Original research

Nurses perceptions of feedback from cardiac rehabilitation registries: a qualitative study across the UK and Denmark

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**Abstract**

Background/Aims Feedback on performance is a widely used strategy aiming to improve quality of care; however, limited research exists regarding nurses’ perceptions of feedback. This article explores cardiac rehabilitation nurse leads’ perceptions of the feedback provided through two national registries.

Method This was a qualitative study which used semi-structured interviews. Cardiac rehabilitation nurses (*n*=12) were strategically recruited across the UK and Denmark. The transcribed interviews were analysed using content analysis, and differences and similarities were identified.

Results Overall, five themes emerged; accessibility, reliability, usefulness, relevance and attitudes towards public reporting. In the UK, the nurses perceived that data regarding feedback were accessible, trustworthy, useful and reflected the important elements in cardiac rehabilitation. However, in Denmark the nurses perceived that feedback data were unavailable, had reliability issues and only partly reflected the important aspects of cardiac rehabilitation. Nurses in both countries were ambivalent towards public reporting.

Conclusions In order to facilitate high quality service delivery and improvement, registries should consider cardiac rehabilitation nurse leads’ perceptions when delivering feedback.

Key words

cardiac rehabilitation, clinical quality registries, feedback, quality improvement, nurse

**Introduction**

Cardiac rehabilitation is a complex health intervention that constitutes an important part of treatment to patients with heart disease. It involves various components including patient education, physical exercise and psychosocial care (Dalal et al, 2015). However, several reviews have documented that cardiac rehabilitation is underused (Bjarnason-Wehrens et al, 2010; Perk, 2012) and falls short of the recommended standards (Piepoli et al, 2015) despite evidence-based guidelines.

A central strategy of quality improvement in healthcare is feedback, which is often delivered through clinical quality registries (Ivers et al, 2012). A clinical quality registry is a database where patient-level data are systematically collected for clinical or policy purposes (Bhatt et al, 2015). Feedback from the clinical quality registries aims to monitor and support high quality interventions and is delivered to stakeholders in various ways; for example, reports with aggregated data or websites with local data (van der Veer et al, 2010).

A Cochrane review assessed the role of feedback and found variability in the effect and significant heterogeneity in the studies (Ivers et al, 2012). Other studies have found that data quality, user motivation, organisational factors, outcome expectancy (van der Veer et al, 2010) and the way feedback is perceived among users (Hysong et al, 2012) are associated with the effectiveness of feedback.

Within cardiac rehabilitation, little is known about the use of feedback data from clinical quality registries, although they have been adopted as a quality improvement strategy (Poffley et al, 2017). One study showed a complex picture of how feedback influences the intentions of quality improvement. Here, the health professionals were influenced by their level of agreement with the chosen indicators, if they believed a change of practice was realistic and if the indicators were considered important (Gude et al, 2017). In light of the considerable policy attention given to data-driven quality improvement, there is a need to improve understanding of how users of cardiac rehabilitation registries perceive the methods of feedback delivery in real-life practice as this may influence the use of data. The methods for such feedback delivery and content are often poorly described, leaving a gap in the knowledge of how to provide feedback (Poffley et al, 2017).

Routine practice and clinical recommendations stress the importance of a multidisciplinary team (Piepoli et al, 2016) and registry data shows that nurses play a substantial role – often as the cardiac rehabilitation lead at a programme level (BACPR, 2017; Doherty et al, 2017).

The cardiac rehabilitation lead tends to be responsible for coordinating services and acts as a link between management and clinicians. Cardiac rehabilitation leads are expected to have a good knowledge of the feedback recieved from the clinical quality registries.

Therefore, this study investigates the perceptions of cardiac rehabilitation leads on feedback delivery via the use of content provided from two national cardiac rehabilitation clinical quality registries.

