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How did Moroccan immigrants in the Netherlands decide with regard to their COVID-19 vaccine uptake? An exploratory qualitative study

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Abstract

Background In the Netherlands, a low COVID-19 vaccination uptake was reported among Moroccan immigrants. This population also faced a higher risk of contracting COVID-19, as well as severe morbidity and mortality, compared to native Dutch. We aimed to explore the COVID-19 vaccination decision-making process and the process from vaccination intention to uptake among Moroccan immigrants in the Netherlands.

Methods Between April and June 2022, an exploratory qualitative study was performed among Moroccan immigrants in the Netherlands ($n=29$). Participants were recruited through community centres, mosques, and social media. Interviews were transcribed verbatim and thematically analysed.

Results Seven themes were generated: (1) Attitudes shifted over time and the vaccination decision was postponed, (2) A personal multi-faceted risk-benefit assessment, rather than feelings of social responsibility, resulted in a decision to vaccinate or not, (3) Feelings of decisional or anticipated regret that accompanied the personal risk-benefit assessment influenced the vaccination decision, (4) Used information sources, (5) A perceived lack of trustworthiness of the information disclosed by the government and media had a direct or indirect negative influence on the decision-making process, (6) The social environment and its norms as support or burden in the decision-making process, and (7) Religious beliefs and values holding back and encouraging in the decision-making process.

Conclusions Many participants described the COVID-19 vaccination decision as a personal risk-benefit assessment, rather than a social responsibility. Many participants experienced lack of transparency of information from the government and the media, inhibiting them from making a good decision. We recommend providing clear and transparent information that explains possible contradictions and acknowledges uncertainties and potential adverse effects. Religious beliefs and values, and the strong influence of children and parents in making the vaccination decision should also be carefully considered in communication strategies.

Clinical trial number Not applicable.

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Keywords COVID-19, Vaccine, Decision-making, Moroccan, Immigrants, The Netherlands

Background

The COVID-19 pandemic has severely affected the health and wellbeing of people worldwide [1, 2]. COVID-19 was declared a global pandemic by the World Health Organization in March 2020 and was a leading cause of death globally [3]. Since the start of the pandemic, several non-pharmaceutical interventions, including social distancing, contact tracing, travel bans, and lockdowns, were used to prevent the transmission of the coronavirus (SARS-CoV-2). However, for a long-term approach to control the pandemic, the development and use of vaccines was essential. In December 2020, the European Commission had granted the first marketing authorisation for COVID-19 vaccines, marking the start of large-scale vaccination campaigns throughout the European Union (EU) [4].

In the Netherlands, the COVID-19 vaccination campaign started in January 2021. By September 2023, an estimated 82% of individuals aged 18 years and older had been fully vaccinated with the base series (i.e. two doses, except for the Janssen vaccination (one dose)) [5]. Despite this high overall vaccination coverage, inequalities were observed among subgroups, with a lower vaccination uptake among individuals with a Moroccan, Antillean, Turkish, Surinamese, or other non-Western migration background [6, 7]. This was especially concerning, because of the higher SARS-CoV-2 incidence and the higher risk of COVID-19 death in individuals with a migration background, compared to the native Dutch population [8, 9].

A cross-sectional study investigating COVID-19 vaccination intent (from November 2020 to March 2021) in Amsterdam, the Netherlands, found the lowest intention figures among Moroccan-Dutch (29.6%), compared to native Dutch (79.2%), Ghanaian (52.1%), South-Asian Surinamese (47.6%), Turkish (47.1%), and African Surinamese (43.1%) groups, respectively [10]. A study among older individuals with a migration background in the Netherlands explored facilitators and barriers of taking the COVID-19 vaccine [11]. This study found that these individuals had many questions and felt anxious about the safety and side effects of the vaccine. Participants frequently mentioned their need for more information about the COVID-19 vaccination. The influence of dis- and misinformation on vaccination decisions was also emphasised [11]. Several sources of mis- and disinformation were mentioned among which their social network (in particular children of respondents), YouTube, and WhatsApp [11]. The impact of mis- and disinformation, or more broadly, conflicting information, on immigrant populations is assumed potentially greater than among individuals without a migration background, as immigrants received information both from their country of origin and the country they live in [11, 12].

Previous work by the Dutch National Institute for Public Health and the Environment has provided some additional insights into determinants of the COVID-19 vaccination uptake among immigrant populations [12]. A complex mix of potential determinants were assumed to play a role. Aside from determinants also known from studies among the Dutch population in general (such as trust in the government, disease risk perceptions, vaccine safety concerns, and social norms), this study also suggested the influence of factors related to having a migration background, namely language barriers, fear of stigmatisation, and the influence of religious and political leaders. Socio-economic status and cultural background could be potential underlying mechanisms [12].

While there are some insights about the barriers and facilitators of COVID-19 vaccination uptake among immigrant populations, very limited insights are available about the process of vaccination decision-making (e.g. how did the decision-making unfold over time, which information sources were used, what was the role of friends and family) and the process between vaccination intention and uptake (e.g. which barriers complicated translating a positive intention into vaccination uptake and what were facilitators). In-depth insights into these processes can potentially provide leads to improve the informed vaccination uptake among immigrant populations. Since previous research found the lowest vaccination uptake among the Moroccan-Dutch [6], we chose to perform our study among Moroccan immigrants, the second largest immigrant population in the Netherlands (425,034 inhabitants in 2023 [13]).

Therefore, the aim of this study was to explore the COVID-19 vaccination decision-making process and the process between vaccination intention and uptake among Moroccan immigrants in the Netherlands, in order to provide leads for increasing the informed COVID-19 vaccination uptake among immigrant populations.

