A double-edged sword: Residents' views on the health consequences of gentrification in Porto, Portugal

José Pedro Silva [a,b,c,*], Cláudia Jardim Santos [a,b,d], Ema Torres [a,b,d],
Lucía Martínez-Manrique [e,f], Henrique Barros [a,b,d], Ana Isabel Ribeiro [a,b,d]

[a] *EPIUnit – Instituto de Saúde Pública da Universidade do Porto, Portugal*
[b] *Laboratório para a Investigação Integrativa e Translacional em Saúde Populacional (ITR), Portugal*
[c] *Instituto de Sociologia da Universidade do Porto, Portugal*
[d] *Faculdade de Medicina da Universidade do Porto, Portugal*
[e] *Preventive Medicine Department, Hospital Universitario de Móstoles, C. Dr. Luis Montes, S/N, 28935, Madrid, Spain*
[f] *Public Health and Epidemiology Research Group, School of Medicine, University of Alcalá, 28801, Madrid, Spain*

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ABSTRACT

Gentrification is currently shaping the urban environment in important ways. It also contributes to shaping the health of the inhabitants of gentrifying cities, although it is still unclear how. Gentrification processes are often linked to different drivers and have specific local translations, further complicating the study of the relationship between gentrification and health. We investigated this relationship in Porto, Portugal, a southern European city undergoing rampant transnational gentrification. In order to study how gentrification impacts health from the point of view of that city's residents, we conducted a study using photovoice with a sample of participants recruited from a population-based cohort, which was divided into three different groups: one from gentrifying areas of Porto, another from deprived non-gentrifying areas, and the other from affluent areas. The thematic analysis of data generated six themes, each referring to a change, or a set of connected changes, related to gentrification: increasing floating population, lack of housing access and displacement, construction and rehabilitation, changing local commerce, loss of place, and broader socioeconomic change. According to the accounts from participants, these changes affect health in different ways, both beneficial and harmful. Participants also reflected on how to act on this issue. This research adds to the knowledge about the relationship between gentrification and health by providing detailed and nuanced views about this relationship considering its city-wide impacts.

1. Introduction

1.1. Gentrification and health

Gentrification, understood as a set of processes of sociospatial change driven by investments in the built environment oriented to the preferences of affluent people (Cocola-Gant, 2016), is a phenomenon shaping the urban environment (Hayes et al., 2020). It implies the renewal of the built environment, the displacement of residents – typically those with less economic resources - and the arrival of new, more affluent people to the gentrifying territories. Thus, it changes the built and social environment in meaningful ways (Lopez-Gay et al., 2021; Tulier et al., 2019). Gentrification may be related to various sociospatial changes, including urban greening, climate change adaptation, changes

in the retail landscape and food environment, tourism, the accommodation of higher education students, and the location of health care services (Cole et al., 2021). One way gentrification may be theoretically linked to health is by conceptualising it as an exposure affecting the latter through various pathways (Cole, 2020), as discussed below.

Although there is a large volume of scholarly literature on gentrification, interest in the relationship between gentrification and health is recent (Cole, 2020). As a whole, the available literature on this relationship presents some gaps and contradictions requiring further investigation (Iyanda et al., 2022). One systematic review (Smith et al., 2020) could not find any quantitative studies documenting a significant relationship between gentrification and health. According to another review (Schnake-Mahl et al., 2020), quantitative investigations have found either no significant association between health and gentrification, a

beneficial or a harmful health effect of gentrification, or both those effects simultaneously. Gentrification-led change is often paradoxical (Cole et al., 2021); hence, it may affect health in contradictory ways. Qualitative studies have proposed pathways through which gentrification affects health (Anguelovski et al., 2020, 2021; Sanchez-Ledesma et al, 2020; Versey, 2022): Gentrification-led changes concerning housing (including housing costs, housing insecurity and displacement), available amenities and services, the physical and symbolic elements of place, spatialised social networks, and safety and crime affect the lives of residents in ways that generate mostly negative health outcomes. Available evidence from quantitative and qualitative studies suggests that gentrification may benefit the health of some social groups while worsening that of others (Cole et al., 2021; Cole, 2020; Smith et al., 2020; Schnake-Mahl et al., 2020; Anguelovski et al., 2021; Versey, 2022; Izenberg et al., 2018; Tran et al., 2020). Moreover, gentrification processes are distinct across time and space (Aalbers, 2019). They often have different drivers, and unfold differently in diverse locations, potentially leading to distinct health impacts (Cole et al., 2021; Anguelovski et al., 2021).

In short, the relationship between gentrification and health is not fully understood. Some authors have called for more studies and different methodologies, including qualitative (Cole, 2020) and participatory (Schnake-Mahl et al., 2020) methodologies, in order to improve our understanding of its complexities. Moreover, researchers should account for the drivers and nuances of different types of gentrification (Cole et al., 2021). Perceptions about gentrification and the neighbourhood are also important (Iyanda et al., 2022).

Gentrification is often studied at the neighbourhood level, providing little information about city-wide impacts (Versey, 2022; Gibbons et al., 2018). Existing quantitative research does not include the accounts of important informers, including residents (Anguelovski et al., 2020), thus disregarding how gentrification shapes daily lives (Versey, 2022). Qualitative research may address this limitation; however, existing studies often dive into a specific neighbourhood where the process is especially salient, and/or recruit participants who are highly invested in the theme, such as housing activists or members of neighbourhood associations (for example (Sanchez-Ledesma et al, 2020)). These approaches generate detailed and contextualised accounts of specific gentrifying places and gather information from people who have a direct and deep knowledge of the phenomenon, yet activists and other highly invested people in the topic may have an interest in communicating a partial view of gentrification (Cocola-Gant, 2018), while the neighbourhood approach may lose sight of the city as a whole. Consequently, we believe it necessary to conduct qualitative studies that go beyond specific, heavily-gentrifying neighbourhoods and into the city level.

