ARTICLE

Housing circumstances and quality of life among local and immigrant population in Norwegian neighbourhoods

Ana Llopis Alvarez[1] ⬤ · **Daniela Müller-Eie[1]** ⬤

Abstract
This paper explores the relationship between the concept of quality of life (QoL) and housing circumstances among the immigrant and local population of two neighbourhoods in Norway: Storhaug in Stavanger and Grünerløkka in Oslo. Objective data regarding housing circumstances, e.g., type of residence, dimension or overcrowding, is collected through spatial analysis and desktop-research. Inhabitants of these neighbourhoods are interviewed with the help of map-based questionnaires to collect both objective data regarding these housing circumstances as well as subjective data, e.g. reason of location and personal satisfaction with housing and QoL. The objective and subjective data is analysed geographically and statistically. This study finds that the immigrant group has less favourable housing circumstances than the local population. Circumstances such as type of residence, the reason of location and satisfaction with the residence are predictors for satisfaction with QoL between both groups. Being local or immigrant, as well as the study area, Storhaug and Grünerløkka, or the type of ownership were not significant predictors of satisfaction with QoL in this specific study. These findings provide a base for understanding the importance of housing circumstances for QoL. Due to the high percentage of the immigrant population and its projection in Norway, these investigations are expected to help practitioners identify housing features and design aspects that can impact on the overall satisfaction with QoL of both host and immigrant society.

Keywords Housing circumstances · Quality of life · Subjective mapping · Spatial analysis · Migration

1 Introduction

Quality of life, or QoL, is a notion that has been discussed in many studies (Massam, 2002; McMahon, 2002) as a response to problems facing the urban areas, such as traffic, crime or social segregation (Myers, 1988; Young, 1999). The literature on the concept of QoL within sociology, psychology, human geography or environmental design fields reveals QoL is a compound of several dimensions (Ferriss, 2004; Sirgy, 2012). Some of

✉ Ana Llopis Alvarez
    ana.l.alvarez@uis.no

[1] Department of Safety, Economics and Planning, University of Stavanger, Stavanger, Norway

these dimensions are particularly relevant to environmental designers and urban planners, i.e., places ranging in scale from the individual dwelling and local neighbourhood, to the city and region, and even the state or nation, influence people's lives. For the design and planning disciplines, it is therefore relevant to understand the relationship between physical conditions, and the user's perception of them. Studying how urban housing environments allow (which) individuals and households, neighbourhoods and communities to achieve high QoL is a topic worthy of investigation (Elariane, 2012). This paper studies to which degree housing circumstances and satisfaction with the residence affect satisfaction with QoL in two case studies in Norway, and whether there are differences between local and immigrant populations. This study is part of a larger study where the housing circumstances represent one of the domains that define the concept of residential conditions, together with neighbourhood conditions. A parallel study about neighbourhood conditions in the same research areas and population groups is conducted (forthcoming).

2 Background

Norway performs very well in many measures of QoL in comparison to most other countries around the world, standing at the top of several indexes when referring to subjective well-being (Eurostat, 2016; Better et al., 2019; HDR, 2019). This fact positions Norway as a worldwide example in many domains for other countries. Numerous studies focus their attention on the Norwegian housing domain at a country level (Aarland & Nordvik, 2009; Hjorthol & Bjørnskau, 2005; Høyer & Holden, 2001; Nordvik, 2015; Søholt et al., 2012) or a city level (Andersson et al., 2010; Thomsen & Eikemo, 2010; Vassenden, 2014). However, in the current study the neighbourhood level is considered as the optimum scale to carry out QoL research giving concrete design and planning implications.

Investigating QoL is important as urban areas and their populations grow. Immigration has become one of the key components of urban population growth, more specifically, immigration in Norway has been the main contributory factor to population growth since the mid-2000s (Statistikkbanken, 2019c). This arrival of immigrants has played an important role in changing the size and geographical composition of Norway, where 17,7% of the population has an immigration background (Statistikkbanken, 2019c).

As in many European countries, migration has been one of the main justifications of development, change and transformation of urban areas in Norway. Immigration in Norway is a factor for urban and social transformation since the 60 s, and more attenuated during the last decade. Norway's migration policy refers to four categories when defining *immigrants (*Ministries, (2017–2018)*)*: (1) labour immigrants, i.e. persons who have a concrete job offer, (2) persons with close family ties to somebody residing in Norway, (3) students, trainees, au pairs and participants in an exchange program and (4) refugees and persons who qualify for a residence permit on humanitarian grounds. Only categories (1), (2) and (3) are included in this study. Many refugees (4) in Norway are under the protection of the state, meaning they are directly located in specific areas and given a place to reside. Since they have not selected their place of residence nor the residence in which they live, interviewing this specific group of immigrants would not provide meaningful results. Thus, the main question is how housing circumstances relate to QoL among locals and immigrants, and whether there are systematic and significant differences between these population groups or between the case study neighbourhoodsr.

2.1 Indicators of QoL and housing circumstances

The interest in QoL began to rise in the 1960s when it became a concept used in health, education, jobs and earnings, politics, civic engagement or income and wealth (Marans, 2012). The growing interest in human well-being led to the need to measure this subjective reality through objective data. In addition to referring to physical, economic and social conditions, QoL also includes personal satisfaction with the physical, socio-economic, and cultural conditions under which a person lives. Some authors use the term interchangeably with other concepts such as subjective well-being, happiness, life satisfaction, the good life and liveability (El Din et al., 2013).

In the European literature, there is a consensus that immigrants and minority ethnic groups face disadvantages in the housing market (Lindberg, 1993; Stamsø, 2009). The literature on segregation and housing market for ethnic minorities in Western European cities has shown that minorities have typically been confined to the least desirable private or social rented housing in the inner city or peripheral estates (Butler et al., 2008). This is also the case in four Nordic countries: Denmark, Finland, Norway and Sweden. These Nordic countries have experienced substantial growth in immigration over the last 25 years, which has changed the composition of the population. Despite universal welfare policies, the majority of the immigrants in all four countries find themselves in different housing positions from the general population.

One of the most essential tasks facing people in host countries is ensuring that they can meet their own needs, 'housing' being one of their most important (Maslow, 1943). It has been demonstrated an increase in housing satisfaction is accompanied by an increase in life satisfaction (Peck & Kay Stewart, 1985; Westaway, 2009). Studies also suggest an individual's QoL is influenced by a combination of social and physical domains; with housing being a significant indicator of QoL (Campbell et al., 1976; Oswald et al., 2003; Sirgy & Cornwell, 2002; Zebardast, 2009). Certain housing conditions can be responsible for health inequities among different groups of people based on social and economic class, gender, and ethnicity. These health inequities refer to the concept of Social Determinants of Health, SDOH, defined as complex circumstances under which individuals live and can affect their health (Catalyst, 2017). Factors such as political, socioeconomic, cultural as well as place-based conditions are included. Well-designed neighbourhoods and access to housing and certain utility services (adequate proportion, affordability, the existence of certain spaces or sufficient light) can be associated with higher levels of housing satisfaction (Howley, 2010; Meen, 2011).

