ORIGINAL RESEARCH:
EMPIRICAL RESEARCH – QUALITATIVE

An analysis of the diagnostic accuracy and peer-to-peer health information provided on online health forums for heart failure

Annabel Farnood[1] | Bridget Johnston[1,2] | Frances S. Mair[3]

[1]Nursing and Healthcare, School of Medicine, Dentistry & Nursing, University of Glasgow, Glasgow, UK

[2]NHS Greater Glasgow & Clyde, Glasgow, UK

[3]General Practice and Primary Care, Institute of Health and Wellbeing, University of Glasgow, Glasgow, UK

Correspondence
Annabel Farnood, Nursing and Healthcare, School of Medicine, Dentistry & Nursing, University of Glasgow, Glasgow, UK.
Email: a.farnood.1@research.gla.ac.uk

Abstract

Aims: To examine the accuracy of diagnostic responses and types of information provided on online health forums.

Design: Qualitative descriptive study.

Methods: This paper reports the findings of a thematic analysis of peer responses to posts included on heart failure online health forums, to understand the quality and types of information provided. Responses posted between March 2016 and March 2019 were screened, collected and analysed thematically using Braun & Clarke. Themes were conceptually underpinned by Normalization Process Theory. Responses were assessed for quality against the NICE and SIGN guidelines to determine whether they were evidence based or not.

Results: The total number of responses collected for analysis was 639. Five main themes were identified: diagnostic, experiential, informational, peer relations and relationships with healthcare professionals. Out of 298 diagnostic responses, 5% were guideline evidence-based and 6% had information that were partly evidence-based. Non-evidence based and potentially dangerous responses were 10%. Experiential responses were 10%; 23% included advice that was not supported with any clinical evidence; and 46% signposted users to other online references/healthcare professionals.

Conclusion: Online health communication largely focuses on provision of experiential responses to assist those in need of pre- or post-diagnosis advice and support. However, there is evidence of inaccurate information provision which suggests the use of a moderator would be beneficial.

Impact: This study suggests heart failure online health forums are a source of support, however, there are potential risks. Increasing nurses and other health care professional's awareness of online health forums will be important. Additional training is needed to help them learn more about patient's use of online health forums, to gain a better understanding about the types of information sought, and how best to address such knowledge deficits. Healthcare systems must ensure sufficient time and resources are available to meet information needs for people with heart failure.

1 | INTRODUCTION

Heart failure is a major public health challenge and described as an epidemic (Cowie, 2017). It is a serious condition that is associated with high levels of health care utilization (Escobar et al., 2020). Heart failure continues to have a poor 5 year survival (45.5%), despite many advances in both pharmacological and non-pharmacological therapies (Taylor et al., 2019). It is estimated that there are around 900,000 people in the UK and 26 million people worldwide, living with heart failure (Apps & Phelan, 2018; Chew et al., 2019).

People with heart failure are known to have many unmet needs, particularly information needs relating to diagnosis, treatments and when to seek help (Browne et al., 2014). People with heart failure have access to different information sources such as general practitioners, cardiologists, heart failure specialist nurses, district nurses and practice nurses (Brennan, 2018). In between waiting for health care professional (HCP) appointments, many people resort to the internet as a source of health information. They may use this before or after an appointment to find out more information about heart failure, or to search for symptoms (Robertson & Harrison, 2009).

Online health forums have become an increasingly common way to obtain information and support health-related issues (Lin et al., 2015). For many people, the internet is now a major source of health information (Daraz et al., 2019). It is, however, important to know how accurate the diagnostic advice on these online health forums are, and the types of information they provide. This may impact the nurse and HCP-patient relationship and influence approaches to health care delivery.

The nursing profession continues to evolve and specialized roles such as heart failure nurses and advanced nurse practitioners are becoming more commonplace. It is therefore essential for nurses to be made aware of patient's use of online health forums as an information source and understand how and why people use them.

2 | BACKGROUND

The National Institute for Health and Care Excellence (NICE) guidelines define heart failure as 'a complex syndrome in which the ability of the heart to maintain the circulation of blood is impaired as a result of a structural or functional impairment of ventricular filling or ejection' (NICE, 2017).

Online health forums can be a more engaging, conversational and investigational alternative to web searches on available search engines (Nguyen et al., 2020). However, there is a concern about the accuracy of health information provided online (Coulson et al., 2007; Plinsinga et al., 2019).

Findings from a recent mixed methods systematic review suggest that HCP's have concerns about the quality of health information that is being accessed and the potential for people to be misinformed (Farnood et al., 2020). Previous research also suggests that misinformation from the internet can add pressure to the appointment, constraining the HCP's time (Zolnierek & DiMatteo, 2009). If a person has become misinformed from online health information, the HCP may need to spend time and effort correcting misunderstandings (Lee et al., 2015; Lu et al., 2018; Tan & Goonawardene, 2017).

To date, online health forum studies have predominantly focused on mental health conditions (Cohan et al., 2017; Kummervold et al., 2002; Prescott et al., 2017; Pruksachatkun et al., 2019). Previous research has investigated other conditions such as breast cancer, type 2 diabetes and stroke (Chen, 2012; De Simoni et al., 2016). The existing literature around heart failure and online health forums is limited and focuses on heart failure medications (Liu et al., 2014; Sarrazin et al., 2014) and assessing the online health forums for changes in health behaviours (Lindsay et al., 2009). No previous literature has been found assessing the quality of information provided on heart failure online health forums or the types of information provided. Due to the scarcity of previous research on online health forums and heart failure, we undertook qualitative research to gain a preliminary understanding of the quality and types of information provided on online health forums focusing on heart failure.

3 | THE STUDY

3.1 | Aims

We aim to understand the types of information people discuss when engaging with online health forums for heart failure and explore the quality of diagnostic advice provided. The main research questions to be addressed are:

- To what degree is the diagnostic advice provided on heart failure online health forums evidence based?
- What type of information is provided on online health forums for heart failure?

3.2 | Study design

A qualitative descriptive approach (Sandelowski, 2000) was undertaken to describe this phenomenon as no previous research was found prior to this study. We examined responses to discussion posts on online health forums for those with heart failure or those

looking to understand whether their symptoms might suggest a diagnosis of heart failure. We used thematic analysis and conceptualized our data through a normalization process theory (NPT) lens to help us understand and evaluate the types of information sought and provided. NPT is a useful framework to explain and understand self-management (Gallacher et al., 2011, 2013) and how people implement new interventions into their everyday routines through four constructs: coherence; cognitive participation; collective action; and reflexive monitoring (May et al., 2018).

3.3 | Sample participants

Widely used internet search engines, Google, Yahoo and Bing, were used to identify online health forums. The search terms used were 'heart failure online support forums' and 'online health discussion forums for heart failure'. The first two pages of results from each search engine were analysed as it has been reported that the typical internet user does not browse further than the second page (Pan et al., 2007). Responses were screened accordingly to the eligibility criteria, and online health forums were selected according to the name and content (see Figure 1). There was no interaction or participation from the researchers on the forums. Only patient and public discussion forums were included as we examined people's use of the internet as opposed to forums used by HCPs. Only forums that were about heart failure or discussing heart failure were included.