Methods

Study design and study population

Between April and June 2022, we conducted an exploratory qualitative study through semi-structured one-on-one interviews. This design was chosen to explore participants' individual perceptions regarding their COVID-19 vaccination decision-making process and behaviour. The study is reported in line with the Consolidated criteria for reporting qualitative research (COREQ) checklist [14].

Participants were eligible for this study if they were first- or second-generation Moroccan immigrants in the Netherlands and aged 16 years or older. In line with Statistics Netherlands, first-generation immigrants were defined as individuals who were born in Morocco. Second-generation immigrants were defined as individuals who were born in the Netherlands and having at least one parent who was born in Morocco [15].

We aimed to include a diverse study population based on age, gender, educational level, residence, first- and second-generation migration background, and COVID-19 vaccination status. Participants were recruited through several strategies. In a private Facebook group with a large number of members with a Moroccan migration background, a post was published to recruit potential study participants. Participants were further recruited through community centres, mosques, and the researchers' social and professional network (e.g. LinkedIn). This recruitment was done by NH and a researcher who conducted the interviews. Study participants were recruited until we reached a satisfactory diverse population, and data saturation was reached (i.e. no new (sub)themes were generated during the analysis of the last interview held).

Interview guide

In developing the interview guide, various previous studies and theoretical models were taken into consideration. Many theoretical models have been developed to explain human behaviour in general and health behaviour in specific, among which the Health Belief Model [16], the Protection Motivation Theory [17], and the Reasoned Action Approach [18]. These theoretical models have in common that they state that the transition to health-related behaviour is a trade-off between the assessment made of the necessity to act (e.g. perceived susceptibility to and severity of disease) and the perception of the effect of the action (e.g. perceived benefits, perceived response-efficacy). For our study specifically, it is also important to consider religious and cultural values and beliefs in decision-making, as these have shown to influence health-related behaviour [19–21]. Betancourt's Model of Culture and Behaviour assumes that health behaviour is associated with aspects of culture, such as value orientation, which can either influence behaviour directly or indirectly through psychological processes [22]. In addition, studies regarding health behaviour among Turkish- and Moroccan-Dutch populations that incorporated such cultural factors confirmed the importance of cultural values in health decisions [19–21]. In addition to the aforementioned factors, vaccination behaviour has been associated with a number of additional specific factors, among which importantly the perceived safety of vaccines, trust in involved institutions, and social norms. For persons with a migration background, additional factors were identified, such as language barriers, fear of stigmatisation, and the influence of religious and political leaders [12].

Informed by the mentioned theoretical models and empiric studies, we developed an interview guide with open questions concerning the following subjects: (1) Thoughts and feelings regarding COVID-19, (2) Thoughts and feelings regarding the COVID-19 vaccines, (3) Experiences with the process of vaccination decision-making and getting vaccinated, (4) Previous and future vaccination intent, and (5) Information needs and possibilities to improve the current information. The final version of the interview guide (English translation) can be found in Additional file 1.

The interview guide was developed in collaboration with a diverse group of experts (e.g. qualitative researchers, health psychologist, public health specialist, key community leaders), and two pilot interviews were conducted with Moroccan-Dutch participants. The pilot interview transcripts were reviewed and discussed by two researchers (researcher conducting the interviews and NH), and small adjustments to the interview guide (mainly in the formulation and sequence of questions) were made consequently. The data of the pilot interviews were included in our analysis, since the same questions were asked as in the final version of the interview guide.

Data collection

Semi-structured interviews were held by a Moroccan-Arabic speaking female researcher (MSc) in Dutch, Moroccan-Arabic, or a combination of both, and lasted approximately one hour. Part of the interviews were held online and part face-to-face. Online interviews took place via Microsoft Teams. Face-to-face interviews took place at a convenient place for the interviewee and the researcher. Each participant was given a small incentive (a gift voucher worth 10 euros) as a token of appreciation. All interviews were audio recorded (by means of Microsoft Teams or a voice recorder) and transcribed verbatim. The interviews that were held in Moroccan-Arabic were directly translated to Dutch while transcribing. This was done by the researcher who conducted the interviews.

Prior to the interviews, participants were asked to fill out a short questionnaire consisting of questions regarding several socio-demographic characteristics (e.g. age, gender, educational level, residence, and (parental) country of birth). The results of the questionnaire were used to gain insights into the diversity of our sample and to enable comparison of the results based on socio-demographic characteristics.

Table 1 Sample characteristics ($n = 29$)

Characteristic	Value
Age categories (n; %)	
16-30 years	6 (20.7%)
31-50 years	13 (44.8%)
51 years and older	10 (34.5%)
Female (*n; %*)	17 (59%)
Country of birth (*n; %*)	
Morocco (first-generation)	18 (62%)
The Netherlands (second-generation)	11 (38%)
Educational level* (*n; %*)	
No education	7 (24%)
Low education	10 (35%)
Intermediate education	3 (10%)
High education	9 (31%)
COVID-19 vaccination status (*n*; %)	
Unknown	1 (4%)
No vaccination	9 (31%)
Base series (i.e. two doses, except for the Janssen vaccination)	11 (38%)
Base series + Booster	8 (28%)

* Educational level was categorised following the categorisation of Statistics Netherlands: primary education, preparatory secondary vocational education, senior secondary general education, pre-university education, or senior secondary vocational education (low), senior secondary general education, pre-university education, or senior secondary vocational school (intermediate), and higher professional education or academic higher education (high) [24]

Data analysis

Interviews were analysed using the qualitative software programme MAXQDA v.20.0.7 (Berlin: VERBI GmbH). All interviews were coded by the researcher who conducted the interviews, of which one-third was double coded by NH to reduce subjective interpretation of data. The second coder (NH) relied on the translated transcripts (in case the interview was conducted in Moroccan-Arabic) by the first coder/researcher who conducted the interviews. Discrepancies were discussed until consensus was reached.

