

# Patients' perceptions on the facilitators and barriers using injectable therapies in dyslipidaemia: An empirical qualitative descriptive international study

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## Abstract

**Background:** Injectable medicines are increasingly used to manage abnormal levels of lipids, which is a major risk factor for cardiovascular events. Enhancing our understanding of patients' perceptions of these injectables, can inform practice with the aim of increasing uptake and medication adherence.

**Aim:** To explore patient's experiences of using injectables and to identify potential facilitators and barriers to using injectable therapies in dyslipidaemia.

**Design:** A qualitative descriptive study using semi-structured interviews was conducted with patients who were using injectables to manage their cardiovascular conditions.

**Methods:** A total of 56 patients, 30 from the United Kingdom and 26 from Italy, were interviewed online from November 2020 to June 2021. Interviews were transcribed and schematic content analysis performed.

**Results:** Four distinct themes emerged from interviews with patients and caregivers: (i) Their behaviours and personal beliefs; (ii) Knowledge and education about injectable medication; (iii) Clinical skills and previous experiences and (iv) Organizational and governance. Participants expressed initial fears such as needle phobia, and their concerns about commencing therapy were compounded by a lack of accessible information. However, patients' pre-existing knowledge of lipid lowering medication, previous experience with statins and history of adverse side effects informed their decision-making regarding using injectables. Organization and governance-related issues were primarily around the distribution and management of medication supply within primary care, and the lack of a standardized clinical support monitoring system.

**Conclusion:** Changes are needed in clinical practice to better educate and support patients to improve the uptake of injectables and optimize their use of these medications in the management of dyslipidaemia.

[Correction added on 04 July 2023 after the first publication: Dr. Ercole Vellone's affiliation has been updated]

Geraldine A. Lee and Angela Durante—Joint first authors.

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**Impact:** This study suggests that injectable therapies were acceptable to people with cardiovascular disease. However, healthcare professionals need to play a key role in improving education and providing support to aid patients' decision-making regarding commencing and adhering to injectable therapies.

**Reporting Method:** The study adhered to the Consolidated Criteria for Reporting Qualitative Research.

**Patient or Public Contribution:** There was no patient or public contribution.

#### KEYWORDS

barriers and facilitators, cardiovascular disease, injectable therapies, patient perceptions

## 1 | INTRODUCTION

Although mortality from cardiovascular disease is decreasing, there are many individuals living with multiple risk factors, including dyslipidaemia (Sabatine et al., 2017). Dyslipidaemia is defined as increased levels of serum total cholesterol, low-density lipoprotein cholesterol (LDL-C), triglycerides or a decreased serum high-density lipoprotein and is a recognized risk factor for cardiovascular disease and hypercholesterolaemia is defined as high levels of plasma cholesterol and LDL (Hedayatnia et al., 2020).

Novel strategies in the form of injectable medicines have been developed to reduce the risk of cardiovascular events in patients at high risk of, or with established, cardiovascular disease. These medicines include proprotein convertase subtilisin-kexin type 9 (PCSK9) inhibitors. Randomized controlled trials for high-risk primary and secondary prevention of cardiovascular disease have demonstrated the effectiveness of PCSK9 monoclonal antibodies in lowering cholesterol and improving survival rates in secondary prevention (Rached & Santos, 2020; Saborowski et al., 2018). In addition, major leading trials (FOURIER and ODYSSEY) found that injectable PCSK9 significantly lowered LDL-C, and both trials met their primary end points of reducing major adverse cardiovascular events (Sabatine et al., 2017; Schwartz et al., 2018).

