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Mammography-induced skin tears: Unraveling personal and professional narratives through netnography

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Aim The study sought to uncover the multifaceted impacts of skin tears resulting from mammography by analysing online discussions and highlighting the importance of addressing this complication.

Design A netnographic approach was employed to analyse online discussions related to skin tears caused by mammography. The study identified four key data sites and utilised the Walkthrough Method to understand the sociotechnical features of these online spaces.

Methods Thematic analysis was conducted on extracted text data from online platforms and immersive journaling. The discussions, spanning 16 years, were analysed to identify recurring themes and concerns related to skin tears in mammography.

Results The analysis revealed low contemporary activity on the topic, with eleven themes emerging, emphasising the reporting and awareness of skin tears, patient concerns, community dynamics, and misinformation. Significant issues such as pain, distrust in medical professionals and potential impacts on future mammography engagement were highlighted.

Conclusion The study underscores the need for greater consideration of skin tears as a complication of mammography. It also points to the role of digital platforms in health-related discussions and the necessity for healthcare professionals to engage in these spaces to provide accurate information and counteract misinformation. The findings suggest the need for post-procedural examinations to identify tears early, robust reporting systems and

clear informational materials. Further research is needed to provide more comprehensive data on the prevalence and management of skin tears in mammography.

Patient or public contribution

No patient or public contribution.

Implications for the profession and/or patient care

The risk of skin tears during mammographic procedures needs to be included in training of mammographers.

Post procedural examinations are needed to identify and manage skin tears early.

Robust reporting systems are required to provide accurate data on the number of patients affected.

Patient information materials are required that address the risk of skin tears and tissue damage.

Further research is required to explore the role of healthcare professionals engaging in online digital platforms.

Introduction

Mammography is a widely employed diagnostic tool that involves compression of breast tissue to generate high-quality X-ray images for medical assessment. However, a complication of this procedure is the occurrence of skin tears.¹ There is currently limited literature and a dearth of comprehensive data regarding the frequency, prevalence and optimal management of these skin tears, as identified in a recent review of the literature.² The findings of this review indicated that approximately 4.7% of individuals undergoing mammography experience skin tears, with 10.8% of them subsequently refraining from further mammograms. It also emphasised the scarcity of data on skin tear incidents from mammography outside the United States.² Given the absence of evidence-based advice and literature related to mammography skin tears, those experiencing them may turn to alternative internet sources to meet their health information needs around skin tears.

However, given that there are significant differences between the practice, training and medical systems in different countries, and the global nature of information access online, this raises interesting questions about the information shared and exchanged related to skin tears in mammography. Furthermore, user-generated content may not necessarily distinguish the nuanced differences between mammograms used in screening, diagnostic or therapeutic pathways.

Therefore, this study investigates discourse related to skin tears as a complication of mammography within online platforms, using netnography,³ a method designed for conducting detailed observational qualitative research in social media and online spaces. Our study examines these discourses, and the role of both mammography clients and healthcare professionals in them, to uncover the multifaceted impacts of these injuries on individuals, evaluate current treatment approaches, and analyse the utilisation of online spaces in this context.

While a range of studies have been conducted to explore reasons for non-attendance at mammography screening,^{4,5,6,7} this study is the first to explore the information needs and responses of those experiencing skin tears from mammography. In addition, the paper provides a novel contribution to the literature on skin tears by investigating the role of online platforms in shaping discourses on this topic, as the first study to employ a netnographic approach in this area.

Research Questions and Objectives

This study sought to answer the following research question through the realisation of five objectives:

Research question

What is the nature of online discourse related to skin tears as a complication of mammography?

Objectives

1. Identify information needs related to the management and prevention of skin tears in mammography
2. Describe the nature of wound care advice provided within online spaces related to skin tears from mammography/the culture of these online communities
3. Identify the role of healthcare professionals within these online spaces in relation to information sharing and use
4. Explore the nature of online sites where information/advice is sought and shared around skin tears caused by mammography
5. Explore whether there is any potential relationship between skin tears in mammography and intentions to engage with future imaging with mammography

Methodology

This study, and the methodology selected for it, is rooted in Actor-Network Theory⁸, a perspective that recognises that humans and technologies are mutually shaping, and that

online discourses are impacted by both the individuals that use them and the digital platforms, algorithms and other technological actors that mediate their use. Therefore, the study used netnography, a methodology specifically designed to study online communities, cultures and phenomena.³ In netnography data is collected through a series of processes that centre around the immersion of the researcher in a digital environment, including the collection of data from comments and images, and recording of researcher field notes in an immersion journal.⁹ This method was selected as it has been used to study online health communication in a range of contexts including diabetes,¹⁰ Parkinson's disease¹¹ and gestational trophoblastic disease.¹² In addition, netnography is supported by a structured ethical framework which ensures that all online data encountered is treated with the utmost respect for protection of the individuals it originated from. The research team also valued netnography as a non-intrusive data collection method which uses an observational approach to access authentic, unfiltered online discussions. This also enabled longitudinal analysis of evolving discussions and provided a deeper understanding of the perspectives of individuals impacted by skin tears following mammography.