1.2. Porto and transnational gentrification

Gentrification has become a global phenomenon, with local translations shaped by the features and history of specific places (Hayes et al., 2020; Aalbers, 2019). It has also become transnational (Sigler et al., 2016, 2020), meaning that gentrification processes at the local level are connected both to global capital and a transnational mobile middle and upper class that includes lifestyle migrants, international students, and tourists, mainly from affluent countries (Cocola-Gant, 2016, 2018; Hayes et al., 2020; Lopez-Gay et al., 2021; Aalbers, 2019; Sigler et al., 2020; Cocola-Gant et al., 2020, 2021). This connection, which is facilitated by short-term rental technological platforms such as Airbnb (Aalbers, 2019; Cocola-Gant et al., 2021; Wachsmuth et al., 2018), increases the revenue that real estate ownership may generate in a given city, paving the way to gentrification (Hayes et al., 2020; Sigler et al., 2016; Cocola-Gant et al., 2020, 2021). The alignment of the local real estate market with global capital and demand escalates housing prices as houses become increasingly targeted for investment and treated as just another class of assets (Aalbers, 2019). Neighbourhoods possessing architectonic value, cultural amenities and a distinctive local culture are particularly susceptible to transnational gentrification (Sigler et al., 2020).

Transnational gentrification is closely linked to contemporary mobilities (Hayes et al., 2020; Lopez-Gay et al., 2021; Sigler et al., 2020). The intertwined phenomena of short-term rentals and tourism seem important to this process: the former offers greater flexibility and profits than traditional renting (Cocola-Gant et al., 2021; Wachsmuth et al., 2018; Chamusca et al., 2019), while the latter may result in the transformation of attractive touristic areas in visitor-oriented districts increasingly empty of locals (Cocola-Gant et al., 2020, 2021; Chamusca et al., 2019; Sequera et al., 2020). The loss of available houses for the short-term rental market, coupled with costlier housing and changes in the local culture and environment, may drive locals out while attracting, besides tourists, young and affluent transient transnational migrants (Cocola-Gant et al., 2020).

Portuguese and Spanish cities are privileged locations to inspect transnational gentrification processes (Hayes et al., 2020). In the aftermath of the 2008–2009 crisis, cities such as Barcelona (Cocola-Gant et al., 2020), Lisbon (Cocola-Gant et al., 2021; Mendes, 2021) or Porto (Chamusca et al., 2019; Carvalho et al., 2019) can be considered hotspots of transnational gentrification, with tourism playing an important role alongside the financialisation of real estate and the action of the state and its actors.

In recent years, Porto has become an increasingly attractive tourism destination. The city has witnessed a surge in the number of passengers in its airport, escalating housing prices, significant functional and/or property changes concerning downtown retail shops, and a surging number of houses listed as short-term rentals. Some neighbourhoods are being converted into visitor districts, while current and prospective residents are being priced-out of the city (Carvalho et al., 2019). These trends have been quickly transforming Porto, especially, but not exclusively, its historical centre and downtown. They have been welcomed by an important part of the city's political, economic and (to a lesser degree) academic elite as a way to revitalise the city centre (which has been losing population since the 1980s) and solve some of its problems (Sousa et al., 2021). However, the ways such changes may affect the health of Porto inhabitants remain unstudied. We conducted a study with the goal of exploring how the inhabitants of Porto feel that gentrification impacts their health and well-being.

2. Methods

We conducted a photovoice study. Photovoice is a participatory action research method that uses photographs to reveal meaning and promote collective discussion (Sutton-Brown, 2015). Its objectives are threefold: to allow people to record and reflect on the strengths and concerns of their communities, to promote critical discussion and knowledge about community issues, and to reach policymakers (Wang et al., 1997). It empowers participants and encourages community awareness and engagement (Budig et al., 2018).

Photovoice is adaptable and may be implemented in different ways (Sutton-Brown, 2015; Wang et al., 1997). We limited the discussion sessions to one per group of participants, and the analysis of these discussions was not participatory. Nevertheless, many participatory, action-research and community-centred aspects of the method were retained (see below for details on how we implemented photovoice).

We recruited participants both from areas where gentrification processes are intense and where they are mostly absent. To define these areas, we compared the values of municipal housing tax (IMI) from 2006 to 2009 and 2015–2022. We considered the areas where IMI increased at least 20% as gentrifying areas, while areas with an increase of at most 10% were classified as non-gentrifying. This does not mean that there is no gentrification in these neighbourhoods: at least some of them may be gentrifying, but the process should be incipient, in contrast with other areas where gentrification and its effects are noticeable. Non-gentrifying areas were further divided into two areas: those with the highest IMI values were labelled as "affluent non-gentrifying, "and those with the lowest were designated "deprived non-gentrifying." The result of this procedure is broadly aligned with the general perception of the city shared by the research team (Fig. 1).
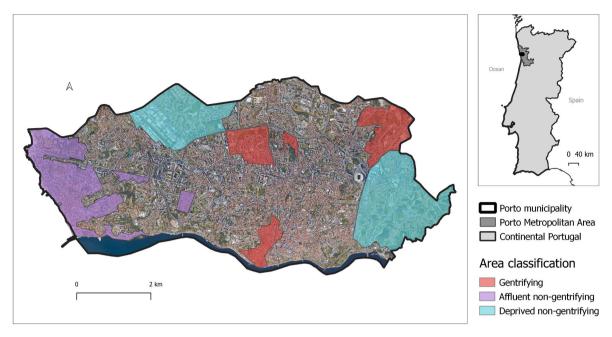
Fig. 1. Map of Porto showing the areas classified as gentrifying, affluent non-gentrifying and deprived non-gentrifying.

