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A qualitative exploration of interactions with natural environments among immigrant women in Norway

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ABSTRACT

The role of nature in potentially improving people's health – including immigrant women, who are particularly prone to health challenges – has been highlighted. Success in this public health arena requires an adequate understanding of the target group's current practices and preferences. However, knowledge in this field is lacking, and is nearly non-existent in the Norwegian context. The present study therefore aims to explore practices regarding interactions with nature among immigrant women in Norway. Data were gathered through individual interviews with 14 immigrant women from Iran (2), Poland (2), Palestine, Afghanistan, Congo, Kenya, Thailand, Russia, Portugal, Latvia, Colombia, and Bulgaria. The qualitative content analysis revealed a relatively comprehensive and mixed use of natural environments, which took place in three distinct types of locales: 1) local natural environments, e.g. neighboring wooded areas, sites by the water, playing fields, and school yards; 2) domestic natural environments, e.g. indoor and garden plants; and 3) distant natural environments, e.g. mountains and fjords requiring driving and often overnight visit. Nature outings often included passive recreational pursuits, such as eating a meal and enjoying the scenery, with a few close friends or family members. Walking emerged as a common local nature-based physical activity. Study findings also portray a complex 'image of nature' among the women, reflecting their valuing of both more managed and more pristine nature. Findings therefore suggest that future public health practices targeting immigrant women may apply a broad definition of 'interaction with nature', incorporating various geographical locales as well as types of nature.

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Introduction

Significant mental and physical health challenges among immigrants in Norway and other Western societies (Abebe 2010; Abebe, Lien, and Hjelde 2014; Rechel et al. 2013) call for special efforts to reach this group in public health work. This applies to the female immigrant population in particular, as they appear to be at additional risk for mental

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Note Some of this study's findings have been published in general terms in Norwegian as part of the conference proceeding of the Norwegian National Outdoor Recreation Research Conference 2018. Accessed 12.05.20 <https://norskfriluftsliv.no/wp-content/uploads/2019/06/Forskning-i-friluft-2018-Konferanserapport.pdf>.

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health problems (Abebe 2010; Statistics Norway 2017). Based on the increase in knowledge concerning the beneficial mental and physical health effects of interaction with nature (Maller et al. 2006; Tzoulas et al. 2007), Norwegian health authorities have announced the promotion of outdoor recreation among immigrants as a public health priority (Norwegian Ministry of Health and Care Services 2014). A first step for succeeding in this arena is to have an adequate understanding of the target group's actual practices and preferences (Bartholomew et al. 2001); this understanding is needed to inform the design of initiatives addressing this subgroup, and to allow universal initiatives to be sensitive to the diversity of a given population (Diaz et al. 2017). However, immigrant voices are typically not conveyed in research in this area, and therefore limited knowledge exists on their engagement with nature – in Norway or other comparable countries. Indeed, such knowledge about immigrants' practices and preferences concerning interactions with nature is especially requested by the Norwegian authorities in order to successfully target them in their outdoor recreation promotion work (Norwegian Ministry of Climate and Environment 2016).

Some Norwegian and international quantitative studies indicate that immigrant populations are underrepresented in outdoor recreation compared to the majority populations (Dervo et al. 2014; Jay and Schraml 2013; Bjerke and Krange 2011). For instance, Bjerke and Krange (2011) demonstrated that two-thirds of minority students between 16 and 19 years of age in Oslo, Norway, 'never or almost never' went for a walk in the woods, compared to 38% of the majority students. Also, international studies have shown that many groups of immigrants visit non-urban natural areas less often than the majority populations (Kloek et al. 2013). However, it appears that such studies capture the more traditional types of interactions with nature in the immigrants' host countries (Bjerke and Krange 2011; Dervo et al. 2014). Research indicates that health-enhancing interactions with nature may occur in many different ways (Maller et al. 2006; Stodolska, Peters, and Horolets 2017), underlining a need to develop a broad understanding of immigrants' relations to and use of nature. For instance, international studies reveal that some immigrant groups, more often than the majority populations, use natural environments as arenas for social gatherings, including passive recreation and shared meals (Kloek et al. 2013; Ordonez-Barona 2017). Accordingly, studies also show that various ethnic minority groups prefer more manicured natural environments over wilder ones (Jay and Schraml 2013; Kloek et al. 2017).