All forums had the same purpose of being an online community for those with heart failure or looking to diagnose or seek further information about heart failure. There was no geographical limit to the forums. Posts were browsed by subject title, date and relevancy to heart failure. If they met the inclusion criteria, they were collected for analysis (see Table 1).

3.4 | Data collection

Internet discussion forum posts that were considered to be part of the public domain were examined. Responses posted between March 2016 and March 2019 were collected from each forum. This timeframe was chosen as the Scottish Intercollegiate Guide Network (SIGN) guidelines for heart failure were last updated in 2016. Data were not collected if it stated that the person was under the age of 18. The SIGN and NICE guidelines only apply to those over the age of 18 (NICE, 2018; SIGN, 2016). Posts were only collected if they discussed issues related to heart failure (Table 1). Usernames were not extracted from the data; only the content of the post was included. All identifying information was deleted to protect the anonymity of the forum's participants. We only analysed health forums that were publicly available and did not require a login to review the posts.

Socio-demographic data was collected but limited to what the online members wanted to share, for example: location, gender and age.
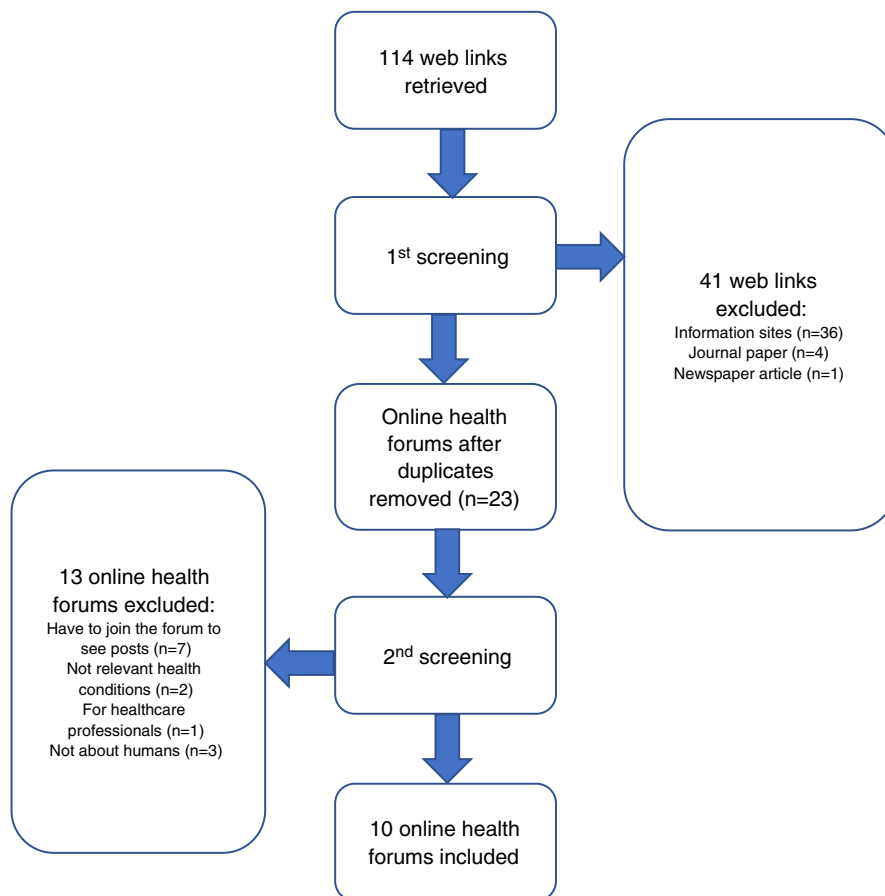

FIGURE 1 Search strategy

TABLE 1 Eligibility criteria

Inclusion	Exclusion
• Search engines: Google, Yahoo and Bing. • Only the first two result pages of each search engine were analysed. • Selected forums must be about heart failure. Can be about 'heart diseases', if it includes discussion on heart failure. • Discussion posts will be analysed from the year 2016–2019.	• Exclude search engines that do not meet the inclusion criteria. • Exclude posts before 2016. • Forums that are not health related. • Forums that do not allow patient engagement. • One-word responses. • If the user states they are under the age of 18, the response will be excluded.

TABLE 2 Normalization process theory coding frame for people responding to discussion posts

Coherence (sense-making work)	Cognitive participation (relationship work)	Collective action (enacting work)	Reflexive monitoring (appraisal work)
Differentiation	*Initiation*	*Interactional workability*	*Systemization*
Using online health forums to gain and understand information.	The peer-to-peer engagement in the groups and seeking assurance.	Communicating complex health issues online with peers.	Determining the benefits and risks of online self-diagnosis and health information seeking on online health forums.
Communal specification	*Enrolment*	*Relational integration*	*Communal appraisal*
Responding to posts requesting further information to gain a better understanding of the individuals health situation.	Peers reactions and behaviours towards other peers' comments.	The influence of sharing health advice with others sharing similar issues and gaining support. Maintaining a level of confidence and accountability to continue using the online forums.	Working together on the internet to determine and evaluate the value of certain treatments. To aid decision-making on treatments.
Individual specification	*Legitimation*	*Skillset workability*	*Individual appraisal*
People achieving an understanding of their diagnosis and its implications through health information gained via the internet through peers.	Respondents sharing their own experiences to the posts on the online health forum.	The effect of using online information on roles and responsibilities of members of the public or HCPs. The impact online information has on the decision-making process.	Distributing information on the internet to determine how effective their treatment is and to provide or gain a diagnosis.
Internalization	*Activation*	*Contextual integration*	*Reconfiguration*
Peoples understanding of using the internet to self-diagnose and knowing if this is their preference or if they value the role of the HCP consultations instead.	Communicating effectively with peers by expressing relatability and assurance.	Recommending the individual to seek professional medical attention or to be seen by an HCP. Offering health advice by referring to other online resources.	Individuals decision-making process of how effective online health forums are for diagnosing and seeking health information for heart failure. The impact this has on relationships with their HCP.

TABLE 3 Frequency count of the quality of evidence assessment (based on the John Hopkins nursing evidence-based practice guidelines)

Total number of responses that were diagnostic	N = 298
Level 1. High-quality evidence: Aligned with SIGN or NICE guidelines for heart failure—responses that contained information that can be found in the SIGN or NICE clinical guidelines for heart failure (does not have to include reference to guidelines)	N = 15 (5%)
Level 2. Good quality evidence: Responses that included information that was supported by a mix of high- and moderate-quality evidence such as the BHF	N = 19 (6%)
Level 3. Evidence-based: Responses that included information that were not in the guidelines but were supported by some reliable sources but appeared inconclusive	N = 0 (0%)
Level 4. Opinion: No advice given but opinion provided to help inform the next steps by signposting users to their HCP or other information sources	N = 136 (46%)
Level 5a. Low quality (experiential): Responses that offered advice based on an individual's personal experience but included no evidence	N = 29 (10%)
Level 5b. Low quality (lack of evidence): Advice provided that was not deemed potentially dangerous but had no supporting evidence	N = 70 (23%)
Level 5c. Non evidence-based and potentially harmful: Includes responses including information that is inconsistent with the national guidelines or high-quality/good evidence of best practice and may be harmful	N = 29 (10%)

3.5 | Ethical considerations

This study was granted ethics approval from the College of Medical, Veterinary and Life Sciences, University of Glasgow ethics committee (200180115). Informed consent was not sought, as data was collected from open access websites that were already in the public domain. We have not included the names of the forums to ensure anonymity for the members.

