

Perceived pathways between tourism gentrification and health: A participatory Photovoice study in the Gòtic neighborhood in Barcelona

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ABSTRACT

Tourism gentrification is a process of urban change and neighborhoods transformation, according to the needs of affluent visitors, increasing in some global cities. However, the link between tourism gentrification and resident's health is still an understudied topic. Using Photovoice, a participatory action research method, the aim of this study was to identify the perceived pathways that underlie the relationship between tourism gentrification and health among residents of Gòtic neighborhood, in Barcelona. The study was conducted between January 2018 and January 2019. Thirteen residents, recruited from two neighborhood organizations, took photographs of how tourism gentrification of the neighborhood was affecting their health. Participants analyzed and critically discussed their photographs in small group sessions. Through a consensus-building process, participants categorized 35 photographs and identified 7 emerging categories acknowledged as possible pathways between tourism gentrification and health, in Gòtic neighborhood: 1) decline of social networks; 2) loss of identity; 3) environmental changes; 4) pollution; 5) changes in services and stores; 6) property speculation/eviction and; 7) activism by residents. This Photovoice study recognizes important pathways underlying the relationship between tourism gentrification in the Gòtic neighborhood and the health of its residents, by altering the built environment, the social environment or psychological factors. Among them, six pathways were related to negative health outcomes, both physical and mental (respiratory diseases; worse nutrition habits; sleep deprivation; stress, anxiety and depression). 'Activism by residents' was perceived to buffer the negative health effects of living in a touristic area. The study also provides recommendations to tackle this serious urban health issue.

1. Introduction

Gentrification has been described as the transition of a neighborhood from working-class to middle/upper-class (Glass, 1964; Shaw, 2008). Its definition, as well as its causes and consequences, has been widely debated among academics, activists, and the public (Bardus et al., 2015; Brown-Saracino, 2013; Lees, 2000). Lees defined gentrification as “a process of neighborhood change through which the demographic, real estate and business characteristics of a place reveal a transition towards a more educated, wealthy, whiter population, able to afford new or renovated pricier properties while also fomenting new

cultural and consumption practices, increasing the cost of living in an area (Lees, 2000). Lower income residents in gentrified neighborhoods may be displaced by these higher living costs (Davidson and Lees, 2010, 2005). Displacement characterizes gentrification and can even be accompanied by physical displacement (Marcuse, 1985) and by a sense of loss for long-term residents (Fullilove and Wallace, 2011).

As a constantly evolving process, different forms of gentrification have been described: rural gentrification, 'studentification', new-built gentrification, super-gentrification and others (Còcola-Gant, 2018a). Tourism gentrification is defined as the “transformation of a middle-class neighborhood into a relatively affluent and exclusive enclave

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characterized by the proliferation of corporate entertainment and tourism venues” (Gotham, 2005). In tourism gentrification, displacement provokes the out migration of the original residents due to the expansion of holiday rentals and increased conversion of housing into tourist accommodation. This results in rising housing prices and changes in the local commerce and services landscape to satisfy the needs of tourists and newcomers over those of the long-term residents. (Cócola-Gant, 2018b). If classical gentrification brings together a new community of middle-class people, tourism gentrification creates an array of consumers which forms a floating population that continuously passes through and changes on a weekly basis, making it impossible for residents to access tourist areas. Therefore, the occurrence of displacement is more intense than in classical gentrification and may lead to a situation in which long-term residents would be replaced by transient consumers and tourism investors (Cócola-Gant, 2018a).

To our knowledge, the health effects of gentrification processes have been little studied, and even less so in the case of tourism gentrification. In order to understand the implications of gentrification for population health, Mujahid et al. (2019) proposed a conceptual framework where gentrification can affect individual health through multiple pathways by altering the built environment (including health-promoting resources) and the community social environment. For instance, gentrification can affect the placement of community resources vital to health, such grocery stores that supply healthy food, or it can also affect community social cohesion when long-term residents move out as a result of involuntary displacement. Recent reviews describe how gentrification can lead to high psychosocial stress and poor health outcomes through discrimination, diminished social networks, housing insecurity, and reduced attachment to the local area (Mehdipanah et al., 2017; Schnake-Mahl et al., 2020; Tulier et al., 2019). In most cases, this is related to the forced displacement of original residents, although those who stay in the area can also suffer negative consequences (Davidson, 2009; Shaw and Elger, 2015). Gentrification-driven displacement of vulnerable residents, who often have the worst health profiles, may contribute to widening health inequalities (Centers for Disease Control and Prevention, 2012). Some studies have also shown how experiencing increased financial strains because of relocation expense or disruption of protective social connections was associated with stress among displaced residents (Fullilove, 1996; Schnake-Mahl et al., 2020). A cohort study from neighborhoods undergoing gentrification in New York City showed that displaced residents were more likely to be hospitalized, visit the emergency department, and suffer mental health problems than those who remained in the neighborhoods (Lim et al., 2017). Similarly, for residents that remain in gentrified neighborhoods, the observed displacement of neighbors, family, or friends and anticipation of one's possible dispossession may present psychosocial burdens and possible long term physical health impacts (Anguelovski et al., 2019; Pearsall, 2012). In this regard, a study conducted in Melbourne found that long-term residents who remain in gentrified areas reported a sense of loss of control, stability, and identity with their area, and feel excluded and under continuous pressure to move due to the rising costs and the reduced range of daily goods and services (Shaw and Hagemans, 2015). These factors all contribute to a lower quality of life and wellbeing. A recent study comparing two gentrified neighborhoods of Boston and Barcelona revealed a multiplicity of health impacts on long-term residents, including individual physical and mental health outcomes (i.e. obesity, chronic stress or depression) and interpersonal pathways (i.e. social-culture erasure; lesser physical activity and social contact) (Anguelovski et al., 2019).