This study research includes several of these mentioned housing circumstances. *Firstly*, residence type. Preferences about the type of residence, if given a choice, can affect individuals (Burgess & Skeltys, 1992; Winston, 2014). *Secondly*, the reason for locating in a certain area and choosing a residence is considered a relevant housing condition and a personal need. People frequently prioritize certain characteristics of urban areas such as environmental amenities (Bhat, 2015; Rouwendal & Meijer, 2001), good maintenance (Gawande & Jenkins-Smith, 2001; Nowak, 2002), perspective views and natural environment (Hörnsten & Fredman, 2000; Lindhagen & Hörnsten, 2000), recreational opportunities including green areas and open public spaces (Colwell et al., 2002; Greenberg & Lewis, 2000), the presence of nearby service facilities (Apparicio & Séguin, 2006; Bowes & Ihlanfeldt, 2001), as well as the housing itself (Margulis, 2002; Sirmans et al., 2006). Housing preferences for the immigrant population can also depend on expectations concerning staying in the country or returning to where they come from (Andersen et al.,

2013; Musterd & Deurloo, 2002). *Thirdly*, the study also considers the number of people and number of bedrooms in the residences. The number of rooms in a dwelling, divided by the number of persons living there, indicates whether residents are living in crowded conditions. Overcrowded housing may harm physical and mental health, relations with others, and children's development (Better et al., 2019). *The fourth* objective indicator analysed in this study is the type of tenancy. Some studies suggest that homeowners enjoy better quality housing and neighbourhood satisfaction than a renter does (Elsinga & Hoekstra, 2005; Mulder, 2006). This concept is individualistic and includes other concepts such as economic or labour aspects. This study investigates two different population groups and therefore difference between them with regards to tenancy must be contemplated (Benson and O'reilly, 2009; Williams & Hall, 2002).

Studies tend to focus on cognitive evaluations of individuals' situations when referring to subjective well-being, e.g., happiness, and/or life satisfaction. This paper attempts to complement existing studies by focusing on satisfaction (the subjective component) as a measure of QoL and exploring the possible links between it and certain housing circumstances. This particular focus on housing circumstances and QoL among local and immigrant population leads to sub-sequent research questions: (1) Do immigrants and locals live under systematically different housing circumstances, and are these circumstances different in Storhaug and Grünerløkka? (2) Do immigrants and locals experience a different QoL? (3) Which housing circumstances affect QoL?

3 Method

3.1 Data collection

This study aims to identify the relationship between housing circumstances and Quality of Life of the local and immigrant populations in two Norwegian neighbourhoods. Housing circumstances under which individuals live are considered a significant indicator of Quality of Life (Westaway, 2009). Storhaug (Stavanger) and Grünerløkka (Oslo) are the Case Study areas, selected due to their percentage of immigrant population as well as their urban, social and environmental characteristics. Local and immigrant residents have been interviewed in both neighbourhoods (238 participants in total). These population groups are being compared based on their housing circumstances and their perceived Quality of Life.

For the purposes of breadth and depth of understanding and corroboration, this research combines elements of qualitative and quantitative research approaches. This combination of qualitative and quantitative methods is defined as mixed methods.

Several definitions of mixed methods have emerged over the years that incorporate various elements of methods, research processes, research purposes and philosophy (Creswell & Creswell, 2017). Tashakkori et al., (1998) defined mixed methods as a combination of qualitative and quantitative approaches in the methodology of a study. A more elaborated definition stood years later as a research in which the investigator collects and analyses data, integrated the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry (Tashakkori & Creswell, 2007).

In this study, qualitative data provides a detailed understanding from the participants while quantitative data provide a more general understanding of the housing

circumstances in the Norwegian neighbourhoods. The qualitative data studies individuals and explore their perspectives in-depth, whereas the quantitative examine a large number of people assessing responses to a few variables related to their housing circumstances. Qualitative and quantitative data provide therefore different pictures, perspectives and each has its limitations. When studying a certain number of participants qualitatively, the ability to generalize the results to many is lost. Similarly, when examining quantitatively many individuals' situation, the understanding of any individual is diminished. Hence, the limitations of one method can be offset by the strengths of the other, and the combination of quantitative and qualitative data in this project provides a more complete understanding of the research problem than either approach by itself.

Integrating both qualitative and quantitative findings into this study helps to gain insight into participants' points of view, explore social, demographic, and urban phenomena.

This study enhances the qualitative method by integrating the subjective component (participants' satisfaction and perception) used to link activities and place perceptions of spatial and physical referents as an essential method for this study and substantial input for researches of similar scale and purpose.

This section includes a research design model in which the relationship between housing circumstances and QoL is explored using the previously mentioned methodologies (Fig. 1). First, the housing circumstances under which both population groups, i.e., local and immigrant populations, live are identified. Objective data from different sources has been collected and mapped (Statistikkbanken, 2019a, 2019c). Besides, subjective data has been collected by map-based questionnaires to identify both groups' satisfaction with their residences and their QoL.
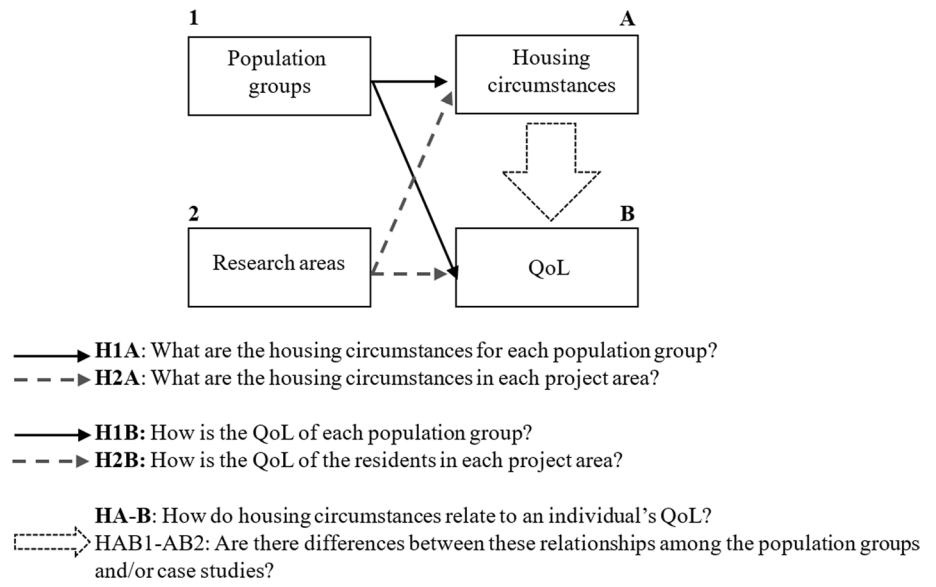

H1A: What are the housing circumstances for each population group?
H2A: What are the housing circumstances in each project area?