**Method**

*Setting*

Both the UK and Denmark have developed national clinical quality registries, consisting of The National Audit of Cardiac Rehabilitation (NACR ) (Doherty et al, 2017), and The Danish Cardiac Rehabilitation Database (DCRD) (Zwisler et al, 2016). By choosing these, this study was able to investigate the perceptions of feedback from registries that differ on feedback delivery and content. These registries also differ on parameters such as maturity, incentives for participation, and administration (*Table 1*). Similarities include the aim of the registries, which is to monitor and improve the quality of cardiac rehabilitation, and being initiated by national CR associations.

Table 1. An overview of the national cardiac rehabilitation registries in the UK and Denmark

|  |  |  |
| --- | --- | --- |
|  | **The National Audit of Cardiac Rehabilitation** | **The Danish Cardiac Rehabilitation Database** |
| **Country** | The UK | Denmark |
| **Inhabitants (*n)*** | 65.6 million | 5.7 million |
| **Patient groups** | Cardiovascular disease | Coronary heart disease |
| **Registry coverage** | England, Wales and Northern Ireland | National |
| **First launched** | 2005 | 2013  (Relaunched in, 2015) |
| **First annual report** | 2007 | 2016 |
| **Participation** | Voluntary | Mandated by Danish law |
| **Participating programmes (*n)*** | 224 | 35 |
| **Annual patient-level entries (*n)*** | Approx. 101 000 | Approx. 6000 |
| **Governed by** | Steering committee | Steering committee |
| **Daily management** | Administrative unit at the University of York | The Danish Clinical Registries |
| Team equivalent to 3.5 full time employees  Consists of a project lead, manager, training officer, data analyst and a secretary | The team consists of a manager, quality manager, epidemiologist and a data manager.  All with responsibility for the registry, as well as a number of other Danish clinical quality registries |
| **Financing of registry** | The British Heart Foundation | Government  (Danish Health Regions) |
| **Financing of data collection/entry** | Financed locally by each participating Trust | Financed locally by each participating department |
| **Data collected and entered by** | Clinicians (mainly) or dedicated data administrators | Clinicians (mainly) or secretaries |
| **User support opportunities** | Training sessions, telephone, e-mail, user manual | Telephone, e-mail, user manual |
| **Data linkage** | No | Yes (The Danish Civil Registration System; The Danish National Patient Register; The Danish National Prescription Database) |
| **Programme-level data** | Collected via registry and questionnaire | Collected via questionnaire |
| **Patient-level data** | Initiating event, treatment type, lifestyle, medication, demographics, pre-cardiac rehabilitation and post-cardiac rehabilitation clinical outcomes, patient-reported measures | Initiating event, risk factor control, lifestyle, medication, demographics, pre-cardiac rehabilitation and post-cardiac rehabilitation clinical outcomes, patient-reported measures |
| **Case-mix adjustment** | No | No |
| **Feedback delivery** | Annual report; participating programmes can access internal data and benchmark on a variety of outcomes, through the NACR/NHS Digital database; programme-level data available on general NACR webpage; specific requests on demand | Annual report; participating sites can access internal data and benchmark (monthly updated) on the indicators, through regional quality management systems; specific requests on demand |
| **Feedback content** | Key service indicators by national average and patient outcomes on programme, health region and national levels.  Annual report with comments and recommendations | Status on indicators (target achievements by number and percentage) on programme, health region and national levels. Annual report with comments and recommendations |

*Design and participants*

This was a qualitative study, which used individual semi-structured interviews with cardiac rehabilitation nurse leads to gather data. Several cardiac rehabilitation programme sites were included in order to broaden author understanding (Graneheim and Lundman, 2004). Participants were sampled strategically, aiming to achieve variation on the following parameters: experience with cardiac rehabilitation and the registries, hospital type (university/non-university) and geography (rural, urban and capital). The participants were recruited by each registry, while identifying a cardiac rehabilitation lead through their contact database which is publicly available and includes e-mail addresses. An invitation to participate in the study was sent by email to the nurse leads and, if they were interested, they received further information on the context of the interview. All of the people invited, agreed to participate in the study.