This netnographic approach, which used the process outlined by Kozinets,³ as seen in Figure 1 below, was complimented by use of the Walkthrough Method.¹³ The walkthrough method uses a systematic three-step process of evaluating a website or app to provide a deeper understanding of how the digital architecture and culture of sites themselves are related to and may influence a user's experience of them.



*All data related specifically to skin tears resulting from mammography were saved for analysis

Figure 1. Netnographic process

Data collection

Possible data sites were identified using search engines, including Google and Google Images, to search key terms related to skin tears in mammography. Any additional terms emerging during the 'scouting' phase of the netnography were added to extend searches. These searches were used to identify publicly accessible online spaces, such as comments on YouTube videos, blogs and forum threads about mammography and publicly accessible social media pages where individuals are talking about skin tears and mammography. To

protect the privacy and identities of individuals within the data, the authors have chosen not to report the search process in further detail, in keeping with netnographic ethics.

Data collection occurred over a period of two months (September–November 2023) and included the collection of retrospective data that was available online within this period. Searches were completed independently by three researchers to ensure factors impacting search results such as combinations of search terms, algorithmic influences and navigation of websites and links did not lead to potentially relevant data being omitted.

The inclusion criteria for data sources were:

- Must be available on a public site, webpage or forum that does not require login details
- Relate to skin tears caused by mammography
- Be in English language

As the subject being investigated is a potentially rare clinical event it was anticipated that data may be limited and therefore all data sites which met the above criteria were included in the study.

Ethical considerations

The authors recognise that work with publicly available internet data must be treated with the utmost ethical sensitivity. Therefore, this study addressed ethical considerations systematically using the guidance and process provided by Kozinets^{3 p179} and in line with the Association of Internet Researchers ethics guidance.¹⁴ Some of the key aspects of this ethical usage of the public data is:

- Only data available on public online spaces was included in the study. Any private groups or sites requiring a login to view were not included.
- Researchers have intentionally not disclosed the process for finding the specific data included in this study to avoid it being traced back to individual users.
- No direct quotes from the data are included in this paper, instead the findings focus on themes and patterns within the discourse, with occasional paraphrased examples used to avoid direct quotes being identifiable.

Ethical approval was given by the University of Salford ethics board (ID: 12830). The study used no interactive methods and, as such, consent from participants was not feasible. Detailed consideration of the ethical considerations for this study are provided as supplementary information.

Data analysis

In this study, a comprehensive approach to data analysis was employed, guided by the netnographic method outlined by Kozinets³, and utilising thematic analysis¹⁵ which was conducted using Nvivo (Version 14.23.0 (13)). Content analysis was also used to extract wound care advice in relation to treatment options for skin tears to address objective 2. Both inductive and deductive coding was used to reflect the nature of the research objectives.

Researcher characteristics and reflexivity

The authorship team comprised experts in mammography, wound care, and online culture within the health context. Their diverse expertise is instrumental in framing the interdisciplinary approach necessary for this study, with clinicians providing practical health insights and non-clinicians contributing a broader cultural perspective. Each team member's role was delineated to leverage their strengths, ensuring a comprehensive analysis of the online forums. In acknowledging our positionalities, we reflected on our potential biases, such as preconceived notions about online health-seeking behaviours. This reflexivity was an ongoing process, continuously informing our research design, data collection methods, analytical processes and interpretations of the data.

Despite not being users of the forums included in the study, we engaged in critical discussions about our outsider status, considering both the detachment it provided for objective analysis and the limitations it imposed on our understanding of the users' experiences. The team's diversity across several demographics prompted reflection on how our backgrounds might influence interactions within the research process and the framing of findings. To mitigate any unintended influence, we implemented reflexive practices, including regular debriefing sessions and maintenance of a reflexive journal by the lead author. By constantly engaging in these reflective practices, we aimed to enhance the research's integrity and authenticity, striving for a balance between objective analysis and sensitivity to the subjects of our study.

Results

Summary of data sites

A total of four data sites were identified for analysis. These sites provided primarily textual data, however in one site images were also shared. The data sites contained discussion spanning 16 years although none showed high levels of contemporary activity in relation to skin tears. It was evident from the sites that in some cases individuals were finding posts made many years previously and responding to them to instigate further discussion or elicit new information. The data sites presented a range of affordances including both non-medical and medically focused sites. Findings of the full thematic analysis for each objective including walkthrough analysis of the data sites are provided below.