The theoretical concept of 'images of nature' (Buijs, Elands, and Langers 2009) has been applied in this area of research; these are 'mental frameworks of values, beliefs, and value orientations that direct and structure the understanding and perception of nature' (Buijs 2009, 420). Five frameworks have been identified. Those holding a *wilderness image of nature* believe that nature is fragile and are concerned with preserving the naturalness of nature in the absence of human influence; here, only pristine nature is defined as real nature. Those holding an *autonomy image of nature* are also concerned with untouched nature, but less with the visibility of human artifacts – meaning that nature can also be experienced in the city, in road verges, or in one's garden. Those holding an *inclusive image of nature* regard nature and culture as mutually dependent and are more positive towards management of nature. Those holding an *aesthetic image of nature* are more focused on the recreational or aesthetic values of nature; access to diverse beautiful landscapes is particularly valued, and therefore limited forms of

management are preferred. Finally, those holding a *functional image of nature* value intensively managed nature, as this is deemed aesthetically more attractive and facilitates utilitarian purposes. In line with the previously presented findings of international studies regarding immigrants' practices and preferences for nature interactions, Buijs, Elands, and Langers (2009) found that immigrants in the Netherlands generally hold a more functional image of nature than the majority population.

To our knowledge, only Figari, Haaland, and Krange (2009) have conducted a deeper investigation of outdoor recreation patterns and preferences among immigrant women in Norway. Based on qualitative interviews with 17 women with non-Western backgrounds living in a suburb of Oslo, the authors found that nature walks were an essential part of the women's everyday life: their use of natural environments was a way to avoid a sedentary, isolated indoor life and to meet people. These women, too, preferred using paths in built-up green environments in their neighborhood over walking in the neighboring woods.

There is a clear need for additional knowledge in this field. Although the topic is increasingly being investigated in some Western European countries and the United States (Kloek et al. 2013), differences e.g. in natural environments, weather conditions, and immigrant populations between Norway and these countries support further exploration of this issue from a Norwegian perspective. Immigrant women's voices are particularly interesting in this context, due to the larger potential mental health gains in this group (Abebe 2010). Thus, this study aimed to explore interactions with natural environments among immigrant women in Norway. In doing so, it complements two other articles (drawing from the same data) investigating the mental health influences of interactions with nature (Lorentzen and Viken 2020) and barriers/enablers for such interactions, respectively (in review).

Materials and methods

Data were obtained from individual semi-structured interviews. An explorative qualitative research design that allowed a deeper understanding of the issues being investigated was considered appropriate, as there was limited knowledge on the subject. It was expected that individual interviews would ease clarification in case of language barriers (Barriball and While 1994).

Interviewees were recruited through a public health center and Norwegian language practice gatherings in two Southeastern Norwegian municipalities. Initially, we aimed at recruiting non-Western immigrant women, as research had shown that enhanced information on this topic could benefit this subgroup's health the most (Abebe 2010). However, we experienced difficulties in recruiting participants and also found it ethically challenging to exclude, on-site, the immigrant women from Western countries who expressed a willingness to participate in the study. For these reasons, we included all immigrant women at the recruitment sites who were willing to participate in the study. These consisted of fourteen women – aged between 27 and 70 years – from Iran (2), Poland (2), Palestine, Afghanistan, Congo, Kenya, Thailand, Russia, Portugal, Latvia, Colombia, and Bulgaria. They had all emigrated as adults and had lived in Norway for between 1 and 43 years at the time of the interview. Seven emigrated for work-related reasons (for their husband or themselves), four as refugees, and three to marry

a Norwegian man. The sample was also highly heterogeneous concerning civil status, educational background, employment status, and residence type and location.

