies. The satisfaction with the technical criteria demonstrated to be deeply dependent on the surrounding conditions and the climatic context and is related to the materials and the morphology of balconies, which could mitigate or accentuate unpleasant outdoor conditions.

The review demonstrates that perceptions related to functional criteria influenced both tendencies of the inhabitants' preference in relation to balconies. On the one hand, several studies referred to the leisure and recreation functions of balconies as one of the main reasons for their valorisation by inhabitants, while some articles presented the need to increase indoor space as the primary reason for the transformation of the balcony into an indoor space. The satisfaction with the functional criteria of balconies was found to be closely tied to the user's needs and profile, as well as the balcony's size and shape, which was confirmed to be crucial for the usefulness of balconies.

The perceptions related to the behaviour criteria are the most mentioned in the literature. Behaviour criteria are shown to be dependent on the personal cultural background of the occupants since the spatial experience is not just visual but multisensorial and can affect the psychological and sociological well-being of the inhabitants (Hall, 1966). The decision to modify balconies, as seen in various studies, often reflects the cultural and social norms of a place.

This study also found that inhabitants' perceptions of balconies related to behavioural criteria are not only connected with the cultural and social background but also to the particularities of each moment. The Covid-19 pandemic crisis highlighted the relevance of perceptions related to behavioural criteria for the valorisation of the in-between condition of balconies. Connection with the neighbourhood, connection with nature and a sense of openness were found to be perceptions created by the presence of balconies, which are essential to increase well-being during long periods of confinement inside the home.

Moreover, the literature review revealed that inhabitants' preferences for balconies changed during the Covid-19 crisis, with an increase in the importance of having a private outdoor space for the health and well-being of communities. It was highlighted the relevance of rethinking and exploring the design of intermediary spaces in order to deal with future pandemic crises. There is consensus on recommendations for private balconies large enough to accommodate a seating area and multiple activities of leisure and daily life, as well as the creation of spaces that could be used year-round and promote flexibility and adaptability in housing design to help deal with the new arising activities. Since the pandemic is still a recent event, the long-term effects that it might impose on living spaces have not been well studied yet, and future research needs to address the effects of the pandemic on the appreciation and use of balconies.

This research allowed the identification of how satisfaction with the POE criteria affects the inhabitants' preferences and the use of balconies, which is a practical and scientific contribution of this paper. Some research approaches and methods were presented on this review to support further studies.