The analysis was based on the principles of thematic analysis [23], and was aimed at exploring the COVID-19 vaccination decision-making process and the process between vaccination intention and uptake. First, transcripts were coded by labelling relevant fragments of text with concepts abstracted from this text (i.e. open coding). Thereafter, themes and subthemes were identified through systemic comparison of the coded text (i.e. axial and selective coding). Interpretation of the themes and subthemes was discussed among the researchers (NH and MdV) until consensus was reached. We also compared the results based on the socio-demographic characteristics.

Results

Study population

In total, we conducted 29 interviews among Moroccan immigrants in the Netherlands. We included 18 first- and 11 second-generation Moroccan immigrants (see Table 1). The majority of the participants was female (59%). Participants had a mean age of 45.5 years. First-generation immigrants had a mean age of 62.3 years compared with 28.7 years for second-generation immigrants. Participants had varying educational backgrounds ranging from no education to high education. Twelve participants (41%) reported to have completed a medium level of education or higher. Two-thirds of the participants ($n = 19$) reported to have been vaccinated with (at least) the base series. One participant wanted to keep his/her vaccination status private.

Thematic analysis

The following themes were generated regarding the COVID-19 vaccination decision-making and vaccination uptake process: (1) Attitudes shifted over time and the vaccination decision was postponed, (2) A personal multi-faceted risk-benefit assessment, rather than feelings of social responsibility, resulted in a decision to vaccinate or not, (3) Feelings of decisional or anticipated regret that accompanied the personal risk-benefit assessment influenced the vaccination decision, (4) Used information sources, (5) A perceived lack of trustworthiness of the information disclosed by the government and media had a direct or indirect negative influence on the decision-making process, (6) The social environment and its norms as support or burden in the decision-making process, and (7) Religious beliefs and values holding back and encouraging in the decision-making process.

Attitudes shifted over time and the vaccination decision was postponed

Most participants indicated that during the pandemic their attitudes and feelings towards the vaccine were not constant, but subject to change. Participants mentioned that at the beginning of the pandemic, the vaccine was received by them very positively, since they saw it as a way out of the pandemic situation. Gradually, the positive attitudes and feelings towards the vaccine changed for some participants into negative attitudes and feelings:

> *"At first, I trusted the vaccine, but not anymore. They are all lies." (female, 51–60 years, fully vaccinated with the base series).*
>
> *"It [the vaccination] is a remedy that you have to take to activate your body, so that you can at least make some antibodies, in case you are attacked by the virus. I thought it was very serious, necessary. And now, I think very differently. Now, I think, I've*

been through the flu, I think my body is now ready to fight the[corona]virus, should I get it again. And yes, I think, I don't relate it now to the fact of, I'm dying, no." (female, 41–50 years, fully vaccinated with the base series and the booster).

Some participants mentioned having postponed their vaccination decision:

"Because I've been waiting too long. […] Do I want it or do I not want it? So, I found it very difficult. So, I've actually decided I'll just wait and see how people react to it [the vaccination]." (female, 61–70 years, fully vaccinated with the base series).

Participants indicated to postpone their vaccination decision due to feelings of doubt, mainly about the short- and long-term safety of the vaccine and the feeling of being overwhelmed by the new pandemic situation. By postponing the decision, participants kept the options (of vaccinating or not) open.

A personal multi-faceted risk-benefit assessment, rather than feelings of social responsibility, resulted in a decision to vaccinate or not

Many participants described the COVID-19 vaccination decision as a personal risk-benefit assessment, rather than a social responsibility:

"I just measure the balance […]. I just look at the risks. If the risk is so high and the chance is also so high that I will die from corona, then I think I don't mind to be vaccinated, but the chance is so small." (male, 21–30 years, fully vaccinated with the base series).

Social responsibilities, such as protecting vulnerable individuals or a way out of the pandemic were recognised, but were, for most participants, not essential for their vaccination decision-making process. The choice to take the COVID-19 vaccine was self-evident for some, while others experienced that they had no choice because of the dangerous nature of the pandemic, the need to undertake (social) activities, or wanting to go on a vacation abroad. In order to make a personal risk-benefit assessment, multiple factors were taken into account by the participants (further discussed below).

The factors that participants took into account in their personal risk-benefit assessment were categorised into the following subthemes: (1) Perceived susceptibility to and severity of disease, (2) Perceived adverse effects and safety of the vaccine, (3) Perceived effectiveness of the vaccine on preventing (severe) disease, and (4) Perceived consequences of the vaccine on daily life. Below, the results linked to these subthemes are described into detail.

Perceived susceptibility to and severity of disease

Almost all participants had experienced a COVID-19 infection at least once since 2020. Some of these participants expressed that they are still experiencing long-term symptoms due to the disease (i.e. long COVID). Many participants (also) mentioned seeing the serious consequences of COVID-19 in their social environment, e.g. a friend or relative died due to COVID-19 or was still experiencing (serious) long-term symptoms of the disease (i.e. long COVID). Participants often stated to perceive COVID-19 to be similar to the flu, which can have a severe course in certain vulnerable groups (e.g. elderly, individuals with comorbidities), but is generally mild for others (i.e. healthy and young individuals). As a consequence, young and/or healthy participants mentioned they thought they did not need the COVID-19 vaccine to combat the disease:

"I am healthy and strong. I have had corona, but did not feel anything because of it. I do not think I need it [the vaccination]. You see that with a lot of young people." (male, 41–50 years, fully vaccinated with the base series).

