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Patients' Views About Skin Self-examination After Treatment for Localized Melanoma

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IMPORTANCE Skin self-examination (SSE) is a key factor in the early detection of melanoma, and many new and recurrent melanomas are first detected by patients themselves or their family members.

OBJECTIVE To explore the views of patients with melanoma regarding SSE in general, as well as their attitudes toward using novel digital technologies to support their own SSE.

DESIGN, SETTING, AND PARTICIPANTS Qualitative study with semistructured interviews that were conducted from June 20 to December 12, 2016, with 37 individuals in Sydney, Australia, who were previously treated for a first primary localized melanoma during 2014 and had not had a recurrence or new primary melanoma in the time since treatment.

MAIN OUTCOMES AND MEASURES Patients' views and experiences, analyzed thematically.

RESULTS A total of 37 patients (11 women and 26 men; median age, 67 years [interquartile range, 59.5-72 years]) were interviewed. Participants perceived SSE as important for the early identification of local recurrence or new primary melanomas. Despite this belief, participants did not report undertaking full-body SSE on a regular basis. Factors that influenced their low engagement in thorough SSE included lack of self-efficacy, reliance on clinician consultations as the primary means of melanoma detection, and fear of cancer recurrence. Regarding the use of digital technology to assist with SSE, the key motivating factors in favor of such tools were the ability to track changes in lesions over time and the use of automated reminders to undertake SSE. Deterrents included a lack of confidence in undertaking SSE and in using new technology.

CONCLUSIONS AND RELEVANCE Patients with melanoma are aware of the importance of thorough skin examinations. However, a lack of confidence in their ability to undertake SSE and reliance on clinicians as the primary means of melanoma detection may inhibit patients from undertaking regular and thorough SSE. Patients may benefit from new digital technologies that assist them in undertaking SSE, provided they have appropriate education and technical support.

Author Audio Interview

Supplemental content

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Skin self-examination (SSE) by patients after treatment for a localized melanoma is a key method of surveillance for detecting new or recurrent melanoma,[1,2] and may substantially reduce mortality from melanomas.[3] Despite these benefits, most patients fail to undertake SSE thoroughly and regularly, with only 44% of Australian patients with melanoma and 14% of US patients with melanoma reporting that they examine all parts of the body.[4,5] The lack of thoroughness in SSE is reflected in its suboptimal sensitivity (detection of proven melanomas, 25%-93%) but reasonable specificity (correct assignment of lesions as nonmelanoma, 83%-97%).[6] A randomized trial found that providing patients and their partners with skills training (delivered face-to-face) increased the detection of new melanomas ahead of their clinic visit.[7] Patient or partner detection of melanomas increased from 0% in the control group (none of the 16 new or recurrent melanomas in 99 people were patient detected) to 81% in the intervention group (43 of the 53 new or recurrent melanomas in 395 people were patient detected).

Other research suggests that digital technologies such as smartphone apps and teledermoscopy may improve the sensitivity of SSE for melanoma detection.[8] Murchie and colleagues[9] developed and piloted a digital tablet-based application to prompt, record, and respond to regular SSE in people previously treated for melanoma (the ASICA [Achieving Self-directed Integrated Cancer Aftercare] Skin Checker app). This app was found to be acceptable and safe for patients to use. Manahan and colleagues[10] undertook a pilot study of patient-performed teledermoscopy among people at high risk of a first primary melanoma, and found patient-performed teledermoscopy to be a feasible method of surveillance. Building on these developments, a recent study has described a new model of follow-up care for patients after treatment of localized melanoma: patient-led surveillance.[5] Compared with traditional clinician-led surveillance, the new model has increased reliance on patient detection of melanoma that prompts unscheduled clinic review and may include fewer routinely scheduled clinic visits. The increased support needed for patient-led surveillance may be achieved through face-to-face skills training and/or new digital technologies, including teledermatology. This support is coupled with timely access (<2 weeks) to review by a specialist should the patient detect anything concerning.

The aim of this study was to investigate patients' views on SSE and the use of digital technology for surveillance as a part of follow-up after undergoing treatment for localized melanoma.