H1B: How is the QoL of each population group?
H2B: How is the QoL of the residents in each project area?

HA-B: How do housing circumstances relate to an individual's QoL?
HAB1-AB2: Are there differences between these relationships among the population groups and/or case studies?

Fig. 1 Model of research design. (Color figure online)

3.2 Measures

In this study, quantitative data has been gathered by spatial analysis and desktop research. Sources are official governmental websites, including census data and geographic information systems sources (GIS). Both Stavanger and Oslo municipalities have official websites where demographic and spatial information has been gathered (StavangerKommune, 2019; Oslokommune, 2019). At the national level, *Statistisk Sentralbyrå* (Statistics Norway), has provided for this study much of the objective data related to social and physical aspects (Statistikkbanken, 2019c).

Regarding the qualitative data, paper-based and digital questionnaires have specifically been designed for this study to interview the participants (Llopis & Müller-Eie, 2019, under review). GIS, besides serving as an instrument for collecting objective data, has also served as a tool for linking subjective data from the participants to the spatial components.

3.3 Analysis

Statistical analysis is used to describe qualitative and quantitative data as well as validating it. The analytical approach is a cross-sectional ordered logit regression model with self-assessed satisfaction with QoL as the dependent variable and a set of explanatory independent variables: a population group variable encoded as Norwegian or Non-Norwegian, and a variable for each research area. Furthermore, a set of variables for the reason of residence location, type of residence and type of ownership. Finally, a variable for satisfaction with residence, the number of people living in the residence and number of bedrooms.

Satisfaction with QoL is measured with a five-point Likert scale. As QoL is a discrete and ordered variable rather than a continuous variable, an ordered logit regression with maximum likelihood estimation (MLE) has been used.

3.4 Sampling and limitation

In this research study, 238 participants have been interviewed. These are inhabitants of the two research areas and therefore considered individuals who can provide significant data about their housing circumstances and their perception and satisfaction with their residences and their QoL.

Participants were randomly reached as they passed by public streets, green areas, or open public spaces around their neighbourhoods. The selected areas for conducting the questionnaires are located around the neighbourhood and distanced from each other, expecting to reach as many participants as possible living in the different areas of the neighbourhood.

In Storhaug, 124 people have been interviewed, 74 Norwegians (60%) and 50 immigrants (40%). In Grünerløkka, 114 people have been interviewed, 68 Norwegians (60%) and 45 immigrants (40%).

There is an overrepresentation of Norwegian participants. This can be due to different reasons. The immigrant group may be more concerned to talk about their personal situation or QoL especially if they consider it is still different from what they are aiming for; and therefore, not willing to contribute to this research by answering the questionnaires. Another reason may be that participants were approached in public spaces, in streets or in green areas in their neighbourhoods. Local participants in a parallel study have reported

using more public spaces and green areas than immigrants (Llopis & Müller-Eie, 2019, *under revision*). This may be the reason why it has been easier to find a higher number of local inhabitants in open spaces and green areas than immigrants.

Participants were firstly approached without indeed knowing if they were residents of the project areas. Some participants happened to just be visiting the area and therefore excluded from the study since the purpose is to collect data from participants' satisfaction with their residences living in Storhaug and Grünerløkka.

Map-based questionnaires (digital and paper format) are the qualitative method used in this study for registering participants' perception and satisfaction. These questionnaires have been designed for this specific study. Participants were able to choose the format since the interviewer could conduct the questionnaire using paper or digital format. Certain groups were more interested in the digital format, especially younger participants, probably due to their familiarity with technologies. However, both formats resulted favourable, probably due to the positive impact of using a background map, encouraging discussion and dialogue between the participant and the interviewer. Presenting a map to the participants where they can locate their residences and identify the areas they normally visit, may contribute to starting a discussion about areas they feel familiar with.

4 Local and immigrant population in Storhaug and Grünerløkka

Storhaug (in Stavanger) and Grünerløkka (in Oslo) are the Case Study areas. These two neighbourhoods are selected due to the high percentage of the immigrant population (20%) as well as their actual urban and social development. Storhaug and Grünerløkka differ from each other in demographic and urban aspects, i.e., physical distribution of services, housing layout or transport system. The most prominent difference between the neighbourhoods is the housing structure, where 93% of the residences in Grünerløkka are apartments compared to a more variety of residence types in Storhaug (Statistikkbanken, 2019a). Both areas have a similar percentage of green areas (15%), but different shares per resident due to the population density (100 m^2 green areas /person in Storhaug, 40 m^2 green areas / person in Grünerløkka). According to the transport system, Grünerløkka offers more possibilities (bus, tram, tube and el-cycle) than Storhaug does (bus). Probably due to a larger amount of population or the relevance of the transport system in Oslo, as a capital.

When referring to their morphological structure, Grünerløkka is more homogenous than Storhaug, which has a greater variety of residences, both in terms of typology, dimension, and cost. Socially, Storhaug presents specific areas where the share of the immigrant population is very high in comparison to others where the share is low. Grünerløkka is more homogeneous, where 93% of the residences are apartments and the share of immigrants is very similar across the research area. Of the immigrant population in Storhaug 16% are Polish, followed by 6% Swedish and 6% English. In Grünerløkka, the biggest community is Swedish with 16%, followed by 13% Polish and 5% Spanish (Statistikkbanken, 2019c). Among the respondents, the most prominent immigrant nationalities in Storhaug were 8% Polish, 6% Portuguese and 6% Spanish. In Grünerløkka, the most prominent nationalities were 6% Somali and 4% Spanish (Table 1).

When asking the respondents about their reason for migration to Norway, in Storhaug, 60,9% answered it was due to the labour market, 34,8% answered it was due to family or social contacts, and 4,3% said it was for other reasons. In Grünerløkka, 37,8% answered it was due to the labour market, while 40,0% due to family or social contacts, and 22,2% said

Table 1 Population data, Storhaug and Grünerløkka (Statistikkbanken, 2019c)

	Total Population	Immigrants	Norwegians	% Immigrants	Dimension (km²)
Storhaug	17,174	3544	13,630	20.6	11.5
Grünerløkka	60,844	12,497	48,347	20.5	17.4

it was for other reasons. When referring to the cities corresponding to the research areas, Stavanger, the oil capital of Norway, attracts particularly work immigrants, while Oslo, the capital of Norway, attracts larger numbers and diverse categories of immigrants. According to collected data referring to the reason for migration in both research areas, it can be said that 50% of the participants moved to Norway due to the labour market and 36% due to social or family reasons. Given this importance of the labour and social dimensions, these aspects must be considered when interpreting the results about satisfaction with QoL.