In this study it was not possible to determine the precise geographical origins of individuals posting due to the anonymous nature of some sites. As such the data must be interpreted with caution. This is important due to the variations in practice related to mammography between, for example, the age at which regular screening begins, frequency, and practice in mammography between countries. There are also important differences between the context of user generated content (content created by the users of a platform or site as opposed to by professionals and subject to formal editorial standards) dependant on whether the individual had experienced screening, symptomatic imaging and/or radiotherapy. These issues appeared not to be identified, disclosed, or discussed by forum users and there was evidence that these differences were not discriminated between when discussing mammography experiences.

A total of 11 final themes were identified across the research objectives. The initial codes and final themes can be seen in Table 1.

Table 1. Initial coding and thematic framework

Research objective	Theme	Related codes
Objective 1 Identify information needs related to the management and prevention of skin tears in mammography.	Understanding and awareness of skin tears	Understanding and awareness of skin tears, what causes skin tears, no bleeding as indicator of tear severity, challenges of imaging tears, late identification of the tear
	Patient experiences and concerns	Anticipation of pain during mammography, burning sensation of the tear, frustration at tears being missed
	Reporting of skin tears	What to report, when to report
Objective 2 Describe the nature of wound care advice provided within online spaces related to skin tears from mammography/the culture of these online communities.	Nature of online advice and information	Clinical advice from non-professionals, speculation by non-professionals on diagnosis, speculation on the cause of skin tears, discussion of negative experience of mammography, apprehension about online information
	Preventative measures and management strategies	Antibiotic ointment, how to avoid tears, treatment options, preventative clinical advice from non-professional
	Community dynamics and support	Community support, sharing stories, challenging clinical advice from other posters, professional anecdote, anonymity, litigation
	Misinformation and trust issues	Conspiracy theory about mammography, dishonesty of professionals, distrust of internet information sources, encouraging others not to attend mammography, comparing mammography to other imaging methods, distrust
Objective 3 Identify the role of healthcare professionals within these online spaces in relation to information sharing and use	Interaction between professionals and non-professionals	Patient trying to educate professional, clinical advice from non-professionals, propagation of real-world clinical advice from a professional in an online forum, professional providing support, professional encouraging attendance at mammography, professional defending practice, professional registration as validation
	Perceptions of professionalism	Anger at professionals, distrust, uncaring, litigation as a reason to avoid acknowledging harm
Objective 4 Explore the nature of online sites where information/advice is sought and shared around skin tears caused by mammography	No thematic analysis performed. Technical Walkthrough completed as per Light et al (2018) ¹³	
Objective 5 Explore whether there is any potential relationship between skin tears in mammography and intentions to engage with future imaging with mammography	Impact of negative experiences	Intention not to re-attend mammography, frustration at response to tears, gender, agency
	Pain	Pain

Objective 1 — Information needs related to the management and prevention of skin tears in mammography

Theme 1 — Reporting of skin tears

This theme reflects the sense of importance of reporting skin tears resulting from mammography expressed by the participants in online forums. Participants discussed various methods of documenting and reporting these incidents, emphasising the need for accountability and prevention of future occurrences of skin tears. The data showed a strong inclination towards taking photographs of the injury as evidence and sharing these with healthcare providers. There is a sense of urgency in communicating with health

professionals and legal advisors, reflecting a concern for personal health and a broader responsibility to inform medical professionals about such incidents. Overall, the theme highlights the significance of reporting as a means of validation, seeking remedy, and contributing to safer mammography practices.

Theme 2 — Understanding and awareness of skin tears

This theme reflects the awareness and identification challenges associated with skin tears during mammography. The data indicate a common experience of delayed realisation of the injury, often not noticed until after the procedure, during activities like showering or changing. Participants describe the shock and pain upon discovering tears, burns, or cuts, indicating the difficulty in detecting these injuries immediately post-procedure. The narratives also touch on the confusion about what causes these tears, with some attributing it to the pressure and handling during the mammogram. There is an underlying concern about the underreporting of such incidents, possibly due to the late identification and the absence of immediate bleeding in some cases. This theme highlights a gap in awareness and understanding of skin tears, both among patients and potentially within the medical community.

Theme 3 — Patient experience and concerns

This theme captures the sharing of personal experiences and emotional responses of those undergoing mammography, particularly focusing on the anticipation of pain and the aftermath of skin tears. The narratives reveal a sense of apprehension and resignation, especially among those with prior painful experiences, such as breast cancer survivors who anticipate discomfort and skin damage during their annual screenings. Descriptions of sensations like burning and rope burns illustrate the physical discomfort encountered. Additionally, there is a palpable sense of frustration and distress over the lack of attention or care given to these injuries by medical professionals, as expressed by patients who felt their concerns and experiences were overlooked or minimised. This theme underscores the emotional and physical toll of mammography on patients, highlighting the need for greater sensitivity and improved care practices in these procedures.