Gentrification, especially tourism gentrification, is a current problem in Barcelona, especially in the city center where the Gòtic

neighborhood is one of the most affected areas. Gòtic is the oldest nucleus of Barcelona. It has 17,035 inhabitants (50.1% are foreign born, mainly of countries from the European Union) in an area of 84,20 ha. People aged ≥ 75 years' account for 15.6% of the population; a high proportion of these live alone and are often isolated due to the lack of elevators and structural instability of residential buildings. Gòtic is specialized in the services sector. Many famous landmarks and commercial areas are located there, as are several political and religious entities, becoming a well-known tourist attraction where 23% of land is used for tourism (Ajuntament de Barcelona, 2019; Cócola-Gant, 2018a). House prices in the area, mainly in the rental sector, have been increasing by around 10% annually in recent years (Cócola-Gant, 2018b). Some research suggests that the strategy by local authorities in the second half of the last century was to dilute the existing working-class population to create new activities and public spaces to be used by the middle-classes and tourists (Cócola-Gant, 2009; Degen, 2008; Fernández González, 2014). However, it is commonly agreed that hosting the Olympic Games in 1992 helped to reform Barcelona and its image, contributing to its promotion as a global tourist destination (López Palomeque, 2015). In turn, the games assisted social and urban regeneration of the degraded Ciutat Vella neighborhoods of the city center, including the Gòtic neighborhood (Capel, 2007).

As mentioned, gentrification has been argued to contribute to urban inequalities, including those of health inequities (Centers for Disease Control and Prevention, 2012; Gibbons et al., 2018). Since 2007, the municipal strategy *Barcelona Health in the Neighbourhoods* (BHIn) has been working to reduce health inequalities through community-based interventions (Diez et al., 2012; Daban, 2020). In 2016, the program started in the Gòtic neighborhood. Based on a conceptual framework of the social determinants of health inequalities in urban areas (Borrell et al., 2013) it encompasses five phases: (1) alliances with stakeholders; (2) health needs assessment; (3) action plan; (4) monitoring and evaluation; and (5) sustainability (Comissionat de Salut, 2016). During the participatory health needs assessment of the Gòtic neighborhood, tourism gentrification was identified and prioritized as a major problem by residents. To tackle this issue, the health steering group of the Gòtic neighborhood agreed to design an action plan, through participatory action research, to investigate how tourism gentrification in the area affects the daily lives and health of local residents.

Participatory action research (PAR) is a suitable approach for understanding key determinants of the urban context influencing residents' health from a residents' perspective (Nykiforuk and Vallianatos, 2018). It acknowledges community members and researchers as equals throughout the research and action processes (Caldwell et al., 2015). Photovoice is a participatory method, coming out of PAR paradigms, in which “people can identify, represent, and enhance their community through a specific photographic technique” (Wang and Burris, 1997) In Photovoice, participants use photography to document the features that they think are related to a particular community issue in order to inform social action (Wang and Burris, 1997). Thereby, Photovoice can facilitate a process of social action by: 1) involving residents in documenting their community needs and concerns with their photographs and narratives; 2) engaging participants in a reflective process, where they critically discuss and analyze their built and social environment; and 3) disseminating participant-generated results with the community and local policy-makers (Catalani and Minkler, 2010; Murray and Nash, 2017). Photovoice has been used previously as a method for identifying key neighborhood elements that are important for urban health (i.e. food environment, physical activity or housing) (Diez et al., 2017; Gullón et al., 2019; Vásquez-Vera et al., 2019).

The aim of this participatory action research was to identify the pathways that are perceived by residents to underlie the relationship

between tourism gentrification and health among residents of the Gòtic neighborhood, and to summarize the proposed recommendations using the Photovoice method. The research questions underlying this study were: 1) how tourism gentrification shapes the neighborhood's context and impacts on neighborhood daily life; and 2) how these impacts are critical to residents' health.

2. Methods

2.1. Study design, setting and participants

This study employs a Participatory Action Research (PAR) approach using the Photovoice method, where participants are encouraged to take photographs about a topic of their daily lives and discuss them in order to collectively build a critical dialogue, and form recommendations to address the topic under discussion (Baum et al., 2006; Nykiforuk et al., 2011). In our study, the topic was to identify the means by which tourism gentrification affects the health of local residents.