References

- Akbari, P., Yazdanfar, S.A., Hosseini, S.B. and Norouzian-Maleki, S. (2021), "Housing and mental health during outbreak of COVID-19", *Journal of Building Engineering*, Vol. 43, 102919, doi: [10.1016/j.jobbe.2021.102919](https://doi.org/10.1016/j.jobbe.2021.102919).
- Amole, D. (2009), "Residential satisfaction in students' housing", *Journal of Environmental Psychology*, Vol. 29 No. 1, pp. 76-85, doi: [10.1016/j.jenvp.2008.05.006](https://doi.org/10.1016/j.jenvp.2008.05.006).
- Aronis, C. (2009), "The balconies of Tel-Aviv: cultural history and urban politics", *Israel Studies*, Vol. 14 No. 3, pp. 157-180, doi: [10.2979/isr.2009.14.3.157](https://doi.org/10.2979/isr.2009.14.3.157).
- Aronis, C. (2020), "Architectural liminality: the communicative ethics of balconies and other urban passages", *Cultural Studies*, Vol. 36 No. 3, pp. 1-27, doi: [10.1080/09502386.2020.1844254](https://doi.org/10.1080/09502386.2020.1844254).
- Avermaete, T. and Koolhaas, R. (2014), *Elements - Balcony*, Marsilio, Venezia.
- Aydin, D. and Sayar, G. (2020), "Questioning the use of the balcony in apartments during the COVID-19 pandemic process", *Archnet-IJAR: International Journal of Architectural Research*, Vol. 15 No. 1, pp. 51-63, doi: [10.1108/arch-09-2020-0202](https://doi.org/10.1108/arch-09-2020-0202).
- Babae, F., Fayaz, R. and Sarshar, M. (2016), "The optimum design of sunspaces in apartment blocks in cold climate", *Architectural Science Review*, Vol. 59 No. 3, pp. 239-253, doi: [10.1080/00038628.2015.1077326](https://doi.org/10.1080/00038628.2015.1077326).
- Bassetti, C. (2020), "Across balconies. Interaction in porous home territories in the Italian lockdown", *Etnografia e Ricerca Qualitativa*, Vol. 13 No. 2, pp. 233-243.
- Berg, B.L. and Lune, H. (2012), *Qualitative Research Methods for the Social Sciences*, Vol. 8, Pearson, Boston, MA, available at: https://www.academia.edu/44569933/Qualitative_Research_Methods_For_the_Social_Sciences_by_Howard_Lune_Bruce_L_Berg
- Berthier, J. (2008), "Balcon Additionnel", November, available at: <http://www.julienberthier.org/Balcon-additionnel.html>
- Blazhan, R. (2020), "Enter through the balcony M. Movie";
- Browne, R.A.V., Cabral, L.L.P., Freire, Y.A., Macêdo, G.A.D., Oliveira, G.T.A., Vivas, A., Elsangedy, H.M., Fontes, E.B. and Costa, E.C. (2021), "Housing type is associated with objectively measured changes in movement behavior during the COVID-19 pandemic in older adults with hypertension: an exploratory study", *Archives of Gerontology and Geriatrics*, Vol. 94, 104354, doi: [10.1016/j.archger.2021.104354](https://doi.org/10.1016/j.archger.2021.104354).
- Chan, A.L.S. and Chow, T.T. (2010), "Investigation on energy performance and energy payback period of application of balcony for residential apartment in Hong Kong", *Energy and Buildings*, Vol. 42 No. 12, pp. 2400-2405, doi: [10.1016/j.enbuild.2010.08.009](https://doi.org/10.1016/j.enbuild.2010.08.009).
- Choi, J., Chun, C., Sun, Y., Choi, Y., Kwon, S., Bornehag, C.G. and Sundell, J. (2014), "Associations between building characteristics and children's allergic symptoms – a cross-sectional study on child's health and home in Seoul, South Korea", *Building and Environment*, Vol. 75, pp. 176-181, doi: [10.1016/j.buildenv.2014.01.019](https://doi.org/10.1016/j.buildenv.2014.01.019).
- Cirugeda, S. (1998), "Building yourself an urban reserve, scaffolding", November, available at: <http://www.recetasurbanas.net/index1.php?idioma=eng&REF=1&ID=0003>
- Creswell, J.W. (2016), *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, Sage Publications, California.
- Creswell, J.W. and Clark, V.L.P. (2017), *Designing and Conducting Mixed Methods Research*, 3rd ed., Sage Publications, California.
- Creswell, J.W. and Miller, D.L. (2000), "Determining validity in qualitative inquiry", *Theory into Practice*, Vol. 39 No. 3, pp. 124-130, doi: [10.1207/s15430421tip3903_2](https://doi.org/10.1207/s15430421tip3903_2).
- Dahlan, N.D., Jones, P.J., Alexander, D.K., Salleh, E. and Alias, J. (2009), "Evidence base prioritisation of indoor comfort perceptions in Malaysian typical multi-storey hostels", *Building and Environment*, Vol. 44 No. 10, pp. 2158-2165, doi: [10.1016/j.buildenv.2009.03.010](https://doi.org/10.1016/j.buildenv.2009.03.010).