In the United Kingdom, the National Institute for Health and Care Excellence (NICE) have approved the PCSK9 medicines, Evolocumab and Alirocumab, for primary hypercholesterolaemia and mixed dyslipidaemia as medications that can be self-injected or by healthcare professionals (NICE, 2019). The purpose of their introduction is to optimize lipid therapy in those who are statin intolerant or do not respond to statin therapy (NICE, 2016). A recent study evaluated a new, multidisciplinary medicine optimization clinic for the initiation of PCSK9 inhibitors (Khatib et al., 2022). The authors reported not only reductions of 45% in total cholesterol and 67% reduction in LDL-C in patients taking PCSK9 inhibitors, but also noted that 8% of patients declined the therapy due to concerns and 4% were non-adherent by the end of the first year (Khatib et al., 2022). A Cochrane systematic review has reported high-quality evidence supporting the use of both Evolocumab and Alirocumab with patients who had failed to gain control on traditional treatments; however, there was no conclusion with regard to patients' perceptions of taking these

medicines in the review (Schmidt et al., 2020). Clearly, patients are likely to have attitudes and preconceptions on commencing new medications after others have been ineffective, especially ones that are relatively new in their development, and when the method of administration may be less preferable or comfortable, that is, through injection. In order to ensure that the significant effects produced in trial data from these novel injectables are replicated in practice, it is necessary to enhance our understanding of patient preferences through qualitative work. Such research needs to determine the factors which are likely to affect patients' choices of medication for cardiovascular protection, whether these new treatment modalities fit with their preferred approach to managing their health, and how this will affect their overall adherence to treatment.

## 2 | BACKGROUND

Recently, an integrative review was published on patients' perspectives on injectables for chronic conditions in cardiovascular patients, and a comprehensive European survey of healthcare professionals' views on use of injectable therapies for cardiovascular conditions was conducted on behalf of the Association of Cardiovascular Nurses and Allied Professionals (Khatib et al., 2021; Lambrinou et al., 2020). This research highlighted a number of organizational and administrative problems in using injectable therapies, alongside a perceived lack of available educational material by healthcare professionals on their use (Khatib et al., 2021; Lambrinou et al., 2020). The integrative review also demonstrated that most research to date has focused on patients' use of injectable insulin and psychiatric medications, with few exploring patient experiences of injectable therapies for cardiovascular disease (Lambrinou et al., 2020). With the European Society of Cardiology and NICE both recommending the use of these medications, it is important to foster patient confidence in using these relatively new treatments. Increasing uptake of PCSK9 inhibitors is especially important in patients at high risk of adverse cardiovascular events and for those who have been unsuccessfully treated with other medications. To achieve this, empirical research is needed which explores the perceptions, knowledge and experiences of patients currently being treated with these innovative injectable therapies (Rached & Santos, 2020).

### 3 | AIM AND OBJECTIVES

The aim of the study was (i) to explore the experiences of patients in the United Kingdom and Italy with dyslipidaemia or hypercholesterolaemia who were undergoing treatment with injectable PCSK9 inhibitors and (ii) identify the perceived facilitators and barriers to their use of injectable therapies.

### 4 | METHODS

#### 4.1 | Theoretical framework

The philosophical assumption behind qualitative nursing research is constructionism, which supports the view that individuals actively construct their own understanding and knowledge of the world through their experiences, related to a context, and interactions with it (Lincoln et al., 2011). In this study, it was used to understand how people with the same diagnosis of cardiovascular disease (either hypercholesterolaemia or dyslipidaemia) undergoing the same therapy (injectable PCSK9 inhibitors) may have different experiences (or realities).

Qualitative descriptive research generates data that describe the 'who, what and where' of events or experiences from a subjective perspective. The researcher attempts to understand and describe the experiences and perspectives of participants in the study, rather than trying to test hypotheses or determine causality of events (Doyle et al., 2020; Kim et al., 2017). Thus, this design was chosen for its suitability to provide direct, rich descriptions of experiences and perceptions (Sandelowski & Barroso, 2003) while valuing participants' expert knowledge which can lead to informing and improving clinical practice (Doyle et al., 2020). The study is reported in accordance with the consolidated criteria for reporting qualitative research (COREQ) (Tong et al., 2007).

#### 4.2 | Sampling and recruitment

The study was conducted between November 2020 to June 2021 using a convenience sample of patients attending cardiology clinics at three centres; two in Italy (Milan and Rome), and one in the United Kingdom (Leeds). The rationale for choosing these two locations was to collect data from countries in northern and southern Europe with different healthcare systems for comparison. The United Kingdom and Italy were identified specifically as countries that were currently using PCSK9 inhibitors as treatment for cardiovascular conditions.