This paper analyses (part of) the physical dimension that defines the concept of QoL, more specifically the focus is on the housing domain. Participants are asked about their satisfaction with certain housing circumstances, about their satisfaction with their residence and their satisfaction with QoL. However, participants may consider other personal aspects (labour and social) when providing their degree of satisfaction about QoL (Table 2).

5 Housing circumstances in the case studies

To operationalise housing circumstances in the case studies, several indicators have been considered: type of residence, type of ownership and overcrowding measure.

5.1 Type of residence

At a national level, the *single-family house* is the predominant type of residence. However, there is an important difference between the two research areas, since 93% of the residences in Grünerløkka are apartments, compared to more diverse types of residence in Storhaug (Statistikkbanken, 2019a).

When comparing this to the questionnaire data, 92% of the respondents in Grünerløkka live in apartment buildings, while we can find more variety in Storhaug with 58% of respondents living in apartments, 27% in single-family houses, 14% in semi-detached houses and 2% in terraced houses. Thus, the questionnaire data is representative concerning housing types.

Table 2 Percentage of residences according the type, 2018. Norway (Statistikkbanken, 2019a)

	Block of apartments (%)	Terraced house (%)	Semi-detached (%)	Single-family house (%)	Other (%)
Norway	19.3	11.8	9.7	56.2	3.0
Grünerløkka	93	1.9	1.3	0.9	2.9
Storhaug	31.6	13.2	31.7	18	5.5

With the majority of respondents in Grünerløkka living in apartments, there are little differences between locals and immigrants. In Storhaug, there is a clear difference with the majority of immigrants (84%) living in apartments, while locals live in single-family houses (42%), apartments (39%) or semi-detached houses (17%) (Fig. 2). When referring to the residences, dwellings in Grünerløkka are smaller than the ones in Storhaug. With *apartments* being the predominant type of residences in Grünerløkka, the majority of them (61%) are between 50 and 90 m^2. In Storhaug only 44% are between 50 and 90 m^2, and 36% are over 100 m^2, mostly representing single-family houses (Statistikkbanken, 2019a).

One of the possible reasons why immigrants differ from the local population in terms of the type of residence may be related to their migration process stage. The immigrant population's settlement in the city has to be understood as a dynamic process involving different stages: the arrival, settlement and stabilization. With the improvement of the economic and legal status, residential conditions and relationship with the host society, the stages will vary accordingly (Burgess & Skeltys, 1992; Dieleman & Everaers, 1994; Fullaondo & Garcia, 2007; Nordvik, 2015). These migration phases can be interpreted as an indicator of the living conditions and social position of the immigrant population, where certain phases may be translated into more limited and economic or reasonable residences than the local population.

The collected data indicates that there are systematic differences between locals and immigrants (H1A). These differences are prominent when referring to the type of their residences, especially in Storhaug, where most of the immigrant population live in apartments, and locals live in a major variety of residences, more specifically, single-family houses. Certain types of residences can be associated with other dimensions that define QoL, e.g., economic, or labour market dimension. Single-family houses in most cases represent the largest and most expensive types of residences. Therefore, participants living in this typology are considered to live under favourable conditions referring to economic, labour, migration, or other personal aspects.
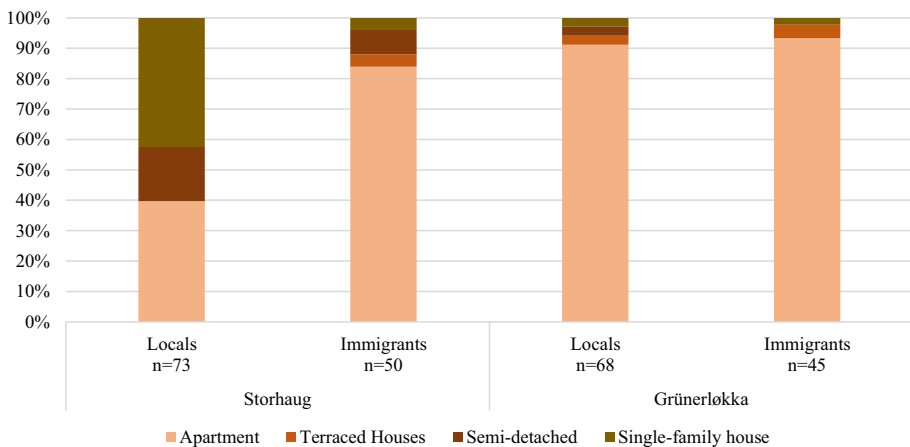

Fig. 2 Type of residences among respondents, by population group in the two research areas (*Source*: own research questionnaires). (Color figure online)
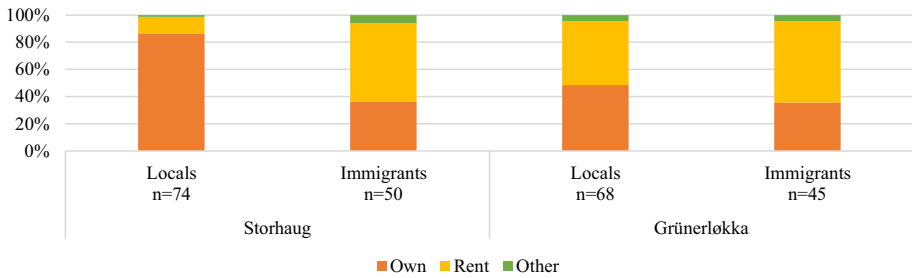
Fig. 3 Type of ownership, by population group in the two research areas (*Source*: own research question-naires). (Color figure online)
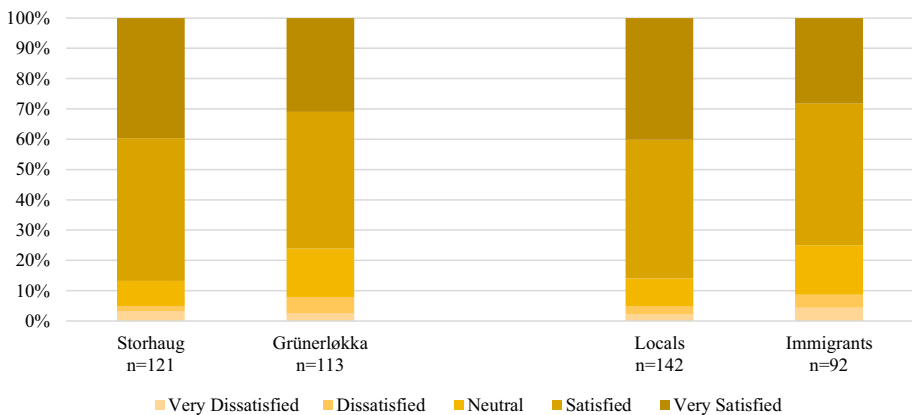

Fig. 4 Degree of satisfaction with the residence among Norwegian and immigrant participants, Storhaug and Grünerløkka. (Color figure online)

5.2 Type of ownership

Whether an individual owns a residence depends on many factors (Aarland & Nordvik, 2009; Elsinga & Hoekstra, 2005): economic situation, satisfaction with the residence itself or the neighbourhood in general, the settlement stage in an urban area or personal aspects among others, e.g., heritage. In Storhaug 66% of the housing is owned, while in Grüner-løkka only 43% is owned (Statistikkbanken, 2019b). Based on the questionnaire, 86% of the local respondents in Storhaug own their residences, while only 36% of the immigrant population do. In Grünerløkka, 48% of the local respondents own their residents compared to 35% of the immigrant respondents (Fig. 3).