-
- Duarte, C.C., Cortiços, N.D., Stefańska, A. and Stefańska, A. (2023), "Home balconies during the COVID-19 pandemic: future architect's preferences in Lisbon and Warsaw", *Applied Sciences*, Vol. 13 No. 1, 298, doi: [10.3390/app13010298](https://doi.org/10.3390/app13010298).
- Durmusoglu, Ö.Ö. and Warsza, J. (2021), "Art as a necessity, a recovery, a drug, and a neighborhood. On Die Balkone and on what to go back to and what not?", August, available at: <https://www.diebalkone.net/context>
- Ek, F.İ., Traunmuller, I.C. and Yayalali, B. (2020), "Balcony as an intermediate space: a prosthetic threshold in the domestic-urban life of Izmir", *Meltem İzmir Akdeniz Akademisi Dergisi*, No. 7, pp. 6-27.
- Elzein, Z. and Elsemary, Y. (2022), "Re-thinking post-pandemic home design: how Covid-19 affected the perception and use of residential balconies in Egypt", *Future Cities and Environment*, Vol. 8 No. 1, doi: [10.5334/fce.140](https://doi.org/10.5334/fce.140).
- Fathy, H. (1986), *Natural Energy and Vernacular Architecture*, University of Chicago Press, Chicago, IL.
- Fidler, M. (2020), "Balcony spirit: hope in face of coronavirus – in pictures", *The Guardian*, available at: <https://www.theguardian.com/world/gallery/2020/mar/19/balconies-sites-hope-coronavirus-in-pictures>
- Grigoriadou, E.T. (2020), "The urban balcony as the new public space for well-being in times of social distancing", *Cities and Health*, Vol. 5 sup1, pp. S208-S211, doi: [10.1080/23748834.2020.1795405](https://doi.org/10.1080/23748834.2020.1795405).
- Grudzińska, M. (2021), "Overheating assessment in flats with glazed balconies in warm-summer humid continental climate", *Building Services Engineering Research and Technology*, Vol. 42 No. 5, pp. 583-602, doi: [10.1177/01436244211008690](https://doi.org/10.1177/01436244211008690).
- Guerra-Santin, O. and Tweed, C.A. (2015), "In-use monitoring of buildings: an overview of data collection methods", *Energy and Buildings*, Vol. 93, pp. 189-207, doi: [10.1016/j.enbuild.2015.02.042](https://doi.org/10.1016/j.enbuild.2015.02.042).
- Guest, G., Bunce, A. and Johnson, L. (2006), "How many interviews are enough? An experiment with data saturation and variability", *Field Methods*, Vol. 18 No. 1, pp. 59-82, doi: [10.1177/1525822x05279903](https://doi.org/10.1177/1525822x05279903).
- Hall, E.T. (1966), in Editions, A.B. (Ed.), *The Hidden Dimension*, New York.
- Hassanain, M.A., Iftikhar, A., Al-Hammad, A.M., Alshibani, A., Ibrahim, A.M. and Abdallah, A. (2021), "POE of public higher education facilities in Saudi Arabia: lessons learned from three case studies", *Property Management*, Vol. 39 No. 2, pp. 250-276, doi: [10.1108/PM-06-2020-0037](https://doi.org/10.1108/PM-06-2020-0037).
- Henriques, A. and Barros, J.P. (2011), "Fechar varandas ou não fechar, eis a questão", *Público*, available at: <https://www.publico.pt/2011/05/15/jornal/fechar-varandas-ou-nao-fechar-eis-a-questao-22049062>
- Hilliaho, K., Mäkitalo, E. and Lahdensivu, J. (2015), "Energy saving potential of glazed space: sensitivity analysis", *Energy and Buildings*, Vol. 99, pp. 87-97, 5808, doi: [10.1016/j.enbuild.2015.04.016](https://doi.org/10.1016/j.enbuild.2015.04.016).
- James, R. (2007), "Multifamily housing characteristics and tenant satisfaction", *Journal of Performance of Constructed Facilities*, Vol. 21 No. 6, pp. 472-480, doi: [10.1061/\(asce\)0887-3828\(2007\)21:6\(472\)](https://doi.org/10.1061/(asce)0887-3828(2007)21:6(472)).
- Kamin, B. (2010), "Battle of the balconies: Chicago architects try to outdo one another on sky-high decks", *Chicago Tribune*, available at: <https://www.chicagotribune.com/2010/05/16/battle-of-the-balconies/>
- Kaplan, R. (2001), "The nature of the view from home: psychological benefits", *Environment and Behavior*, Vol. 33 No. 4, pp. 507-542, doi: [10.1177/00139160121973115](https://doi.org/10.1177/00139160121973115).
- Kearney, C. (2020), "Italians sing patriotic songs from their balconies during coronavirus lockdown", *The Guardian*, available at: <https://www.theguardian.com/world/2020/mar/14/italians-sing-patriotic-songs-from-their-balconies-during-coronavirus-lockdown>