3.6 | Data analysis

Phase one of data analysis involved thematic analysis of the responses to understand what types of information were provided on these forums based on the methodology outlined by Braun and Clarke (2012). Analysis was conducted by first author (AF), a doctoral student at the University of Glasgow and registered nurse, in collaboration with the interprofessional authorship team (BJ, FM) who bring extensive clinical and academic expertise in chronic health management and qualitative health research.

Thematic analysis (Braun & Clarke, 2012) was undertaken as we were interested in understanding the nature of the responses to the questions that are posted online, and such analysis supports identification of semantic elements of texts or what they mean (Braun & Clarke, 2012). The data were read and re-read to ensure thorough analysis. Extracted data were coded to initial themes generated from the data. The initial themes were then compared and grouped into themes and subthemes.

Once themes were identified, they were mapped onto the constructs of NPT (Table 2). At this point, the constructs of NPT were cross referenced against the derived themes to see if NPT could illuminate the themes from the data. This stage was performed to ensure that themes were directly derived from the data and the data was not forced to fit the constructs of NPT. NPT was used as a theoretical lens with which to interrogate the findings.

In Phase 2 we analysed the quality of evidence of responses. We used the SIGN (SIGN, 2016) and the NICE (NICE, 2018) guidelines for heart failure symptoms and diagnosis as the gold standard with which to judge the quality of the information being provided to patients through the online health forums and compared the extracted content. The British Heart Foundation (BHF) (BHF, 2020), provides further lay information outside the scope of the guidelines and appeared the most often in our search strategy; therefore, we also used the BHF website to compare the accuracy of responses, as people commonly used this source.

As the study was conducted in the UK and considering the types of responses and scale of the study, NICE and SIGN guidelines were deemed most appropriate to be used after being carefully compared with the American Heart Association guidelines (AHA, 2017) to ensure similarity and appropriateness. If the content was not displayed in the guidelines, we looked at the BHF website (BHF, 2020) as 'good evidence', as this was a reliable and recognized information source that most frequently appeared in our search results.

We adopted the hierarchy of evidence, based on the John Hopkins nursing evidence-based practice guidelines (Dang & Dearholt, 2017), as a guidance to assess the levels and quality of evidence provided in the responses. The quality of evidence was categorized between levels one to five (see Table 3). High quality evidence included those aligned with the NICE and SIGN guidelines and good quality evidence included information in the BHF website. Level four included opinions of people signposting others to help inform people's decision-making. Level five was graded low quality evidence and split into three categories—lack of evidence, experiential or included potentially harmful responses that were inconsistent with the national guidelines or high quality and good evidence.

3.7 | Validity and reliability/rigour

The appropriateness of the themes identified were verified by two researchers. Five themes were identified from the thematic analysis and then mapped onto the constructs of the NPT framework. NPT provides a conceptual vocabulary for rigorous studies of self-management (Gallacher et al., 2011, 2013) and implementation processes (May et al., 2018).

Each item of extracted data was coded independently through thematic analysis. During the process, common themes were identified and there was an indication of data saturation. The codes were analysed in a framework and then mapped onto the constructs of NPT. Any data that fell outside the framework was noted to ensure there was no 'shoe-horning' of themes into the framework.

The consolidated criteria for reporting qualitative research (COREQ) was adhered to when reporting the results (Tong et al., 2007).

4 | FINDINGS

4.1 | Screening

The search criteria returned 114 web results in total. Seventy-three were online health forums and the remaining 41 were excluded as they did not meet the inclusion criteria. Ten of the online health forums were eligible for the study (Figure 1). Four forums were identified by Google, six by Yahoo and Bing did not identify any additional health forums that were not already included from the other search engines.

4.2 | Data collected

Ten online health forums from the UK ($n = 6$) and USA ($n = 4$) were included, and the total number of responses collected for analysis was 639 (from 204 original posts). In some threads, each member posted on average two or three comments, although some members were particularly active (usually the original poster). The frequency count of response in each theme and sub-theme are presented in Table 4.

Gender was specified in 51/639 of the response posts. Of these, 39 were females (76%) and 12 males (24%). The members ranged from people seeking a diagnosis, to those already diagnosed sharing their experiences, providing advice or gaining support. Geographical location was mentioned in 49/639 of the response posts (see Table 5).

5 | MAIN THEMES

Five broad themes with sub-themes were identified: diagnostic responses, experiential, informational, peer relations and relationship with HCP's (Table 4). Each theme was mapped onto the core constructs of the NPT framework (Table 2).

The themes have been illustrated with paraphrased extracts from the response posts. Direct quotations have been limited as these may allow the data to be tracked to the original source which will compromise anonymity. Therefore, we have only included one quotation per sub-theme. The themes have been developed from quotations across the sources of data, highlighting similar topic areas identified from the heart failure forums.

TABLE 4 Frequency count of responses in each theme

No. of responses in each theme	No. of responses in each sub-theme
Diagnostic responses (n = 298) Collective action (CA) & reflexive monitoring (RM)	- Evidence-based nature of the diagnostic responses ($n = 162$) - Signposting services ($n = 136$)
Experiential (n = 135) Cognitive participation (CP)	- Sharing personal experiences ($n = 68$) - Experiential supportive information ($n = 67$)
Informational (n = 101) Coherence (CO) & cognitive participation (CP)	- Finding out more information ($n = 59$) - Giving advice ($n = 35$) - Advising against internet ($n = 7$)
Peer relations (n = 84) Cognitive participation (CP) & reflexive monitoring (RM)	- Peer conflict ($n = 14$) - Support ($n = 70$)
Relationship with HCP's (n = 21) Cognitive participation (CP) & reflexive monitoring (RM)	- Distrust/conflict with HCP's ($n = 16$) - Supportive of HCP's ($n = 5$)

NPT has helped highlight the important aspects of the types of information people seek on heart failure online health forums: diagnostic advice (collective action—enacting work; reflexive monitoring—appraisal work), support, sharing experiences and confirmation that beliefs or concerns were legitimate (cognitive participation—relationship work), seeking information (coherence—sense-making work; cognitive participation—relationship work), building peer relationships (cognitive participation—relationship work; reflexive monitoring (appraisal work), and relationships with HCP's (cognitive participation—relationship work; reflexive monitoring—appraisal work).