The study was conducted between January 2018 and January 2019 in the context of the BHiN program. To lead and organize the entire process, a steering committee was formed including six members of the Gòtic working group: two technicians from ASPB, two from neighborhood associations, one from the municipality, and a photographer from the Gòtic Photographic Archive.

As a recruitment strategy, the project was presented at two neighborhood associations (*Associació de Veïns/es Gòtic-La Negreta* and *Casal de Gent Gran del Pati Llimona*). Participants were required to meet the following inclusion criteria: 1) were aged ≥ 18 years; 2) had been living in the neighborhood for ≥ 10 years; 3) were able to operate a digital camera; and 4) were willing to attend up to eight weekly group sessions. A total of 13 adults were recruited and gave informed written consent to participate in the project, which was then approved by the Ethics Committee of Parc de Salut Mar, Barcelona (n° 2019/8869/I).

2.2. Photovoice procedure

We set up two Photovoice groups: one group with six members from the *Associació Veïns/es Gòtic-La Negreta*, and another with seven members from the *Casal de Gent Gran-Pati Llimona*. A sequence of eight sessions were conducted, six in each group separately, and two joint sessions with both groups present. Both groups met weekly for 2 hours over five weeks. The meeting days and schedules were decided by each group. In each session, a facilitator from the steering committee explained the objectives of the session, encouraged participation, and led the discussions, while one non-participant observer took field notes. Sessions were audio recorded and transcribed.

At the first session, the team explained the aims of the project, the Photovoice methodology and some ethical issues. Participants took part in a photography workshop conducted by the Gòtic Photographic Archive. At the end of this session, participants were invited to "take pictures of all the features related to tourism in your area that may have changed your everyday life, and may affect your health or well-being".

Participants brought their photographs to sessions 2 to 6. In each session, they chose three to five pictures, which were printed and discussed. The aims of the second session were to reinforce the ideas that had to be captured by participants, give advice concerning technical and ethical issues, and start the photograph discussion. During sessions 3 to 6, participants discussed and shared their photographs with the group using, as a discussion guide, the SHOWED method, which includes five key questions: *What do you See here? What is really Happening? How does this relate to Our lives? Why does this problem or*

strength Exist? What can we Do about it? (Wang and Burris, 1997). In the sixth session, participants brought their final five selected photographs and grouped them into categories to represent factors involved in the relationship between tourism gentrification and health.

In the last two sessions, participants from the two groups worked together to share and select the final photographs and categories, and proposed recommendations to tackle the factors identified. During these sessions, participants were asked to write individually recommendations for each of the categories identified, without setting a maximum number of recommendations. Once all the recommendations by category were presented, participants prioritized them according to impact, time and feasibility criteria, resulting in a total of 45 recommendations (see the [supplementary file](#)).

2.3. Data analysis

We carried out a participatory analysis of the data, including Photovoice participants throughout the entire research process, defined by three stages: selecting those photographs that reflect participants' concerns; contextualizing and discussing what the photographs mean/represent for each participant; and finally, codifying the issues, themes or topics that arose from their photos (Wang and Burris, 1997). Once both groups finished their meetings, two members of the steering committee performed a preliminary thematic content analysis of the five sessions, using the categories proposed by participants as a frame of reference. Themes were re-coded and classified into broader themes and common patterns, convergences, and divergences in data were identified through an iterative process of constant comparison, following a deductive analytical strategy (Mahmood et al., 2012). Lastly, the final categories were discussed and agreed on by the participants of both groups in a devolution session (session 7).

3. Results

13 residents aged 43–80 years participated in the project. Socio-demographic characteristics are presented in Table 1.

The participants took a total of 476 photographs, of which 174 were printed for analysis in the discussion sessions. Using participants' selected photographs, the SHOWED narratives and other members' related discussion, 35 final photographs were categorized into seven broader themes representing different factors related to tourism

Table 1
Socio-demographic characteristics of participants.

	Female (n = 10)	Male (n = 3)	Total (n = 13)
Age			
50 or less years-old	1	–	1
51 to 60 years-old	2		2
61 to 70 years-old	4	2	6
71 to 80 years-old	3	1	4
Country of origin			
Spain	10	3	13
Educational level			
Primary or less	5	–	5
Secondary	2	3	5
University or more	3	–	3
Employment status			
Employed	3	–	3
Unemployed	0	–	0
Retiree or pensioner	4	3	7
Type of housing			
Rent	8	1	9
Mortgage	1	–	1
Ownership	1	2	3

Table 2
Perceived pathways involved in the relationship between tourism gentrification and health.