Objective 2 — The nature of wound care advice provided within online spaces related to skin tears from mammography and the culture of the online communities identified

Theme 1 — Preventative measures and management strategies

This theme encapsulates a range of self-administered and suggested interventions for managing and preventing skin tears during mammography. Participants predominantly discussed the use of antibiotic ointments and creams, often in conjunction with gauze and specific types of bras, to treat and protect the affected area. There is a notable emphasis on

keeping the skin dry and clean, with some references to alternative treatments like vitamin E, fungal infection creams, and home remedies like boiled cabbage leaves. The data reflects a mix of personal experiences and advice, highlighting a proactive approach towards skin care in the context of mammography, with a focus on both immediate treatment and preventative measures. The narrative also reveals a sense of community and shared learning among those who have experienced skin tears, as they exchanged tips and support for dealing with this issue. It was highlighted that the information below was not medically endorsed, and additional information has been provided in Table 2 to highlight potential harms of the treatment options discussed online.

Table 2. Content analysis of treatments discussion online alongside potential harms of such treatments

Treatments suggested online	Potential harms*
Antibiotic ointment	Unnecessary in non-infected wounds ¹⁶
Antifungal cream	
Savlon (antiseptic)	
Medipuly (antiseptic) powder	
Neosporin (type of antibiotic ointment)	
Kleenex	May adhere to the wound tissues and obstruct healing
Dry dressing	
Paper towel	
Cabbage leaves (boiled)	May cause burns, unclear evidence available on impact of boiled cabbage leaves on healing
Keeping the wound dry	Wounds require a moist environment to heal ¹⁷
Sisley phytobuste (oat seed extract)	Unclear harms, this product is not intended for use on open wounds
Vitamin E	Unclear benefits in wound healing ¹⁸
Prayer and holy water	Unproven efficacy
Nystatin (antifungal treatment) and triamcinolone (topical steroid) -to toughen skin as a preventive	Antifungals are unnecessary in non-infected wounds. Steroids can have antagonistic effects on healing ¹⁹
Cornstarch	May enhance bacterial growth in wounds and increase inflammation ²⁰
Gauze	Unlikely to cause harm
Bandages	

*Further information on the management of skin tears can be seen in Stephens et al¹

Theme 2 — Community dynamics and support

This theme explores the nature of online communities formed around the discussion of skin tears due to mammography, highlighting a complex interplay of support, scepticism and shared experiences. The anonymity of online platforms allows individuals to freely share personal stories and seek advice, in some cases expressing apprehension about relying on internet-based information for health concerns. These communities are characterised by a

mix of empathy and legal considerations, with members often suggesting litigation in response to negative experiences. Professional insights occasionally emerge, with (self-identified) healthcare professionals sharing their experiences and advice, though these are sometimes met with scepticism. The narratives often challenge clinical advice, reflecting a broader questioning of medical practices and a desire for more compassionate care. These online spaces serve as a critical outlet for individuals to voice their concerns, share experiences, and seek both emotional support and practical advice, forming a unique culture that blends personal anecdotes with professional insights.

Theme 3 — Misinformation and trust issues

This theme captures the pervasive sense of distrust and misinformation circulating in online discussions about mammography. Participants frequently compare mammography to other imaging methods, often questioning the efficacy and safety of mammograms. Conspiracy theories are present in the discourse, with some individuals suggesting that mammography is a profit-driven scheme by the medical industry, ignoring patient well-being. These discussions contain references to alternative theories, such as the harmful effects of plastic bottles and the supposed ineffectiveness of mammography in reducing breast cancer mortality.

The narrative is at times marked by a deep scepticism towards healthcare professionals and the medical system at large. Many participants share personal anecdotes of perceived dishonesty by doctors and radiologists, accusing them of using fear tactics or misleading information to promote mammography. This distrust extends to internet information sources, with some individuals expressing regret over relying on online data for medical decisions.

There was clear evidence of discussion within the forums dedicated to encouraging others to avoid mammography, often based on personal negative experiences or the shared stories of pain and injury. The theme reflects a complex web of fear, misinformation and mistrust, where personal experiences and anecdotal evidence overshadow scientific data and professional medical advice. This environment fosters a culture of scepticism and fear, potentially influencing individuals' decisions regarding breast cancer screening and care.