TABLE 5 Location of responders

Country	No. of responses (n = 49)
UK	N = 16 (33%)
USA	N = 16 (33%)
Australia	N = 10 (20%)
Canada	N = 4 (8%)
France	N = 2 (4%)
Pakistan	N = 1 (2%)

5.1 | Diagnostic responses

A large proportion of the responses was of a diagnostic nature. Direct diagnostic responses (n = 291) were compared against the NICE and SIGN guidelines and were measured for quality of evidence based on the John Hopkins evidence-based practice guideline (Dang & Dearholt, 2017) (Table 3). Figure 2 provides a detailed illustration of the obtained results. These relate mostly to the NPT theoretical construct of collective action (enacting work) as this is the process of communicating health information with peers and recommending resources and information. The reflexive monitoring construct (appraisal work) is also related as it involves the distribution of information that leads to decision-making (Table 2).

5.1.1 | Evidence-based nature of the responses

Only 5% (n = 15) of the obtained responses were evidence-based and aligned with the SIGN and NICE guidelines. Another 6% (n = 19) presented information that was available on the BHF website or partly evidence-based information. Importantly, 10% (n = 29) of the responses were non-evidence based and potentially harmful. No responses (0%) provided inconclusive evidence. The majority of responses lay in between low-quality categories and opinions, for
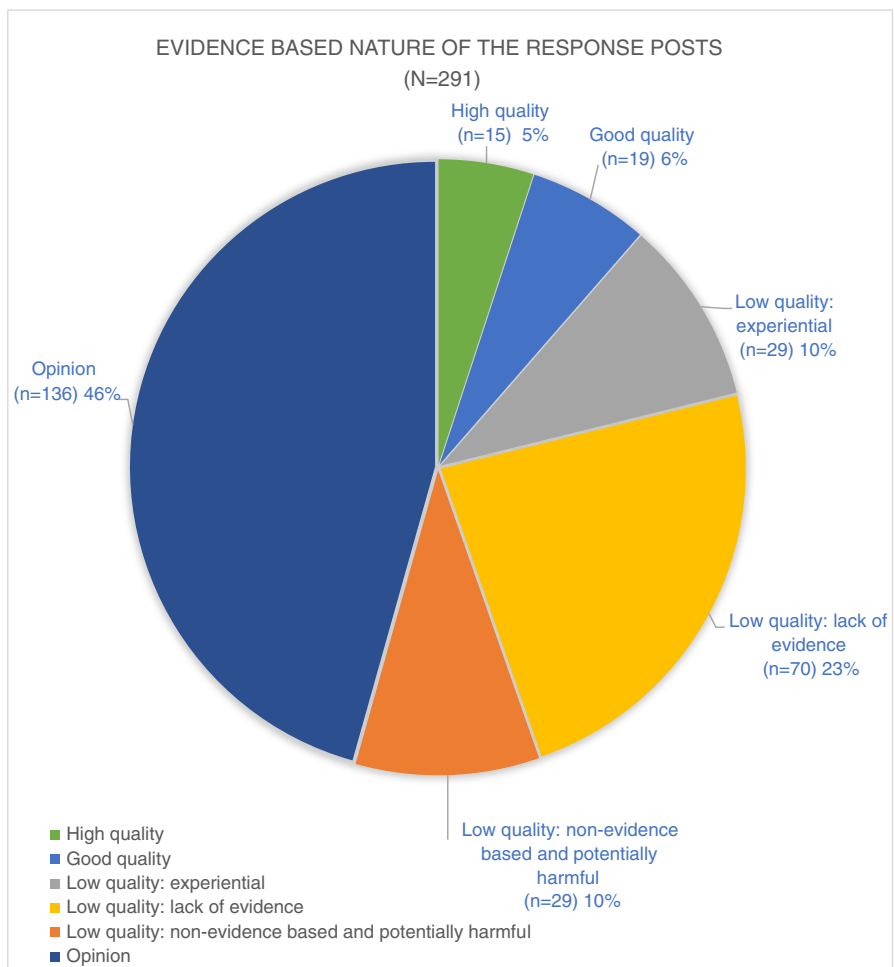

FIGURE 2 Evidence-based nature of the responses

example: experiential responses 10% (*n* = 29), innocuous advice unsupported by clinical evidence 23% (*n* = 70) and signposting services 44% (*n* = 136) (Table 3). Table 3 presents the levels of evidence for the responses. Figure 2 illustrates the results of rating the quality of evidence of responses.

Many responders stated they were not HCPs but advised the individual to seek medical attention. In these replies, a medical diagnosis or opinion was also given. This was deemed to be evidence-based, if it provided information compatible with that found in the NICE or SIGN guidelines. In addition, the offered advice was considered as evidence-based if reported on the BHF website, even though it could not be found in NICE or SIGN guidelines.

> Sorry to read about what you are going through. I would suggest visiting your primary care doctor and ask to be referred to a cardiologist. Also, many things can cause chest pain that are not heart related.

Very few posts shared information about research, and none mentioned ongoing research. This may suggest that research sources are not rapidly and easily accessible to the public. Diagnostic advice was offered based on their own experiences of the signs, symptoms or questions asked by the user (10%). While this type of diagnostic advice may be supportive to the posting individual, it does not represent good and reliable advice since no scientific evidence was shared.

> It sounds like the same thing I had. The doctors called it congestive heart failure. Sadly I need to say if this is the case, you will need a lot of heart care.

Non-evidence based and potentially harmful replies included those offering a confirmed diagnosis to the individual (*n* = 29, 10%). This diagnosis was incorrect, not supported by information included in the NICE, SIGN or BHF guidelines, and did not contain any underpinning evidence to support the advice given. Many posts signposted users to their HCP or other web sources including informational websites, other more appropriate online health forums and charity or university websites. Out of 46 website suggestions, 41 were deemed reliable, and 5 were unreliable sources and potentially dangerous.

> Echo and BNP are the tests for heart failure. HF with preserved ejection fraction would also show up on echo.

5.1.2 | Signposting services

The majority of responses (*n* = 136, 46%) provided opinions that informed the posting individual to take action and visit their HCP (*n* = 90) or to visit other web sources (*n* = 46) and were graded as level four evidence (Table 3) as they provided no evidence but were responses based on opinion (Figure 2). Usually, this suggestion was given when the responder perceived that the query departed significantly from

their knowledge spectrum and required specialist advice. In addition, the responders acknowledged their inability to provide sound diagnostic suggestions for individuals perceived to be in need of urgent attention and appropriate testing to determine their cause for concern. When individuals experienced high levels of anxiety, usually responders offered psychological support simultaneously suggesting they seek professional help to receive appropriate care to ease their worries.

When professional help was suggested, a variety of terminologies were used, and different HCP types were recommended. Most responders urged the individual to visit a doctor. A visit to the cardiologist or doctor represented the most frequent recommendation, followed closely by an appointment with the general practitioner/primary care practitioner. While mentioned, nurses, even heart failure specialist nurses, were not as commonly endorsed. Other recommended services included pharmacists, social services and counsellors. When the responder perceived the presented scenario to be an emergency situation, hospital services were strongly advised. Different terminologies were used for hospital settings, including going to the emergency room or accident and emergency, based on the responder's geographical location (see Table 6).