Suitable patients who were on injectable therapies (PCSK9 inhibitors) were identified through posters placed in the cardiac clinics. Clinicians who were not involved in the research also identified suitable patients who could be contacted via telephone (for those who were not attending face-to-face appointments and had remote consultations). Once identified, the clinicians asked patients if they were interested in participating in the study. If the patients' initial

response was positive, a trained member of the local research team contacted them to explain the project in full. They were then sent an information sheet and interested individuals returned their written consent form by post. All participants were invited to take part in online interviews conducted via Zoom/Teams due to social distancing restrictions in place at both locations as a result of the Covid-19 pandemic.

#### 4.3 | Inclusion criteria

Patients were eligible to participate if they had been: (i) diagnosed with dyslipidaemia or hypercholesterolaemia and (ii) were undergoing treatment with injectable PCSK9 inhibitors which they injected themselves. There were no other exclusion criteria as the study aimed to include a range of patients including 'new users' (i.e. commenced injectable therapies within the previous 6 weeks) as well as 'long-standing users' (i.e. using injectable therapies for >3 months). It was hoped that the decision to include participants from both countries who had been using injectables for different durations would allow for a greater exploration of the issues across earlier and later stages of treatment, and of the distribution and availability of the drug across the two participating countries. In addition, selected participants also had to have the capability and technological resources to participate in an online interview.

#### 4.4 | Data collection

Interviews were conducted by members (AD, MK) of the research team with experience in qualitative research. A semi-structured interview with an accompanying guide was constructed (Supplementary file) according to Kvale's principles (Brinkmann & Kvale, 2018). The topic guide was informed by findings from a previous review and issues arising from the health professionals' survey of injectables in patients with cardiovascular conditions (Khatib et al., 2021; Lambrinou et al., 2020). The first part of the interview included questions which aimed to elicit the story of patients' clinical history and their general experience of using injectables (PCSK9). The second part of the interview was specifically dedicated to exploring and prompting for patient perceived barriers and facilitators to using the injectables. An explanation was given to the participants to ensure they were clear on the purpose of the interviews. All interviews were conducted in the native local language. In addition to the semi-structured interview, a socio-demographic study-specific questionnaire was used to record key information about participants. Each interview lasted between 20 and 60 min.

All interviews were recorded using the built in function within Zoom and Teams with the permission of the participants. Patients were assured of confidentiality and were never addressed in the interviews by name. Digitally recorded interviews were transcribed verbatim, and checked for accuracy with the lead author spot-checking a 20% subset of the transcripts (MacLean

et al., 2004). The interview audio recording was kept separately from files containing participant identification. Demographic data were organized in Excel databases. Sensitive data were stored in the encrypted server of the University in which the relevant researchers were based. Data were managed according to local policy (including ensuring GDPR and confidentiality of the participants' information).

#### 4.5 | Ethical considerations

Participants were told that they could withdraw at any time and that they were not obliged to answer questions if they felt uncomfortable. The study respected the principles of the Helsinki Declaration. Approval was requested and obtained from the ethics committees of each of the participating centres in Italy (Institutional Review Board Lazio 2 in Rome: ref: 22.21 and the Institutional Review Board of San Raffaele in Milan ref: 365.2020). The UK site deemed the project as a service evaluation and therefore ethics approval was not required. The patients were volunteers and received no remuneration for their participation.

#### 4.6 | Data analysis

Interviews were conducted until no more new information emerged, suggesting that data saturation was reached (Saunders et al., 2018). The interviews generated 180 pages of transcript. Analysis occurred by keeping the data set within the two original languages, with researchers fluent in the appropriate language initially analysing each data set separately. This choice was made to maintain the cultural integrity of the dialogue (Younas et al., 2023). The principal steps of analysis were performed which included: reading interviews and write memos, developing general notes, read and re-read transcripts to become familiar with the data, deriving headings to describe aspects of the transcript also known as 'open coding' with the scope of summarizing the text, developing initial category codes avoiding overlap, collapsing to a maximum of 12 categories and then re-read the text according to the categories (framing with laterals bars using NVIVO 12 Plus®) and finally themes were generated from the categories to produce the final report (Newell & Burnard, 2010). At the final stage, Italian quotations were translated into English. The translation was conducted by English-certified researchers (AD), and the meaning of the codes were validated by a native English speaker (GL).