- Kennedy, R., Buys, L. and Miller, E. (2015), "Residents' experiences of privacy and comfort in multi-storey apartment dwellings in subtropical Brisbane", *Sustainability*, Vol. 7 No. 6, pp. 7741-7761, doi: [10.3390/su7067741](https://doi.org/10.3390/su7067741).
- Kim, M.-J. and Kim, H.-G. (2007), "Field measurements of façade sound insulation in residential buildings with balcony windows", *Building and Environment*, Vol. 42 No. 2, pp. 1026-1035, doi: [10.1016/j.buildenv.2005.10.036](https://doi.org/10.1016/j.buildenv.2005.10.036).
- Kim, J., Kim, T. and Leigh, S.B. (2011), "Double window system with ventilation slits to prevent window surface condensation in residential buildings", *Energy and Buildings*, Vol. 43 No. 11, pp. 3120-3130, doi: [10.1016/j.enbuild.2011.08.012](https://doi.org/10.1016/j.enbuild.2011.08.012).
- Koh, D. (2004), "Illegal construction in Hanoi and Hanoi's wards", *European Journal of East Asian Studies*, Vol. 3 No. 2, pp. 337-369, doi: [10.1163/1570061042780928](https://doi.org/10.1163/1570061042780928).
- Kotulla, T., Denstadli, J.M., Oust, A. and Beusker, E. (2019), "What does it take to make the compact city liveable for wider groups? Identifying key neighbourhood and dwelling features", *Sustainability*, Vol. 11 No. 12, 3480, doi: [10.3390/SU11123480](https://doi.org/10.3390/SU11123480).
- Kwak, N.H. (2021), "Urban informality in the global north: a view from Los Angeles", *Esboços: Histórias Em Contextos Globais*, Vol. 28 No. 47, pp. 182-196, doi: [10.5007/2175-7976.2021.e76639](https://doi.org/10.5007/2175-7976.2021.e76639).
- Lades, L.K., Laffan, K., Daly, M. and Delaney, L. (2020), "Daily emotional well-being during the COVID-19 pandemic", *British Journal of Health Psychology*, Vol. 25 No. 4, pp. 902-911, doi: [10.1111/bjhp.12450](https://doi.org/10.1111/bjhp.12450).
- Laurel, B. (2003), *Design Research: Methods and Perspectives*, MIT Press, Massachusetts.
- Maxwell, P. (2020), "Post-pandemic urbanism: how access to open outdoor space will redefine high-density housing", *Frame*, available at: <https://www.frameweb.com/article/post-pandemic-urbanism-how-access-to-open-outdoor-space-will-redefine-high-density-housing>
- Molaei, P., Hashempour, P. and Tang, L.M. (2022), "Semi-open spaces of apartments considering COVID-19 pandemic: general expectations of balcony design in the post-pandemic world", *Architectural Engineering and Design Management*, Vol. 18 No. 5, pp. 705-722, doi: [10.1080/17452007.2021.2021385](https://doi.org/10.1080/17452007.2021.2021385).
- Mustafa, F.A. (2017), "Performance assessment of buildings via post-occupancy evaluation: a case study of the building of the architecture and software engineering departments in Salahaddin University-Erbil, Iraq", *Frontiers of Architectural Research*, Vol. 6 No. 3, pp. 412-429, doi: [10.1016/j.foar.2017.06.004](https://doi.org/10.1016/j.foar.2017.06.004).
- Niu, J. (2004), "Some significant environmental issues in high-rise residential building design in urban areas [Conference Paper]", *Energy and Buildings*, Vol. 36 No. 12, pp. 1259-1263, doi: [10.1016/j.enbuild.2003.07.005](https://doi.org/10.1016/j.enbuild.2003.07.005).
- Origoni, C. and Origoni, M. (2020), "A brief history of the balcony, from ancient Persia to the COVID-19 pandemic", *Domus*, available at: <https://www.domusweb.it/en/architecture/2020/04/03/a-brief-history-of-the-balcony-from-ancient-persia-to-the-covid-19-pandemic.html>
- Pereira, F.P.F. (2018), "Avaliação do comportamento dos ocupantes no desempenho higrotérmico em edifícios residenciais", [PhD, Faculdade de Engenharia da Universidade do Porto]. Porto.
- Permentier, M., Bolt, G. and Van Ham, M. (2011), "Determinants of neighbourhood satisfaction and perception of neighbourhood reputation", *Urban Studies*, Vol. 48 No. 5, pp. 977-996, doi: [10.1177/0042098010367860](https://doi.org/10.1177/0042098010367860).
- Pescada, C. (2020), "E Portugal saiu à janela para homenagear os profissionais de saúde", *Público*, available at: <https://www.publico.pt/2020/03/15/p3/video/portugal-saiu-janela-homenagear-profissionais-saude-20200315-003733>
- Peters, T. and Halleran, A. (2020), "How our homes impact our health: using a COVID-19 informed approach to examine urban apartment housing", *Archnet-International Journal of Architectural Research*, Vol. 15 No. 1, pp. 10-27, doi: [10.1108/ARCH-08-2020-0159](https://doi.org/10.1108/ARCH-08-2020-0159).