The present study intended to focus on nearby nature, since prior research has shown such natural environments to have particular value from a public health perspective, as they are easily accessed (Calogiuri and Chroni 2014). The interview guide therefore included questions related to nearby natural environments, intended to cover the overall study's three main topics: 1) access to nature and actual practices and preferences (e.g. 'What does it look like outside where you live?', 'How far is it to natural areas?', 'What types of natural areas are there?', 'Do you use the natural areas? If so, which ones? What are you doing there? With other people? Specifically, who? How often? For how long? When, during the day? When, during the week? When, during the year? For leisure or as transport?', 'What kind of natural areas do you like best?', 'Are there any natural areas you do not like so much?'); 2) the health-related aspects of interacting with nature (e.g. 'If you tend to use nature in the area where you live – how does it feel when you are out?', 'What does it do to you?', 'Is there anything positive about it?', 'Have you experienced anything negative about being in such areas?'); and 3) perceived barriers and facilitators for interacting with nature (e.g. 'Do you sometimes find it difficult to use the natural areas where you live? What is it that makes it difficult?', 'What might make it easier for you to use the natural areas?'). Interviews commenced with open-ended questions and the more detailed queries were used for follow-up when necessary. Data for the present study were obtained from different parts of the interviews, although the majority were acquired from answers to the first group of questions. As noted above, findings concerning the overall study's two other main topics are reported in two prior articles.

The interviews were conducted between November 2016 and March 2017, either in the interviewees' homes or in a meeting room at a local library. They were conducted in Norwegian by one or the other of the two researchers in this study, both women of Western European background. There were some linguistic challenges in two of the interviews, which were resolved by switching to English or rewording questions. The researchers ended the interviews when they felt that no new information about the topic would be attained. The interviews lasted between 33 and 74 minutes, and were audio-recorded and transcribed verbatim. The Norwegian Centre for Research Data approved the study, and interviewees provided written informed consent prior to the interviews.

The material was analyzed using the qualitative content analysis method (Graneheim, Lindgren, and Lundman 2017; Graneheim and Lundman 2004). Both authors read the transcripts several times to obtain an overview of the data and had a preliminary discussion of the material. The first author then inductively abstracted meaning units into codes. Differences and similarities between codes were identified, and these were classified into tentative categories and themes. This was complemented by a deductive analysis process, in which data were viewed in light of the existing literature. The authors then further discussed interpretations and categorization until they reached consensus – involving more than one researcher in this phase of the analysis is expected to strengthen trustworthiness of the findings (Graneheim, Lindgren, and Lundman 2017). The analysis was conducted in Norwegian, and quotes were later translated into English.

Results

The analysis revealed a composite picture of interviewees' interactions with natural environments. Two of the interviewees sought nature areas to a lesser extent than the other interviewees. They expressed a preference for urban environments, and explained that this came from having grown up in urban areas and being used to meeting more people. While they did sometimes visit and enjoy nature, they generally did so in the company of others. Overall, however, the interviewees' narratives generally indicate a high engagement with and use of nature. As mentioned earlier, they were asked specifically to reflect on their relation to and use of nearby natural environments, exemplified as wooded areas, parks, playing fields, and hiking paths; however, they spontaneously talked about interactions with a much wider range of natural environments. Three essential themes emerged from the analysis, related to the specific locales of the natural environments with which they interacted: 1) local natural environments, 2) domestic natural environments, 3) and more distant natural environments.

Local natural environments

Interviewees described an extensive use of natural sites located near their homes – primarily wooded areas and sites by the water but also more human-influenced sites.

Wooded environments

First and foremost, interviewees described using nearby wooded sites. Such areas were visited primarily for walks and social gatherings, and for picking berries and mushrooms. Some described hiking trips through the woods, either to a small peak or lake, with subsequent enjoyment of the view. Those who often visited the woods described such areas as easily accessible physically, as they generally lived quite close.

You can walk up into the woods and then you can walk around until you get to the high school. And then the other woods are near the grocery store, not too far from here, but you can walk in the woods and then get to the beach. (Kenyan interviewee)

It's up in the woods. I like to walk up to the peak so I can see the view. (Latvian interviewee, describing where she likes to go hiking)

Interviewees mostly visited the woods with one or a few close friends or family members.