The concept of ownership can be related to the reason why an individual locates their residence in a specific urban area. One of the main reasons why respondents said to have chosen Storhaug to locate their residences is due to its location within the city, and therefore an intrinsic characteristic of the neighbourhood. In Grünerløkka however, most respondents value the proximity to work or school, which can be seen as a tempo-rary reason and therefore less influential when buying a residence (Fig. 4). Ownership is also related to the type of residence and size. The fact that most of the residences in

Grünerløkka are apartments of small/medium size may not be of interest to those who are planning to own a residence. This can be due to the location of the residence being just temporary and therefore less interesting for ownership.

As established in studies of tenure preferences (Andersen et al., 2013; Vassenden, 2014), homeownership is highly dependent on future expectations: employment, rising income or permanent settlement. Newly arrived immigrants are often uncertain about their future and whether they will settle permanently in the new country. It is therefore expected that immigrants have a higher preference for renting than the local population. Some studies explain the housing situation of ethnic minorities with a lack of economic, cognitive, political and social resources (Van Kempen & Şule Özüekren, 1998). Specifically referring to the housing market, having relevant knowledge about the possibilities and rules of the housing market often requires good language skills or good access to advisers (Søholt, 2007; Søholt & Astrup, 2009).

The collected data thus indicates that there are systematic differences between locals and immigrants concerning ownership status (H1A) since the local respondents are the ones representing the majority of the owners. When comparing the two research areas (H2A), Storhaug has a larger number of owners compared to Grünerløkka.

5.3 Overcrowding

This indicator assesses the proportion of people living in an overcrowded dwelling, as defined by the number of rooms available to the household, the household's size, as well as its members' ages and family situation (Myers, Baer, & Choi, 1996). Having sufficient space is essential to meet people's basic need for privacy and for making home a pleasant place to be. It is important to understand that households may choose to live in smaller houses or apartments located in better-serviced areas, rather than in larger homes located in poorer neighbourhoods. This indicator can differ from one participant to another according to family situation, their migration process stage if immigrants, preferences according to house vs neighbourhood or other personal preferences.

Both the number of people living at the residence and the number of bedrooms at the residence are related to the type of residence. When referring to the number of bedrooms per residence, 60% of the residences in Storhaug have either two or three rooms, while in Grünerløkka 73% (Statistikkbanken, 2019a). In Grünerløkka only 11% have four or more bedrooms, while in Storhaug it is 31%, reflecting the predominance of apartments in Grünerløkka and single-family houses in Storhaug (Statistikkbanken, 2019a). In the questionnaire, local participants from Storhaug are the ones representing most of the residences with three or more occupiers (60%), and four or more bedrooms (36%), confirming the connection between the type of residence (single-family house) and dimension (over 100 m^2) among locals in Storhaug. In Grünerløkka, 62% of the participants live in residences with one or two people, and 76% of them live in residences with one or two bedrooms. This corresponds to dwelling type and size, with most of the residences in Grünerløkka being apartments of 50–99 m^2.

Thus, overcrowding also presents differences between the two groups (H1A), since the locals are the most representatives in residences with three or more people as well as residences with three or more bedrooms. Comparing the two research areas (H2A), due to the type and dimension of the residences, only Storhaug presents high percentages of residences with three or more people or three or more bedrooms.

5.4 Satisfaction with the residence

Participants living in the research areas have been asked to report perceptions regarding their residence that do not satisfy them. The size, noise in the area, maintenance of the residence (isolation in winter), the absence of certain amenities (balcony, terrace, own entrance, garage) or insufficient natural light, have been the most commented aspects in the research areas. In Storhaug 47% of all the respondents are satisfied with their residence, and 40% are very satisfied. In Grünerløkka, 45% of all the respondents are satisfied with their residence, while 31% are very satisfied (Fig. 5). Most of the locals are either satisfied (45%) or very satisfied (40%) with their residences. On the contrary, 46% of the immigrant population is satisfied while only 28% are very satisfied with their residences (Fig. 5). Based on this, the degree of satisfaction with housing is similar when comparing the two research areas. Results are also similar when comparing the population groups except at the highest degree of satisfaction since a larger share of the local population seems very satisfied with their housing compared to the immigrant population.

Two conclusions can be drawn from these results. Firstly, the participants of this study are highly satisfied with their residences, regardless of the neighbourhood they reside in. Secondly, there is a difference when comparing the two population groups at the highest degree of satisfaction. As presented, the type of their residences, type of ownership or overcrowding rates are less favourable for immigrants. Their personal situation in the host country, their position in the labour market, social aspects or their migration stage process can influence this degree of satisfaction.

5.5 Quality of life

When analysing satisfaction with QoL of each population group (H1B), results indicate that the degree of satisfaction with QoL does not differ much between the two areas (H2B), since in Storhaug 38% of all the participants are very satisfied, compared to a 32% in Grünerløkka (Fig. 6). The most substantial difference is at the highest degree of satisfaction, where locals represent a higher percentage (44%) than immigrants (22%). The difference between the two groups at the highest degree of satisfaction is higher when comparing satisfaction with QoL than satisfaction with the residence. When asking the participants about their satisfaction with QoL, the focus is no longer on the housing domain nor the
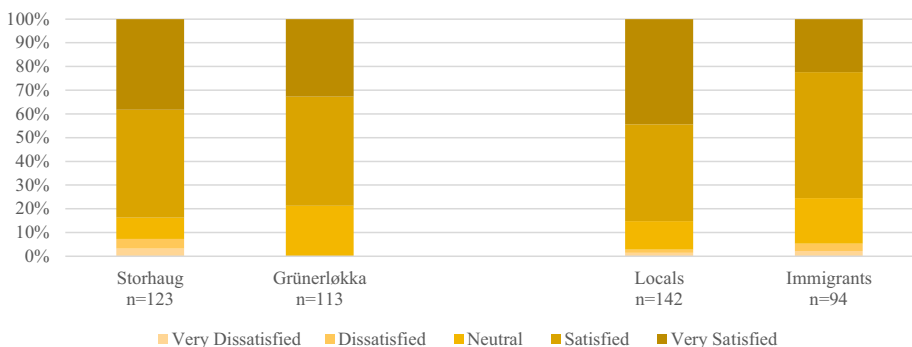