We recruited from EPIPorto (Ramos et al., 2004), a closed population-based cohort. EPIPorto started in 1999 with the recruitment of a representative sample of adults from Porto using random digit dialling and households as the sampling unit. Its main goal is to evaluate the health determinants of Porto's population. We intended to recruit an equal number of participants, evenly divided by sex, for each defined area. However, we managed to recruit 6 participants (3 males, 3 females) from gentrifying areas, 4 participants from deprived non-gentrifying areas (3 males, 1 female) and 6 participants from affluent areas (1 male, 5 females).

We followed a set of procedures, described below, that took place sequentially and separately for each area.

After we obtained the necessary authorisations from EPIPorto and ethical clearance from the ISPUP ethics committee, a team member, also an EPIPorto assistant, telephoned prospective participants, providing an initial explanation of the study and inviting them to a session where they would receive further information. Those who accepted the invitation came to a presentation at the Faculty of Medicine of the University of Porto (FMUP). One researcher explained the research's goals, concepts and methods and the role expected from participants. By the end of the presentation, attendants were given the opportunity to ask questions and decide if they wished to join the project. Formal informed consent was obtained from those who chose so. Participants were then offered a photography workshop conducted by a professional photographer. The workshop addressed basic photography concepts, the functioning of the cameras that participants would use, and ethical issues related to the use of photography in research. We provided each participant with a basic analogue camera (AgfaPhoto Camera 35 mm) carrying enough film for 36 photos. Two participants later requested additional film, which we provided. We requested participants to return the camera and film within two weeks and scheduled a session for them to present and collectively discuss their photographs. Meanwhile, after the cameras and film were returned, we produced the participants' photographs and coded them. A discussion session was scheduled with each group. At the beginning of each discussion session, we requested participants to select about six photographs that would best represent their views about gentrification and health in Porto. Each participant presented their selected photographs and they were collectively discussed. These sessions were moderated by a researcher who flexibly used the SHOWeD method (Wang, 1999) to guide them. We requested participants to

answer the following questions when presenting their pictures: What do you see here? What is happening here? How does this relate to our health? Why does this exist? What can we do about it? Other researchers were present, observing and taking notes. Participants stated the code of each picture before talking about it, allowing us to link words to images later on. After each session, the team reflexively discussed it, identifying any necessary improvements and ways to implement them. The discussion sessions with participants from gentrifying, deprived non-gentrifying and affluent non-gentrifying areas took place on July 29th, October 17th and November 17th, 2022, respectively. All sessions were held at FMUP.

The discussion sessions were audio-recorded and transcribed. An inductive thematic analysis (Braun et al., 2006) was performed using NVivo (release 1.7) software. One researcher analysed the data, coding for gentrification-related changes and their consequences, including consequences on health and well-being, and for suggested measures addressing those consequences. Codes were revised and refined, and themes were built by seeking connections between the codes and clustering them around broader gentrification-related changes. Then, both codes and themes were refined into a final version. NVivo annotations were used to promote reflexivity and ensure coding awareness and consistency. Difficult coding decisions were discussed with another team member. The final themes were also revised with another team member.

3. Results

Table 1 presents the participants' socio-demographic data.

As a whole, the discussions depict a city undergoing gentrification, driven essentially by real estate financialisation (linked to transnational investment) and tourism, but also by the arrival of wealthier residents to previously deprived city areas. Such process was understood as having consequences for health.

Many presented photographs depicted the city's downtown and historical centre, where transnational gentrification is ostensive (Chamusca et al., 2019; Carvalho et al., 2019). Retail gentrification (Cole et al., 2021) in this area is noteworthy. Tourism, including short-term rental units, is concentrated here (Chamusca et al., 2019; Carvalho et al., 2019). Participants also presented some photographs about gentrification and health from other neighbourhoods, mostly where they live or work. Participants from affluent areas presented some

Table 1
Participants' socio-demographic data.

		Gentrifying areas (n = 6)	Deprived non-gentrifying areas (n = 4)<	Affluent non-gentrifying areas (n = 6)
Gender	Male	3	3	1
	Female	3	1	5
Age	50–60	1	0	0
	61–70	3	3	3
	71–80	2	1	2
	81–90	0	0	1
Completed education (ISCED, 2011 levels)	Early childhood	1	0	0
	Primary	1	0	0
	Lower secondary	2	0	1
	Upper secondary	0	1	1
	Tertiary	2	3	4
Work situation	Employed	2	1	1
	Unemployed	1	0	0
	Homemaker/no paid work	1	1	0
	Retired	2	2	5
Type of housing	Ownership	5	4	6
	Relative-owned house	1	0	0

photographs about Foz, a western middle and upper-class neighbourhood that we classified as "affluent non-gentrifying." This suggests that the alignment of local real estate markets with global flows of capital and consumption creates broader opportunities for gentrification in the comparatively less affluent European periphery, rendering local middle-class neighbourhoods susceptible to gentrification.

The thematic analysis yielded six themes: increasing floating population; lack of housing access and displacement; construction and urban rehabilitation; changing local commerce; loss of place; and general socioeconomic change. Each of these themes covers one or several related important changes regarded as consequences of gentrification and described as impacting the health of the city's inhabitants in a number of ways. Some changes were described as simultaneously bringing beneficial and harmful consequences for health, here understood as a complete (physical, mental and social) sense of well-being (WHO, 2005 [1946]). Participants also suggested measures to minimise the negative impacts of some, but not all, gentrification-related changes.

We next present the themes, illustrated with photographs and quotes from the discussion sessions. All of the participant names are pseudonyms.

3.1. Increasing floating population

Floating population (Cocola-Gant, 2018; Carvalho et al., 2019) refers to highly mobile transnational people in a state of permanent flux in the city. Participants described a noteworthy increase in this population in recent years, especially tourists and, to a minor degree, students. This is mostly noted in Porto's central commercial areas and historical centre (Fig. 2). This trend was described as being both beneficial and harmful to health. On the bright side, it was portrayed as bringing new life to previously decaying neighbourhoods and turning Porto into a pulsating cosmopolitan city. This was linked to increased well-being and, consequently, better health:

Fig. 2. Photograph by a participant from a gentrifying area depicting tourists and tourist services near São Bento train station.