Theme (Perceived pathways)	Features
Decline of social networks	Privatization of public space Loss of social networks and community life Loss of nearby traditional stores Insecurity and mistrust towards the neighborhood residents Loneliness and isolation Sadness
Loss of identity	Uprooting and dissociation from the local environment (symbolic or emotional displacement) Sense of loss Indifference and alienation Impotence and anger Anxiety, sadness
Environmental changes	Invasion of public spaces, e.g. terraces, crowds of tourists, increased traffic circulation. Occupation of common spaces inside buildings: presence of luggage, garbage, etc. Insecurity while walking and risk of falls and accidents, e.g. crowded streets and constant presence of obstacles Damage and deterioration of public and private spaces Feelings of dispossession Changing to unhealthier habits Stress and anxiety
Pollution	<u>Environmental:</u> Polluted air, e.g. smoke from road traffic and cruise ships Presence of garbage Polluting products/single-use waste Anti-social behaviors and vandalism due to nightlife (e.g. human noise in public spaces) Rubbish and dust from construction works Respiratory problems Proliferation of pests (rats, flies, insects) Risk of falls (due to presence of garbage on streets) <u>Acoustic:</u> high levels of noise, bustle of streets of tourists, and leisure nightlife cause insomnia, stress, and anxiety <u>Visual:</u> presence of hyper stimuli (showcases, lights, sounds from stores) cause anger, strain, stress. Tourist-oriented stores, disconnected with residents' daily needs.
Changes in services and stores	Loss of relationships and acquaintances that give comfort and support to neighbors Difficulty to access essential products and fresh food Price increases Changes in food habits Feelings of dispossession Loneliness and Isolation
Speculation/Eviction	Increase in rental and house prices Proliferation of tourist flats Housing harassment Evictions Physical displacement to other areas of the city Discomfort derived from tourism (pressing wrong bells, elevator doors opened, noise, dirt, etc.) Mistrust (constant changes of neighbors of the area)
Activism by residents	Mental health problems: stress, uncertainty, anxiety, and depression Activism in the fight against tourist gentrification of the area Protective factor that mitigates the negative health impacts of living in a tourist area (such as feelings of dispossession, loneliness, etc.) Rebuild social networks Empowerment and mode to influence in their social reality Hope, motivation and resistance

gentrification and health: (1) decline of social networks, (2) loss of identity, (3) environmental changes, (4) pollution, (5) changes in services and stores, (6) property speculation/eviction and (7) activism by residents to mitigate the negative health effects of living in a tourist area. A summary of the main features of each theme is provided in [Table 2](#).

3.1. Theme 1: the decline of social networks

The loss of relationships and familiarity between neighbors was one of the most photographed topics. Participants identified two main determinants: a) the privatization of public space whereby socializing on the streets is not allowed, and b) the closure of traditional stores that

previously gave support to residents and their replacement by tourist-oriented shops. For instance, a 64-year-old man revealed, "Years ago, there was a neighborhood daily life. Now, the neighborhood has disappeared and become a tourist attraction" ([Photo 1](#)). Participants reported an increase in loneliness and isolation as well as insecurity and mistrust towards the new neighborhood residents. A 72-year-old woman said: "If something happens to me, who will care about it?" Feelings of sadness were depicted repeatedly in photographs, describing the loss of proximity and community life.

3.2. Theme 2: the loss of identity

Some photographs described the loss of identity which relates to a

place-based displacement experienced by participants as sense of loss as a whole (loss of neighbors and social networks, loss of public space for socializing, destruction of familiar environments and neighborhood services, etc.). It involves an emotional loss that participants described as a feeling of uprooting, or of symbolic or emotional displacement. Participants experience this sense of loss as a disruption in their daily lives. They felt powerless when seeing how their neighborhood had become a showcase that is kind to tourists but hostile towards its own residents. They reported having lost a sense of belonging to the neighborhood due to the many changes that have occurred in recent years. Now it belongs to “others”. A 64-year-old woman said: “It’s like you are the tourist because they have already taken you away from the neighborhood. You feel strange in your own street” (Photo 2). Regarding health, participants highlighted emotional insecurity, i.e. being in a state of alienation, as well as feelings of stress, anxiety, disaffection, and anger. As a 67-year-old woman said: “You feel uprooted when you are on the street because what you find is indifference. That gives us emotional insecurity”.

3.3. Theme 3: environmental changes

Photographs in this category describe the changes that tourism has produced in the physical environment of the neighborhood (public space), and in private environments (in the common areas within the same building where several neighbors coexist).

Changes in the physical environment, such as occupation of public spaces, were identified by participants as an invasion that makes them feel vulnerable. Many examples identify the cause of this occupation to be crowds of tourists, the presence of terraces in the public space, or increased transit of different types of vehicles (cars, bicycles, segways, skateboards, and wheeled luggage). A 58-year-old woman explained: “It causes mobility problems and anxiety because you want to walk through the street, and you see trucks at the same time as children are entering the school. And it’s impossible to pass. It causes me stress!” (Photo 3.a). Participants also reported how overcrowding in public spaces damages and deteriorates the heritage of the neighborhood. Moreover, they reported disruption to their mobility in a way that undermines their quality of life. For instance, living with constant stress, having to dodge obstacles in busy streets in order to move around, or changing their itineraries due to these disruptions. Some participants also highlighted the risk of accidents and falls due to damaged pavements or garbage on the ground.

Similarly, in private environments, where in the same block of apartments residents coexist with tourists, the increase in overnight stays in buildings causes annoyance in private spaces such as in the community stairs or entries where there may be luggage, skateboards, and additional discarded waste. Participants highlighted a risk of falls and feelings of fear and insecurity that cause them to change their daily habits. A 68-year-old woman said: “Inside the building you [have to] constantly avoid obstacles because [the tourists] have left their scooter, or their garbage. Imagine you must go down the stairs at nighttime and find yourself with all this stuff. It’s an invasion of space, and it also makes me feel insecure” (Photo 3.b).