Consistently, most replies offered advice but simultaneously recommended that the person should visit their HCP for urgent attention, testing, and further support or to receive the appropriate care.

> 'I think you should go to the emergency room for a second opinion'.

We analysed the websites content and link reliability, in the event of web sources being suggested through the diagnostic advice process. A total of 46 replies recommended other web sources. It was discovered that 41 of these websites were reliable and 5 were unreliable.

Charity websites (*n* = 22), such as the American Heart Association or BHF were the most frequently recommended. Individuals were also directed towards other online health forums (*n* = 7), presumed to be more suitable for their needs, information websites (*n* = 10) such as NHS, and university web links (*n* = 2),

Unreliable sources included an uncredited YouTube link for a channel belonging to an unknown user (*n* = 1), and a Wikipedia page (*n* = 1), untrustworthy by definition since the reported information is subject to change implemented by anyone. Other unreliable sources included web links that did not work or pages that could not be found (*n* = 3).

5.2 | Experiential responses

Experience sharing was a common occurrence identified in the responses (Figure 2) but graded as level five evidence (low quality) as they provided no evidence and were based on people's experiences (Table 3). A significant number of people felt they could relate to the individuals experience. This led them to share their own and created a community where they did not feel alone coping with their conditions. By sharing their experiences, people offered support to each other as result. This relates to the NPT construct of cognitive

Healthcare professionals	Frequency of mentions (N = 90)
Doctors	
Cardiologist	N = 25
Doctor	N = 25
General practitioner	N = 7
Primary care practitioner	N = 3
Physician	N = 3
Primary care doctor	N = 2
Neurologist	N = 1
GI doctor	N = 1
Nurses	
Heart failure nurse	N = 2
Nurse	N = 1
BHF nurse	N = 1
Other healthcare professions	
Heart failure team	N = 1
Social services	N = 1
Pharmacist	N = 1
Counsellor	N = 1
Hospital services	
Emergency room	N = 7
Hospital	N = 6
Accident & emergency	N = 2

participation (relationship work) due to people engaging in discussions with peers and sharing their experiences. This type of information sharing promotes relationship work and helped people to legitimize concerns or problems (Table 2).

5.2.1 | Sharing personal experiences

Often, responders shared their own experiences when they felt able to relate to what the individual discussed. Responders shared their experience of the difficult process undertaken to attain a diagnosis, of symptoms and conditions suffered, of treatment and medications received, and of relationships. Usually, people reacted well when the responder shared their own experiences, since this made them feel part of a community and less alone. Frequently, individuals wanted to share and compare experiences. This generated suggestions in changes of approach for the fellow peer to use.

> I was going to post something similar. I've been back and forward to the Drs and hospital for months with similar symptoms.

5.2.2 | Sharing supportive experiences

Support through experience was proven to be beneficial, since people demonstrated to the user that they are not alone. The responder has previously experienced something similar, and he/she reassures the individual that there is hope. A key difference exists between sharing personal experiences and sharing supportive experiences, since the former exercises the powerful ability to ensure that individuals understand they are not alone with their illness, preventing condition isolation.

> I'm sorry about what you're dealing with, I suffer the same things. If you need someone to talk to who's similar, let me know and I'll talk with you. It's always nice to know you're not alone.

5.3 | Informational responses

Informational responses provided substantial intelligence not with the aim to diagnose, but with the objective of offering knowledge to answer a question and were commonly distributed in the responses. These included advice around the condition, lifestyle changes, suggestions on medication and more. These relate mostly to the NPT theoretical construct of coherence (sense-making work) as respondents sought to find out more information by asking the user follow-up questions to provide more efficient advice. Cognitive participation (relationship work) is another construct related to this theme as the sense-making work begins a discussion process where information is being shared between peers, providing assurance for one another (Table 2).

5.3.1 | Finding out more information

Finding out more information included responses following requests for more expertise from the individual who posted, while answering their initial questions. These replies were classified as informational, since they provided knowledgeable advice while requesting more facts at the same time. By finding out further information, a sense of interest in the individual's situation was triggered, contributing to the establishment of a relational bond between participants. Usually, after posting a query, the individual expressed gratitude towards the user who responded, who helped finding a satisfactory conclusion to their questions while asking further details about their situation and providing additional informational advice.

> What does the chest pain feel like? I'm not a doctor but does it hurt when you breathe in?

5.3.2 | Giving advice

A significant difference exists between providing advice around a condition and providing diagnostic information. This divergence recognizes that providing advice does not equate with giving a direct diagnosis to the individual. Therefore, advice was offered in an informational way steering the individual towards services and further resources. Users who responded included information that answered the question directly and made suggestions on what the individuals could do next.

> Stress is a big part of the equation. Relaxing is the cure and one excellent way to do that is exercise. Keep it up!

5.3.3 | Advising against internet advice

Some responders felt that individuals should not rely on the internet or searching Google to determine their health condition and should not receive a diagnosis online. Responders suggested this could generate unnecessary stress and worry because of the overwhelming amount of retrievable information, navigation difficulties and the problem of identifying reliable sources. The individuals themselves suggested that this practice could be unreliable and were aware that they should visit a trained HCP instead.

> The internet will only give a broad diagnosis. Be cautious when researching on the web.

5.4 | Peer relations

We examined patient's communication which led to relationship building responses. A community is characterized and arises from posting in online health forums. In these communities, relationships become established, since the main purpose is to provide support for individuals in their time of need. We discovered that many responses were supportive, but others led to tension and conflict. This relates mostly to the NPT constructs of cognitive participation (relationship work) as this is the peer-to-peer engagement process, as well as reflexive monitoring (appraisal work). The peer-to-peer engagement process leads to peers working together to collectively make a decision (Table 2).

Usually, supportive responses let the individual know that they are not alone, and they have found support in the community. Consequently, the user posted regular updates and found comfort from like-minded people that replied and related to them. Some supportive responses included similar experiences with a positive outcome, increasing hope for the individual.

> You're not alone anymore! We will show compassion and support anytime you need to talk.

However, peer conflict occasionally occurred when people raised their frustrations with a user's post, or in the responses of the post. Some people became frustrated when they felt the post included obvious signs of anxiety, which the user misunderstood for heart issues. Some people also felt that many younger people were misunderstanding anxiety symptoms with heart issues which became frustrating for them.

Some peers responded negatively towards 'bible preachers' and felt they should not be allowed further forum participation. Others disagreed occasionally with responders, leading to further conflict about the user's situation.

> 'Your worrying made me mad, absolute nonsense if you ignore the doctor's advice'.