I think this [tourism] brings movement, colour, and joy to the city.

"Susana," female, 61 years old, gentrifying area

Visitors may introduce new healthy behaviours: One participant from a deprived non-gentrifying area described how locals began adopting the habit of using green spaces to sunbathe, like students and visitors do. Moreover, the presence of more people downtown, where streets were previously mostly empty by night and during the weekend, and in the historical centre, which was formerly perceived as insecure, was described as improving safety.

However, many participants considered the number of visitors in Porto's central neighbourhoods excessive. These areas were described as crowded and, consequently, stressful. This could be a problem for anyone passing by, and especially for people living there:

Near my home, as you can imagine, it's chaos, isn't it? All day long.

"Joana," female, 51 years old, gentrifying area

A crowded, stressful environment was seen as harmful to mental health, but the larger floating population was depicted as bringing other problems. It generates more traffic, garbage, air pollution and noise, all seen as potentially harmful for mental and physical health. One participant from the affluent non-gentrifying areas stated that, in certain central neighbourhoods, residents have trouble sleeping because of the nocturnal noise. A participant from the gentrifying areas claimed that certain vehicles now common in the touristic areas of the city, such as tuk-tuks, are accident-prone. A participant from a deprived non-gentrifying area described the arrival of a large number of international visitors as a stressor for local health systems and a potential risk of infectious disease outbreaks. While some participants regarded the presence of tourists as increasing safety, others saw it as an incentive for crime. Participants from gentrifying areas also discussed if mass tourism could be related to an increase in inequality, violence and crime.

Although the floating population increase is more perceptible in the city centre, it is also visible, in subtler ways, in other neighbourhoods: participants from Foz presented photographs showing some remaining *ilhas* (small, poor-quality working-class homes hidden in the urban fabric) recently reconverted in short-term rentals.

Participants did not position themselves against tourism, which was depicted as an important local economic activity. However, they considered that the city received too many visitors for its size and that there were too many short-term rentals. They argued for stricter regulation and for policies to better manage the consequences of Porto's growing floating population, namely increased waste production, heavier traffic and pressure on health services.

3.2. Lack of housing access and displacement

According to participants, the city has been undergoing a wave of urban rehabilitation; however, most rehabilitated houses, especially in downtown and the historical centre, are not intended to be inhabited by locals. They are investments, frequently put in the short-term rental market. Participants from the deprived non-gentrifying areas claimed that most houses being put in the long-term habitation market now have smaller typologies, while participants from the remaining groups argued that most of the former were directed at the higher segments of the market and frequently at foreign buyers, as witnessed by the many announcements in English (Fig. 3). According to a participant from a gentrifying area, the local real estate market is increasingly attracting international investors. Consequently, housing prices and rents sharply increased, resulting in exclusionary displacement (Marcuse, 1985): Locals, especially younger adults, are unable to move into houses they normally could. According to participants, many locals had little choice but to live in the suburbs, which is worse for their health. Firstly, while

walking was seen as important for health, suburbs were described as less walkable than Porto. Secondly, people living in the suburbs and working in Porto (a common situation) spend more time commuting, having less time for leisure and family life, resulting in less satisfying family relations and a stressful life, leading to worse mental and, possibly, physical health.

The person is tired and is going to get home … tired and even more tired, late, he will arrive upset, he won't be in the mood to deal with his wife, or his daughter, or his son … or maybe his wife won't be in the mood to deal with people who arrive late at home. So, it's in this sense that I say that people should … that this is a public health problem, I think. I think it is. And it's not just about mental [health]. It is mental [health], but then it even has physical consequences.

"Augusto," male, 65 years old, gentrifying area

Participants from Foz suggested that increasing housing prices were driving younger locals to other city neighbourhoods and to the suburbs, while years ago, it was common for them to settle in the area. This was considered to erode family and community ties, thus negative for mental health.

Direct displacement, or the forced displacement from the residence (Marcuse, 1985), was described as having grievous health consequences: One participant told how the neighbour of an acquaintance, an older woman, became socially isolated after being displaced as a result of gentrification in the Bonfim neighbourhood and ended up "dying of sadness" not long after that:

She ends up dying of sadness, because she is uprooted, she is put in a place … segregated, essentially, she was segregated and she went to live in a prison. She was even afraid of opening the window, because she was afraid of thieves. Up there [in her previous house], she could look, and if she screamed, people around her could help. And he [the participant's acquaintance] used to tell me: "Many times, when she was sick, she told me what she wanted, I talked around and people would bring her food upstairs."

"Henrique," male, 64 years old, deprived non-gentrifying area

A participant from the deprived non-gentrifying areas provided an example of direct displacement linked to green gentrification (Anguelovski et al., 2022): A Romani community was removed to rebuild the city's largest green space, which could now be used by anyone in the city in healthy ways.

Furthermore, according to a participant from a gentrifying area and another from an affluent area, deprived individuals are sometimes gullibly led to sell their houses at unfairly low prices. This seems to happen even in affluent areas of the city where pockets of *ilhas* persist, since these, once renewed, become attractive to the short-term rental market. One participant claimed to know people who regret selling their houses for good money and moving to the suburbs because their quality of life worsened.

Despite the above, one participant identified one positive consequence of displacement: Many deprived people who moved from the historical neighbourhoods to suburbs now live better, as most houses being rehabilitated for the short-term rental market in those places were in poor condition.