When the coding phase was concluded, the researchers (AD, GL) met remotely to discuss their findings, present their codes and resolve any discrepancies to reach a consensus. The development of categories and subsequent collapse of these categories was then performed jointly with input from all research members. Finally, research group members met again to construct and conceptualize themes from the categories, reflecting '*shared patterns of meaning, organised around a central concept or idea*' (Braun

et al., 2014). As part of the analysis, a comparison between new and experienced users had been planned. However, as interviews were undertaken and analysis commenced, it became apparent that all recruited participants had been on the medication for more than 6 months and thus there was not appropriate data available to make this comparison.

#### 4.7 | Rigour

Application of the criteria proposed by Lincoln and Guba ensured the trustworthiness of the research (Lincoln & Guba, 1985). Two researchers in Italy (FD, GC) and two in the United Kingdom (GL, EB) cross-checked a small subsection of transcripts, coding and analysis to ensure consistency and accuracy. Dependability and confirmability of the findings was ensured by several remote meetings to discuss findings with members of the research group. The process of the data analysis was recorded step by step and described in detail in two reports (one per each country). Member checking with participants was performed to validate the findings. To ensure dependability, an external expert who was not part of the research team, but who was fluent in English and Italian assessed the preliminary results obtained and checked the accuracy of the findings. Researchers' triangulation was used to ensure credibility by reaching consensus on the final codes and categories. Finally, findings were guided by the 'MIRACLE' narrative framework, which emphasizes the importance of meaningful, interpretative, relational, authentic, contextualized, linked and emic narratives to ensure meaningful descriptions in qualitative research (Younas et al., 2023).

### 5 | FINDINGS

A total of 56 patients were interviewed across both countries. Thirty patient interviews were undertaken in the United Kingdom and all participants were established on injectable therapies for more than 6 months. This sample had a mean age of 66 years (range: 41–82) with 60% ( $n=18$ ) male participants. Twenty-six patients were interviewed in Italy, with a sample mean age of 63 years (range: 43–81) and with 80% identified as male ( $n=21$ ) and all had been using injectables for 6 months or more.

After analysis was completed, initial codes were refined and reduced to 15 final categories in the patient-level data. Four overarching themes were identified (see Figure 1):

- (i) Behaviours and beliefs.
- (ii) Knowledge and education.
- (iii) Clinical skills and experiences.
- (iv) Organizational and governance.

Within each of these four broad themes, both barriers and facilitators were identified. The translated quotes from patients are provided to demonstrate the themes derived from the data.