Key Points

Question What are the views of patients with melanoma on the importance of skin self-examination and what role do they see for new digital technologies to support skin examinations?

Findings In this qualitative interview study among 37 patients with localized melanoma (American Joint Committee on Cancer stage 0, I, or II), participants were aware of the importance of thorough skin self-examination but showed a lack of confidence in undertaking it. Many participants were receptive to new digital technologies to assist them in performing thorough skin self-examination, provided they had sufficient technical support to use these new tools.

Meaning Efforts to integrate new digital technologies to increase regular and thorough skin self-examination are warranted, provided sufficient technical support is provided.

Methods

Sampling

In line with qualitative methods,[11] we aimed to recruit a diverse rather than representative sample of patients. Accordingly, we invited participants with varying sex, residence, and melanoma stage from the 230 patients who had answered a telephone survey about their preferences for, and experience of, follow-up after treatment for localized melanoma (American Joint Committee on Cancer stage 0, I, or II).[5,12] To match the intended clinical population in which patient-led surveillance might be used, we restricted selection to patients who had not developed a recurrence or a new primary melanoma. We sent invitations by postal mail and email in sequential rounds and continued recruiting participants until data saturation was achieved. The study was approved by the University of Sydney Human Research Ethics Committee and the Melanoma Institute Australia Governance Committee. All participants provided written informed consent before taking part in an interview. We followed the Standards for Reporting Qualitative Research checklist in the reporting of this study.[13]

Data Collection

Semistructured interviews were conducted from June 20 to December 12, 2016, with individual participants via telephone. An interview guide was developed to structure the discussion (eTable in the Supplement). Prior to the interview, participants were also emailed a pictorial illustration of how the ASICA app is used to support SSE and 2 short videos on patient-performed mobile teledermoscopy. Data collected during the initial interviews were used to refine the interview guide to ensure that emerging topics were also explored (**Box 1**). The interviews were conducted by 2 of us with experience in qualitative interviewing (A.K.S. and J.H.). The research team discussed and reviewed the interview data regularly to check whether new themes were being identified that required examination and to assess progress toward data saturation.[14] Data saturation was reached once few or no new data were being generated and the new data fit into the already developed categories.[11] This was assessed iteratively throughout the process by reading and rereading the interview data across the transcripts, within the coded categories, and by comparing participant characteristics within the coded data and then later within the developed themes. This process enabled us to compare whether different themes arose according to participant characteristics, including age, sex, and melanoma stage. The interviews were audio recorded and transcribed verbatim by a professional transcriber. Demographic and clinical data were obtained from questionnaire items completed by participants as part of a previous study.[5,15]

Box 1. Interview Guide Key Topics

- **Current Sources of Information and Support for Self-checking**
  - Experience and views on skin examination
    - Awareness and/or experience of self-checking
    - Perceptions of a thorough skin self-examination
  - Perception about information and support available regarding skin self-examination
    - Source of information about skin self-examination
    - People involved in helping perform skin self-examination
    - Confidence in performing a skin self-examination
  - Perceived importance of skin self-examination
    - To describe how important self-surveillance is
  - Perception of the routine follow-up interval
    - Current follow-up interval
    - Perception (satisfaction or dissatisfaction) of the follow-up interval
- **Experience of Any Initiated Follow-up Model**
  - Perception about reducing follow-up visits
    - Views on reducing or having a say on follow-up visit interval, including personal preferences for follow-up interval
- **Digitally Supported Skin Surveillance**
  - Responding to digitally supported self-examination using apps
    - Possibility of using digital tools or apps for performing skin self-examination
  - Responding to teledermoscopy
    - Views on using mobile teledermoscopy
    - Views on taking photos and sending them to their clinician for review

Box 2. Matrix-Based Thematic Analysis

Step 1. Familiarization with the data to identify relevant themes

Step 2. Creating a thematic framework—2 researchers developed themes and discussed with all authors

Step 3. Indexing—the transcripts were coded according to the framework, with any new themes identified discussed and added to the framework