3.4. Theme 4: pollution

In this category, participants selected photographs of three types of pollution:

a) *Environmental pollution*: The fumes of constant road traffic, along with those of cruise ships docked at the harbor, causes alarm among residents. Urban waste has many sources, including the presence of

garbage in the public space because of unsocial behaviors and nightlife. Also, reconstruction works in buildings create rubbish and dust on the streets. Participants identified impacts on health such as respiratory problems and the proliferation of pests such as rats, bugs, flies, and mosquitoes. A 59-year-old woman said: “The cruise ships, I guess, give off lots of pollution. Here, in the middle of Barcelona, it sometimes hurts badly to breathe!” (Photo 4.a). Moreover, many products designed for tourists are wrapped in single-use packaging, and made with plastics and other contaminating materials that often end up on the ground. According to participants, these may lead to increased risk of falls on the street, especially for vulnerable people such as children or the elderly.

- b) *Noise pollution*: Participants agreed that the extremely high levels of noise in the neighborhood, due to nightlife and overcrowded streets, was one of the main disruptions that affect their quality of life, causing insomnia, stress, and anxiety. A 72-year-old man reported: “When the heat [of summer] arrives, I have to open the window, but on the days there is a party outside, I can no longer sleep as I did twenty years ago” (Photo 4.b).
- c) *Visual pollution*: Participants highlighted the large number of hyper-stimuli in the public space, such as showcases, lights, and sounds that cause annoyance, strain and stress.

3.5. Theme 5: changes in services and stores

According to the participants, one aspect of tourism with the greatest effect on their quality of life is the disappearance of traditional stores, and their replacement with tourism-oriented stores that are completely disconnected from their daily needs. First, there is a loss of opportunities to meet acquaintances, with whom residents find comfort and an opportunity to socialize. Second, participants find it more difficult to access essential products, and observe an increase in prices that forces them to change their eating habits. Another important impact for participants is that they have to make more trips, and thus lose more time in daily shopping because they do not find all the products in the same store as before. The loss of the traditional food market for residents, such as ‘*La Boqueria*’, is an example of this feeling of dis-possession and damage. An 80-year-old woman described: “In *La Boqueria*, the juice shops are so annoying for me. Before, there was the fish shop, the grocery, and the butcher. But now, all there is plenty of is this kind of juice, and I dislike it very much. Now, *La Boqueria* is only for tourism” (Photo 5).

3.6. Theme 6: property speculation/eviction

This category is related to housing that is no longer a right, but rather has become a business, leading to eviction of resident as they cannot afford the increased house prices. According to a 64-year-old woman: “It’s a mourning. Something emotional that breaks you. The speculation has passed ahead your neighborhood” (Photo 6.a).

Participants identified aspects like property harassment suffered by older renters, the rise in rental prices, the proliferation of tourist flats, or the evictions of neighbors. Participants emphasized that living in residential insecurity is closely linked to mental health problems such as stress, anxiety, uncertainty, and depression. A 72-year old woman said: “It’s living in a mourning process, a fracture on your own life. If they evict me, they would kill me. My whole life is here, my memories ... all that is mine” (Photo 6.b).