We sometimes walk the coastal path, sometimes in the woods, because my son loves nature. He loves the animals and everything that moves. (Polish interviewee)

Due to a fear of getting lost or being assaulted if alone in the woods, when lacking hiking companions, some would go for walks along the exterior border or in the outskirts of the wooded area. Still, however, they emphasized the importance of being close to wooded areas on their walks.

Although most interviewees visited wooded areas much less in the winter, several still tried to maintain their walking routines in these environments, sometimes aided by crampons, spiked shoes, and/or walking sticks.

My husband and I even go when there is snow. With walking sticks. [...] Sometimes it is difficult if it gets too slippery. But it's really important to get out, you know. (Colombian interviewee)

Sites by the water

Most interviewees also highlighted nearby sites by the sea or a lake as natural environments of which they were very fond and used frequently, primarily in the summer months. Some of them often went to the beach or a pond in the woods. Here, they mostly engaged in relaxing activities, such as enjoying the scenery, reading, and sunbathing. Such outings were often done in the company of others, primarily close family and friends, and usually also included a shared meal with food brought from home.

Often the water is not warm enough to swim [laughter] . . . But we just sit and sunbathe and enjoy ourselves and do a barbecue and eat food . . . (Iranian interviewee)

There is a small beach on the way to [a place in my neighborhood]. [...] Free beach! For all! Very nice area! Every day when the sun shines, all summer, [my husband and I] go there! And sunbathe. And then there are very green trees . . . and grass. You can lie down, you can cook. You can use the grill and cook some food and look at the beautiful view. Towards the fjord. It is very beautiful! (Bulgarian interviewee)

Others described with enthusiasm hiking on a coastal path or alongside a river. Several of the interviewees expressed that being able to see a body of water gave their experience of nature an additional beneficial dimension related to mental health.

The water has a very appealing effect! When you walk and look at such great silence . . . It is very nice! (Columbian interviewee)

More human-influenced environments

Some interviewees made use of other, more human-influenced or -built local green spaces, such as playing fields, parks, playgrounds, road verges, school and preschool yards, and botanical gardens. Such places were primarily used for exercising, walking, playing with children, or undertaking passive recreational activities. Others used adapted green hiking paths, for instance through residential areas towards the center of town, both for walks and for transportation purposes.

Eh yes, with the kids. It's a kindergarten . . . We go on weekends. (Afghan interviewee, when asked whether she uses a green space the interviewer had observed by her house)

Several interviewees expressed a particular fondness for and enthusiasm about trees and the possibility of enjoying this kind of natural element in human-built environments such as streets, schoolyards, and urban park-like areas.

I used to be a volunteer visitor for an old lady, and she lived at [a place in the city center]. So, we walked among the trees, and it was so good! [...] But later the trees were cut down, and that was too bad. (Portuguese interviewee)

One interviewee related how she enjoyed going for walks in residential areas and looking at the beautiful flower-filled gardens, underlining that this kind of nature

experience was not possible in her home country, where gardens were usually shielded by high fences.

Yes, it's different. Here [in Norway], you can see more nature. Because there are no walls around the apartments or private houses. [...] Oh, it is so nice! They have planted such nice flowers and ... It gives you a very nice view, really! (Iranian interviewee)

Domestic natural environments

In addition to visiting local natural sites such as woods and lakes, seaside footpaths, parks, playing fields, playgrounds, and beaches, several of the interviewees were highly engaged with natural environments in very close proximity to, or even within, their homes. These interviewees were surrounded by plenty of flowers and plants – on their windowsills indoors, on terraces, or in their gardens – and expressed great pleasure at being able to look at and take care of them.

And my windows are full of flowers. I must have them! (Polish interviewee, recounting enthusiastically about how she needs to have indoor plants due to a lack of a garden)

And I often have flowerpots outside by the front door, too—small tomatoes and stuff like that. And then I can sit down with a cup of coffee and be there with my flowers ... [...] So I don't really need so much to be out in nature. Only that nearness, maybe ... (Latvian interviewee)

Some described how they also enjoyed having a view of the sea, trees, and/or birds from the terrace. One of the interviewees, living in a block apartment with a view of lush scenery and green spaces from all her windows, expressed an experience of 'being in nature' even when indoors.