Step 4. Charting—themes and supporting quotes from each transcript were independently summarized in the framework

Step 5. Mapping and interpretation—to identify overarching themes and associations, the synthesized data were examined within and across themes and participants

Qualitative Analysis

The interview data were analyzed thematically, which involved thoroughly reading the transcripts, developing a coding framework, coding the data systematically, and defining key recurring themes across the set of transcripts.[16] We used a matrix-based method of thematic analysis used in previous research[17] (**Box 2**). The coding framework was initially developed using the semi-structured interview guide and then further refined according to the patterns of ideas and themes identified in the data. Two of us (M.D. and A.K.S.) independently read the transcripts and then developed the coding framework, which was also reviewed by the research team. One of us (M.D.) coded all 37 transcripts; another of us (A.K.S.) independently coded 8 transcripts (22%) and examined all coded data to check consistency with the themes in the final framework. Any disagreements between coders were resolved through discussion with the research team.

The qualitative data analysis software packages NVivo, version 11.0 (QSR International) and Excel 2013 (Microsoft Corp) were used to facilitate the thematic analysis. Using Excel, we analyzed data in the form of a framework with overarching themes as separate spreadsheets, subthemes as columns, and participants as rows.

Results

A total of 37 participants completed a telephone interview between June 20 and December 12, 2016. Their demographic characteristics are presented in **Table 1**. Median participant age was 67 years (interquartile range, 59.5-72 years), 70% of the sample (n = 26) was male and 30% of the sample (n = 11) was female. The patients resided in both metropolitan (25 [68%]) and rural areas (12 [32%]). The interviews lasted a mean of 20 minutes (range, 9-39 minutes).

Personal Experience and Views on Skin Examination

We identified several key themes related to participants' personal experiences and views on skin examination that are summarized below with illustrative quotes.

Engagement in SSE

Among participants who reported engaging in routine SSE, they perceived this behavior to be an important surveillance strategy. ("Oh I think that's vital, yes, very important that people are looking at their skin.")

Some participants perceived SSE as particularly important for monitoring a particular lesion. Some responses indicated that they may be checking too frequently (which may decrease the effectiveness of SSE to detect a change), emphasizing the importance of educating patients on when to check, as well as how to check. ("….just like an everyday basis, yeah. Unless there's anything that I'm a bit concerned about, so I just keep an eye on it for a little while and then if I'm concerned, I just go back to the doctor.")

Most participants did not have a detailed and specific set routine for SSE, but some did describe a general series of steps they used. ("Well if I see something, I feel something, like if I'm just looking over my body, not that I look at it all the time, but I feel something on my hands, on my elbows or on my forearms or there's something that doesn't look right, I just usually put a pen around it and go and see the doctor.")

Family members—usually partners—were described as a main source of support when performing SSE, particularly to assist with checking areas of the body that are difficult to see (such as the back and backs of legs).

Confidence in SSE

Personal perceptions of confidence in performing SSE were divergent; some individuals reported feeling confident in undertaking SSE and others less so. There was a range of fac-

tors that participants linked to their level of confidence in performing SSE; these included experience around skin cancer such as identification of a previous melanoma by the participants themselves. ("Very confident at being able to look at it. ...with all my experience of melanoma and all the other BCC [basal cell carcinoma] type stuff and just regular spots."

Conversely, if participants had not identified their previous melanoma or felt that they or their physicians had "missed it," then this belief was linked to low confidence in SSE. "It was only really by chance that it was picked up, so even though I'd been going every year, the experts didn't pick it up. So yeah, that's made me a little bit sort of uncomfortable about my ability to pick things up as well."

Positive Perception About SSE

Most participants reported a positive attitude toward SSE, and an ability to integrate SSE in their regular behavioral practices and lifestyle choices. ("I think I've been doing it for such a fair while, it just becomes—it's like cleaning your teeth—it just becomes part of what you're doing.") Reasons for engaging in SSE were diverse; the motivating factors for performing SSE are summarized in **Table 2**.