In total,12 nurses were interviewed (six from each respective country) (*Table 2*). All of the participants were female. The interviews were conducted from September 2016 to April 2017 and lasted between 26 to 47 minutes.

Notably, the first Danish interview was conducted before the official release of the first annual report in Denmark. However, a preliminary report had been distributed 2 months before the official publishing, and thus, in theory, all interviewees would have received the report at the time of the interview. Furthermore, online feedback data had been available for at least 1 year.

Table 2. The participants’ experiences of working with the registries

|  |  |  |
| --- | --- | --- |
|  | **UK participants (NACR)** | **Danish participants (DCRD)** |
| Experience with cardiac rehabilitation | 1–23 years (median 14 years) | 7–20 years (median 10 years) |
| Experience working with the registry | 0.5–10 years (median 8 years)\* | 3.5 years (median 3.5 year)\*\* |

\*Maximum possible time for NACR is 10 years

\*\*Maximum possible time for DCRD is 3.5 years

*Interview guide*

The interview guide was based on empirical and theoretical knowledge (Grol et al, 2007), including the Consolidated Framework for Implementation Research (Damschroder et al, 2009). The Consolidated Framework for Implementation Research was used in the interview guide, to ensure that its domains related to effective implementation were covered in the interviews, including intervention characteristics, inner and outer setting, process and characteristics of individuals (Damschroder et al, 2009). The interviews had a two-fold purpose, as they covered the data-entry process (Egholm et al, 2019) and perceptions of feedback. The interview guide was pilot-tested on the target group in Denmark, and a few questions were modified after reflection and comments from the participants After the first interview in the UK, a single question were adjusted to better fit the context of NACR

*Data collection*

The interviews were conducted at the participants’ workplaces, except in one case where the participant was unexpectedly unable to attend and instead answered questions in writing.

The first and the second author conducted the interviews with one being the interviewer, while the other observed to ensure that the interview guide was followed. Roles shifted between interviews. Notes and observations were made after each interview. As the first author was a cardiac rehabilitation lead nurse, working clinically with DCRD, she was familiar with some of the Danish participants, so to minimise bias she acted as observer during these interviews. The second author has practical experience with interview-based research and has worked as administrator for another clinical quality registry.

*Data analysis*

All interviews were transcribed verbatim and analysed using content analysis, inspired by existing methodology (Graneheim and Lundman, 2004). While the interviewers are proficient in English, native English speakers with good knowledge of cardiac rehabilitation and clinical quality registries transcribed the English interviews in order to minimise potential miscommunication. To let the analysis, reflect the participants’ perceptions as well as possible, an inductive approach, with codes derived from the transcripts and without the use of the Consolidated Framework for Implementation Research, was chosen.

The first and second author separately coded the interviews, and afterwards discussed the codes until a consensus was reached. The written answers given by one of the participants were coded in the same way as the transcribed interviews. For this participant, the answers were shorter than the answers given in the audio interviews, and therefore some details and nuances may have been lost. However, the content of this interview did not stand out from the rest of the interviews; therefore, this is not regarded as an important limitation.

The English and the Danish interviews were handled separately in order to identify similarities and differences between registries. Together with the third author, the codes were sorted and combined into categories and themes as well as subcategories.

*Ethics*

The study was approved by The Danish Data Protection Agency, REG-149-2015. No ethical approval was needed, since the study did not include human material (Denmark) and did not include patients (the UK).