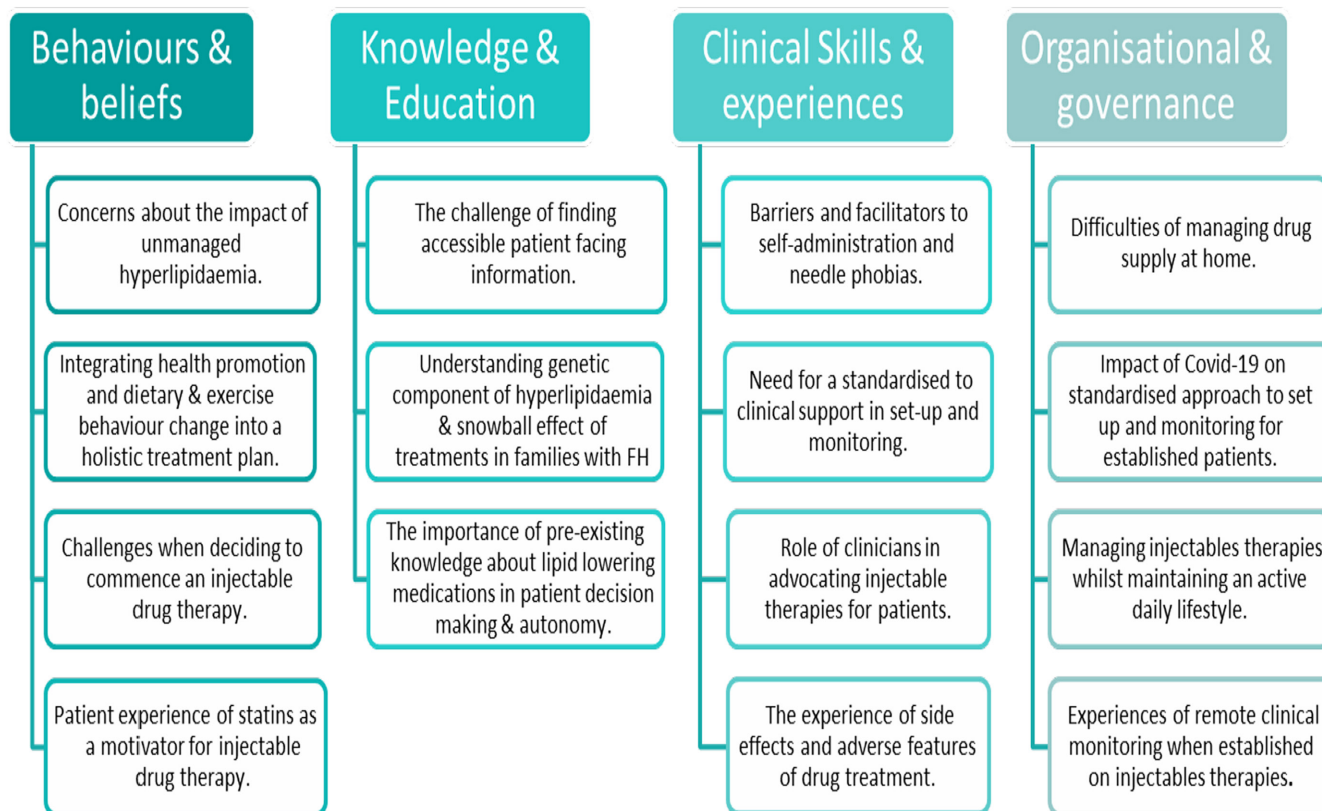


FIGURE 1 Key themes identified by patients.

## 5.1 | Behaviours and beliefs

The first theme related to behaviours and beliefs that patients held with regard to being treated for their condition. Participants expressed concerns about the impact of managing hyperlipidaemia and the implications of the condition, including the risk of major adverse events such as a stroke or transient ischaemic attack:

'I'm quite resigned to the fact that yes I have high cholesterol but what worries me is if it gets out of hand. I am worried about or anxious as you say if I have another TIA or I have a stroke or something'.

[P30, female, UK]

Many respondents explained how important it was for them to integrate lifestyle modifications such as exercise and diet into a holistic treatment plan for their condition.

'...Because I eat the right things apart from butter..... But apart from that, I changed my diet and the way I do things. I've even ordered an exercise bike'.

[P12, female, UK]

However, some individuals were so confident of the effectiveness of their injectable therapies that they still maintained previous dietary habits, including eating saturated fats like dairy products:

'I have to tell you I just love butter and I hate the thought of having to give it up. Like you said it's not what you eat'.

[P30, female, UK]

Other participants perceived that they would no longer have to be so stringent due to the impact of the injectable therapy regimen:

'The results of the tests (LDL) which also by eating cheese and these things like that, I also saw that I had a better chance of being able to live more normally, of being able to afford something more than the very strict diet, and this after 40 years of dieting and food restrictions, I was also pleased'.

[P15, female, Italy]

Barriers to using injectable therapies included their concerns regarding the challenges when deciding to commence an injectable drug therapy:

'Yes, but maybe the first. Now if other experiments were to come, I wouldn't be hesitant anymore, because I've had a good experience....'

[P01, female, Italy]

The failure of previous medications such as oral statins to lower their cholesterol levels, was identified as a motivator for patients to commence injectable drug therapy. Prior experience of side effects on oral statins also convinced some patients to try more novel therapies:

'With taking statins, I was so resigned to and fed up for three years. I really had the side-effects and I was just glad to be offered another alternative just hoping it's going to have the positive effects of lowering my cholesterol...'