Barriers and Deterrents to Routine SSE

Despite positive perceptions of SSE, many participants did not consider themselves to be proficient in SSE and reported a strong preference for "the experts" (ie, medical professionals) to conduct all skin examinations. **Table 3** summarizes the barriers and deterrents to performing SSE identified by the participants. Among participants who were not undertaking SSE, a key barrier was lack of confidence. Individuals who had experienced a misidentification of melanoma by a clinician also reported lacking competence in SSE. ("If someone with that much expertise and a doctorate in that field doesn't always know, it's a little hard for someone to be really sure themselves in self-examination. But I still think, overall, I still think it's a very good thing to do.")

Views on Routinely Scheduled Clinic Visits

Overall, participants expressed positive attitudes toward the routinely scheduled clinical visits they attended for follow-up. Participants reported feeling reassured by the frequency and thoroughness of the skin examinations provided independently by their clinicians, and they valued the clinicians' expertise and experience. ("I just feel comfortable if someone confirms that they feel it's okay as well." "You actually need someone independent looking at it to give you any sense of comfort.")

Many participants recognized the routinely scheduled clinic visit as the principal means for detecting melanoma. This belief was seen as a potential barrier to reducing the frequency of scheduled visits, as well as undertaking regular SSE and acting on any findings (eg, through booking an unscheduled clinic visit). ("I would see them—'the doctors'—as the main source of detection. ...yes, I absolutely do think specialist is the primary means of detecting melanoma and nonmelanoma skin cancer. I see something on my skin and I think in 6 months' time they'll be looking at it anyway. Self-surveillance is probably not worthwhile for me.")

Table 1. Demographic and Clinical Characteristics of the Study Sample

Characteristic	Patients, No. (%) (N = 37)
Sex	
Male	26 (70)
Female	11 (30)
Age, median (IQR), y	67 (59.5-72)
Educational level	
High school	10 (27)
Technical college certificate or diploma	13 (35)
University diploma or degree	14 (38)
Marital status	
Currently married or living with partner	25 (68)
Not married	12 (32)
Area of residence	
Metropolitan	25 (68)
Other	12 (32)
Clinical variables	
Time since most recent diagnosis, median (IQR), y	1.35 (1.19-1.48)
AJCC melanoma stage	
0	7 (19)
I	24 (65)
II	6 (16)

Abbreviations: AJCC, American Joint Committee on Cancer; IQR, interquartile range.

Participants also perceived routinely scheduled clinic visits as a type of self-care and felt that attending routine appointments was a form of taking responsibility for their health. ("It's part of the regime I've got to do. It's sort of, I don't know, bit like brushing your teeth, I suppose.")

Participants were asked if they would consider reducing the frequency of their scheduled clinic visits if they had increased SSE support, and overall they were open to such changes, if this was recommended by their physician. ("I just rely—I don't decide that, the doctor decides that, the routine, the frequency.")

We identified various reasons why patients prefer to fully rely on their clinician for the detection of changes in the appearance of lesions or moles. These reasons included patients' lack of confidence in their capacity to successfully perform SSE, perception of being at high risk of melanoma, and views that consulting the experts was the best way to take more responsibility for their health. ("But I'm very fortunate that I'm getting really thorough examinations, I'm doing my bit.")

Views on Using Smartphone Apps to Support SSE, Including Teledermoscopy

Table 2 summarizes the motivation factors for why participants might use digital technologies to help with their routine SSE. Participants responded positively to using technologies to assist with SSE, particularly for identifying and keeping track of changes in lesions over time. ("I could definitely use that. It's the 'spot the difference' over a period of time thing that I struggle with.")