5.5 | Relationships with the HCP

Peers frequently reported on their relationships and thoughts towards their HCPs. Some experienced disappointment after HCP consultations and decided to use online health forums to seek a second opinion. Others were pleased with their HCPs, trusting them and believing them to be experts. This relates mostly to the NPT constructs of cognitive participation (relationship work) as this relationship work extends beyond the peer engagement process and determines the link between the relationship with online health forums and HCP's. Reflexive monitoring (appraisal work) is also related to this theme because the interactions help inform the decision-making process, for example—whether the user will visit the HCP based on the information they received online (Table 2).

5.5.1 | Positive experiences with HCP's

People reported positive experiences with their HCPs after consultations. Some felt that they could trust the HCPs, since they were experts in their field. In addition, people were reassured when cardiologists had previously received good reviews, making them feel more comfortable and trusting. Moreover, it was discovered that some individuals felt nurses possessed a great ability to speak to them in a very relatable manner. This simplified their consultation experience enabling better understanding of the whole process.

> Above all, trust your Doctor, he is the expert.

> Cardiac wards usually have an educational nurse... they are good because you get the terms spoken with you and not at you with terminology that goes over our heads.

5.5.2 | Distrust with HCP's

Some responses expressed people's frustrations with their HCPs. Often, people felt dismissed and not listened to when visiting their HCP. Usually, this perception led them to online health forums for finding another HCP and seeking second opinions. Time issues were commonly reported: individuals said they often felt rushed during their consultations. Interestingly, there was the belief that some HCPs were only interested in receiving the fee after the appointment, hence recommending further visits for other tests to gain more money. Others felt their health issues were not taken seriously enough and lost trust with their HCP's knowledge.

> They have this obnoxious habit of not listening to patients, when we tell them things, they think they know better.

6 | DISCUSSION

This qualitative study aimed to examine the quality of diagnostic advice, and types of information being provided on heart failure online health forums. By interpreting and mapping the data against the NPT constructs, implications for support and research can be drawn.

The results show that most discussions on online health forums for heart failure focused on issues relating to diagnosis, experiences, information seeking, peer relations and relationships with HCPs. The findings are discussed, in addition to drawing comparisons and differences to previous literature. To our knowledge, this is the first paper to evaluate the quality of evidence provided on heart failure online health forums.

NPT helped to inform conceptualization of the themes of this study and structure the data. Relationship work (Cognitive participation) was a dominant feature of the data found in online health forums. This supports the suggestion that people are drawn to online health forums to build relationships and find similarities and comparisons in their health experiences with other peers. Online health forums can serve to legitimize patient perspectives and concerns. This peer-to-peer engagement process supports communication and relationship development. Reflexive monitoring was the next relatable construct as a lot of online health forum exchanges seemed to help inform decision-making about what to do next.

Our novel findings suggest that online health forums for heart failure could not be considered a reliable source of high-quality evidence-based information on diagnosis of heart failure, with only 11% of the responses including wholly or partial evidence, and 10% (n = 29) of responses being non-evidence based and potentially dangerous. The lack of information about peers, such as demographic data, made it difficult to know who an individual was engaging with. However, our findings suggest that gaining a diagnosis or having symptoms is only part of the reason people use such forums, and that people access such forums to gain support and have their concerns legitimized (cognitive participation work). The forums provide

a community of support and experiential connectivity, which appears to be the key benefits of online health forums for those with heart failure.

Several factors identified, resonated with previous online health forum studies. Online health forums clearly provide and signpost helpful and supportive information to users (Cole et al., 2016; Mamykina et al., 2015; Sarrazin et al., 2014). Online health forums shared more than just diagnostic responses. They provided an opportunity to connect with peers around the world, to share experiences, and to build a supportive community which has been noted previously (Jeong et al., 2018; Lu et al., 2013; Sudau et al., 2014; Willis, 2014). Our findings suggest that for most people, the internet is used to complement, rather than replace offline sources, which is consistent with other research (Farnood et al., 2020; Tan & Goonawardene, 2017). Several concerns such as the potential for misinformation and conflict between peers, have been discussed in previous literature (Plinsinga et al., 2019). Furthermore, the anonymity of online health forums can introduce the increased likelihood of receiving hostile comments and misinterpretation due to the constraints of non-verbal communication (Coulson et al., 2007; Plinsinga et al., 2019).

Interestingly, responders rarely signposted users to consult nurses; rather they usually suggested visiting the doctor, general practitioner or cardiologist. Traditionally, primary HCPs were general practitioners. However, the nursing profession is expanding, and nurses are taking on more advanced and extended roles. Advanced nurse practitioners and primary care nurses are becoming more common, and this will continue to increase with time. It is expected for patients to increasingly refer to nurses on online health forums as the profession grows (McParland et al., 2020; McParland et al., 2019; Rea et al., 2020; Wilson et al., 2020). High quality online health forums that have been assessed, should be recommended to nurses and HCP's to potentially offer as a resource to patients.

Previous literature has suggested that HCPs should improve their awareness about online health information and communities, so they have greater knowledge of the types of informal social support networks patients are engaging in (Tan & Goonawardene, 2017). Future research should explore nurses' perceptions of patient/public online health information seeking. There is a lack of research including the nursing perspective and as the nursing profession expands and more roles continue to develop such as the advanced nurse practitioner, it is essential to develop an understanding of the impact of such online health forums on relationships between patients and nurses.

Additionally, further exploration on the use of moderators on online health forums to determine the key benefits in comparison to those not moderated, would be useful. Furthermore, as nurses are the largest group of healthcare providers worldwide (WHO, 2017), it is important for nurses and other HCP's to be made aware of the risk of patient's accessing incorrect and potentially harmful information as it will allow them to have a better understanding of patient knowledge gaps and to better address them. Technology and the nursing profession will continue to grow and there will be more contact between internet-informed patients and primary care nurses.

Therefore, it is important to understand the impact of this on the relationship between nurses and patients.

6.1 | Limitations

The approach to data collection assembled a diverse range of views from online health forums where individuals felt free to comment and engage in discussions unbounded by the formal constraints of the research environment, and with the protection of anonymity. This meant that the study could be based on an analysis of honest, publicly offered guidance, views, perceptions, and interactions concerning different heart failure conditions and scenarios. Another advantage of this method is its resource effectiveness and the fact that it facilitates access to large quantities of data in a relatively short amount of time.

However, as the discussion forum respondents remained anonymous; it was impossible to obtain complete information in respect of the demographic characteristics of the sample. The scale of the study was limited to online health forums discussing heart failure. Online health forums for different conditions could have yielded different results. However, while the characteristics of the sample inevitably remain ambiguous, the ability of this method to harvest spontaneous views is indisputable.

The posts analysed were anonymous, carrying few details about the user. Therefore, these yielded insufficient socio-demographic data, and the sample may not be entirely representative.

Although users were international and the online health forums were geographically based in the UK and US, for the purpose of the study and diagnostic level of responses, the NICE and SIGN guidelines were deemed appropriate to be used in terms of similarity to the American Heart Association guidelines (AHA, 2017). Careful consideration was taken prior to the study when analysing these guidelines, and during the analysis process.