[P28, male, UK]

## 5.2 | Knowledge and education

Several distinct issues were identified under the theme of knowledge and education in relation to injectable therapies. The challenge of finding accessible patient-facing information was identified as a barrier to patient confidence. Some participants reported having to look on the Internet for information or speak to other patients to try and get further insight. Responses highlighted the difficulties that patients sometimes face when attempting to increase their knowledge on these newer injectable therapies:

'...Well, it was all medical gobbledegook really which I didn't understand anyway'.

[P27, male, UK]

The need for education was also evident in those with familial hypercholesterolaemia, and in particular, the need to understand the genetic component of hyperlipidaemia. However, such patients were also aware of the potential impact of injectables from witnessing their effects and the impact of medication on other family members:

'Satisfaction and hope are the right words...because obviously we have seen on someone close to us the benefits of the drug and, the total change of life in the management of the patient and the illness'.

[P04, male, Italy]

It was clear that when participants did have confidence in their understanding and knowledge about lipid lowering medications, this drove patient decision-making and autonomy:

'I was convinced of the choice I made, I am currently convinced that it was a wise and positive choice, in the light of the results-scientific evidence that it is giving, I am increasingly convinced that I made the right choice...'

[P03, male, Italy]

## 5.3 | Clinical skills and experiences

Patients identified a number of barriers to self-administering injectables, including those with needle phobias who felt that better clinical support when introducing the injectables would have helped to allay initial fears:

'I would have liked to have seen it because I expected a standard hypodermic, but it was obviously a lot more concealed and a lot easier to administer than just a standard hypodermic... Yes, just seeing it in action would have killed off most of the fears'.

[P14, male, UK]

Those with previous experience with needles, such as patients who were dependent on injectable insulin were naturally more confident about commencing injectables:

'I started insulin 50years ago, so I had a complicated social life in the beginning, then about 25years I switched to the pump, so my life changed considerably'.

[P15, female, Italy]

Many participants suffered from multi-morbidity, and the idea of adding to the list of medications they were already on, and the additional side effects that it could cause, influenced the decision by some to commence injectable therapies:

'I do have a lot of side effects from things that I assume that it's things that I eat and medication because GPs just tend to say oh well if you are having this take this, if it's not working take more. At the end of the day, you end up with taking so many things you don't know exactly which one to point your finger at'.

[P25, male, UK]

However, a number of participants also commented on the convenience of having the injectable option rather than having to remember to take a daily statin tablet:

'I was pleased actually because taking a tablet every day is a bit of an inconvenience so having an injection once a fortnight is much more convenient'.

[P8, male, UK]

## 5.4 | Organizational and governance

The final theme related to organizational issues including distribution and supply of the injectable medication and difficulties of

managing drug supply at home and while travelling. In particular, some participants experienced difficulties obtaining their medication and were unsure of whether they needed to collect it from their local pharmacy or the hospital:

'I didn't know where the injections were coming from at all so I was a bit confused I must confess... I hadn't had a letter or anything to say your supply will be coming from such and such a place'.

[P05, male, Italy]

Others were frustrated that they sometimes had to wait for medication, that it was not always available to collect in a way that was most convenient for them, and they did not always arrive on time:

'Well I'm due to take it on Monday but I've none at all in the house so I wouldn't be able to take any anyway'.

[P06, male, Italy]

Some participants were also concerned that they had not been advised about storage and the practical implications of how to manage injectables while travelling or transporting it overseas:

'...Oh, they've always got to be refrigerated haven't they. I don't know how long they can be unrefrigerated. You know like if you are going away, like you are going on holiday are they going to be alright while you are on the long journey'.

[P2, male, UK]

As a result of the pandemic, clinics in both locations had established a standardized approach to remotely monitoring their patients which suited most participants. In general, participants appreciated the extra monitoring of their condition which they felt was more extensive than if they were on a standard oral treatment:

'I accepted because I knew that anyway I was monitored, here I was monitored and therefore I was not left alone to do this drug, like a pill and go...'

[P02, male, Italy]

Finally, participants highlighted the importance of having a strong therapeutic relationship with key healthcare professionals, and how having this gave them confidence and motivation to continue with the injectables:

'I went to the interview (with the cardiologist) and he asked me some questions... I liked it, it gave me confidence, and then the confidence... that gave me more strength, more truth, more enthusiasm is the final result, which is an excellent result'.