Several participants suggested that specific policies are needed to improve local access to housing. Participants from gentrifying areas provided two suggestions: To force short-term rental accommodation entrepreneurs to rehabilitate a certain number of (preferably larger) apartments for long-term housing purposes and to use the municipal income generated by tourism to find housing solutions in the city for at least some of the people that work in Porto and cannot afford a house there.
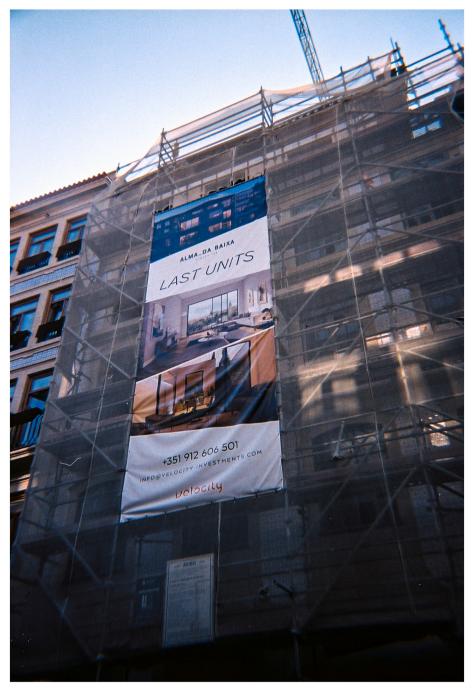
Fig. 3. Photograph by a participant from a gentrifying area, illustrating the international orientation of the local real estate market (notice the announcement in English).

3.3. Construction and rehabilitation

Participants described Porto as undergoing a wave of urban renewal, simultaneous with the construction of hotels and other infrastructure - such as a currently under-construction metro line serving its central areas - as an answer to its increasing floating population (Fig. 4). The general sentiment towards it might be summarised using a sentence by a participant: "It's a necessary evil." On the one hand, it was described as "positive," "necessary," and beneficial for health: it resulted in improved sanitary conditions and a more aesthetically pleasing city, both considered important for well-being and health.

Some changes are necessary, because time has its erosion, isn't it? And it's necessary, otherwise everything would fall, everything would crumble, and we don't want to see … […] But if nothing is done concerning … it'll become unhealthy, one isn't able to live.

"Nuno," male, 67 years old, deprived non-gentrifying area

Nevertheless, for a participant from a gentrifying area, such changes would only be beneficial if they did not result in displacement. Furthermore, ongoing construction works disrupted city life in several ways, with negative consequences for health. They generated intense noise, traffic, air pollution and mobility constraints. These were considered stressful, with implications on both mental and physical health:

Fig. 4. Photograph by a participant from a gentrifying area showing renewed houses and a large luxury hotel under construction in the Lapa area.

"Augusto" (male, 65 years old, gentrifying area): *It [construction works in the city centre] brings, concerning public health, it brings chaotic traffic issues, brutal pollution …*

"Joana" (female, 51 years old, gentrifying area): *Yes, we can't even walk by there now.*

"Augusto": *All kinds of pollution, including noise. And there's noise that actually impacts people's lives. Now, I don't know if these are occasional things, I don't know if this may be considered a public health problem, because a public health problem is something that persists long enough to generate an effect.*

"Joana": *But if you allow me, this [issue] persists, because, in order to go from home to Almada street, I must walk in the middle of the traffic lane, because there are cranes, there are construction works, and there's always that noise. I'm working and I close the window, because there's always that noise from construction works and all those things.*

3.4. Changing local commerce

According to participants, as Porto's floating population increases, local commerce changes to meet its preferences (Fig. 5). Many new stores, cafes and restaurants are oriented towards an international taste and feature English names. Concurrently, traditional retail stores are disappearing. For some participants, the latter are being removed by the former, while, for others, traditional commerce was already decaying for a long time due to the emergence of large shopping centres and supermarkets in the periphery. Such changes were described as negative for health. Increasing prices were identified as a harmful consequence of retail gentrification. Participants from affluent areas discussed the recent remodelling of Bolhão, a downtown market well-known to locals and popular among visitors. It now offers sophisticated products side-by-side with pricier essential products:

"Adelaide" (female, 89 years old): *I thought they were overpricing.*

"Francisco" (male, 72 years old): *It's for tourists. For the tourists it's cheap.*

"Adelaide": *Yes, it is.*

"Francisco": *For the tourists it's cheap.*

"Adelaide": *But the tourists are not going to live in Bolhão.*

"Francisco": *I know that people don't buy a lot, too. I bought a few apples there, "let me see, they look nice," and so on, but they are much more expensive.*

Fig. 5. Photograph by a participant from a deprived non-gentrifying area depicting a traditional grocery store reconverted into a tourist-oriented store selling pseudo-traditional food in the Clérigos area.

Nevertheless, some participants argued that it was still possible to find reasonably priced stores in the city, including its central neighbourhoods, while one participant from the affluent areas claimed that higher prices were unrelated to gentrification. Some participants also mentioned changes in the food offered by restaurants and cafes. According to a participant from a gentrifying area, restaurants increasingly substitute Portuguese food with unhealthy international alternatives.

Retail gentrification brought other problems. Firstly, areas with many tourist-oriented eateries, stores and services may be crowded during certain periods but empty during others, which might pose safety issues and affect mental health. Secondly, as cafes and restaurants proliferate, so do terraces, which invade walking space, creating a stressful experience for walkers. Thirdly, as locally-oriented food products and retail stores are substituted by tourist-oriented eateries in the city centre, certain remaining groups, like older adults with lower mobility, may have diminished access to food or become dependent on relatives to get groceries. No longer having convenient shops in their areas, they may stop walking around, with negative consequences for their health. A participant described a situation faced by a deceased older woman who used to live in Clérigos, a major tourist area:

[…] she stopped moving around. There's no longer codfish, there's no longer the butcher, there's no longer … everything's gone. There's nothing left. She doesn't need to move around to buy anything anymore, anything at all, because her son … She never had that agility to go to a supermarket, she never went there. So, she was not competent enough to do that, it was

her son who did the shopping and took it to her home. So, the mother stops moving around. And we know the consequences this has in the bone structure, muscle, and even at … heart level, isn't it? At the level … cardiology level. So, the lady begun suffering from all this.