Fig. 5 Degree of satisfaction with QoL among Norwegian and immigrant participants, Storhaug and Grünerløkka. (Color figure online)
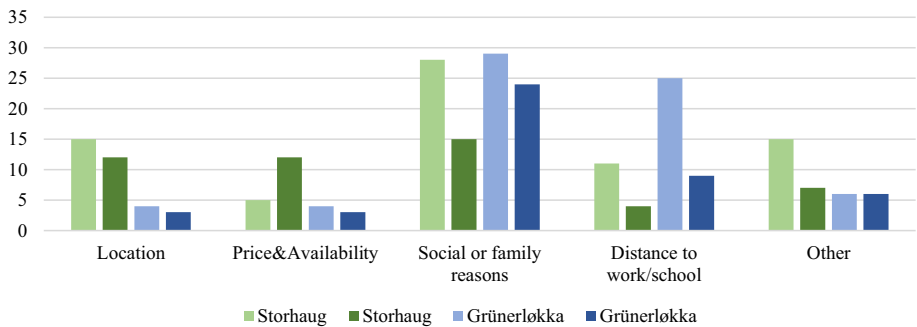
Fig. 6 Count for reason of location between Norwegian and immigrant population in Storhaug and Grünerløkka. (Color figure online)

physical dimension. This implicates a consideration of other dimensions that define QoL, i.e., social, mobility, environmental or personal aspects. Immigrants may be influenced by personal achievements, such as the reason why they migrated to Norway or the progression in the migration process. In this sense, other dimensions that define QoL may impact their life satisfaction: e.g. job and earnings, work-balance, social connections or education and skills (Eurostat, 2016).

6 Relationship between housing circumstances and satisfaction with QoL

The MLE regression model shows a direct effect of housing circumstances on satisfaction with the residence (QoR) (Table 3). Results also confirm the already described difference between the two groups of the population, and the slight difference between the research areas.

Table 4 also shows a direct effect of housing circumstances on satisfaction with QoL. Results confirm that QoL is directly and highly influenced by satisfaction with the residence (OR = 3.46, $p < 0.05$). Results also reveal that there is no significant influence from nationality (Norwegian, Non-Norwegian) or the research areas (Storhaug, Grünerløkka). However, the reason for location of the residence and the type of residence (more specifically single-family house) have an impact on QoL.

These results are further studied individually. To obtain reliable results, only answers that were selected by ten or more participants are included in the analysis below.

6.1 Reason for locating the residences in Storhaug/Grünerløkka

When asking the participants why they have chosen Storhaug or Grünerløkka for locating their residences, results show that 41% of them chose Storhaug or Grünerløkka due to social or family reasons. In Storhaug, its connection to the rest of the city is highly considered (22%). This may be due to its relative closeness to the city centre of Stavanger, as well as a favourable transport system. In Grünerløkka, on the other hand, a large number of local participants have mentioned the distance to work/school (30%). In Grünerløkka

Table 3 Regression results on satisfaction with the residence

QoR	Odds ratio	Robust std. err.	z	p-value	Confidence interval	0
Storhaug	1.67	0.41	2.06	0.040	1.03	2.71
Local	1.82	0.47	2.32	0.020	1.10	3.00
Reason_location	0.93	0.25	− 0.26	0.800	0.55	1.59
Reason_price	0.91	0.33	− 0.26	0.790	0.44	1.87
Reason_social	0.79	0.20	− 0.89	0.370	0.48	1.32
Reason_work	0.88	0.28	− 0.40	0.690	0.47	1.65
Residence_apartment	0.40	0.13	−2.87	0.000	0.21	0.75
Residence_detached	4.14	3.28	1.79	0.070	0.88	19.56
Resid_semidetached	1.00	0.47	0.00	1.000	0.40	2.51
Ownership_own	2.19	0.55	3.13	0.000	1.34	3.57
Ownership_rent	0.55	0.14	− 2.43	0.010	0.34	0.89
Num_people	1.29	0.12	2.80	0.010	1.08	1.54
Num_bedroom	1.42	0.16	3.11	0.000	1.14	1.78

$p < 0.05$ statistical significance

Table 4 Regression results on satisfaction with QoL

QoL	Odds ratio	Robust std. err.	z	p-value	Confidence interval	0
QR	3.46	1.40	3.06	0.000	1.56	7.64
Storhaug	1.00	0.34	0.00	1.000	0.52	1.94
Local	1.55	0.49	1.38	0.170	0.83	2.88
Reason_location	0.36	0.18	− 1.99	0.050	0.13	0.99
Reason_price	0.46	0.22	− 1.63	0.100	0.18	1.17
Reason_social	1.55	0.25	− 1.32	0.010	0.23	1.34
Reason_work	1.43	0.74	0.70	0.040	0.52	3.93
Resid_apartment	0.47	0.27	− 1.29	0.200	0.15	1.47
Resid_detached	4.01	4.22	1.32	0.190	0.51	31.62
Re_semidetach	0.70	0.40	− 0.61	0.540	0.23	2.16
Ownership_own	4.82	3.62	2.09	0.040	1.10	21.04
Ownership_rent	3.52	2.44	1.81	0.070	0.9	13.68
Num_people	0.92	0.18	− 0.43	0.670	0.63	1.34
Num_bedroom	1.24	0.26	1.02	0.310	0.82	1.88

Pseudo-R^2: 0.122 (*DV* Satisfaction QoL; *IV* Satisfaction with the residence)

$p < 0.05$ statistical significance

46% of the population is at university level (Statistikkbanken, 2019c) and so it must be considered that Grünerløkka has an excellent location concerning higher education, e.g., Oslo National Academy of the Arts, Oslo School of Architecture and Design and Westerdals Oslo ACT. It is reasonable to assume that there is a large share of students among the interviewed population.

Part of the immigrant group located their residences due to social and family ties. It must be considered that an existing immigrant population in an urban area is one of the main pull factors in a migration process (Åslund, 2005; Musterd & Deurloo, 2002; Rogers & Henning, 1999). However, the local population in this study also considers the social aspect as the main reason for locating their residences. Connecting this concept to satisfaction to QoL, 74% of the participants who located their residences due to social or family reasons (n = 97) were either satisfied or very satisfied with their QoL.

The connection to the rest of the urban area, the physical layout, the services or the surroundings of a residence are considered physical characteristics of a neighbourhood (Apparicio & Séguin, 2006; Bhat, 2015; Colwell et al., 2002; Mabelis & Maksymiuk, 2009) and they seem to be relevant for participants in this study. Of the participants (n = 83) who located their residences due to physical aspects (location or distance to school/work), 89% were either satisfied or very satisfied with their QoL. These results have been further investigated in a complementary study with data from the same participants where the focus of the study is at neighbourhood level, where other physical aspects are considered due to the relevance on satisfaction with QoL (forthcoming).