[...] When I am in the kitchen or the bedroom, I can see nature through the window. It is a very nice area! I like to have nature around me, really. (Iranian interviewee)

More distant natural environments

As described above, most interviewees – in different and, for some, multiple ways – interacted with nature in close proximity to their homes. Such nearby nature formed a frame for their 'everyday use of nature'. However, many of the interviewees also revealed a great interest in natural environments farther away. They visited such sites on weekends or during holidays, generally in the brighter and warmer months. The closest excursions were primarily to well-known destinations within day-trip distance from home – these were often places by the sea an hour or two away by car. The excursions to nature areas that were farther away were often to Norway's famed mountains and fjords, and often involved overnight lodging. When talking about these distant excursions, interviewees often emphasized the particular beauty and diversity of Norwegian nature.

On the weekends, we use the car. We have been many times to [a wooded area situated by the closest larger city] or in other cities. We also like to go to the fjord. (Bulgarian interviewee)

I think that, in Norway, the air is very fresh, nature is beautiful. Many things I see, like fjords, it's beautiful! [...] I've been to many different places in Norway. (Thai interviewee)

So always you find something new. And it is very exciting! Yes, very exciting! (Palestinian interviewee, talking about the various beaches she has visited during day-trips with her family)

Although some of the interviewees described going for short walks on such trips, it appeared that they primarily involved more passive enjoyment of nature combined with meals, often through picnics or barbecues. Such trips were mostly undertaken with close family: a boyfriend/husband, or a husband and children. Most of those travelling longer distances to enjoy nature did so by car.

Actually, I just jump into the car and then travel there, bring with me a couple of books, something to eat, and we [my husband and myself] . . . , nothing more, actually. It is often on weekends. [...] . . . often there are such spontaneous trips. It's not that we hike for three hours . . . (Latvian interviewee)

Discussion and conclusion

The present study depicts a relatively comprehensive and composite use of natural environments among a highly heterogeneous group of immigrant women in Norway. The natural environments they enjoy include both more human-influenced and wilder areas, nearby and farther away, but also natural elements in or in very close proximity to their homes. Findings also demonstrate that the majority of these women engage in nature pursuits both in their everyday life and during weekends and holidays, often in the company of a few close friends or family members, and for a range of activities and purposes.

First and foremost, these findings suggest that when targeting immigrant women in nature-related public health work, it may be helpful for practitioners to apply a broad perspective concerning both geographic locale and type of nature. Regarding geographic locale, as noted earlier, neighboring natural sites have typically been highlighted as the most relevant from a public health perspective, due to their proximity (Norwegian Ministry of Health and Care Services 2014; Calogiuri and Chroni 2014). Indeed, the Norwegian government's white paper on outdoor recreation and health (Norwegian Ministry of Climate and Environment 2016) explicitly and repeatedly articulates that neighborhood areas are to be prioritized in their promotion of public outdoor recreation. The present study supports the significance of easily accessed local natural environments for interaction with nature in everyday life among immigrant women, as well – as exemplified by the interviewees' extensive use of nearby wooded areas, sites by the water, or playing fields.

Our findings concerning the women's fondness for and visits to neighborhood wooded areas contradict prior studies revealing a preference among non-Western women in Oslo for paths in built-up green areas in the neighborhood over those in neighboring woods (Figari, Haaland, and Krange 2009). Similarly, in a more recent Oslo-based study, drawing on 270 short interviews with people using 3 different local green areas, Skår et al. (2018) found that those who seemed to have an immigrant background

generally expressed an appreciation for woods, but appeared to value green areas in their immediate neighborhood more than wooded areas farther away. These studies point to a need for further understanding around immigrants' relationship to and actual use of wooded areas, and the role such environments may have in health promotion targeting this segment of the population.