Perceived adverse effects and safety of the vaccine

Participants mentioned several concerns about the COVID-19 vaccines related to the vaccines' efficacy, safety, adverse effects, toxicity, and the (lack of) trust they had in the vaccination producing companies. Many participants described negative perceptions regarding the vaccines' efficacy, safety, adverse effects, and toxicity based on their experienced side effects, having heard about side effects in their social environment, and/or because of the perceived short time period in which the vaccines were developed:

"Because it [the vaccination] was developed so quickly and I didn't know what was in it. Actually, I still don't know, but for me, it was a confirmation of my own feelings". (female, 31–40 years, not vaccinated).

Believing that the immunity boost by a vaccine would only last for a short period of time, that vaccines were developed too hastily, that the production process of the vaccines was pushed, and that the vaccines are most probably fake were also mentioned as negative beliefs towards the COVID-19 vaccines. Because of this, many described an unwillingness or hesitancy towards taking the vaccine for the first time or for a next time. Some participants, on the other hand, mentioned that they trusted

medical science and that they were willing to take the vaccine.

Perceived effectiveness of the vaccine in preventing (severe) disease

One of the main concerns of the unvaccinated participants was their perception that the effectiveness of the vaccine was not yet proven regarding lowering the risk of contracting an infection, transmitting the infection to others, and having a severe course of the COVID-19 disease. These participants doubted the effectiveness of the vaccine, since these individuals observed that individuals who were vaccinated still infected others and still got sick themselves:

> *"People say the vaccine doesn't work, because there is no difference between vaccinated and unvaccinated [people]. Unvaccinated people are actually in an even better shape. Because if the vaccination worked, why would vaccinees still have to wear protective measures, such as face masks? […] If the vaccination worked, the vaccinee would not have to keep his/her distance or wear a face mask." (female, 51–60 years, fully vaccinated with the base series).*

The group of vaccinated participants also mentioned this, but these participants indicated that they had confidence and trust in the scientists behind the vaccines, and therefore, chose to be vaccinated against COVID-19.

Perceived consequences of the vaccine on daily life

Many participants indicated that the choice to vaccinate or not had consequences for their daily life and that this aspect was taken into account during their decision-making process. The perception of almost all participants was that vaccinated individuals had more freedoms in society than unvaccinated individuals. On the one hand, participants mentioned this as a reason for them to get vaccinated:

> *"You are restricted so much that you no longer vaccinate because of the vaccine, but because of the restrictions. And I think a lot of people in my environment did that too. And what you also see among people on the street and in organisations you encounter, that that was mainly the reason to vaccinate. Because of the limitations." (male, 31–40 years, vaccination status unknown).*

On the other hand, there were also participants who stated not to get vaccinated because of these perceived privileges. This group of participants believed that more freedoms are not the right incentive to encourage citizens to get vaccinated, and because of this moral value, they chose not to get vaccinated.

Feelings of decisional or anticipated regret that accompanied the personal risk-benefit assessment influenced the vaccination decision

Common feelings that were discussed by the participants regarding the individual decision-making process could be identified as decisional and anticipated regret. Two situations of decisional regret were expressed during the interviews, namely by a few participants who got vaccinated and in retrospect would not, and among one participant who was not vaccinated and in retrospect would have decided to vaccinate. In the first situation, participants regretted their decision because of one or more of the following reasons: (1) they experienced side effects or heard about this in their social environment, (2) they believed, in retrospect, that the vaccine was not effective in preventing contraction of the disease or in experiencing a milder course of the disease (compared to the situation of not being vaccinated), and (3) because they chose to get vaccinated to gain certain freedoms in society and had regrets in retrospect:

> *"Because looking back now, I basically took the vaccine for a one four-week trip. I don't think I would have done it if I could turn back time." (male, 21–30 years, fully vaccinated with the base series).*

In the situation of a participant regretting not to get vaccinated, the participant experienced a serious COVID-19 infection and believed that in retrospect a vaccination would have provided protection against a serious course of the infection.

The majority of the participants mentioned that anticipated emotions shaped their decision-making about the vaccination. Potential feelings of regret regarding possible health consequences because of the administration of the COVID-19 vaccine was the main anticipated emotion mentioned by the participants. Participants often mentioned this in relation to their own (good) health condition:

> *"I think I would have found it very difficult if I had been vaccinated and I would suffer from physical symptoms or something." (female, 21–30 years, not vaccinated).*

Used information sources

The majority of the participants consulted the website of the Dutch National Institute for Public Health and the Environment (RIVM) and the website of the Municipal Public Health Services (GGD) to gain information for making the decision to vaccinate or not. Some

participants also consulted the Dutch institute Lareb, which reports about side effects of medications. Other major sources of information were social media channels, such as YouTube, Facebook, WhatsApp, and Instagram. Many participants mentioned that within the Moroccan-Dutch community, videos were exchanged mainly via WhatsApp. Many of these videos originated from relatives and friends living in Morocco.

A perceived lack of trustworthiness of the information disclosed by the government and media had a direct or indirect negative influence on the decision-making process

The trustworthiness of the government and media was discussed by almost all participants. Their trust in these institutions seemed to relate mostly to the information disclosure of these institutions. Many participants indicated that they perceived a discrepancy between the information disclosed via the government and media, which was in their perception mainly in favour of the vaccine, and the information disclosed via unofficial media channels like YouTube, in their perception mainly against the vaccine. Many participants indicated that they wanted to be informed about all aspects of the COVID-19 vaccine to be able to make an informed decision:

> *"The focus was very much on those vaccines. And that we really needed it, because without it, we wouldn't get out of this corona pandemic. So, I also thought that there was a lot of emphasis on that, while I myself might have wanted to hear other prevention measures earlier." (female, 21–30 years, not vaccinated).*

Due to the perceived lack of transparency of information from the government and the media, many participants had the feeling that they could not make a good decision.