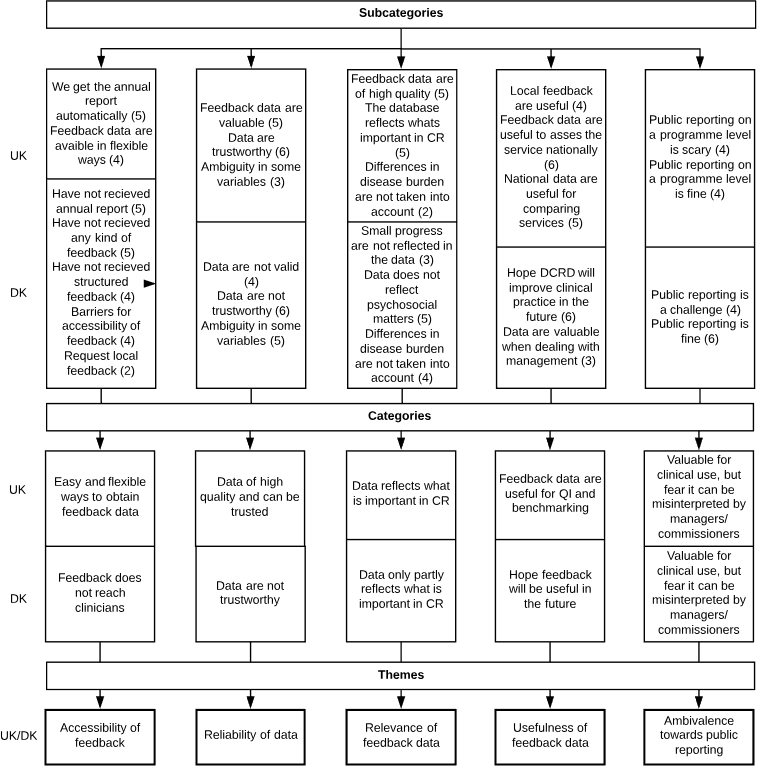
In the UK, recruitment took place through publicly available data sources, which included contact details for the cardiac rehabilitation lead for each programme. No details pertaining to clinical programmes were identified as part of the study. The investigation complies with the Declaration of Helsinki (Rickham, 1964) including confidentiality and permission to record the interviews.

The Consolidated Criteria for Reporting Qualitative Research guided the article’s write-up (Tong et al, 2007).

**Findings**

In total, five major themes emerged from the analysis, reflecting country-specific sets of categories and subcategories (*Figure 1*).

Figure 1. Figure of subcategories, categories and themes derived from the analysis



*Theme 1: accessibility of feedback data*

The UK nurses perceived that feedback data were easily obtainable through websites. Most nurses were experienced with NACR, which meant that they had a thorough knowledge of the data and how to access it. The administrative team behind NACR was perceived as visible and supportive.

One nurse did not perceive feedback data to be sufficient, but was aware of the association between data-entry and output:

*‘Well, we don’t get much back, because we don’t put all that information in, because it’s not a user-friendly system. Not when you are seeing patients, and you would have to literally start taking all that information down and then taking it back to the office and feeding it into the computer. If you could do it whilst you were actually seeing the patient, then that would make a lot more sense [….] if we had iPads and things.’* (UK3)

In this case, a weak correlation between technology and clinical practice had become a barrier for data entry, which led to insufficient access to feedback data and demotivation.

For DCRD, most feedback data, including the annual report, did not reach the nurses. The report is delivered through a chain of health organisational structures; starting from DCRD to the health regions, then to quality departments at local hospitals, then to different management levels, and finally to the clinicians. The informants reasoned that the report must have been stuck in this delivery chain, never reaching them.

However, some nurses had been presented with feedback data on meetings outside DCRD arrangements. While not having received structured feedback, the nurses expressed wishes to do so:

*‘Specifically on us, what could* ***we*** *do better, right? After all, we use it [the DCRD] on a daily base, so that would indeed be nice.’* (DK3)

None of the nurses knew that regional web-based quality management systems enable them to obtain feedback data.