6.2 Dwelling type

Participants living in single-family houses are more satisfied with their QoL. As Fig. 7 shows, the share of satisfied and very satisfied respondents is larger in groups living in single-family houses. Due to a small variance of dwelling types in Grünerløkka, only Storhaug is included in Fig. 7. 27% of all the participants from Storhaug are living in single-family houses, 67% of them being very satisfied with their QoL.

Certain types of residences can be associated with other dimensions that form the concept of QoL, e.g., economic or labour market dimension. Single-family houses are, in most cases, the most expensive houses. Aspects such as the economic situation of the participant or the stage of the migration process can interfere with which residence an individual can afford.
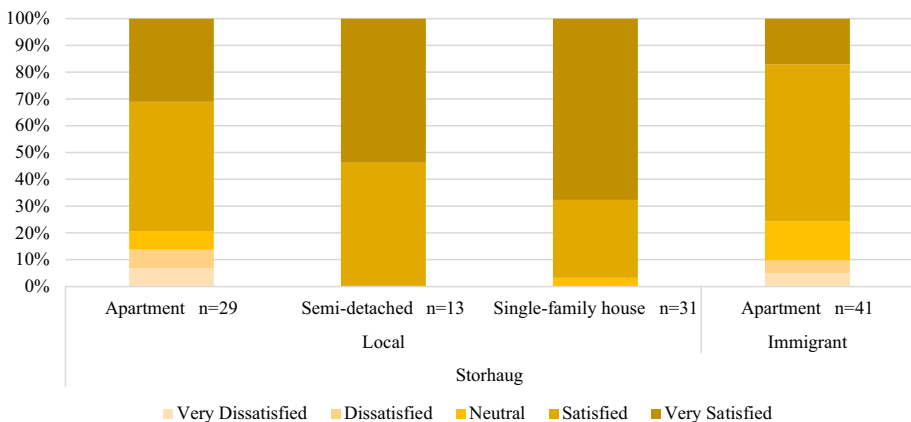

Fig. 7 Satisfaction with QoL depending of type of dwelling. (Color figure online)

Figure 8 shows the area of Storhaug with the different types of residences. The map shows the location of the residences of the 124 participants. They are marked in different colours representing the degree of satisfaction with QoL, from very dissatisfied (red) to very satisfied (green).

Most of the participants who were very satisfied with their QoL are living in semi-detached or single-family houses. Participants with less satisfaction with QoL are those living in residential areas where the most predominant type of residences are apartments.

6.3 Dwelling ownership

Figure 9 shows that the participants reporting the highest degree of satisfaction with their QoL are those who own their residences. 55% of all the participants are owners of their residences, 86% of them being either satisfied (41,8%) or very satisfied (44,2%) about their QoL. However, 80% of those who rent have the same degree of satisfaction. In this study it can be said that satisfaction with QoL depending on the type of ownership has no considerable variance.

The concept of ownership is related to the type and size of residence since the type and dimension of a residence are directly related to its cost. Also, demand for homeownership is highly dependent on future expectations that include aspects as employment, rising income and permanent settlement in an urban area. Ownership can be interpreted as a sign of favourable conditions, e.g., adequate economic position, satisfaction with the residence and its location (neighbourhood), settlement stage or positive personal aspects that impact satisfaction on an individual's QoL.
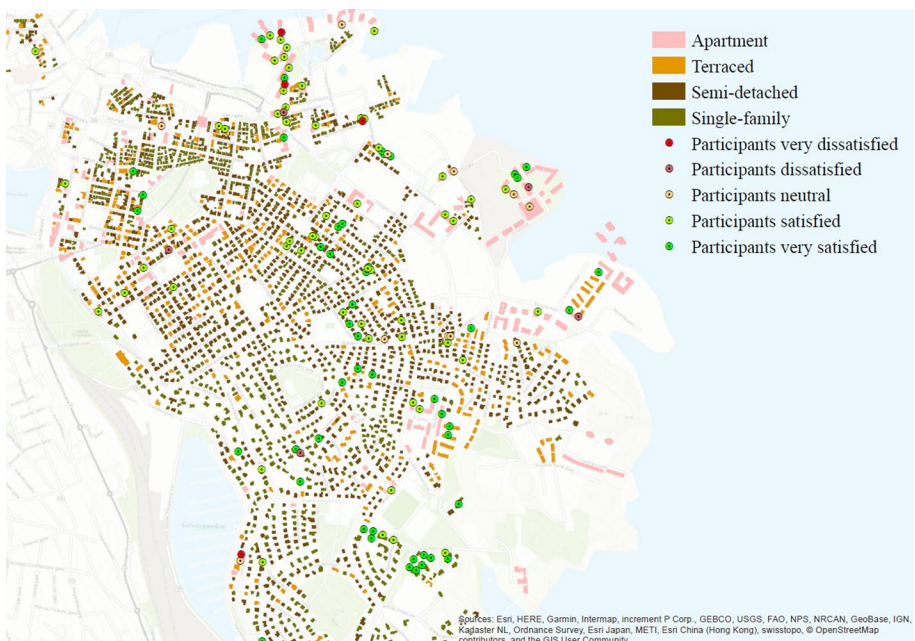

Fig. 8 Dwelling types and participants' degree of satisfaction in Storhaug, Stavanger. (Color figure online)
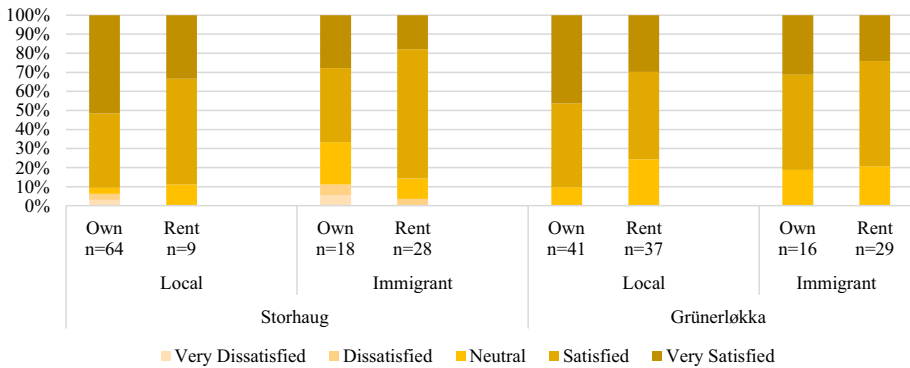
Fig. 9 Percentages of type of ownership and level of satisfaction about QoL. (Color figure online)

6.4 Overcrowding

The number of people living at the residence and the number of bedrooms can have an impact on an individual's QoL. This can be due to different reasons, e.g., more individual space for each resident or, on the contrary, more shared life with relatives or co-habitants. Participants living together with three, four or more people are more satisfied with their QoL. 43% of all the participants live in a residence with three, four or more people, 35,6% of them are satisfied and 51% very satisfied.