Most participants indicated a need for good communication to be able to trust the government and the media. All participants described "good communication" as clear and non-contradictory information, including information about uncertainties. Participants additionally mentioned that they expected the media to pay attention to other voices in society in addition to the government's point of view towards the vaccine and the COVID-19 policy. Some participants indicated that the Dutch media not showing dissenting voices resulted in feelings of distrust. It made them assume that the media was not independent from the government. Many participants mentioned that this distrust in the government and the media negatively impacted their trust in the COVID-19 vaccines.

All participants indicated that they were aware of uncertainties with regard to controlling the pandemic. Participants mentioned a need to be informed about these uncertainties rather than to be shown an 'apparently all-knowing government'. Therefore, transparent information about the COVID-19 vaccination (e.g. possible adverse effects, uncertainties) was a recommendation to the government that was often mentioned by the participants:

> *"Tell the truth like we don't know […], we work with the best resources, this is our best option. That increases credibility." (female, 31–40 years, fully vaccinated with the base series and the booster).*

Furthermore, many participants indicated that it should also be taken into account that individuals have their hesitance and scepticism about the vaccine, and that they should not be ignored or punished for this.

Many participants indicated that they often perceived the information from the government about the vaccine to be conflicting or contradictory. Most participants mentioned that this resulted in feelings of confusion and a loss of confidence in the information they received, and therewith in the vaccination itself. This applied to both unvaccinated and vaccinated participants:

> *"I'm lost so to speak. And in my view, it's like hey, I've seen so many different opinions and changes over the past three years, what's the right one, what's coming next, is that the right one, you know. The trust is simply gone, that's it." (female, 41–50 years, fully vaccinated with the base series).*

The social environment and its norms as support or burden in the decision-making process

The social environment was experienced by the participants as a 'warm blanket', but also as a burden during the decision-making process and even afterwards. The majority of participants mentioned that they consulted family, friends, and colleagues to hear their considerations in deciding to vaccinate or not, and to discuss the COVID-19 restrictions and reliability of information. Although many participants wanted to hear the considerations of individuals in their environment, they did not feel that these conversations influenced their own vaccination decision (except for children and their parents). Some participants did, however, mention they felt the need to justify or defend their vaccination decision towards others. They mentioned to be more likely to share their vaccination decision when this corresponded with the vaccination status of the social environment they perceived to belong to:

> *"But I could say that I was not vaccinated, but I was going to disguise it a little bit. So, I'd say, for example, "Yeah, I don't know yet. I haven't been vac-*

cinated yet, but you know, I'm still thinking about it." More like that. I left it very open." (female, 21–30 years, not vaccinated).

Based on what many participants indicated, there seemed to be a two-way influence in the decision-making process of children and their parents. Young adults indicated that they weighted the opinion of their parents heavily in their vaccination decision or even left the decision to their parents. The reason mentioned for this was that they felt they should be obedient to their parents. Similarly, some elderly first-generation participants indicated that the vaccination decision was made by their children due to the language barrier they experienced, but also out of habit. Many indicated that they agreed and were satisfied with the decision that was made for them. One elderly individual wanted to be vaccinated against the wishes of the children:

"I actually kind of came secretly [to get vaccinated], because my children don't want that at all." […] "I'm not getting a letter about this, am I?" […] "There is no need for a letter, because I don't want my children to know about this." (male, 31–40 years, fully vaccinated with the base series).

The reverse situation in which the elderly did not want to vaccinate themselves against the wishes of their children was not mentioned among this group of participants.

Community centres and mosques played a particularly large role in the provision of COVID-19 information to elderly participants. In particular, the information in their own language and the presence of key figures were perceived as having great value.

Religious beliefs and values holding back and encouraging in the decision-making process

Most participants viewed themselves as religious (Muslim) and expressed their belief that health and health behaviour plays an important role in the Islam. In line with this belief, most participants indicated that from an Islamic point of view, one is obliged to take good care of their own body, that their religion encourages using all medical options available (e.g. vaccination), and that Muslims should follow the rules of the country they are living in, especially during an epidemic or pandemic:

"Islamically, we are obliged to vaccinate, because we have to follow the rules of the country, regarding an epidemic, pandemic." (female, 31–40 years, fully vaccinated with the base series and the booster).

Some participants described the COVID-19 vaccination as senseless, since they believed that everything is already written for them. These participants expressed to believe in fate (for example whether one falls ill with COVID-19 or not; i.e. fatalism), which cannot be influenced by individual actions taken (i.e. getting the COVID-19 vaccination). Health behaviour like vaccination cannot, from a fate standpoint, prevent illness, and is thus regarded as unbeneficial. Therefore, fatalism seemed to function as a barrier for vaccinating against COVID-19:

"In the end, what Allah has written for us happens and we have no influence on it." (female, 51–60 years, fully vaccinated with the base series).

Interestingly, a few vaccinated participants also mentioned believing in fate in the context of possibly getting side effects because of taking the vaccine:

"Everything is in the hands of God. If your day has come, then you die from the vaccination. If not, then that day was not for you." (female, 41–50 years, fully vaccinated with the base series).

Discussion

This qualitative study was, to our knowledge, the first to explore the COVID-19 vaccination decision-making process and the barriers and facilitators experienced in the vaccination process among Moroccan immigrants in the Netherlands. We conducted this study to find concrete input to improve the strategy for increasing the informed COVID-19 vaccination uptake among this population and immigrant populations in general in the Netherlands. These results can be used for the current Dutch vaccination campaigns targeting individuals with a migration background, also beyond COVID-19.