*Theme 2: reliability of the data*

The UK nurses perceived data from NACR to be trustworthy and were proud that these data contributed to guideline development and a higher recognition of cardiac rehabilitation. However, they did have concerns about some factors. For example, they were not able to enter reasons for delay in waiting time to cardiac rehabilitation:

*‘You can work out why people haven’t come, or why they stopped coming, but not why there might be a delay between referral and starting. So that is quite a difficult discussion to have with managers if they do query.’* (UK2)

This was important to the nurses, since this indicator is used for benchmarking and a focus area for management.

Ambiguity in some variables was mentioned, but most NACR nurses did not percieve it to be an issue that affected data reliability.

For DCRD, the nurses spontaneously and emotionally talked about the lack of reliability because of the absence of well-functioning data capture and the lack of training. Although they had not seen much feedback, they knew how data had been entered. They questionned the lack of rigour which led them to query the reliability of the data:

*‘Usually I correct it [when automatic data capture is incorrect], but we just talked about it, and the other cardiac rehabilitation nurses don’t do it. Management has told us not to use time on that. So that’s what they get. And we know we are submitting wrong data (eg on the use of statins).’* (DK5)

This illustrates that the nurses experienced a tension between wanting correct data-entry, and managerial demands on not using time on the data-entry process. Furthermore, issues of reliability were amplified by an ambiguity among variables, which led to a low degree of trust in the data.

Nurses from both countries, who were located in areas with a high burden of disease and low socioeconomic status, were concerned about being benchmarked, and perceived it unfair that they had to reach the same targets as areas with high socioeconomic status.

*Theme 3: relevance of feedback data*

Overall, the NACR nurses thought that the feedback data reflected the important aspects of cardiac rehabilitation. NACR includes a low number of mandatory variables, and this means that the local cardiac rehabilitation programmes have a choice on which variables to register:

*‘So, like here, we don’t use the Mediterranean Diet scoring tool. Neither do we do waist measurements. But that doesn’t matter. Whereas in other national projects that I’m involved with, it’s mandatory: ‘You must do this’, and it’s like the database is trying to inform our practice, rather than us recording what our practice actually is. So, I think it’s a real positive of NACR that.’* (UK4)

This flexibility increased the nurses’ perceptions of the relevance of data, since it gave them a choice on what to register and how to potentially improve.

The Danish nurses perceived that DCRD only partly reflected what they found important in cardiac rehabilitation. They acknowledged the importance of registering risk factors, but expressed that the registry did not capture important psychosocial components, which the nurses found important:

*‘You know,* ***everything*** *was completely hopeless with him [a complex patient]. Nevertheless, when he left, he had his hands in the air, ‘cause he thought he’d accomplished* ***huge, huge*** *changes, right? And you can’t document that change in the database.’* (DK5)

This nurse was talking about lifestyle changes; cutting down on cigarettes. However, since the registry only documents smoking vs non-smoking, the efforts put into health education became invisible in the data. The lack of sensibility for psychosocial improvements were important to the nurses, since they used a lot of time on motivating patients to change their lifestyles.

*Theme 4: usefulness of feedback data*

Most UK nurses were positive towards the usefulness of feedback data. In addition, some perceived that benchmarking was useful because of the learning potential:

*‘It [benchmarking] is good for the fact that it shows the influx of what we have compared to other trusts [….] Or, it shows that someone is doing a bit better and then we’ll go, well, how can we match you? – What are you doing that we’re not?’* (UK6)

These nurses saw potential regarding the use of the data.

Although the Danish nurses had not seen much feedback data, they were positive towards the concept of a cardiac rehabilitation registry and expressed hope that it would be useful in the future as a tool for quality improvement. Some nurses, however, only had a vague understanding of the purpose of the registry.