7 | CONCLUSION

The ubiquitous nature of online health forums and peer to peer communication, and the continued expansion of online resources suggest the use of such resources is likely to gain increasing importance for HCPs. Online health forums allow peers to connect globally. They generate content which enables individuals to share their own experiences in the confines of the forum (Jeong et al., 2018; Lu et al., 2013; Sudau et al., 2014; Willis, 2014). However, online forums also represent an opportunity to provide misinformation and 10% ($n = 29$) of the information provided was unsafe and not evidence based. Nonetheless, such forums provide support, addressing issues of isolation and ensure users feel they are not alone (Cole et al., 2016; Mamykina et al., 2015; Sarrazin et al., 2014). Despite the growing use of online health forums, very little research makes use of this low-cost resource for identifying people's health interests to guide person orientated research, nor are we using this information

to help us better understand patient support needs to underpin a more person-centred healthcare delivery. HCPs and health care systems should use learning from such forums to identify service gaps and care deficiencies to optimize care delivery. Online health forums may provide increasing benefit through the addition of a moderator.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

PEER REVIEW

The peer review history for this article is available at https://publo ns.com/publon/10.1111/jan.15009.

ORCID

Annabel Farnood https://orcid.org/0000-0001-5648-4495

REFERENCES

AHA. (2017). *Diagnosing heart failure*. Retrieved from https://www.heart.org/en/health-topics/heart-failure/diagnosing-heart-failure

Apps, T., & Phelan, A. (2018). Working together to achieve better outcomes for patients with heart failure. *Primary Health Care*, *28*(3), 35–41. https://doi.org/10.7748/phc.2018.e1348

BHF. (2020). *Information & support*. Retrieved from https://www.bhf.org.uk/informationsupport

Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology*, *Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57–71). American Psychological Association.

Brennan, E. J. (2018). Chronic heart failure nursing: Integrated multidisciplinary care. *British Journal of Nursing*, *27*(12), 681–688. https://doi.org/10.12968/bjon.2018.27.12.681

Browne, S., Macdonald, S., May, C. R., Macleod, U., & Mair, F. S. (2014). Patient, carer and professional perspectives on barriers and facilitators to quality care in advanced heart failure. *PLoS One*, *9*(3), e93288. https://doi.org/10.1371/journal.pone.0093288

Chen, A. T. (2012). Exploring online support spaces: Using cluster analysis to examine breast cancer, diabetes and fibromyalgia support groups. *Patient Education and Counseling*, *87*(2), 250–257. https://doi.org/10.1016/j.pec.2011.08.017

Chew, H. S. J., Sim, K. L. D., Cao, X. I., & Chair, S. Y. (2019). Motivation, challenges and self-regulation in heart failure self-care: A theory-driven qualitative study. *International Journal of Behavioral Medicine*, *26*(5), 474–485. https://doi.org/10.1007/s12529-019-09798-z

Cohan, A., Young, S., Yates, A., & Goharian, N. (2017). Triaging content severity in online mental health forums. *Journal of the Association for Information Science and Technology*, *68*(11), 2675–2689. https://doi.org/10.1002/asi.23865

Cole, J., Watkins, C., & Kleine, D. (2016). Health advice from internet discussion forums: How bad is dangerous? *Journal of Medical Internet Research*, *18*(1), e4. https://doi.org/10.2196/jmir.5051

Coulson, N. S., Buchanan, H., & Aubeeluck, A. (2007). Social support in cyberspace: A content analysis of communication within a Huntington's disease online support group. *Patient Education and Counseling*, *68*(2), 173–178. https://doi.org/10.1016/j.pec.2007.06.002

Cowie, M. R. (2017). The heart failure epidemic: A UK perspective. *Echo Research and Practice*, *4*(1), R15–R20.

Dang, D., & Dearholt, S. L. (2017). *Johns Hopkins nursing evidence-based practice: Model and guidelines*. Sigma Theta Tau.

Daraz, L., Morrow, A. S., Ponce, O. J., Beuschel, B., Farah, M. H., Katabi, A., Alsawas, M., Majzoub, A. M., Benkhadra, R., Seisa, M. O., Ding, J. (F.), Prokop, L., & Murad, M. H. (2019). Can patients trust online health information? A meta-narrative systematic review addressing the quality of health information on the internet. *Journal of General Internal Medicine*, *34*(9), 1884–1891. https://doi.org/10.1007/s11606-019-05109-0

De Simoni, A., Shanks, A., Balasooriya-Smeekens, C., & Mant, J. (2016). Stroke survivors and their families receive information and support on an individual basis from an online forum: Descriptive analysis of a population of 2348 patients and qualitative study of a sample of participants. *British Medical Journal Open*, *6*(4), e010501. https://doi.org/10.1136/bmjopen-2015-010501

Escobar, C., Varela, L., Palacios, B., Capel, M., Sicras, A., Sicras, A., Hormigo, A., Alcázar, R., Manito, N., & Botana, M. (2020). Costs and healthcare utilisation of patients with heart failure in Spain. *BMC Health Services Research*, *20*(1), 1–11. https://doi.org/10.1186/s12913-020-05828-9

Farnood, A., Johnston, B., & Mair, F. S. (2020). A mixed methods systematic review of the effects of patient online self-diagnosing in the 'smart-phone society'on the healthcare professional-patient relationship and medical authority. *BMC Medical Informatics and Decision Making*, *20*(1), 1–14. https://doi.org/10.1186/s12911-020-01243-6

Gallacher, K., May, C. R., Montori, V. M., & Mair, F. S. (2011). Understanding patients' experiences of treatment burden in chronic heart failure using normalization process theory. *The Annals of Family Medicine*, *9*(3), 235–243. https://doi.org/10.1370/afm.1249

Gallacher, K., Morrison, D., Jani, B., Macdonald, S., May, C. R., Montori, V. M., Erwin, P. J., Batty, G. D., Eton, D. T., Langhorne, P., & Mair, F. S. (2013). Uncovering treatment burden as a key concept for stroke care: A systematic review of qualitative research. *PLoS Medicine*, *10*(6), e1001473. https://doi.org/10.1371/journal.pmed.1001473

Jeong, J.-S., Kim, Y., & Chon, M.-G. (2018). Who is caring for the caregiver? The role of cybercoping for dementia caregivers. *Health Communication*, *33*(1), 5–13. https://doi.org/10.1080/10410236.2016.1242030

Kummervold, P. E., Gammon, D., Bergvik, S., Johnsen, J.-A.-K., Hasvold, T., & Rosenvinge, J. H. (2002). Social support in a wired world: Use of online mental health forums in Norway. *Nordic Journal of Psychiatry*, *56*(1), 59–65. https://doi.org/10.1080/08039480252803945

Lee, K., Hoti, K., Hughes, J. D., & Emmerton, L. M. (2015). Consumer use of "Dr Google": A survey on health information-seeking behaviors and navigational needs. *Journal of Medical Internet Research*, *17*(12), e288. https://doi.org/10.2196/jmir.4345

Lin, T.-C., Hsu, J.-S.-C., Cheng, H.-L., & Chiu, C.-M. (2015). Exploring the relationship between receiving and offering online social support: A dual social support model. *Information & Management*, *52*(3), 371–383. https://doi.org/10.1016/j.im.2015.01.003

Lindsay, S., Smith, S., Bellaby, P., & Baker, R. (2009). The health impact of an online heart disease support group: A comparison of moderated versus unmoderated support. *Health Education Research*, *24*(4), 646–654. https://doi.org/10.1093/her/cyp001

Liu, X., Liu, J., & Chen, H. (2014). Identifying adverse drug events from health social media: A case study on heart disease discussion forums. Paper presented at the International conference on smart health.