3.7. Theme 7: activism by residents

Activism carried out by residents is perceived to improve the mental

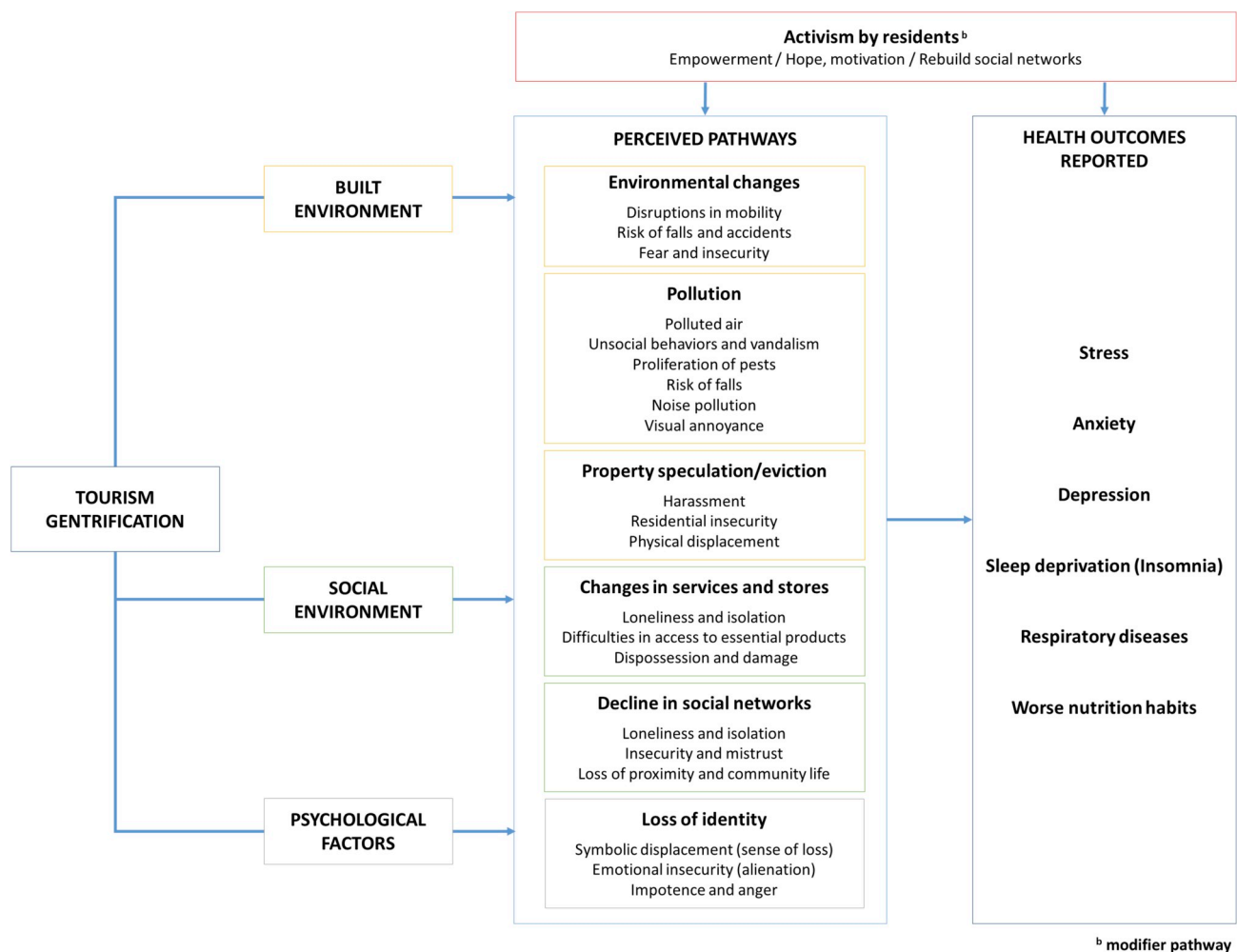


Fig. 1. Perceived pathways involved in the relationship between tourism gentrification and health.

health of the resident population, and is a way to tackle the feeling of dispossession the participants described. Meeting with equals and not feeling alone helps them to feel good about their difficult living situations. According to participants, activism is a way to rebuild a community network. A 67-year-old woman mentioned: “It is our medicine. Social networks are declining but, on the other hand, new ones are being created” (Photo 7). Further, activism activities give residents the opportunity to influence their settings by giving them hope and motivation. It is their way to resist unwanted forces in the neighborhood, such as the effects of tourism gentrification. Residents’ activism emerged as a protective factor for their health, according to the participants.

Finally, based on previous evidence (Anguelovski et al., 2019; Mujahid et al., 2019), we graphically present the range of perceived pathways related to tourism gentrification and health, reported by participants, classifying them by altering the built environment, social environment or psychological factors (see Fig. 1).

4. Discussion

The findings provided by this Photovoice study have allowed us to identify factors that link tourism gentrification and health. Residents of

the Gòtic neighborhood in central Barcelona were recruited to a participatory action research project, in which they identified seven categories that describe how the daily impacts of intense tourism can affect the health of local residents. One of the identified categories, ‘activism by residents’, was perceived to buffer the negative health effects of living in a touristic area.

To our knowledge, this is the first study that describes the perceived mechanisms of how tourism gentrification impacts health, while also allowing participants to form a critical analysis of their neighborhood. Our study provides valuable recommendations from participants, which policymakers and stakeholders can implement as adequate actionable solutions (see the supplementary file). Another strength of the study is the participatory action research approach, whereby participants were encouraged to make decisions and validate results from the beginning of the process. In this context, participants collected, discussed and coded the data and agreed the final categories of analysis. They were also involved in all dissemination and outreach activities of the project. Moreover, the ease of transmitting messages through photography facilitates participation by a broad demographic of people, and thus allows broad access to knowledge and awareness of the issue.

In our study, participants identified the ‘decline of the social networks’ and ‘changes in services and stores’ as two interrelated

categories. Both are linked with the loss of relationships between neighbors. Social networks decline due to the lack of meeting places to socialize and develop community life, while the loss of local shops causes residents to lose confidence and a sense of security in their neighborhood. Residents' sense of limited places to socialize, and the resulting loss of social contact caused by friends and acquaintances relocating elsewhere, has also been described previously (Shaw and Hagemans, 2015). Studies have described how the level of familiarity with one's neighborhood affects feelings of safety, which can in turn be undermined by gentrification (Blokland and van Eijk, 2011; Newman and Wily, 2006). A reduction in local food markets makes it more difficult to access affordable fresh food, thereby leading to changes in food habits. Pathways to poor health may therefore be explained by psychological changes and adopting unhealthy behaviors. These findings are consistent with those of a previous study describing shop closures as having the most substantial impact on people's sense of place (Shaw and Hagemans, 2015). New retail landscapes may evoke a sense of disconnection, independent of reduced access to affordable products (Tulier et al., 2019). Areas where residents have poor access to affordable healthy food, either due to high prices or the closure of traditional shops, are described in the literature as "food desert areas", and may lead residents to adopt more unhealthy habits (Cummins and Macintyre, 2002; Lang and Caraher, 1998; Shannon, 2014). In both categories, the participants described feelings of loneliness, isolation, mistrust, and insecurity with the new neighborhood residents.