Table 2. Motivators for Skin Self-examination and Digitally Supported Skin Self-examination

Motivators	Illustrative Quotes
Skin Self-examination	
A personal or family history of melanoma	"Because my first melanoma was in 1993. So I regularly check skin and I check the moles to see if there's any change with them." (Patient 135: woman in her mid-60s)
	"It's something I've heard about and done at different times, because I've had melanoma quite early on, about in my 20s I had my first melanoma and I'm now in my late 50s." (Patient 128: man in his late 50s)
	"Well having had melanoma, yeah, pretty important to try and, yeah, ward off any other melanomas that may or may not occur or any other sunspots or if that's what they turn out to be or whatever." (Patient 112: man in his mid-50s)
Previous melanoma detected by patient	"It was my observation that found the change in the mole. Yeah, so yes, I am very aware of skin self-checking." (Patient 116: man in his late 60s)
Early identification	"Well I think it's very important. If you don't get something and it doesn't—it's not cut out, well it can spread." (Patient 123: woman in her late 40s)
	"I do it because I want to—if anything pops up, I want to know as soon as I can" (Patient 125: man in his late 40s)
Upcoming clinical visit	"What I do is I like to, particularly before then, have a really thorough look, quite a few times, for anything that I can point out to them to help out with the consultation." (Patient 109: man in his mid-50s)
	"I just, you know, give myself a bit of a feel over, so by the time I go to the doctor, I'm pretty much on top of everything that needs attention." (Patient 109: man in his mid-50s)
Taking responsibility for own health and well-being	"That's one of those simple things you do for good health, just like I watch my diet and I exercise and you know, just to keep—don't drink too much and all those sort of things, just things you do for your own health." (Patient 116: man in his late 60s)
	"I think the person that owns the skin has to be responsible for it." (Patient 124: man in his late 70s)
	"I think I've got to take a certain amount of responsibility, and having now dealt with all these different people and specialists, I feel comfortable about ringing people and [saying] I've got a concern about this one." (Patient 110: man in his early 60s)
Digitally Supported Skin Self-examination	
Reassurance between scheduled clinical visits	"....that would be a great little tool to have just at home and to keep track of any little bits and pieces that may be of concern, may be nothing, may be something. Yeah, I think it's a great thing." (Patient 123: woman in her late 40s)
	"I actually think that would be really useful, because I mean one of the things I do, when I find something, is take a photo of it, but the photos aren't always that visible or clear to see and to have something like that, that actually gave you quality that you could then send on to a doctor, I think would be really reassuring actually, would be good." (Patient 106: woman in her mid-50s)
Prevention	"I think it's an extra weapon in the sort of arsenal of fighting against disease and bloody death." (Patient 136: man in his mid-60s)
Care planning	"Well I like that it's giving opportunity to the patient or whatever and needs some commitment from them to do it. Ah, it gives them an action plan, so if they find something, you know, you might think, oh I'll take a picture of that and pop it off and then I've done something, rather than just looking and saying, oh do I worry about that now, will I get—wait 6 months and bring it then. So I do like it, I think it's a good plan." (Patient 111: man in his early 70s)
	"If there was a good reason to take over this responsibility, well every piece of technology that assisted you to do that would be good and I would use it." (Patient 101: man in his late 60s)
Help with tracking the changes in moles	"I could definitely use that. It's the spot the difference over a period of time thing that I struggle with." (Patient 133: man in his late 50s)
Facilitate timely access	"I think it's got its place, you know, especially if you're travelling. Like I travel a fair bit on business and you know, if you're away on business and you're not going to be home and you see something like that, you could flick an email or whether it goes direct through an app or whatever, you know, great." (Patient 125: man in his late 40s)

Using new technologies was also described by participants as a way of taking responsibility for their health, which was similar to views on attending routine follow-up appointments. ("If there was a good reason to take over this responsibility, well every piece of technology that assisted you to do that would be good and I would use it.")

Patients perceived teledermoscopy as a supplementary tool to complement their physician's visits. However, they expressed reluctance for the apps to replace face-to-face visits with their clinician. ("It would not reduce those scheduled visits. It would be just kind of like an extra thing.")

Some patients also thought that the apps may be useful to remind and prompt them to perform SSE. ("I think it's certainly better than just saying, check your skin, you know? It's like it's actually giving you some instruction and it's— well it's got a reminder there, which is probably important for old people who forget things.") Patients also perceived apps to be most useful for patients living in remote areas.

Barriers to using apps or teledermoscopy are summarized in Table 3. Key barriers and deterrents included a lack of confidence in using technology in general, lack of confidence in the app's reliability, and a lack of confidence in performing a thorough SSE with the aid of technology.