Lu, X., Zhang, R., Wu, W., Shang, X., & Liu, M. (2018). Relationship between internet health information and patient compliance based on trust: Empirical study. *Journal of Medical Internet Research*, *20*(8), e9364. https://doi.org/10.2196/jmir.9364

Lu, Y., Zhang, P., Liu, J., Li, J., & Deng, S. (2013). Health-related hot topic detection in online communities using text clustering. *PLoS One*, *8*(2). https://doi.org/10.1371/journal.pone.0056221

Mamykina, L., Nakikj, D., & Elhadad, N. (2015). Collective sensemaking in online health forums. Paper presented at the Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems.

May, C. R., Cummings, A., Girling, M., Bracher, M., Mair, F. S., May, C. M., Murray, E., Myall, M., Rapley, T., & Finch, T. (2018). Using Normalization Process Theory in feasibility studies and process evaluations of complex healthcare interventions: A systematic review. *Implementation Science*, *13*(1), 80. https://doi.org/10.1186/s13012-018-0758-1

McParland, C. R., Cooper, M. A., & Johnston, B. (2019). Differential diagnosis decision support systems in primary and out-of-hours care: A qualitative analysis of the needs of key stakeholders in Scotland. *Journal of Primary Care & Community Health*, *10*, 2150132719829315. https://doi.org/10.1177/2150132719829315

McParland, C., Cooper, M., & Johnston, B. (2020). Exploring differential diagnosis decision support systems for trainee advanced practitioners in primary care. *Primary Health Care*, *30*(5). https://doi.org/10.7748/phc.2020.e1665

Nguyen, D. M., Olteanu, A., & Kıcıman, E. (2020). External information sharing on health forums: An exploration. Paper presented at the Proceedings of the International AAAI Conference on Web and Social Media

NICE. (2017). *Heart failure - chronic*. Retrieved from https://cks.nice.org.uk/topics/heart-failure-chronic/

NICE. (2018). *Chronic heart failure in adults: Diagnosis and management*. Retrieved from https://www.nice.org.uk/guidance/ng106

Pan, B., Hembrooke, H., Joachims, T., Lorigo, L., Gay, G., & Granka, L. (2007). In Google we trust: Users' decisions on rank, position, and relevance. *Journal of computer-mediated Communication*, *12*(3), 801–823. https://doi.org/10.1111/j.1083-6101.2007.00351.x

Plinsinga, M. L., Besomi, M., Maclachlan, L., Melo, L., Robbins, S., Lawford, B. J., Teo, P. L., Mills, K., Setchell, J., Egerton, T., Eyles, J., Hall, L., Mellor, R., Hunter, D. J., Hodges, P., Vicenzino, B., & Bennell, K. (2019). Exploring the characteristics and preferences for online support groups: Mixed method study. *Journal of Medical Internet Research*, *21*(12), e15987. https://doi.org/10.2196/15987

Prescott, J., Hanley, T., & Ujhelyi, K. (2017). Peer communication in online mental health forums for young people: Directional and nondirectional support. *JMIR Mental Health*, *4*(3), e29. https://doi.org/10.2196/mental.6921

Pruksachatkun, Y., Pendse, S. R., & Sharma, A. (2019). Moments of change: Analyzing peer-based cognitive support in online mental health forums. Paper presented at the Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems.

Rea, T., Esposito, M. R., Guillari, A., Simeone, S., Gargiulo, G., Continisio, G. I., & Serra, N. (2020). Nurses in Public Health: A profession in continuous evolution. *Epidemiology, Biostatistics and Public Health*, *17*(1). https://doi.org/10.2427/13229

Robertson, N., & Harrison, P. (2009). What's wrong with me? Concerns about online medical self-diagnosis. Paper presented at the ANZMAC 2009: Sustainable management and marketing conference.

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health*, *23*(4), 334–340. https://doi.org/10.1002/1098-240X(200008)23:4<334:AID-NUR9>3.0.CO;2-G

Sarrazin, M. S. V., Cram, P., Mazur, A., Ward, M., & Reisinger, H. S. (2014). Patient perspectives of dabigatran: Analysis of online discussion forums. *The Patient-Patient-Centered Outcomes Research*, *7*(1), 47–54. https://doi.org/10.1007/s40271-013-0027-y

SIGN. (2016). *Management of chronic heart failure*. Retrieved from http://www.sign.ac.uk

Sudau, F., Friede, T., Grabowski, J., Koschack, J., Makedonski, P., & Himmel, W. (2014). Sources of information and behavioral patterns in online health forums: Observational study. *Journal of Medical Internet Research*, *16*(1), e10.

Tan, S.-S.-L., & Goonawardene, N. (2017). Internet health information seeking and the patient-physician relationship: A systematic

review. *Journal of Medical Internet Research*, *19*(1), e9. https://doi.org/10.2196/jmir.5729

Taylor, C. J., Ordóñez-Mena, J. M., Roalfe, A. K., Lay-Flurrie, S., Jones, N. R., Marshall, T., & Hobbs, F. R. (2019). Trends in survival after a diagnosis of heart failure in the United Kingdom 2000–2017: Population based cohort study. *BMJ*, *364*, 2000–2017. https://doi.org/10.1136/bmj.l223

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, *19*(6), 349–357. https://doi.org/10.1093/intqhc/mzm042

WHO. (2017). Report on the policy dialogue meeting on the nursing workforce, 217. Retrieved from: https://www.who.int/hrh/news/2017.NursingApril2017-2.pdf.

Willis, E. (2014). The making of expert patients: the role of online health communities in arthritis self-management. *Journal of Health Psychology*, *19*(12), 1613–1625. https://doi.org/10.1177/1359105313496446

Wilson, R. L., Carryer, J., Dewing, J., Rosado, S., Gildberg, F., Hutton, A., Johnson, A., Kaunonen, M., & Sheridan, N. (2020). The state of the nursing profession in the International Year of the Nurse and Midwife 2020 during COVID-19: A Nursing Standpoint. *Nursing Philosophy*, *21*(3), https://doi.org/10.1111/nup.12314

Zolnierek, K. B. H., & DiMatteo, M. R. (2009). Physician communication and patient adherence to treatment: A meta-analysis. *Medical Care*, *47*(8), 826–834. https://doi.org/10.1097/MLR.0b013e31819a5acc

---