Related to the two previously discussed findings, 'loss of identity' was described as emotional displacement or a feeling of uprooting. The result consisted of negative impacts on the mental health of residents, causing stress, sadness, disaffection and anger. Feelings of displacement can be experienced when a place changes, thereby emerging a community displacement (Davidson, 2009). Studies have shown that the loss of a sense of place among residents who remain in an gentrified area is as distressing as physical relocation, thereby exacerbating their community's displacement and social isolation (Davidson, 2009; Newman and Wily, 2006). Dissociation with the changing neighborhood is also linked to ontological security, which is understood to be the trust people place in the continuity of their own identity and experiences within their social environments (Giddens, 2012). Several studies have reported how loss of ontological security increases a sense of alienation and emotional insecurity, while also causing mental health problems such as anxiety or depression (Hiscock et al., 2001; Hulse and Sauger, 2008).

The participants in our study described 'environmental changes' as negative consequences of gentrification. The decline in public spaces, and resulting difficulties in mobility for residents, causes an increased risk of falls, as well as stress and anxiety. A previous study of tourism gentrification in the Gòtic area identified such daily disruptions to mobility due to the large number of visitors and the way in which, according to local residents, squares had been "rented" to bars and restaurants, which made the area "unlivable" (Cócola-Gant, 2018b).

Pollution was pointed out by participants as having a direct negative health impact due to tourism gentrification. Although several types of pollution were discussed, the high levels of noise in the area was a prominent topic in the participants' discussion. This observation is consistent with a recent report about nightlife noise in Barcelona, in which Gòtic is highlighted as one of the most strongly affected areas (Puiç-Barrachina, 2016). In our study, participants reported that this situation leads to insomnia, stress, and anxiety. In fact, previous studies have highlighted that noise makes it difficult to sleep at night, thereby having a harmful impact on health and quality of life (Stansfeld et al., 2000; Van Kamp and Davies, 2013; WHO, 2011). Moreover, poor quality sleep is associated with psychological and emotional

deterioration, resulting in negative changes in social behavior, and adverse effects on cognitive development, especially among children (Van Kamp and Davies, 2013; WHO, 2011).

Our study found that tourism impacts housing. Participants reported that the loss of affordable housing and eviction of residents from the neighborhood could have negative effects on mental health. Housing affordability and secure tenure, which allows people to have a stable home, contributes to physical and mental health and supports the development of a life plan and social integration (Shaw and Hagemans, 2015). In turn, recent reviews agreed that housing affordability, as well as foreclosures and the eviction process, have negative consequences for both mental health (depression, anxiety, and suicides) and physical health, including poor self-reported health, high blood pressure, and mistreatment of children (Downing, 2016; Tsai, 2015; Vásquez-Vera et al., 2017). There is also evidence that people affected by these processes are more likely to develop unhealthy behaviors (Vásquez-Vera et al., 2017).

Residents' activism and protest were described by participants as their way of empowering themselves to influence their social environment and elicit changes in their neighborhood. In this sense, activism may act as a mental health tool by mitigating feelings of dispossession. Prior studies have shown the positive effects of social cohesion in both physical and mental health (Kawachi et al., 2008; Kawachi and Berkman, 2000; Vásquez-Vera et al., 2019), and how social support and mutual help decreases anxiety and stress (Berkman and Glass, 2000; Vásquez-Vera et al., 2019). Several authors have proposed the category of "stress" as an intermediate psycho-social variable that links living conditions with mental health, exploring the vulnerability to susceptibility and disease of individuals (Cassel, 1976; Karasek, 1979; Levi, 1984). Cassel's work highlighted how social support, understood as the quality of personal social relationships, played a central role in maintaining individual health by facilitating adaptive behaviors in situations of stress, hence acting as a protective health factor (Cassel, 1976). Similarly, collective work and cooperation with others gives a sense of coherence and can bring greater access to material resources and services (Kawachi and Berkman, 2015).

Lastly, another aspect of our study is the participatory action research process, which can have a positive effect on empowerment and advocacy at both the individual and community levels. As part of the dissemination strategy of this Photovoice project, we developed a free downloadable magazine (www.fotoveugotic.org) and a photographic exhibition of the 35 photographs selected by participants and their corresponding narratives. The exhibition has been placed in various public settings in Gòtic neighborhood, such as the library, community facilities, the Gòtic health care center and neighborhood associations. We also organized a meeting with local policymakers where participants delivered the recommendations they had generated (see the [supplementary file](#)). Moreover, the project has been followed with interest by media, where participants have been interviewed by a local radio program and television news.