-
- Peters, T. and Masoudinejad, S. (2022), "Balconies as adaptable spaces in apartment housing", *Buildings and Cities*, Vol. 3 No. 1, pp. 265-278, doi: [10.5334/bc.191](https://doi.org/10.5334/bc.191).
- Phuong, D.Q. and Groves, D. (2011), "The aesthetics of Hanoi's architecture: sense of place through the eyes of local painters", *The Journal of Aesthetics and Art Criticism*, Vol. 69 No. 1, pp. 133-142, doi: [10.1111/j.1540-6245.2010.01454.x](https://doi.org/10.1111/j.1540-6245.2010.01454.x).
- Poon, L. (2020), *A Lesson from Social Distancing: Build Better Balconies*, City Lab, Bloomberg, Washington, DC. available at: https://www.citylab.com/life/2020/04/apartment-design-balcony-private-outdoor-space-zoning-laws/610162/?utm_source=facebook&utm_medium=social&utm_campaign=socialflow-organic&utm_content=citylab&fbclid=IwAR1A3Edn8zTmnRAGPfZ2PYbfUO82mljSWFCfNzWAsWsiuX1X2lkJMxvIY3Y
- Preiser, W.F.E., Rabinowitz, H. and White, E.T. (2015), *Post-occupancy Evaluation (Routledge Revivals)*, Routledge, Oxfordshire.
- Privitera, P., Diodato, M. and García Sáez, S. (2014), "Solar radiation influence on pre-modern openings features: La Coruña and Valletta", in *Vernacular Architecture: towards a Sustainable Future*, CRC Press, pp. 637-642, doi: [10.1201/b17393](https://doi.org/10.1201/b17393).
- Ribeiro, C., Ramos, N.M.M. and Flores-Colen, I. (2020), "A review of balcony impacts on the indoor environmental quality of dwellings", *Sustainability*, Vol. 12 No. 16, pp. 1-19, doi: [10.3390/su12166453](https://doi.org/10.3390/su12166453).
- Ribeiro, C., Pereira, P.F., Ramos, N.M.M., Flores-Colen, I. and Valentim, N. (2023), "Assessment of the impacts of balconies on indoor environmental quality in mild climate conditions, Portugal", *Building Research and Information*, Vol. 52 No. 3, pp. 292-310, doi: [10.1080/09613218.2023.2229451](https://doi.org/10.1080/09613218.2023.2229451).
- Saleh, P.H. (2015), "Thermal performance of glazed balconies within heavy weight/thermal mass buildings in Beirut, Lebanon's hot climate", *Energy and Buildings*, Vol. 108, pp. 291-303, doi: [10.1016/j.enbuild.2015.09.009](https://doi.org/10.1016/j.enbuild.2015.09.009).
- Sennett, R. (2020), "How should we live? Density in post-pandemic cities", *Domus*, available at: <https://www.domusweb.it/en/architecture/2020/05/09/how-should-we-live-density-in-post-pandemic-cities.html>
- Smektała, M. and Baborska-Narożny, M. (2022), "The use of apartment balconies: context, design and social norms", *Buildings and Cities*, Vol. 3 No. 1, p. 134, doi: [10.5334/bc.193](https://doi.org/10.5334/bc.193).
- Song, D. and Choi, Y.-J. (2012), "Effect of building regulation on energy consumption in residential buildings in Korea", *Renewable and Sustainable Energy Reviews*, Vol. 16 No. 1, pp. 1074-1081, doi: [10.1016/j.rser.2011.10.008](https://doi.org/10.1016/j.rser.2011.10.008).
- Sugiyama, T., Ward Thompson, C. and Alves, S. (2009), "Associations between neighborhood open space attributes and quality of life for older people in Britain", *Environment and Behavior*, Vol. 41 No. 1, pp. 3-21, doi: [10.1177/0013916507311688](https://doi.org/10.1177/0013916507311688).
- Traverso, V. (2020), "Why do balconies inspire us?", *BBC*, available at: <https://www.bbc.com/travel/article/20200409-the-history-of-balconies>
- Valizadeh, P. and Iranmanesh, A. (2021), "Inside out, exploring residential spaces during COVID-19 lockdown from the perspective of architecture students", *European Planning Studies*, Vol. 30 No. 2, pp. 211-226, doi: [10.1080/09654313.2021.1939271](https://doi.org/10.1080/09654313.2021.1939271).
- Viana, C. (2020), "Há muitas famílias a viver em casas onde o isolamento é impossível", *Público*, available at: <https://www.publico.pt/2020/03/24/sociedade/noticia/ha-familias-viver-casas-onde-isolamento-impossivel-1908943>
- Wågø, S., Hauge, B. and Støa, E. (2016), "Between indoor and outdoor: Norwegian perceptions of well-being in energy-efficient housing", *Journal of Architectural and Planning Research*, Vol. 33 No. 4, pp. 329-346.
- Waltzer, M. (1986), "Public space: a discussion on the shape of our cities", *Dissent*, Vol. 33, pp. 470-494.