[P05, male, Italy]

## 6 | DISCUSSION

To the best of our knowledge, this is the first study to explore in depth, patients' perceptions of injectable therapies for cardiovascular disease. Despite participants in this study being largely positive towards them, similar to previous research on injectables (Lambrinou et al., 2020), there were issues around needle phobia, as well as the impact of negative past experiences with statin medication and other injectables such as insulin. However, further issues were identified in these patient interviews not previously reported, including the need to understand more about the genetic component of hyperlipidaemia and the anxiety around the risk of cardiac events which could affect multiple family members.

In terms of motivation to try injectables, facilitating factors were having trust in healthcare professionals, and being able to access evidence-based research on the impact of injectable therapies on lipids. Patient choice was also seen as important as they appreciated the necessity to reduce their cholesterol levels and their cardiovascular risk. For some, the decision to start these injectable therapies was easy as they had previous experience of injectables for diabetes. Others, who had experienced a cardiac event, were also strongly motivated to reduce their risk of a future cardiovascular event as previously highlighted by Smith et al. (2014).

With regard to the theme of knowledge and education, it is clear that there are issues commencing these novel injectable therapies. However, providing education about how injectables work and their clinical benefits in optimizing lipid levels appears helpful to patients in their decision-making. There appeared to be a lack of accessible patient information reported by patients in both Italy and the United Kingdom. It was concerning that participants were seeking information from other patients or having to search the Internet to learn more about the medications, rather than obtaining good quality information from their healthcare professionals. Observing lipid profiles improving is key to monitoring the success of injectable therapies, but previous studies have not identified how this should be incorporated into patient education (Schmidt et al., 2020). However, this study did demonstrate that participants were keen to see the change in their lipid profiles after using the medications. While this provided motivation for appropriate self-care for some, the observed positive changes in their lipids for others meant that they paid less attention to their diet (i.e. they increased their level of saturated fats). This highlights the need for professionals to provide further dietary advice and education once they are established on injectables. Previous studies have shown that patients are well aware of the long-term negative effects of heart disease on their health (Smith et al., 2014). However, there is ample evidence that education can improve clinical outcomes and should be central to the introduction of any new medication (Palacios et al., 2017), as well as ongoing monitoring.

There is also the need to have regular contact with patients, especially when they have chronic cardiovascular conditions (Jiang et al., 2020). A recent article highlighted how community-based

pharmacists could improve delivery of these medications and would be able to monitor patients and reduce the barriers (Dixon & Saseen, 2021). It is clear that initial and ongoing monitoring is needed for those prescribed injectable therapies as with many chronic conditions.

Despite the identified barriers, there were also some clear facilitators once initial fears of the relatively new therapies and needle phobias were overcome. These included personal beliefs, knowledge and experiences. These findings echo those from a recent article by Khatib et al. (2021) where a person-centred multidisciplinary service successfully initiated PCSK9 inhibitors with good rates of medicines optimization and adherence, and high levels of patient satisfaction. Certainly, in Khatib et al.'s study, the role of the clinician who supported them was decisive in patients' acceptance of the medication, especially those who were referred to cardiologists or nurses. This highlights the importance of shared decision-making (Hendriks & Lee, 2020). Healthcare professionals, and in particular nurses, need to be aware of patients' anxiety when suggesting a new medication and take this into consideration when planning education with patients (Lee & Boyde, 2012). Often there is poor dissemination of research findings, and the results are presented in a manner that is not comprehensible to patients (Lee, 2022). Nurses are often the primary care providers as well as educators for patients and as such, need appropriate knowledge and skills in order to confidently provide the relevant information for patients and their families.

In relation to organizational and governance issues, problems with the delivery of injectables as well as the practical issues around remote monitoring were also raised. One problem that patients identified was the distribution and supply of the injectable therapies. Older people were concerned about increasing travel difficulties and often referred to digital communication and distribution in local pharmacies as a much better option for obtaining their medication. Interestingly, the Covid-19 pandemic improved delivery and highlights that changes where the medication was delivered to the patients' homes can be made which are advantageous to patients. Indeed, lipid control was reported to remain well controlled during Covid-19 in a Spanish study (Seijos-Amigo et al., 2022).