Theme 4 — Nature of advice and information

This theme reflects the diverse range of advice and information shared online about skin tears and other complications related to mammography. The discussions are characterised by a mix of personal anecdotes, clinical advice from non-professionals, and speculation about the causes and nature of injuries sustained during mammography.

1. **Clinical advice from non-professionals:** Many participants shared their personal remedies and suggestions for dealing with skin tears and related issues. These range from recommending specific products and supplements to suggesting different types of bras for support and comfort.
2. **Discussion of negative experiences:** A significant portion of the conversation focuses around sharing negative experiences with mammography. Participants express their feelings and concerns, often highlighting the physical pain and emotional distress caused by the procedure.
3. **Speculation by non-professionals:** There is a notable amount of speculation about diagnoses and causes of injuries. Participants often tried to diagnose the nature of the injuries (such as burns, cuts) and speculated on what might have caused them, such as the equipment used or the technique of the technician. Suggestions ranged from the presence of gels or rough edges on the equipment to the technique of the technician, particularly in handling large breasts.
4. **Blame on technicians/professionals:** Many posts blame the technicians for the injuries, describing them as inexperienced, aggressive or even masochistic. There were stories of technicians causing tears, rashes or other injuries due to poor handling or technique.

This theme reflects a complex landscape where personal experiences, anecdotal evidence and non-professional advice converge, often filling the gaps left by perceived inadequacies in professional healthcare advice. While these online spaces provide a platform for sharing and support, they also highlight the need for accurate, professional medical information and advice to guide individuals through their health care decisions and experiences.

Objective 3 — The role of healthcare professionals and patients within online spaces in relation to information sharing and use

Theme 1 — Interaction between professionals and non-professionals

In online forums discussing mammography, a complex interplay is observable between healthcare professionals and non-professionals. Patients, voicing their experiences, often seek to educate professionals about the mammography process, advocating for gentler techniques and empathetic care. In contrast, professionals defend their practices, balancing the necessity of accurate diagnosis with patient comfort. They also emphasise mammography's critical role in early cancer detection, urging attendance despite discomfort. Supportive interactions are evident as professionals offer guidance and reassurance, addressing concerns and sharing clinical advice. These narratives highlight the diverse nature of patient-professional interactions, underscoring the importance of

communication and understanding in healthcare. It was also evident that in some cases advice given by professionals in real-world contexts was decontextualised and propagated in online spaces whereby it was subjected to group critique by the forum users. It was noticed that while forum users expressed apprehension or inability to raise their concerns directly to professionals in clinical contexts, they were more comfortable to question advice they were given or practice they had observed online. We consider this effect to create a *'digital information echo'* whereby information provided in the real world is repeated, without context, online. In some cases, forum users identifying themselves as professionals would attempt to mediate these discussions by re-contextualising information from a professional perspective however this often proved ineffective due to the power imbalances observable between the more numerous, often unhappy, forum users who had experienced traumatic mammography, and professionals who were themselves already the subject of critique within the forums. Figure 2 illustrates this dynamic.