"Henrique," male, 64 years old, deprived non-gentrifying area

Finally, one participant from a gentrifying area reported a very specific situation: As most commerce in her neighbourhood is now visitor-oriented, bakeries and similar stores closed down during the COVID-19 pandemic confinements. Consequently, there was nowhere nearby to buy essential food products, namely bread.

3.5. Loss of place

We understand place as a geographical area with specific physicality and invested meaning and value (Gieryn, 2000). Participants argued that the current gentrification processes in Porto are transforming both the materiality and meaning of place in a way that depletes the city of its identity and severs the emotional connection that locals, especially older ones, have with it (Fig. 6). This is also related to what has been defined by others as sociocultural displacement (Versey, 2022).

Loss of place was described as harmful to health. Retail gentrification was linked to the substitution of emblematic stores by indistinctive stores oriented to transnational customers and souvenir stores. Local associations also tend to disappear. This purportedly erases the city's identity, with negative consequences for mental health.

The influx of visitors results in languages other than Portuguese being regularly spoken in the city's central areas, while many stores adopt English names. This purportedly produces a sense of estrangement, even exclusion, that may negatively affect mental health. The following exchange about a photograph depicting tourists in the city centre illustrates this:

"Nuno" (67 years old, male, deprived non-gentrifying area): *So, with so many tourists, what's my place here, in the middle of all of this? And people almost feel bad in their skins, because, man, it's all foreigners and, who knows, if they sell a cup of coffee they must speak Spanish or something. So, this is going to affect psychologically, [people] feel excluded, because it's … there are more … any of us may feel this pressure. We leave the bus, we still came with other people speaking*

Portuguese … we get there … in certain places in the city, Portuguese is no longer the only spoken language. Those people who are more sensitive will say, "I don't feel well here any longer, I … don't meet Joaquim anymore, nor Alzira, nor Clotilde …" Here it already affects health. […]

"Jorge" (male, 66 years old, deprived non-gentrifying area): *Depressions. It's not just stress, it's even depressions that … that maybe affect …*

Aligned with the discomfort and alienating feelings that some people may feel in the touristic areas of the city, the crowding, the changes in the physical environment and the increasing prices of eateries were identified by some participants from the affluent neighbourhoods as reasons to avoid the former.

One participant described how gentrification was generating a sense of place dispossession in a working-class neighbourhood undergoing urban renewal and the arrival of both foreign visitors and wealthier residents. Its long-time residents shared a strong attachment to place and were unhappy with these changes they could not control. Consequently, the health of some of them decayed, while others engaged in violence.

So, those people who don't accept it, what do they do? Well, where they go, they scratch cars, there were shootings. There was a shooting because of a car that wanted to go through and it couldn't go through. So, those persons that … how do you say? That accept things better, they're older. And it's those people, the older ones, that accept [things] better, that pay a higher price than all the others. Some of them get nervous, and therefore stress, like our friend here [another participant] was saying. [There's] A lot of stress among these people. And a lot of visits to the doctor. A lot more.

"Henrique," male, 64 years old, deprived non-gentrifying area

Participants from the affluent non-gentrifying areas argued that some of the undergoing changes could fit the taste of younger people, whose memory of Porto is recent. They agreed that older adults, who are more deeply embedded in place, were the group whose health and well-being could be more impacted by loss of place.

However, a few participants from the gentrifying areas argued that the centre of Porto was already losing its identity before the current wave of gentrification, as a result of abandonment and neglect. One of them added that, although tourism could deplete local identity, it also

Fig. 6. Photograph by a participant from an affluent non-gentrifying area depicting a local association in Foz that, according to another participant, will exist "until some foreign investor decides to turn it into a few luxury villas."

generated income that could be used to protect it, and mentioned a municipal programme that protects historical stores as an example of a positive initiative.

3.6. General socioeconomic change

This theme refers to broader gentrification-related socioeconomic changes in the city. Participants agreed that the current international attractiveness of Porto has improved its economy (Fig. 7). Sanitary conditions also improved, which should benefit health. Concurrently, gentrification may also increase inequality across the city:

> It [tourism] dramatically raised, at least on average, independently of the inequalities that are, perhaps, deepening, on average it improved, obviously, the life standards, didn't it?

"Jorge," male, 66 years old, deprived non-gentrifying area

This simultaneous growth of wealth and inequality was mentioned across all discussion groups and thoroughly explored by participants from the gentrifying and affluent non-gentrifying areas. They described several striking contrasts. For example, in central Aliados Avenue, homeless people sleep near some of Porto's most valued real estate. Participants considered it mandatory to find ways so that the income generated by tourism and real estate investment could benefit all the population in the city, and not just investors and real estate entrepreneurs. Namely, the additional income should be used to increase social support to vulnerable groups and deal with poverty and homelessness.

Both direct and exclusionary displacement were portrayed as eroding a local social mix considered beneficial for health. Once again, this was discussed by participants from the gentrifying and affluent non-gentrifying areas:

> That was something magical in the city of Porto, it was a city where houses of different economic strata and different social strata could coexist.

"Isabel," 62 years old, female, affluent non-gentrifying area

The group discussion from the affluent areas showed how gentrification could move safety concerns away from gentrified areas into other neighbourhoods: One participant photographed an encampment of drug users near a social housing neighbourhood described as previously quiet. They moved there after another social housing neighbourhood, where they used to dwell, was demolished to give place to luxury real estate, transferring safety issues to another location.

Table 2 presents a global view of the results. Results for each discussion group are included as supplementary material.