Inclisiran was approved in late 2021 and is found to significantly reduce LDL-C and administered once every 6 months. Inclisiran offers a reduced frequency of administration compared to Alirocumab and Evolocumab; however, cardiovascular outcomes are not proven yet in the clinical trials. The recently published ORION-3 data on the long-term efficacy of Inclisiran demonstrated good tolerance over 4 years compared to the treatment arm with Evolocumab (Ray et al., 2023). Alirocumab and Evolocumab are available from secondary care and are self-administered. Inclisiran is available in both primary and secondary care but requires administration by a healthcare professional. This tends to be a nurse or a pharmacist and as such, these clinicians will be managing patients in terms of initiating and monitoring treatment and critically, undertaking education with patients and

their families about self-injecting and ensuring their technique is appropriate.

Participants were able to provide suggestions about how the use of injectables could be further optimized in clinical practice. Availability and distribution of injectable therapies is one area that needs to be improved if a greater number of eligible patients are going to be offered these therapies. Some of the themes reflect the findings from the pan-European healthcare professionals survey on injectable therapies which also identified the various barriers to initiation, continuation and adherence to these therapies (Khatib et al., 2021). Cardiovascular disease management is difficult as there are often multiple co-morbidities to be managed and there are a lack of evidence-based integrated care models across Europe (Lee et al., 2022). One study undertaken in Italy reported reduced adherence and suggested connecting with patients via telemedicine in order to improve adherence and ensure continuity with medication (Caso et al., 2022).

## 6.1 | Strengths and limitations

The main strength of this study was in completing over 50 interviews in the United Kingdom and Italy and obtaining a rich source of data and ability to take the context of care in both settings into consideration and provide a 'real-world' perspective. The study allowed us to capture the issues facing patients when considering injectable therapies and from this data, we hope that healthcare professionals can gain some insight into patients' concerns, as well as assist in the development of suitable educational material. A limitation is that we were unable to undertake the interviews face-to-face but given the data obtained, the move to virtual interviews due to the pandemic does not seem to have had an adverse effect. Comparisons with Inclisiran could not be undertaken as it was not approved at the time of the interviews.

Although the themes were generated across two European countries, it is important to comment on the Italian cohort as prescription procedures are univocal in Italy, the management and organization of hospital centres is primarily regional, with a fair degree of leeway for decision-making by the hospitals themselves.

## 6.2 | Recommendations for future research

As this research was only undertaken in two locations, it would be useful to explore if the facilitators and barriers identified here were similar in other healthcare settings. A possible study examining short-term (<6 months) and long-term use of injectable therapies from a healthcare professional and patient perspective would also be beneficial as medication adherence is a well-known problem in long-term chronic conditions. It would also be beneficial to examine the perceptions and impact of the different types of PCSK9 inhibitors; Alirocumab and Evolocumab which are primarily initiated in secondary care and self-administered once every 2 weeks (or once



a month) compared with Inclisiran which is available in primary and secondary care, and administered by a healthcare professional once every 6 months.

## 7 | CONCLUSION

The patient interviews identified several themes around the facilitators and barriers in initiating and maintaining self-administered injectable monoclonal PCSK9 inhibitors. Through the in-depth interviews, the results have also provided some suggestions on how issues with delivery and education could be addressed to improve the uptake and adherence to injectables for cardiovascular conditions. Although there were several barriers to initiation, continuation and adherence with these injectable therapies, many of these can be relatively easily addressed. Healthcare professionals can make changes to reduce these barriers, especially around education and ongoing support for patients. Injectable therapies for cardiovascular disease are a growing field and reducing and eliminating the barriers will undoubtedly lead to improvement and optimization of these therapies.

### FUNDING INFORMATION

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### CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

### PEER REVIEW

The peer review history for this article is available at <https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jan.15739>.

### DATA AVAILABILITY STATEMENT

Due to the sensitive nature of qualitative data, the authors elect to not share data.

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