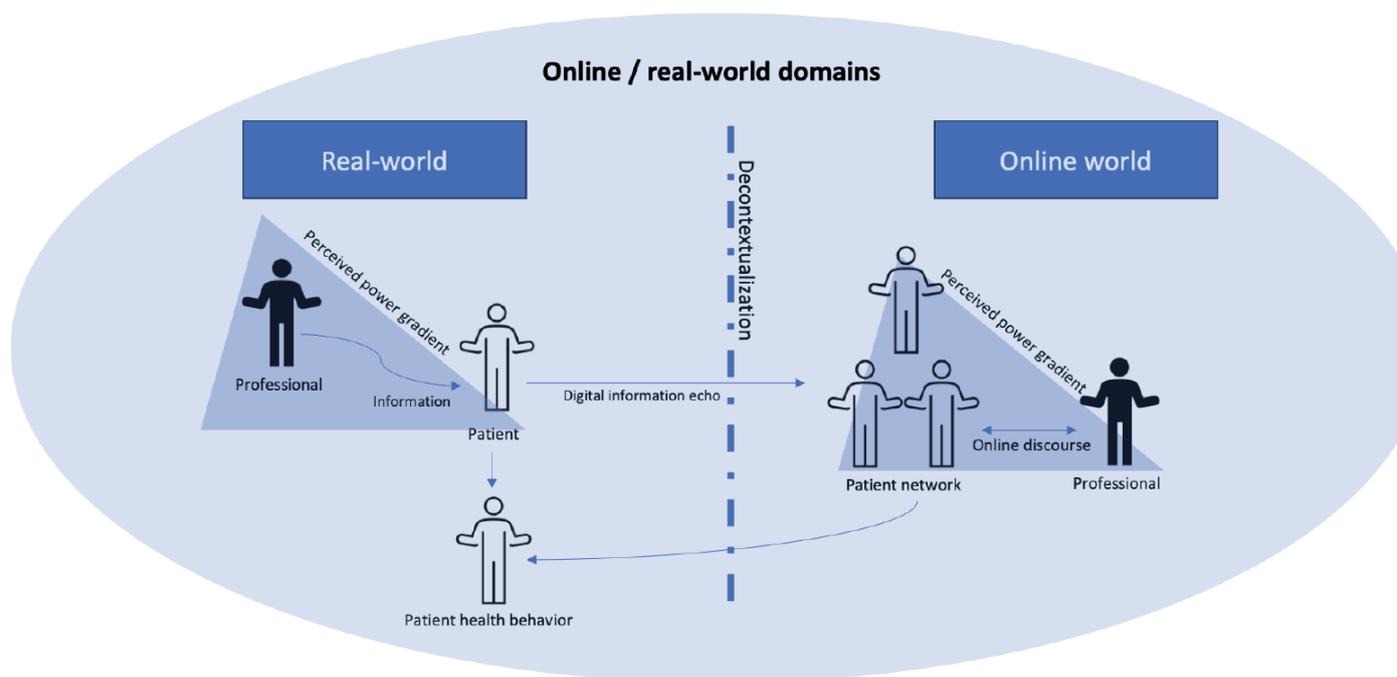


Figure 2. Mediation of discourse between professionals and non-professionals across online / real-world domains

Theme 2 — Perceptions of professionalism

The theme of 'perceptions of professionalism' in online discussions about mammography reveals a deep-seated frustration and distrust towards healthcare professionals. Patients express anger and disappointment, feeling treated insensitively, akin to "cattle." Many

recount experiences of excessive pain during mammograms, attributing this to uncaring or incompetent technicians. The fear of litigation is seen as a barrier to professionals acknowledging and addressing harm caused during procedures. Even healthcare professionals, in one case a registered nurse, voiced their disillusionment with the current state of patient care. These narratives underscored a perceived lack of empathy and validation in the healthcare system, highlighting a significant gap in patient-professional communication and trust.

Objective 4 — The nature of the online sites where information / advice is sought and shared around skin tears caused by mammography

In our exploration of online spaces dedicated to discussing skin tears in mammography, we identified a diverse range of platforms, each with unique characteristics. The first site, a forum originally designed for crafting enthusiasts, but later re-purposed by users to discuss other issues, presented an outdated design, and limited modern features, potentially affecting its credibility as a reliable source of medical information. The absence of clear rules for medical discussions highlighted concerns about the regulation of medical information shared on the platform. Despite its unconventional origins, users occasionally adapted the forum for medical conversations by sharing images including medical scans, suggesting a need for more visual content in health discussions. Interestingly, most visitors were passive readers rather than contributors. This was determined via the number of users online, which was visible on the site. Ethical concerns arose due to the open accessibility of user data without a login requirement. The second site, functioning as a blog comment section for an American medical company, benefited from its affiliation but was limited in materiality, potentially restricting in-depth medical discussions compared to dedicated health forums. Notably, this platform was openly seeking to sell products for preventing skin tears and linked users to another site where negative experiences of mammography were discussed at length. This potentially indicates the motivation of the site developers to direct narrative around the experiences of mammography to support commercial aims. The third and most active site was a dedicated health-related platform with diverse content formats, emphasising human moderation and health improvement. Despite its significant user base and extensive content on breast trauma from mammography, issues emerged about the moderation of comments, as some instances of medical misinformation and conspiracies seemed to go unchallenged, potentially impacting the quality of discussions. This was despite its claims to extensive human moderation. Lastly, the fourth site, a general Q&A platform, offered a wide range of subjects, including health topics, in a Q&A format. It allowed users to view content without creating an account, enhancing accessibility and engagement. The presence of identifiable posters with qualifications added credibility, though an inaccurate response to a question about skin tears from mammography from a

ChatGPT chatbot embedded within the site was observed. These four online spaces together offered a spectrum of insights into the nature of online discourse on skin tears in mammography, reflecting various levels of credibility, user engagement, and ethical considerations. Understanding these nuances is essential for evaluating the reliability of medical information shared within these spaces and informing future research and communication strategies in the field of healthcare.

Objective 5 — The relationship between skin tears in mammography and intentions to engage with future imaging with mammography

Theme 1 — Pain

The theme of 'pain' in discussions about mammography illustrates the discomfort and distress experienced by many individuals. These posts often described the pain as excruciating, lingering for weeks or even months, and in some cases, leading to emergency room visits. The severity of the pain was compared to childbirth, with some expressing that they would rather endure labour than another mammogram. This intense discomfort led to a strong reluctance to undergo future mammograms, with some expressing fear and determination to avoid repeat experiences. Such accounts highlight an issue in mammography procedures, where the pain experienced not only causes immediate distress but also potentially deters individuals from engaging in future essential breast imaging, impacting their long-term health monitoring and care.