Main findings in relation to previous literature

Comparing our results with the WHO's behavioural and social drivers of vaccination (BeSD), we see that various drivers play a role in the Moroccan-Dutch population also. Themes 1 and 3 "Attitudes shifted over time and the vaccination decision was postponed" and "Feelings of decisional or anticipated regret that accompanied the personal risk-benefit assessment influenced the vaccination decision" are linked to the BeSD construct Decision process (i.e. the general decision process followed). Theme 2 "A personal multi-faceted risk-benefit assessment, rather than feelings of social responsibility, resulted in a decision to vaccinate or not" is related to the BeSD construct Perceived COVID risk (to self) (i.e. perceived risks posed by COVID disease). Themes 4 and 5 "Used information sources" and "A perceived lack of trustworthiness of the information disclosed by the government and media had a direct or indirect negative influence on the decision-making process" are related to

the BeSD construct COVID vaccine (i.e. heard information and felt confidence in the vaccine and the vaccine providers), more specifically to Confidence in vaccine and provider. Themes 6 and 7 "The social environment and its norms as support or burden in the decision-making process" and "Religious beliefs and values holding back and encouraging in the decision-making process" are in line with the BeSD construct Social norms (i.e. any social norms involved in vaccine decisions or access), more specifically with Family support / permission to vaccinate and Religious beliefs and norms.

Many participants explained that their vaccination decision was made through a personal risk-benefit assessment, rather than the belief that herd immunity (i.e. large proportion of the population is immune to the disease) will lead to an end of the pandemic. This is in contrast to a previous study among the general Dutch population, in which the strongest determinant of the COVID-19 vaccination intention was the belief that the COVID-19 crisis will only end if many persons get vaccinated [25].

Campman, et al. (2023) found being female, believing that COVID-19 is exaggerated in the media, and being younger than 45 years of age as determinants of a lower COVID-19 vaccination intention among immigrants, such as Ghanaian, South-Asian Surinamese, Turkish, African Surinamese, and Moroccan groups [10]. These determinants may represent one's perceived susceptibility to and severity of the disease, which was also found in our study. Another study among the general Dutch population investigated specific beliefs that persons have regarding COVID-19 and COVID-19 vaccines, and to what extent these beliefs explain COVID-19 vaccination intentions [25]. In line with our study, beliefs about safety of vaccines, (social) benefits of vaccination, social norms regarding vaccination behaviour, and effectiveness of vaccines were found as the strongest determinants.

Especially young and/or healthy individuals often concluded that vaccinating was not beneficial for them. A study among Dutch teenagers, aged 12–18 years, also suggested that their COVID-19 vaccination willingness was related to the perceived personal and societal benefits, and the perceived side-effects and potential unknown long-term consequences of the vaccine [26].

Other factors related to vaccination uptake that stood out from our results were decisional and anticipated regret, religious beliefs and values, and the social environment. Participants often mentioned feelings of regret, in regards to possible health consequences because of the administration of the COVID-19 vaccine. This is in line with previous research among a diverse range of populations [27].

Religious beliefs and values acted both facilitating and hindering in their decision to vaccinate against COVID-19. Similar findings among Moroccan-Dutch were also found in the context of deciding whether or not to participate in (cancer) screening programmes [19, 20].

Regarding the social environment, in particular, young adults indicated that the opinion of their parents weighted heavily in their decision or that they left the decision entirely up to their parents. Also, elderly first-generation parents often mentioned that the COVID-19 vaccination decision was made by their children due to a language barrier and out of habit. Many indicated that they agreed and were satisfied with the decision that was made for them.

Almost all participants mentioned a perceived lack of trustworthiness of the government and the media as having a negative influence on their decision to take the COVID-19 vaccine or not. These results are not specific to the Moroccan-Dutch, as previous work already found that trust in the safety and efficacy of vaccines, trust in the individuals that administer vaccines or give advice about vaccination, and trust in the wider health system are all important factors which influence the vaccination decision-making process [28–30].

Participants often mentioned a need to have clear, transparent, and non-contradicting information materials about a new vaccination, while acknowledging the uncertainties and the possible adverse effects that may unfold in the future. This helps individuals in not having second thoughts about whether or not information is deliberately withheld. This transparent and open communication by the government can also play an important role in having trust in the government (and thereby the vaccine) [31].

Overall, we found similarities with findings of previous studies among the general Dutch population. However, Moroccan immigrants' decision-making process seems to differ in some specific aspects, namely that it was a personal risk-benefit assessment rather than a social responsibility, the religious beliefs and values, and the strong influence of children and parents in making the decision to vaccinate against COVID-19 or not (i.e. parents made the vaccination decision for their children and vice versa).

Strengths and limitations

A major strength of this study was that we interviewed a diverse sample of Moroccan immigrants in the Netherlands, based on age, gender, educational level, and first- and second-generation migration background. Another strength is that we formulated broad and open questions for our interview guide, inspired by a diverse range of health behaviour theories and models. We also conducted this study in a point of time at which all COVID-19 measures had just been relaxed, and participants could retrospectively recollect their thoughts on how they experienced the COVID-19 pandemic and how their

COVID-19 vaccination decision-making process was (or still is) formed.

However, a number of limitations should also be addressed.

First, our sample included more vaccinated participants (66%) than the suspected national vaccination rate among Moroccan-Dutch. A previous Dutch study conducted in Amsterdam found a vaccination rate of 35.8% among Moroccan-Dutch participants [6]. However, we believe important insights in the vaccination decision-making processes of both vaccinated and unvaccinated individuals are retrieved. More importantly, we saw that the decision-making processes of vaccinated and unvaccinated individuals were similar. As an example, both vaccinated and unvaccinated individuals reported a lack of transparency of information from the government and the media, but for vaccinated individuals, this did not stop them from taking the vaccine.