*Theme 5: ambivalence towards public reporting*

In the UK, the interviews took place when reporting feedback was about to undergo a paradigm change from publishing outcomes on national and health region levels, to publishing outcomes on programme levels, meaning that it would publicly show how each cardiac rehabilitation programme was performing. The UK nurses were concerned, and somewhat ambivalent about this change in strategy. The nurses were interested in working with data locally but perceived a wide gap in the understanding of the feedback data between the clinicians and the upper management. Most nurses were anxious about how the data would be used:

*‘That’s quite scary [….]. In fact, I’m a big believer in that you need to know how your own service is developing. But it is scary in the thought that people are going to see that data and you don’t have an opportunity to explain it [….]. So, our commissioners might look at our data and think it is rubbish [….].* ***We*** *don’t actually get asked that, so nobody comes down to us and says: “Why have you got a problem?” It is done at a higher level by people that don’t necessarily know very much about our service.’* (UK2)

At the same time, some nurses could see an advantage in public reporting, as they hoped that it could force management to make appropriate investments in cardiac rehabilitation.

In Denmark, the results from clinical quality registries have been openly published for years, but still the subject caused mixed-emotions:

*‘So, it’s pretty cool when your department is performing well, right? But it doesn’t feel good when you’re doing bad.’* (DK1)

The nurses were emotionally divided between believing it was right to publicly share data and feeling anxious and embarrassed about potentially being exposed if standards went unmet.

**Discussion**

This study of how nurses perceive feedback delivery and content from national cardiac rehabilitation registries found several differences between the two registries and identified important barriers for using feedback for quality improvement in clinical practice. Notably, the findings from the two registries cannot easily be compared because of differences in their maturity. However, using two registries illuminates different aspects of feedback use.

*Feedback delivery*

There were major differences in the perceptions of the feedback delivery. In the UK, most nurses had positive perceptions. Easy access to user support, facilitated through direct communication between users and registry administrators, may have played an important role, which is in concordance with the positive effect of supportive organisational factors, as previously described (van der Veer et al, 2010). The fact that participation in the registry is voluntary could mean that the NACR organisation aims to make participation worthwhile. In some programmes, limited technology may be a barrier to data-entry, and thus, no feedback can be provided for potential quality improvement. Motivation of the users is reported as having an impact on the effectiveness of feedback (van der Veer et al, 2010), and double entry of data onto both paper and computer was clearly perceived as demotivating, resulting in limited feedback possibilities.

The Danish nurses, on the other hand, had poor experiences with feedback delivery. This could be explained by the fact that DCRD is relatively new and that the delivery process may not be fully implemented. Further, the lengthy chain of organisational levels that the annual report follows implies a high-risk of feedback not reaching the clinicians. In addition, the Danish nurses had no knowledge of the possibility of finding feedback data through their health region. According to Ivers et al (2012), feedback delivered more than once is more effective, and theoretically, DCRD delivers data monthly, but in practice, this option had not been disseminated to the users. Altogether, this indicates that the pathways that deliver feedback are not operating efficiently within DCRD. The nurses need feedback to be made readily available if the data is to be used for quality improvement purposes.

There was a high degree of similarity across the two registries in the nurses’ ambivalence towards the strategy of public reporting on a programme-level. Scepticism among health professionals towards public reporting of performance data has been found in previous studies (Barr et al, 2008; Canaway et al, 2017), but it remains to be seen how public reporting will influence the behaviour of professionals and managers using these registries. Based on these findings, it may be possible to minimise concerns and improve engagement by increasing user involvement in the variety of indicators and the feedback delivery process.

*Feedback content*

This study found that NACR nurses had a high degree of trust in data, while DCRD nurses were demotivated and lacked training and managerial support, leading to a low degree of trust.

In Denmark, DCRD links to a national patient registry system (Zwisler et al, 2016) to minimise the registration workload. However, because of a time lag in the registries, some of the captured data had not been updated when the nurses met the patients. This means that data capture is no guarantee, which affects the users’ perceptions of data quality.