Association Between Themes

The **Figure** summarizes the thematic schema of patients' experiences and perspectives of melanoma follow-up. Perceived confidence in SSE influenced the perception of the importance of routinely scheduled clinic visits for melanoma surveillance, which influenced attitudes toward digitally supported SSE. Low confidence in SSE led to reluctance to consider patient-led surveillance as an alternative to clinician-led surveillance. Low confidence in SSE also directly influenced patients' attitudes toward apps and teledermoscopy. Having high confidence in performing SSE and an openness to considering patient-led surveillance was integral to being open to using apps, enabling self-care, enhancing reassurance, and engagement in care planning. No new or different themes were identified according to participant age, sex, or melanoma stage.

Table 3. Barriers to Skin Self-examination Including Digital Methods (Telephone Apps and Teledermoscopy)

Barrier	Illustrative Quotation
Barriers to Skin Self-examination	
Perceived lack of competence	"I don't really routinely examine myself because I don't really feel competent to do it." (Patient 101: man in his late 60s)
	"I reckon I'd be 25 percent compared to what [physician] would see, she'd see every day, so she'd know, where I'm just sort of thinking that looks a bit like that, I'd better get that checked out. No, I do have a look at myself, because if anything worries me—but the only thing is that's hard with me, I live by myself, so nobody, you know, I'm trying to look at my back and that's pretty hard to do. So I think you should be checked over by a doctor." (Patient 117: man in his late 60s)
Routine clinical check	"I do have the regular all-over-body checks at the Melanoma Institute, unless I was worried about something, I wouldn't do the whole all-over-body check [myself], because I go up there every 6 months at the moment." (Patient 106: woman in her mid-50s)
	"I think there's no point in me doing a personal examination when I'm getting these regular ones, that he [physician] can see parts of my body that I can't." (Patient 127: man in his early 80s)
Fear of cancer recurrence	"I think self-surveillance is probably not worthwhile for me. I'd be in and out of the doctor's every 5 seconds." (Patient 119: man in his early 60s)
Barriers to Digitally Supported Skin Self-examination	
Perception of not being able to perform a thorough skin self-examination	"My issue, though, is again probably the area that I would find it really hard to take photos of and would need some assistance and wouldn't be self-monitoring, but it would be someone else monitoring my back." (Patient 107: man in his mid-70s)
	"I suppose if you had access to a second person all the time, it would work perfectly, but I don't have access to a person all the time. Well, I tell you what I could do and that would be fine, I'd go to the local community health center and get the nurses to do it." (Patient 108: woman in her late 60s)
Regular scheduled follow up as a barrier	"Oh look, I don't use apps and frankly I'm not that interested in it given the surveillance I have, by my wife and the regular checks with the dermatologist." (Patient 102: man in his late 60s)
	"My preference would be for a qualified person to physically examine me." (Patient 104: man in his mid-60s)
	"I like to keep to the scheduled timeframe because I know that they're going to check everything up and I certainly don't want to go [only] once a year or once every 9 months. Now I'm getting to the ones every 6 months, it's sort of the stage where it's real good." (Patient 125: man in his late 40s)
Burdensome	"Yeah, look I must admit, I'd probably find it easier to go to—if I was worried about a mole, I'd go to the skin cancer doctor in preference to using that." (Patient 105: man in his early 70s)
	"Well I'd have to consult with him [physician] whether he wants to be burdened with an extra step for regular check-ups, having to check some results of an app use." (Patient 102: man in his late 60s)
Lack of confidence in using or access to technology	"Look, my honest opinion would be it seemed a little complicated and I'm 69 years old, so I'm not sort of—I mean I'm computer literate, but not as computer literate as like a 30-year-old." (Patient 105: man in his late 60s)
Lack of confidence in app reliability	"I wouldn't like to trust my life with that, because it's only one form and it's easy to make mistakes with the iPhone when you can't go over your whole body." (Patient 136: man in his mid-60s)
Missed a melanoma in the past	"Look, I think the concept is very good, but my own experience with the way that mine was picked up doesn't give me confidence in someone looking at a photo and saying that's nasty or it's not." (Patient 118: woman in her early 60s)
Apps not perceived as very useful	"No, it's useful, but I guess it would be good if it were just a little bit more sophisticated than that, otherwise you could get a sheet of paper and have the places to look. You wouldn't need maybe a whole app for that." (Patient 121: woman in her early 70s)
Suspicion of cost cutting	"I'm sort of worried they're going to say, we'll save money for the health system, we'll give you an iPhone or give you an iPhone app or iPhone camera as well and you can examine yourself." (Patient 136: man in his mid-60s)
Living in the city (where services are readily available)	"I probably think that's worthwhile for people in remote locations. I don't know if it's worthwhile for someone who's in—I'm city based." (Patient 119: man in his early 60s)
	"So, I personally probably wouldn't want to be involved in a remote diagnosis of these things. But I can see a benefit there for people who are not in the high risk, like myself and also if I was remote, if I wasn't near a clinic, something like that would be pretty good." (Patient 116: man in his late 60s)