Second, since participants were asked to retrospectively recollect their thoughts on their experiences regarding the COVID-19 pandemic and their COVID-19 vaccination decision-making process, recall bias could have played a role.

Third, we did not record if any (and why) approached participants refused to take part in the interviews. Since we managed to include a diverse sample in terms of age, gender, educational level, and first- and second-generation migration background, different perspectives were taken into account.

Fourth, the accuracy of the translations of the Moroccan-Arabic (parts of the) interviews could not be verified by a second Moroccan-Arabic speaking individual. This might have introduced subjectivity into the data, but is expected to be limited, since only three interviews have taken place in Moroccan-Arabic.

Finally, we did not explicitly ask whether participants encountered practical barriers to get the vaccination. However, a few participants mentioned having insufficient financial means to get to a vaccination location. It was also noted by some participants that the degree of priority and relevance in the light of all things they had to think of (e.g. children, work, household chores) can stimulate or hinder vaccination uptake.

Recommendations for practice and future research

Best practices and guidance have been formulated for 'good' risk communication in crises, such as a pandemic like COVID-19 [32–35]. In line with our results, common recommendations are to explore the perceptions and information needs of the public and taking these into account, to engage with and involve important stakeholders, to communicate about uncertainties, to practice honest, open, and compassionate communication, and to ensure that other trusted information sources provide the same information.

In light of our results, we recommend that extra attention is paid to possible contradicting aspects in the information materials about a new vaccination, and to explain these in a clear and honest manner. It is also important to acknowledge and explain the uncertainties and the possible adverse effects that may unfold in the future. Also, since many participants mentioned feelings of distrust towards the government, we would like to recommend the government (but also health-related organisations, such as Municipal Public Health Services) investing time and effort in building and maintaining trust in non-pandemic times by reaching, engaging with, and involving immigrant populations.

Specific factors found for the decision-making process of Moroccan immigrants in the Netherlands were that it was a personal risk-benefit assessment rather than a social responsibility, religious beliefs and values, and the strong influence of children and parents in making the decision to vaccinate against COVID-19 or not. We believe it is crucial to carefully consider how these aspects can be included in future communication strategies and information materials in regard to (new) vaccinations. Engaging with and involving key organisations and figures in the society, such as mosques and community centres, in reaching and informing immigrant populations is widely appreciated by the immigrants themselves and can help in bridging trust issues and information gaps.

Conclusions

Multiple themes played a role in the COVID-19 vaccination decision-making process among Moroccan immigrants in the Netherlands. Based on several perceptions (perceived susceptibility to and severity of disease, perceived adverse effects and safety of the vaccine, perceived effectiveness of the vaccine on (contracting) the disease, and perceived consequences of the vaccine on daily life), participants made a personal risk-benefit assessment in deciding to take the COVID-19 vaccine or not. Participants also emphasised the need to have clear and transparent information. We, therefore, recommend that possible contradicting aspects are explained, and uncertainties and possible adverse effects that may unfold in the future are acknowledged. Specific to Moroccan-Dutch, the personal risk-benefit assessment rather than a social responsibility, the religious beliefs and values, and the strong influence of children and parents in making the decision to vaccinate against COVID-19 or not should be carefully considered in future communication strategies and information materials in regards to (new) vaccinations. In bridging trust issues and information gaps, it is key to engage with and involve key

organisations and figures in the society, such as mosques and community centres, especially during non-pandemic times, in reaching and informing immigrant populations about (new) vaccinations.

Abbreviations

COVID-19	Coronavirus disease
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
EU	European Union
COREQ	Consolidated criteria for reporting qualitative research
RIVM	The Dutch National Institute for Public Health and the Environment
GGD	Municipal Public Health Services

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

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Author contributions
Conceptualised and supervised the project: NH, MdV, AT. Developed and tested the research materials: NH, MdV, with support of MS, RC, PH, MvdM, AT. Performed data collection: NH. Performed data analyses: NH, MdV. Wrote first version of the manuscript: NH. Critically reviewed and substantively revised the manuscript multiple times: MdV, MS, RC, PH, MvdM, AT.

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Data availability
The data generated and/or analysed during the current study are not publicly available due to privacy reasons, but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
This study was conducted in accordance with the Declaration of Helsinki. Interested individuals were informed about the study via an information letter. Individuals willing to participate in the study were explicitly asked for their (digital) informed consent. Participants who were unable to provide informed consent (due to a language barrier) gave (oral) consent after the oral explanation of the information letter by the interviewer. Ethical clearance was obtained from the Medical Ethics Review Committee of the University Medical Centre Utrecht. The Committee confirmed that the Medical Research Involving Human Subjects Act (WMO) does not apply to this study (nr. 22/543).

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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References

1. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): A review. Int J Surg. 2020;78:185–93.
2. Phua J, Weng L, Ling L, Egi M, Lim CM, Divatia JV, et al. Intensive care management of coronavirus disease 2019 (COVID-19): challenges and recommendations. Lancet Respir Med. 2020;8(5):506–17.
3. Worldometer, COVID-19 Coronavirus Pandemic. 2024. Available from: https://www.worldometers.info/coronavirus/?utm_campaign=homeAdvegas1
4. European Commission authorises. first safe and effective vaccine against COVID-19 [press release]. 2020.
5. Rijksoverheid. Coronadashboard. 2023. Available from: https://coronadashboard.rijksoverheid.nl/landelijk/de-coronaprik
6. Campman SL, Boyd A, Coyer L, Schinkel J, Agyemang C, Galenkamp H, et al. SARS-CoV-2 vaccination uptake in six ethnic groups living in Amsterdam, the Netherlands: A registry-based study within the HELIUS cohort. Prev Med. 2024;178:107822.
7. Labuschagne LJE, van de Smorenburg N, Bom B, de Weerdt AC, de Melker HE, Hahné SJM. Neighbourhood sociodemographic factors and COVID-19 vaccine uptake in the Netherlands: an ecological analysis. BMC Public Health. 2023;23(1):1696.
8. Chilunga FP, Stoeldraijer L, Agyemang C, Stronks K, Harmsen C, Kunst AE. Inequalities in COVID-19 deaths by migration background during the first wave, interwave period and second wave of the COVID-19 pandemic: a closed cohort study of 17 million inhabitants of the Netherlands. J Epidemiol Community Health. 2022.
9. Coyer L, Boyd A, Schinkel J, Agyemang C, Galenkamp H, Koopman ADM, et al. Differences in SARS-CoV-2 infections during the first and second wave of SARS-CoV-2 between six ethnic groups in Amsterdam, the Netherlands: A population-based longitudinal serological study. Lancet Reg Health Eur. 2022;13:100284.
10. Campman SL, van Rossem G, Boyd A, Coyer L, Schinkel J, Agyemang C, et al. Intent to vaccinate against SARS-CoV-2 and its determinants across six ethnic groups living in Amsterdam, the Netherlands: A cross-sectional analysis of the HELIUS study. Vaccine. 2023;41(12):2035–45.
11. HELIUS. Bevolkingsgroepen met migratieachtergrond zwaarder getroffen door COVID-19. 2021. Available from: https://heliusstudy.nl/nl/over-helius/resultaten/
12. RIVM Corona Gedragsunit. Vaccinatiebereidheid COVID-19 onder groepen met een migratieachtergrond; verkenning van beïnvloedende factoren en mogelijke strategieën voor communicatie en beleid. 2021. Available from: https://www.rivm.nl/documenten/vaccinatiebereidheid-covid-19-onder-groepen-met-migratieachtergrond
13. Statistics Netherlands. Bevolking; herkomstland, geboorteland, leeftijd, regio, 1 januari. 2023. [Available from: https://opendata.cbs.nl/#/CBS/nl/dataset/85458NED/table?ts=1707297907427]
14. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349–57.
15. Statistics Netherlands. Wat is het verschil tussen de eerste en tweede generatie? 2023. [Available from: https://www.cbs.nl/nl-nl/faq/specifiek/wat-is-het-verschil-tussen-de-eerste-en-tweede-generatie-#:~:text=Iemand%20met%20een%20migratieachtergrond%20is,geboren%20(de%20tweede%20generatie)].
16. Champion VL, Skinner CS. The health belief model. Health behavior and health education: Theory, research, and practice. 2008;4:45–65.
17. Rogers RW, Prentice-Dunn S. Protection motivation theory. 1997.
18. Fishbein M, Ajzen I. Predicting and changing behavior: the reasoned action approach. Taylor & Francis; 2011.

19. Hamdiui N, Marchena E, Stein ML, van Steenbergen JE, Crutzen R, van Keulen HM et al. Decision-making, barriers, and facilitators regarding cervical cancer screening participation among Turkish and Moroccan women in the Netherlands: a focus group study. Ethn Health. 2021:1–19.
20. Hamdiui N, van der Stein ML, van Steenbergen JE. Hepatitis B in Moroccan-Dutch: a qualitative study into determinants of screening participation. Eur J Public Health. 2018;28(5):916–22.
21. van der Veen YJ, van Empelen P, Looman CW, Richardus JH. Social-cognitive and socio-cultural predictors of hepatitis B virus-screening in Turkish migrants, the Netherlands. J Immigr Minor Health. 2014;16(5):811–21.
22. Betancourt H, Flynn PM. The psychology of health: Physical health and the role of culture and behavior. 2009.
23. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Res Psychol. 2006;3(2):77–101.
24. Statistics Netherlands. Standaard Onderwijsindeling 2021. CBS Den Haag/Heerlen, Divisie Sociale en ruimtelijke statistieken SS-et; 2021/2022.
25. Mouter N, de Ruijter A, Ardine de Wit G, Lambooij MS, van Wijhe M, van Exel J, Kessels R. Please, you go first! Preferences for a COVID-19 vaccine among adults in the Netherlands. Soc Sci Med. 2022;292:114626.
26. Euser S, Kroese FM, Derks M, de Bruin M. Understanding COVID-19 vaccination willingness among youth: A survey study in the Netherlands. Vaccine. 2022;40(6):833–6.
27. Short MB, Marek RJ, Knight CF, Kusters IS. Understanding factors associated with intent to receive the COVID-19 vaccine. Fam Syst Health. 2022;40(2):160–70.
28. Larson HJ, Jarrett C, Eckersberger E, Smith DM, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007–2012. Vaccine. 2014;32(19):2150–9.
29. Paterson P, Meurice F, Stanberry LR, Glismann S, Rosenthal SL, Larson HJ. Vaccine hesitancy and healthcare providers. Vaccine. 2016;34(52):6700–6.
30. Thomson A, Robinson K, Vallée-Tourangeau G. The 5As: A practical taxonomy for the determinants of vaccine uptake. Vaccine. 2016;34(8):1018–24.
31. Peters RG, Covello VT, McCallum DB. The determinants of trust and credibility in environmental risk communication: an empirical study. Risk Anal. 1997;17(1):43–54.
32. Covello VT. Best practices in public health risk and crisis communication. J Health Commun. 2003;8(Suppl 1):5–8. discussion 148– 51.
33. WHO Organization. WHO outbreak communication guidelines. World Health Organization; 2005.
34. WHO Organization. Communicating risk in public health emergencies: a WHO guideline for emergency risk communication (ERC) policy and practice. World Health Organization; 2017.
35. Seeger MW. Best practices in crisis communication: an expert panel process. J Appl Communication Res. 2006;34(3):232–44.

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