Also of specific interest regarding the role of natural sites in health promotion is whether they can serve as arenas for physical activities. In line with the findings of Figari, Haaland, and Krange (2009), the present study reveals walking as a common physical activity performed in neighboring natural environments among participating women. Similarly, in their survey of adult urban neighborhood walking in Norway, Nordh et al. (2017) found that frequency of walks was independent of ethnic background. Requiring little investment in terms of time, money, and physical effort, and also highly relevant as a mode of transport, they emphasize neighborhood walking as an under-promoted, low-threshold, everyday health-enhancing physical activity (Nordh et al. 2017). The public health potential of walks in natural environments is further supported by both the demonstrated additional health gains from exposure to nature (Korpela, Stengård, and Jussila 2016) and accessibility of such environments in Norway (Statistics Norway 2020), which are free for anyone to visit due to Norway's 'right of common access' (Norwegian Ministry of Climate and Environment 1957). In line with the Norwegian government's specific intention to enhance the population's health through increased physical activity in neighborhood green areas (Norwegian Ministry of Climate and Environment 2016), further research into the occurrence and health benefits of neighborhood nature walks among immigrant women in Norway is needed.

However, our findings underline that also other natural environments than those in the local neighborhood may be valuable in health promotion work targeting this subgroup, from both an everyday and a weekend/holiday perspective. Firstly, the possibilities for interaction with nature that lie in direct proximity to one's residence – such as in one's garden, or even within one's home – should not be overlooked. Many of the interviewees emphasized nature that can be viewed, listened to, touched, smelled, or taken care of from their residence: in the garden or on the terrace, or inside the home. In line with previous research demonstrating the health-enhancing benefits of exposure to and interaction with nature elements indoors, through windows, or in one's garden (Ambrose et al. 2020; Raanaas, Patil, and Alve 2016), such domestic natural environments may be equally regarded as a significant source of health-enhancement for this subgroup of women. This may be of particular relevance for those living in urban areas where access to nature in the neighborhood is lower. More light therefore needs to be shed on the role of domestic nature in health promotion practices for this segment of the population.

Furthermore, natural sites farther away from the women's neighborhood – such as beaches, mountains, and fjords within driving distance (and often involving overnight stays) – were outlined as areas for enjoyable outdoor recreation practices. These findings may be interpreted as contradicting other international research demonstrating that immigrants visit non-urban natural areas to a lesser degree than majority populations (Kloek et al. 2013). Although such distant natural environments do not contribute to everyday health-enhancing activities, and may be resource-demanding as goals for public health initiatives, they still represent a potential contribution to improved health in this

population. As such, the health potential for immigrant women of visiting distant natural sites is worth investigating, including perceived barriers to and facilitators of these visits.

In addition to the geographic locales of the natural environments, the broad perspective of nature emphasized in the present study's findings also encompasses *types* of nature. Here, Buijs, Elands, and Langers' (2009) 'images of nature' (described above) offers a lens for interpretation. The extensive use of various human-influenced or -built natural sites for social gatherings, shared meals, play, walks, and transportation in this study's sample may be viewed as paralleling Buijs, Elands, and Langers' (2009) findings that immigrants in the Netherlands generally hold a more *functional image of nature* than the majority population (i.e. valuing intensively managed nature for utility purposes). This also confirms the findings of other international studies (e.g. Ordonez-Barona 2017) and an earlier study in Norway (Figari, Haaland, and Krangle 2009), which show a preference among many groups of immigrants for natural sites with a high degree of human interference to facilitate its use. However, the *aesthetic image of nature* and the *autonomy image of nature* were also reflected in the present study, in interviewees' use of and statements about nature (i.e. valuing natural areas with varying degrees of human influence on, for instance, aesthetics): this is exemplified by the women's appreciation of flowers in their own or others' gardens or of old trees in the city center. Nevertheless, the interviewees also expressed a particular fascination and enthusiasm for more pristine natural areas, such as mountains and fjords, which reflect a *wilderness image of nature* to a higher degree. These findings suggest that this study's sample overall holds a more complex image of nature than one might originally have hypothesized.