Theme 2 — Impact of negative experiences

The final theme reveals a sense of agency, loss, frustration, and gender-based indignation among patients. Many expressed a feeling of being treated impersonally, with little regard for their comfort or consent. The responses to skin tears and injuries were often perceived as dismissive or inadequate, exacerbating the sense of frustration and helplessness.

A notable aspect was the gendered perspective, with several comments suggesting that if men were subjected to a similar procedure, there would be more empathy and quicker innovation in the technology. This may reflect a belief that women's pain is not taken as seriously in medical contexts.

Furthermore, these negative experiences had a significant impact on individuals' intentions regarding future mammography. Many expressed a firm decision never to undergo the procedure again, citing the unbearable pain and traumatic experiences. This reluctance was not just about avoiding physical discomfort but also stemmed from a sense of violation and distrust in the healthcare system. The posts suggested that these experiences led to a broader questioning of the mammography process itself, with some advocating for alternative screening methods.

Discussion

To the authors' knowledge this is the first netnographic study to explore wound complications resulting from medical imaging. It is also the first qualitative study to explore the impact of skin tears as result of mammography which a recent review indicated to be an understudied complication of this procedure.²

Previous studies exploring the factors affecting attendance at mammography did not identify skin tears as a significant issue.⁶⁷ Our findings indicate that skin tears are likely to be identified after individuals have left the location of their mammography procedure and, therefore, these injuries may not be reported due to a lack of process and guidance to facilitate this. These factors may explain why this adverse event has received little research attention. It is evident however, that skin tears may cause significant pain and discussions in online forums indicate they may affect intention to re-attend mammography. These findings have implications for health professionals. It is essential to recognise the diverse landscape of online medical information sources, educate individuals on evaluating credibility and engage those who may encounter health information in unconventional spaces. This is of particular significance in cases of relatively rare medical issues, such as skin tears as a complication of mammography. Additionally, health professionals should be prepared to address and correct medical misinformation while adhering to ethical standards when engaging themselves in online interactions.

Based on the findings of this study it is recommended that the following be considered by practitioners responsible for caring for individuals undergoing mammography procedures:

- Practitioners should be aware of the misinformation shared online in relation to mammography procedures and counsel individuals on how and where to access reliable information.
- Education of those practitioners in training to develop their knowledge of skin tears relating to the mammography procedure
- Development of clear information materials for practitioners around the management of skin tears
- Development of clear information materials for individuals attending mammography, highlighting the potential for tears as a complication and how these can be managed if they occur
- Post-procedural examinations of the breast to identify whether tears have occurred
- Implementation of robust reporting systems to establish the prevalence of skin tears and to generate quantitative evidence of its impact on re-attendance

- Further data are needed to help develop an understanding of who is at most risk of skin tears from mammography and the intrinsic and extrinsic factors which contribute to their occurrence

Limitations of the netnographic approach and potential biases

This study lacked a universally accepted definition for 'skin tears,' which can introduce ambiguity into the research, as different sources may interpret skin tears differently. The researchers had to make inferences about wounds or tears described online and make assumptions about whether these were the type of wounds of interest. Bias may also be introduced by the demographics of those who engage in conversations online who may not represent the entire population of mammography patients. The study utilised only qualitative data from online discussions and field-notes, therefore causality and the significance of the findings of this study need to be confirmed with further empirical studies. It was also unclear whether the experiences being described represented experiences of symptomatic or screening imaging. These limitations should be considered when interpreting its findings.

Conclusion

This netnographic study sheds light on the underexplored issue of skin tears resulting from mammography, revealing significant gaps in awareness, and understanding among both those undergoing mammography and medical professionals. The thematic analysis of online forums and communities highlights the profound physical and emotional impact of these injuries on those individuals who have undergone mammography, influencing their perceptions of and trust in the healthcare system. These findings indicate the need for pre-procedural awareness, communication, and post-procedural skin examinations in mammography. Additionally, the study emphasises the role of digital platforms in health-related discussions, calling for healthcare professionals to actively engage in these spaces to provide accurate information and counteract misinformation. While acknowledging the limitations of the netnographic approach, this research offers vital insights and recommendations for enhancing the experiences of those undergoing mammography, thereby contributing to better breast health care practices. Further studies are required to provide accurate prevalence data on skin tears as a complication in addition to establishing risk factors and prevention and management approaches.