Discussion

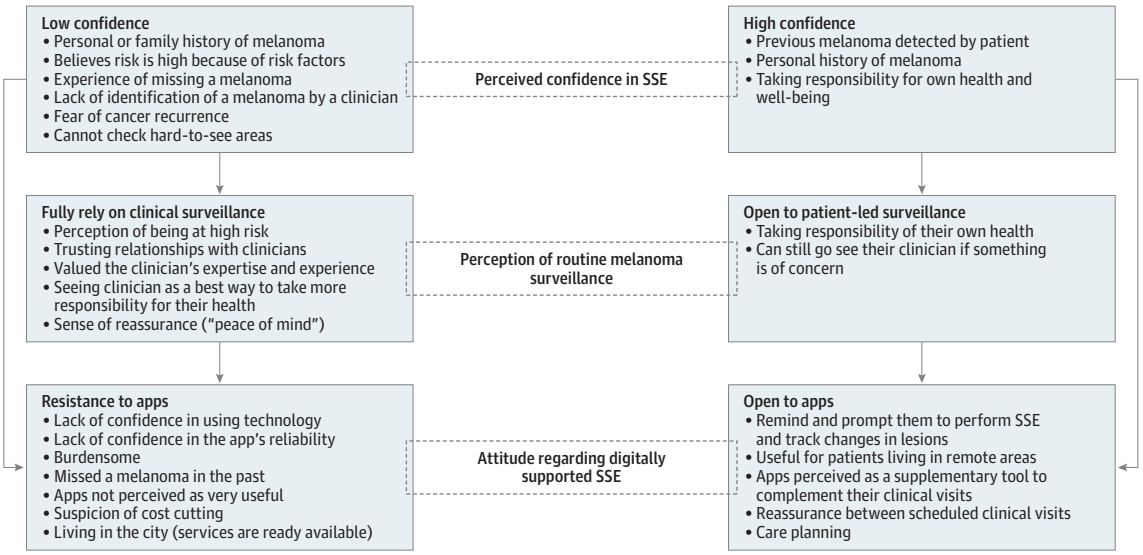
This study provides important information about the views and perceptions of SSE and digitally supported surveillance by patients with melanoma. Low confidence in SSE is a key barrier to patient-led surveillance and to the use of digital technologies for SSE. Patients who have had melanoma are very aware of their risk of future melanoma. Moreover, patients understand the importance of SSE for early identification of melanoma. Perceived lack of competence and reliance on routinely scheduled clinic visits likely contribute to patients' low engagement in thorough SSE.

Most participants only checked part of their body, and thorough and comprehensive SSE was uncommon. This finding echoes previous findings that thorough and regular SSE is only performed by 9% to 18% of patients, even though a much larger proportion of individuals may examine some areas of their skin infrequently.[18,19]

In our study, lack of a partner to help check hard-to-see areas during SSE has been identified as a barrier to SSE by patients with melanoma. Possible solutions to this barrier may be to ask a family member or close friend to assist with hard-to-see areas, as well as using aids such as a full-size and/or handheld mirror.