The concept of overcrowding is directly related to the type of residence, i.e., larger residences are usually the ones hosting more people. As discussed previously, larger houses can be associated with aspects such as the economic situation of the participant or the stage of the migration process, since these aspects can interfere with both the type of residence and the type of ownership under which an individual lives.

7 Results

The present study adds several findings to the literature on the effects of the housing domain on QoL in Norwegian neighbourhoods. In support of previous research (Lee & Park, 2010; Peck & Kay Stewart, 1985; Westaway, 2009; Zebardast, 2009), this study confirms that certain housing circumstances together with satisfaction with the residence influence individuals' QoL (HA-B). More specifically, the regression results of this study show that 12% of the variance in QoL is explained by satisfaction with the residence.

From the studied housing circumstances, it can be confirmed that the *reason of location*, either due to social or physical aspects, has a favourable impact on an individual's QoL. The immigrant group can consider social and family ties as a reason of migration or as a pull factor when selecting a place of residence (Rogers & Henning, 1999). On the other hand, physical aspects of the neighbourhood, i.e., the transport system, urban layout or disposition of services in an urban area can be determinant for individuals when deciding where to reside (Colwell et al., 2002).

The housing circumstance that strongly predicts satisfaction with the residence, as well as QoL in this study, is *the type of residence* under participants live. Previous studies mention residence type as a determinant for QoL (Follain & Jimenez, 1985; Peck & Kay

Stewart, 1985; Sirmans et al., 2006) and the results of this study corroborate it by confirming that the largest share of very satisfied respondents lives in single-family houses. In this study, participants living in single-family houses who are satisfied with their residence and their QoL are considered to live under favourable conditions referring to economic, employment, migration, or personal aspects. It is expected that these participants have chosen this residence typology as the most adequate and favourable to satisfy their QoL when referring to the housing domain.

Unlike in previous studies (Dieleman & Everaers, 1994), *type of ownership* is not found to be a significant predictor of satisfaction with QoL. This can be due to other aspects, especially within the immigrant group, where the stage within the migration process, future expectations or the economic situation can drive them to rent their residence instead of becoming owners. Their QoL would not be affected by their type of ownership, something not representative in other studies (Elsinga & Hoekstra, 2005; Greenberg & Lewis, 2000; Zumbro, 2014) where individuals who own reflect higher QoL understood as an economic, employment or more adequate personal situation than those who rent.

8 Discussion and conclusion

This paper raises theoretical and practical implications as well as providing suggestions for future research. Theoretically, the study demonstrates how certain housing circumstances influence individuals' satisfaction with their residences and their overall QoL in Norwegian neighbourhoods. This study has explored the different housing circumstances of two groups of the population, local and immigrant, located in two research areas. These areas have been worth of study due to their high percentage of immigrant population as well as the relevance of the migration concept when studying urban and social growth, especially in Norway. The study findings confirm that certain housing circumstances can affect both population groups in specific Norwegian neighbourhoods, which has not previously been adequately studied at this scale.

The study found that the immigrant group has less favourable housing circumstances than the local population, and this is also reflected in their lower satisfaction with their QoL (44% of the local population are very satisfied with their QoL, compared to 22% of the immigrant population). However, when comparing the research areas there is a similarity among participants' satisfaction with their QoL (45% of the participants in Storhaug are satisfied and 38% very satisfied compared to 46% satisfied and 33% very satisfied in Grünerløkka) HAB1-AB2. This can be due to other aspects than housing circumstances, i.e., economic, environmental, physical, or social aspects under each participant lives. This paper is part of a larger study, where not only the housing circumstances but also the neighbourhood conditions are explored (services, environment, green spaces, transportation and social aspects) between the local and the immigrant population in Storhaug and Grünerløkka (forthcoming). Having demonstrated that housing circumstances only explain 12,2% of the variance of QoL in this study, it is relevant to complement it with a study about the influence of neighbourhood conditions on QoL.

This research also demonstrates the relationship between the type of residence and QoL. Single-family houses are the most representative type of residence of those having greater satisfaction with both their residence and their QoL. These findings must be considered from an urban perspective when planning housing development or housing structure in Norwegian neighbourhoods where population represents different

nationalities, requirements, economic differences, or social disparities translated into a possible need for more diverse types of residences.

Referring to the concept of ownership, this study finds no significant difference between participants who own or rent their residences. As previously mentioned, personal, economic or migration aspects can be the reason. Rental housing has increased in most European countries for the last decades (Eurostat, 2017). This aspect is especially relevant in densely built-up areas as Storhaug and Grünerløkka. It is the best alternative for population groups that need or aim at greater mobility because the transaction costs associated with changing the place of residence are significantly lower. For this reason, rental housing decreases financial risk and prevails in some of the population groups, as in this case of the immigrant group. Moreover, rental housing tends to be concentrated in the most central, dense, and consolidated areas of cities. This suggests that a rental policy articulated to adequate planning and territorial planning tools helps to mitigate peripheral growth of low density and avoid the segregation, generating more accessible and compact cities (Shelton, 1968).

When studying the differences between population groups, it can be appreciated that certain housing circumstances are different among locals and immigrants. The residence where an individual lives is the result of a complex situation that includes economic, labour, social and personal aspects. These aspects vary among individuals, and more specifically, among locals and immigrants, where the migration process can influence each of the mentioned aspects. The immigrant group lives under different housing circumstances than locals, mostly considered as less favourable. The immigrant population lives in a smaller typology of residences, most of the cases apartments, with renting as the predominant homeownership type. This typology and type of ownership can be associated with less favourable economic and labour conditions, probably related to certain migration processes (arrival stage) under which immigrants live. In most cases, the arrival stage can be connected to an unstable employment situation, lower economy or uncertain forthcoming situation than in future stages (settlement and stabilization stage).

Because this study is limited to two specific Norwegian neighbourhoods, the sample is not highly representative of the entire immigrant population residing in Norway and consequently not generalizable. Future considerations include obtaining equal participation of the two population groups, where social events or gathering people for community participatory GIS would help. Focus groups can help to ensure that the immigrant population feels comfortable sharing their thoughts and perceptions to the interviewer even though these are negative or less favourable when compared to the local group. Future research may replicate the present study in other Norwegian neighbourhoods and thus be able to contrast, confirm, refute or complement results and gather more information about the housing domain at the neighbourhood level in Norway.

Declarations

Conflicts of interest The authors declare that they have no conflict of interest.

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