Although this was not a comparative study, and findings are based on a small sample, the present results contrast the overall impression from existing research that immigrants are less engaged in nature pursuits than the majority populations (Jay and Schraml 2013; Bjerke and Krangle 2011). It is possible that previous studies would have demonstrated other results if 'interaction with nature' had been more broadly defined, for instance also including more passive, but still health-enhancing (Maller et al. 2006) recreational activities in various types of nature. Indeed, the women in our sample appeared to prefer passive recreational activities over active ones when visiting distant natural sites, and seemed to enjoy relaxing activities as much as physical activities when visiting neighboring natural areas. It is likely that ethnic Norwegians generally engage more in physical activities on such outings. Concerning preferences for types of nature, our study suggests that these may differ less than expected between immigrants and majority populations. Contrary to what has been found to be especially characteristic of immigrant populations in previous studies (Buijs, Elands, and Langers 2009; Figari, Haaland, and Krangle 2009; Ordonez-Barona 2017), we could not identify a clear functional image of nature among our sample. This finding is supported by a recently published Norwegian survey study (Suárez et al. 2020) on a representative sample of 1157 Oslo residents, which found no differences between immigrants and the majority population regarding preferences for outdoor recreation spaces (concerning degree of naturalness, tree density, proximity to lakes and fjords, or size of continuous forests). This suggests that there may be both similarities and differences in practices and preferences related to nature between immigrant and majority populations; accordingly, additional studies using comparative designs are needed to explore these issues in greater depth.

Implications for practice

Overall, results from the present study add to the knowledge base for health promotion, both in Norway and internationally. Knowledge on immigrants' interactions with nature is limited with regard to their actual practices and preferences; such knowledge is a necessary starting point for the development of successful programs to promote these kinds of interactions (Bartholomew et al. 2001). While it is likely that study findings are transferable to other countries hosting immigrant women with similar backgrounds, variations in factors – e.g. access to natural sites, outdoor-life culture, and discrimination – between Norway and other host countries may reduce the transferability of certain findings. For instance, access to natural environments in Norway is found to be very good (see e.g. Gundersen et al. 2016).

Nevertheless, findings suggest that those responsible for the design and implementation of measures for promoting immigrant women's health, both in Norway and internationally, should be aware of the health potential that may lie in natural environments not only in one's neighborhood, but also in one's home or garden and those farther away. Study findings related to the women's practices in and preferences for nature suggest specific measures: at the national level (e.g. housing policies that ensure access to natural environments in direct proximity to immigrants' residence); at the local level (e.g. municipal planning that includes the development and maintenance of local natural sites that invite passive recreational activities and local green areas that facilitate walking); and at the group or individual level (e.g. health practitioners who communicate the possible health gains of various interactions with domestic nature). Careful evaluations of such measures should be conducted to further strengthen the knowledge base in the field (Bartholomew et al. 2001).

Study limitations and avenues for future research

Although this study adds to existing knowledge, the limited sample size means that it only displays a preliminary picture of immigrant women in Norway's interactions with nature. To obtain an optimal knowledge base for public health work in this field, future research should attempt to explore this topic qualitatively in larger samples, preferably using methodological approaches that allow the researchers to obtain an even more thorough understanding of the immigrant women's preferences and practices – for instance, through participant-driven photography (interviews based on images taken by the participants) (Van Auken, Frisvoll, and Stewart 2010), participatory observation (Kawulich 2005), or video diaries (Holliday 2000). Further, as immigrants cannot be treated as a homogenous group (Kloek et al. 2015), it would be of interest to illuminate similarities and differences between subgroups of the immigrant population (e.g. according to ethnicity, religion, previous experiences with natural environments, length of residence in Norway, and age). As discussed earlier, immigrants and non-immigrants may display both differences and similarities in their patterns of use and perception of nature (Buijs, Elands, and Langers 2009; Jay and Schraml 2013; Suárez et al. 2020); thus, it is relevant to focus on both the differences and the commonalities between the immigrant and the majority populations. Quantitatively designed research studies would be particularly suitable in this context, and would also aid in assessing the generalizability of findings.

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