Fig. 7. Photograph by a participant from an affluent non-gentrifying area, showing a degraded building in the city centre, now converted into a rooftop terrace.

Table 2
Pathways connecting gentrification to health.

Major gentrification-led change	Pathways to health	Health results
Increasing floating population	Traffic and pollution (garbage, noise, air pollution)	Worse mental and physical health
	Crowded and stressing environment	Worse mental health
	Sleep disturbance	
	Insecure touristic vehicles	Worse physical health
	Higher risk of new, contagious diseases	
	Stress on health systems	Worse health (unspecified)
	Increased crime and violence	
	City life and cosmopolitism	Better mental health
	New healthy practices	Better health (unspecified)
	Increased safety	
Lack of housing access and displacement	Living in the suburbs and loss of walkability	Worse health (unspecified)
	More commuting, less family time	Worse mental health (stress), possibly leading to worse physical health
	Erosion of community ties	Worse mental health
	Uprooting	Worse mental health, possibly leading to worse physical health, including premature death (for older adults)
	Improved housing standards	Better health (unspecified)
Construction and rehabilitation	Traffic and pollution (noise and air pollution)	Worse health (unspecified)
	City embellishment	Better health (unspecified)
	Improved sanitary standards	
	Improved green spaces	
Changing local commerce	Rising prices	Worse health (unspecified)
	Diminished access to essential products in emergency situations (such as covid-19 confinements)	
	Globalised restaurants	Worse nutrition
	Crowding of central areas	Worse mental health
	Proliferation of terraces in walking space	Worse mental health (stress)
	Changing local stores	Worse physical health for older adults (bone, muscle and cardiovascular deterioration as a result of less walking)
Loss of place	Loss of place identity	Worse mental health, especially for older adults
	Alienation from the city centre	Worse mental health, especially for older adults (stress, depression)
	Place dispossession	Conflicts and violence leading to worse general health, especially for older adults
General socioeconomic change	Growing inequalities	Worse health (unspecified)
	Segregation	
	Changing safety landscapes	Worse health in negatively impacted neighbourhoods (unspecified)
	Economic growth and improved life standards	Better health (unspecified)
	Improved sanitary standards	

4. Discussion

Our research has revealed rich and nuanced accounts of how the ongoing gentrification processes in Porto may influence health.

Participants from diverse neighbourhoods presented and discussed many pictures from the city centre, suggesting that gentrification is especially salient there. The meaning of those photographs suggests that the impact of those processes in the city centre may be relevant, in various ways, for the well-being of people living there, but also elsewhere in Porto.

Although the impacts of gentrification on health were often imprecisely defined, several pathways connecting gentrification-related changes to health were thoroughly discussed. These pathways are plural and complex: Some of the identified gentrification-led changes were seen as both beneficial and deleterious to health. Also, according to the accounts of participants, older adults, certain ethnic minorities, and economically deprived people are more vulnerable to some negative aspects of gentrification, namely direct displacement, loss of place, erosion of social ties and changes in commerce and services. Younger people seem vulnerable to exclusionary displacement but protected from loss of place. We also found a contradiction in our participants' views that echoes previous research (Schnake-Mahl et al., 2020): Gentrification was described by some participants as increasing safety in gentrifying areas, while others linked it to crime and violence. Moreover, while the gentrification-related changes in the city centre were described as revitalising and increasing cosmopolitism, they were also related to undesired results, such as displacement, stress, pollution, and alienation from place (Diaz-Parra et al., 2020).

These results reflect the complexity that characterises the relationship between gentrification and health. Local translations of gentrification may have different drivers, which may lead to distinct health effects (Cole et al., 2021; Anguelovski et al., 2021). Several pathways suggested by participants, such as the importation of healthy behaviours from visitors and the stress and loss of walking space related to a surging floating population, seem closely tied to the specificities of transnational gentrification processes where tourism plays an important role. Many of the gentrification-led changes that participants described as negatively affecting health are consistent with findings from previous research: housing insecurity and displacement, changing local identity and loss of place, erosion of social ties, pollution, changes in the local commerce and services, and crime and safety issues were previously suggested as pathways linking gentrification to health in places where tourism is an important gentrification driver (Anguelovski et al., 2021; Sanchez-Ledesma et al, 2020). Similarly, several unhealthy consequences of mass tourism, including noise, public space exclusion, crowding and mobility issues, are also reported by the transnational gentrification literature (Lopez-Gay et al., 2021). Nevertheless, our participants considered some changes beneficial for health, while the pathways proposed by the above studies, except for activism against gentrification (Sanchez-Ledesma et al, 2020), always lead to worse health results.

As different social groups have varying levels of resources and distinct vulnerabilities, their health could be impacted differently by gentrification. Previous literature has alluded to the importance of life stage (Anguelovski et al., 2021; Sanchez-Ledesma et al., 2020); similarly, our results suggest that older age may aggravate that impact, especially when coupled with vulnerabilities such as limited social ties, reduced mobility and economic deprivation. Unsurprisingly, our research suggests that people with fewer resources are more vulnerable to direct and exclusionary displacement; however, exclusionary displacement seems to have become a concern even in middle-class areas, indicating that, as local real estate markets align with global capital and demand, the middle classes become vulnerable to exclusionary (Sequera et al., 2020; Mendes, 2021) and, possibly, direct displacement (Cocola-Gant, 2016).

Although we could only collect second-hand accounts of direct displacement, these suggest that it may have serious health consequences, possibly leading to premature death. Previous research has already revealed this view's existence in Porto (Barbosa et al., 2019; Queirós, 2015). These results are aligned with the claim that direct displacement, and even the fear of it, leads to worrying health effects (Anguelovski et al., 2020, 2021; Versey, 2022; Agbai, 2021; Lim et al.,

2017). Direct displacement may be preceded by harassment (Anguelovski et al., 2020; Sanchez-Ledesma et al, 2020; Chamusca et al., 2019), which is also relevant for understanding its health consequences.