Nurses from both registries perceived ambiguity in some variables. This may indicate that variables are inappropriately constructed. In addition, it may indicate that even with expert users, it is important to continuously educate and discuss the variables in order to obtain reliable data. More focus on registry implementation in cardiac rehabilitation has been recommended (Zwisler et al, 2012; Bhatt et al, 2015), and maintenance and funding have been mentioned as barriers (Davos, 2017; Poffley et al, 2017). This study suggests that usage and maintenance is not just defined by funding and electronic solutions, but also requires sustained educational activities and discussions among the involved stakeholders.

Nurses from both registries perceived feedback data to be relevant, but the Danish nurses believed that some psychosocial aspects were missing since DCRD data do not assess the complexity of the patients. Similarly, one study found that health professionals questioned the validity of feedback data because of the complexity of patients’ life-situations (Bunce et al, 2017). Neither the NACR registry nor the DCRD registry present adjust feedback data for socioeconomic status, which can make cardiac rehabilitation programmes in areas with high deprivation and large numbers of psychosocially complex patients appear as low performing. This may cause frustration and reduce intentions to engage in feedback-driven quality improvement among cardiac rehabilitation programmes in such areas (Gude et al, 2017).

Within NACR, the positive perceptions of feedback relevance may be explained by the relatively high proportion of non-mandatory variables; for example, waist circumference and diet scoring tools, meaning that local cardiac rehabilitation teams have a high degree of ownership on parameters they find important to register and monitor. Previous findings also suggest that health professionals’ intentions to select indicators for quality improvement was influenced positively if the indicator was perceived important (Gude et al, 2017). However, voluntary variables contain a risk of bias, since some programmes might be reluctant to enter data if low performance outcomes are expected.

Since the Danish nurses had not received much feedback, it was not possible to identify similarities or differences regarding the usefulness of data. The interviews with the NACR users implied that increased experience may lead to development of meaningful ways to use data for quality improvement.

*Perspectives*

These findings support previous studies in that the presence of a clinical quality registries is no guarantee for quality improvement as components such as high data quality and efficient feedback processes are needed to achieve this (Zwisler et al, 2016; Poffley et al, 2017). The processes of feedback delivery and the role of management within these processes are topics to be explored further.

*Strengths and limitations*

A strength of this study was the inclusion of participants from two registries in a variety of hospitals, representing two country-specific modes of feedback delivery and content. This design allowed a broad understanding of the nurses’ perceptions and uncovered a valuable learning potential that may be transferable to other clinical quality registries.

A limitation of the study was that – surprisingly – the DCRD users had not seen much feedback data, which meant limited experiences. However, these participants shared several valuable perspectives, which was an important finding that calls for clinical quality registries to evaluate their process of feedback delivery.

**Conclusion**

This study of cardiac rehabilitation nurse leads’ perceptions of feedback delivery and content from two clinical cardiac rehabilitation registries revealed room for improvement in several areas. There was a learning potential between the registries on some parameters, but also areas where the study found similar challenges within both registries. The findings are relevant for stakeholders of clinical quality registries, who may benefit from engaging with users’ perceptions and perspectives as a way to improve the effectiveness of feedback delivery for the benefit of patients.

Key points

* Barriers for easily available feedback data from clinical registries to the users should be identified and targeted
* User involvement in the processes of feedback delivery and feedback content could lead to more effective feedback
* Sustained educational activities may improve data reliability within clinical quality registries
* Public reporting on a programme-level causes mixed-emotions among cardiac rehabilitation nurse leads
* There is a potential for learning across countries and clinical quality registries within cardiac rehabilitation

Conflict of interest

CH is a board member of the steering committee for the Danish Cardiac Rehabilitation Database. The study was conducted independent from this role.

CLE functions as secretary for the chair of the Danish Cardiac Rehabilitation Database. MBK: No conflict of interest. ADZ is the Chair of the Danish Cardiac Rehabilitation Database. PD is the Director of the National Audit for Cardiac Rehabilitation, UK.

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