- Wing Chau, K., Kei Wong, S. and Yim Yiu, C. (2004), "The value of the provision of a balcony in apartments in Hong Kong", *Property Management*, Vol. 22 No. 3, pp. 250-264, doi: [10.1108/02637470410545020](https://doi.org/10.1108/02637470410545020).
- Xue, P., Mak, C.M. and Ai, Z.T. (2016a), "A structured approach to overall environmental satisfaction in high-rise residential buildings", *Energy and Buildings*, Vol. 116, pp. 181-189, doi: [10.1016/j.enbuild.2016.01.006](https://doi.org/10.1016/j.enbuild.2016.01.006).
- Xue, P., Mak, C.M., Cheung, H.D. and Chao, J. (2016b), "Post-occupancy evaluation of sunshades and balconies' effects on luminous comfort through a questionnaire survey", *Building Services Engineering Research and Technology*, Vol. 37 No. 1, pp. 51-65, doi: [10.1177/0143624415596472](https://doi.org/10.1177/0143624415596472).
- Zacka, B. (2020), "An ode to the humble balcony", *The New York Times*, available at: <https://www.nytimes.com/2020/05/09/opinion/covid-balconies-architecture.html>
- Zacka, B. (2021), "What's in a balcony? The In-between as a Public Good", in Bell, D. and Zacka, B. (Eds), *Political Theory and Architecture*, Bloomsbury, pp. 81-102.
- Zarrabi, M., Yazdanfar, S.A. and Hosseini, S.B. (2021), "COVID-19 and healthy home preferences: the case of apartment residents in Tehran", *Journal of Building Engineering*, Vol. 35, 102021, doi: [10.1016/j.job.2020.102021](https://doi.org/10.1016/j.job.2020.102021).
- Zeisel, J. (2006), *Inquiry by Design. Environment/Behavior/Neuroscience in Architecture, Interiors, Landscape, and Planning*, W. W. Norton & Company, California.

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