Conflict of Interest

The authors declare no conflicts of interest.

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SUPPLEMENTARY INFORMATION

Detailed ethical considerations

Research ethics concept (from Kozinets 2020) ³	Definition (from Kozinets 2020) ³	How this was addressed in this study
Public sites	<p>Online platform or web application that has open access to the public and does not require registration or password log in.</p> <p>Public sites present public data that has been shared under conditions that do not require special ethical procedures for netnographic study.</p>	<p>Only public sites will be utilised. This is based on an assumption that most individuals seeking health information online related to skin tears from mammography will do so primarily using publicly available sources.</p> <p>In conducting a netnographic study, researchers often analyse publicly available data from online platforms and communities to gain insights into various social phenomena. Netnography involves observing and interpreting interactions and behaviours within these online spaces. However, obtaining explicit consent from individuals whose data is being analysed can be challenging and sometimes impractical. In such cases, there are valid justifications for not seeking consent while conducting netnographic research:</p> <p>Publicly accessible information: The data retrieved for a netnographic study is sourced from publicly accessible online platforms, forums, or social media sites. Since the information is already visible to anyone with internet access, individuals have chosen to share their thoughts, opinions, and experiences willingly in the public domain. This implies a lower expectation of privacy compared to private or confidential data.</p> <p>Preserving naturalistic behaviour: Netnographic research aims to capture the authentic and unfiltered behaviours and interactions within online communities. Obtaining consent and informing participants about the study may introduce artificiality or self-consciousness, potentially altering the natural dynamics of the community being observed. By not seeking consent, researchers can observe the genuine patterns of communication and behaviour in their natural context.</p> <p>Practicality and scale: Given the vastness of online spaces and the sheer volume of interactions occurring within them, obtaining individual consent from every participant can be logistically challenging or even impossible. Netnographic studies often involve the analysis of extensive datasets encompassing numerous contributors, making it unfeasible to seek explicit consent from each individual.</p> <p>Anonymisation and data protection: When conducting netnographic research, best practices should be followed to ensure the protection of personal identifiable information. Researchers must make diligent efforts to anonymise the data, removing any identifying information such as names, usernames, or specific location details. By adequately de-identifying the data, the privacy and confidentiality of individuals are safeguarded (this is covered in further details in the 'sensitive topics section')</p> <p>Public interest and minimal harm: Netnographic studies often contribute to academic or societal understanding by shedding light on social phenomena, cultural practices, or collective opinions. As long as the research aims to further knowledge in a responsible and ethical manner and does not cause harm or breach privacy, there is a valid argument that the potential benefits to society outweigh the need for individual consent (this is covered in further detail in the 'benefits' section).</p>
User rights	All platform and web application users have legal and ethical rights regarding research and research use of data, which are constantly changing and differ according to national law and academic custom.	The user rights for data sites identified during the study were reviewed to ensure that the study remains compliant with these. Where there was uncertainty the wider research team was consulted in the first instance.
Sensitive topics	<p>Discussion, topic, text, images, or other data that reveal personally sensitive information such as stigmatised behaviours or images of the body.</p> <p>The use of netnographic data that depict sensitive topics must be justified by an assessment of benefits versus risks then handled in special ways including providing extra levels of data security and anonymising the data and site.</p>	The subject of breast wounds is a sensitive topic. As such, 'interactive data procedures' (Kozinets 2020) ³ , whereby the researchers interact with individuals online, were not undertaken. Whereas the benefits of researching information shared and discussed online is of benefit to health services; individuals involved in these online spaces may not wish to partake in research and obtaining informed consent would be challenging. Due to these issues, the data were highly cloaked and anonymised. This occurred at the point of data saving whereby only text, or de-identified images were saved from data sites.
Benefits	An assessment performed by the researcher of the potential benefits to participants, science and society accruing from conduct and completion of the research project.	The benefits of this study may include insights into factors which influence attendance to mammography services. This has the potential impact of reducing missed cancer diagnosis which is considered in this case to justify this study being undertaken.
Data security	The steps taken to ensure that only appropriate individuals involved in the research project have access to its sensitive or confidential data.	<p>All data will be stored within a university OneDrive which is only accessible to the research team.</p> <p>No personal data (any information related to an identifiable person who can be "directly or indirectly identified by reference to an identifier) will be collected – General Data Protection Regulation (GDPR) will not apply</p> <p>Records retention: Source data were kept confidential and anonymous and will be stored securely at the University of Salford for three years, following which data will be destroyed (CHSR) following University procedures</p> <p>To ensure the security of personal data, no data will be transported onto computer discs, CDs and USB memory sticks. Instead, it will always be accessed remotely on a password protected computer via a secure connection.</p>