The results suggest that the health impact of gentrification, namely transnational gentrification, may not be limited to gentrifying neighbourhoods. Indeed, much of this impact may be felt city-wide. It has been speculated that gentrification-led displacement may lead to worse health outcomes in the neighbourhoods that receive households from gentrified areas (Gibbons et al., 2018). Furthermore, inequality within cities can globally increase housing prices and the overall cost of life, aggravate segregation, and discourage public investment. Some residents may thus be limited from enjoying a full city life (Versey, 2022). In Porto, many of the central, commercial and service-oriented neighbourhoods, along with the historical neighbourhoods with high symbolic value, are quickly becoming visitor-oriented areas. This may also impact those who do not live there but use those places for other reasons, such as work or leisure, possibly worsening their well-being and health. Some participants seemed to feel alienated from these spaces by the crowds, the high prices of stores and cafes, and their touristic orientation. They may opt to avoid such areas, becoming semi-voluntarily excluded from them. Likewise, rising real estate prices and consequent lack of housing access were issues felt across the city. Gentrification was also portrayed as generating other potentially health-relevant, city-wide changes, such as increasing inequality and segregation. Nevertheless, people living in the epicentre of gentrification processes seem the most affected, as the pace and scale of redevelopment, tourism, and retail gentrification, besides surging housing prices, may become hardly compatible with living there (Lopez-Gay et al., 2021; Cocola-Gant et al., 2021; Jover et al., 2019).

But the changes identified by participants were also seen as beneficial in some ways. Gentrification was seen as having both desirable and undesirable consequences, and policies were considered necessary to fairly distribute the benefits and protect people, especially vulnerable people, from harm. Although, as stated above, qualitative studies rarely identify any positive health impacts of gentrification, the results of quantitative studies have been mostly mixed. According to Agbai (2021), gentrification may improve health in several ways: by upgrading the physical structure of the neighbourhood and thus reducing the likelihood of accidents; by attracting new grocery stores and potentially improving resident's diet; reducing crime; improving health as a consequence of the higher socio-economic status of the neighbourhood; and increasing satisfaction as a result of the regeneration of the neighbourhood and intensification of commercial activity. Our participants described Porto as a city where cosmopolitism, aesthetic value, housing and sanitary standards and global income are growing in a beneficial way because of tourism and transnational investment. However, they also portrayed it as a city with crowded neighbourhoods where sidewalks are invaded by terraces, people must walk in traffic lanes because of ongoing construction works, insecure tourist vehicles circulate, traditional grocery stores disappear, giving place to tourist-oriented cafes, changes in commerce do not meet the needs of locals, and inequality, segregation and displacement globally increase.

This study presents some considerable strengths. Our methodological approach allowed us to collect and combine visual and verbal data, revealing spatial (where the photographs were taken) and temporal (the stories of change that photographs and words tell) dimensions. Our results rest on rich information about the relationship between gentrification and health, generated by a city-wide set of participants who live in areas differently affected by transnational gentrification. This adds to previous qualitative research about gentrification and health by providing a nuanced account of how gentrification may affect health city-wide, while paying attention to the specificities of ongoing gentrification processes. By portraying and collectively reflecting on the health consequences of transnational gentrification in Porto, participants might have developed their awareness and interest in a pressing issue in this city and other Portuguese and Southern European cities. We

plan to follow through with a book and an exhibition featuring their photographs and a public discussion where they may voice their views and concerns. As far as we know, this is the first study about this subject in Portugal. Its results may be relevant for other cities undergoing transnational gentrification, especially in Southern Europe.

We must also recognise some limitations. Firstly, our youngest participant was 51 years old. This mirrors the reality of EPIPorto, an ageing closed cohort. It would have been valuable to collect the perspectives of younger people, who may feel differently about this topic. Secondly, due to recruitment difficulties, two of our groups had an uneven distribution of participants by sex, increasing the risk of undesired gender-related interactional effects. Finally, we did not include any participants living in rented homes nor participants who underwent or were threatened by direct displacement.

5. Conclusion

We departed from photographs taken by residents to study how gentrification, namely transnational gentrification, is influencing health in Porto. Participants portrayed the central neighbourhoods of the city as cosmopolitan, vibrant and regenerated. The city is seen as internationally attractive for visitors, transient migrants and investors. As we have seen, this is related to gentrification processes that are quickly transforming the physical, socioeconomic and symbolic features of the city, especially of its central neighbourhoods, in contradictory ways. Some of these ways were described as beneficial for health and well-being, while others were related to worsening mental and, less often, physical health. These negative consequences seemed especially serious for some vulnerable groups, such as older people or those with less economic resources, and for those living in gentrifying areas, such as the city centre: crowding, ongoing construction works, pollution and changing commerce and services degrade the quality of life of those people who are not displaced. Displacement seems to be a major concern due to the escalating housing costs and the dire consequences of direct displacement.

Our research suggests that the impact of transnational gentrification on health is unfair in that it may be beneficial in a few ways but hardly so for those in vulnerable situations. This calls for research on policies to better distribute the benefits of the on-going changes and offset its harms and invites local and national governments who see gentrification as a panacea for urban problems to change their stance.

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Author contributions

José Pedro Silva: conceptualisation, formal analysis, investigation, methodology, visualisation, writing-original draft, writing-review and editing. Cláudia Jardim Santos: investigation, writing-review and editing. Ema Torres: investigation, data curation, writing-review and editing. Lucía Martínez-Manrique: investigation, methodology, writing-

review and editing. Henrique Barros: funding acquisition, writing – review and editing. Ana Isabel Ribeiro: conceptualisation, formal analysis, funding acquisition, investigation, methodology, visualisation, writing-review and editing.

Data availability

The data that has been used is confidential.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi. org/10.1016/j.socscimed.2023.116259.

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