However, our study has some potential limitations. First, since it was conducted within BHiN program, the study only covered one neighborhood in Barcelona; therefore, the results may not be transferable to other neighborhoods in the city. However, the Gòtic neighborhood is one of the area's most strongly affected by tourist gentrification, and therefore it was challenging to establish community connections between residents. Second, due to the small sample size, the characteristics of the participants are not representative of all residents in the area. Nevertheless, this study uses an appropriate approach to initially characterize the gentrification problem and its health impacts. Third, women and men were not equally represented in our Photovoice group. A review of uses of the Photovoice methodology in health

studies reported that most projects recruited more females than males, and that women might be more inclined to participate in such community groups (Catalani and Minkler, 2010). We also note that the Photovoice methodology is a long process in which it is difficult to maintain participants' engagement. Finally, in terms of the resulting outcomes in their neighborhood, it was difficult to manage participants' expectations, even though their findings are an important first step towards awareness of the issues of gentrification, and can support the formulation of structural policies to tackle the problem. This concern was also stated by Budig et al. (2018), indicating how Photovoice achieved individual experiences of empowerment (in terms of knowledge gain, developing critical awareness of the community or expanded social networks) but not social change. Strategies and limitations for such social change must have been clearly communicated to participants for avoiding unrealistic expectations (Farquhar et al., 2005; Johnston, 2016).

5. Conclusions

Tourism gentrification impacts neighborhood life and, in doing so, its residents' health. This Photovoice study has provided a greater understanding of the perceived pathways between tourism gentrification in the Gòtic area in Barcelona and the health of its residents by altering the built environment, the social environment or psychological factors. Throughout their photographs and collective discussions, participants identified seven salient pathways underlying the relationship between tourism gentrification and health. Among them, six pathways were related to negative health outcomes, both physical (respiratory diseases, worse nutrition habits) and mental (sleep deprivation, stress, anxiety and depression). Only one pathway, 'activism by residents', was perceived to buffer the negative health effects of living in a touristic area. Participatory action research methods such as Photovoice entail the opportunity for advocacy and empowering affected residents, which is crucial for developing bottom-up health policies. However, further research and public engagement are urgently needed to address tourism gentrification in urban areas.

Credit author statement

Esther Sánchez-Ledesma: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft. **Hugo Vásquez-**

Appendix

Vera: Methodology, Writing - Review & Editing. **Natàlia Sagarra:** Methodology, Writing - Review & Editing. **Andrés Peralta:** Methodology, Writing - Review & Editing. **Victoria Porthé:** Writing - Review & Editing. **Èlia Díez:** Supervision, Funding acquisition, Writing - Review & Editing.

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Availability of data and materials

Transcriptions of the groups' discussions are available from Esther Sánchez-Ledesma (esanchez@aspb.cat).

Ethics approval

All participants gave informed written consent to participate, and the study was approved by the Ethics Committee of Parc Salut Mar, Barcelona (n° 2019/8869/I).

Consent for publication

All participants who appear in the photographs have given their consent for publication.

Declaration of competing interest

The authors declare that they have no competing interests.

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Photo 1. "The closure of the toy shop" (R.P, a 64-year-old man).



Photo 2. “The loss of cultural identity” (M.C. 64- year-old women).



Photo 3.a. “The street is stressful” (B.B. A 58-year-old woman).



Photo 3.b. “Invasion of my space” (M.P, 68-year-old woman).



Photo 4.a. “Sometimes it hurts badly to breathe” (E.A. 59-year-old woman).

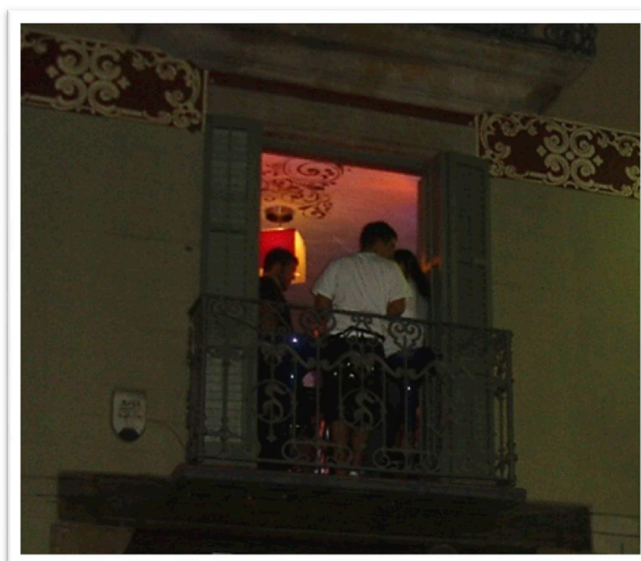


Photo 4.b. “A party during the night” (M.M. 72-year-old man).



Photo 5. "La Boqueria is for tourists" (E.G, 80-year-old woman).



Photo 6.a. "Barcelona is not for sale!" (M.M, 43-year-old-woman; A.G, 72-year-old-woman).



Photo 6.b. “If they evict me, they kill me” (A.G, 72-year-old woman).



Photo 7. “Fem plaça” (T.P, 67-year-old woman).

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2020.113095>.

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