Routinely scheduled clinic visits were perceived to provide different emotional benefits to patients compared with SSE. Many patients with melanoma expressed a strong reliance on routinely scheduled clinic visits to detect melanoma, which was attributed to limited confidence in their capacity to successfully perform SSE. These patients preferred to rely on highly trained clinicians to examine their skin for changes suggestive of melanoma, and regular expert review created a sense of reassurance and self-involvement in their personal care.

Figure. Associations Between Major Themes



The arrows represent direction of influence. SSE indicates skin self-examination.

Many patients with melanoma were willing to consider using digital technologies to assist in their SSE. They were interested in playing a more active role in their melanoma surveillance by being more aware of the lesions present on their skin, and regular SSE has been found to empower patients in this way.[20] Giving patients these new digital technologies may help them to recognize suspicious lesions and prompt them to undergo clinical evaluation ahead of a routinely scheduled clinic visit. By facilitating regular and thorough SSE and rapid review by a clinician as needed, new technologies may provide patients with the confidence to lead surveillance of their body.

Strengths and Limitations

The strengths of this study include use of a large sample for a qualitative interview study, providing a rich, in-depth evidence base for future intervention development. To our knowledge, this is one of the first studies to assess the perceptions of patients with melanoma of the use of new digital technologies in surveillance for recurrent or new primary melanomas. Information around motivators and barriers for digitally supported SSE will be useful in designing interventions to test the efficacy of digital technologies for SSE.

Our study also has some limitations. Although our study included a range of patient perceptions and experiences, the sample was recruited from a single tertiary center, and we may not have captured the full diversity of views of a wider population of patients with melanoma. Further research could explore perceptions of patients who are managed solely in primary care. Also, although we identified no new themes according to participant characteristics such as age, further exploration of this possibility may be useful for intervention planning.

Conclusions

Most patients with melanoma are aware of the importance of thorough SSE and some are receptive to new digital technologies to assist them in performing SSE. Future research might help further define the subset of patients who are most likely to adopt these new technologies to assist them in their SSE. Efforts to test the effectiveness and safety of these new technologies in improving SSE practices and promoting patient-led surveillance are warranted.

ARTICLE INFORMATION

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Concept and design: Dieng, Smit, Morton, Cust, Irwig, D. Low, C. Low, Bell.
Acquisition, analysis, or interpretation of data: Dieng, Smit, Hersch, Cust, Irwig, Bell.
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collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

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REFERENCES

1. Francken AB, Shaw HM, Thompson JF. Detection of second primary cutaneous melanomas. *Eur J Surg Oncol*. 2008;34(5):587-592. doi:10.1016/j.ejso.2007.06.004

2. Francken AB, Shaw HM, Accortt NA, Soong SJ, Hoekstra HJ, Thompson JF. Detection of first relapse in cutaneous melanoma patients: implications for the formulation of evidence-based follow-up guidelines. *Ann Surg Oncol*. 2007;14(6):1924-1933. doi:10.1245/s10434-007-9347-2

3. Berwick M, Begg CB, Fine JA, Roush GC, Barnhill RL. Screening for cutaneous melanoma by skin self-examination. *J Natl Cancer Inst*. 1996;88(1):17-23. doi:10.1093/jnci/88.1.17

4. Coups EJ, Manne SL, Stapleton JL, Tatum KL, Goydos JS. Skin self-examination behaviors among individuals diagnosed with melanoma. *Melanoma Res*. 2016;26(1):71-76. doi:10.1097/CMR.0000000000000204

5. Lim WY, Morton RL, Turner RM, et al. Patient preferences for follow-up after recent excision of a localized melanoma. *JAMA Dermatol*. 2018;154(4):420-427. doi:10.1001/jamadermatol.2018.0021

6. Hamidi R, Peng D, Cockburn M. Efficacy of skin self-examination for the early detection of melanoma. *Int J Dermatol*. 2010;49(2):126-134. doi:10.1111/j.1365-4632.2009.04268.x

7. Robinson JK, Wayne JD, Martini MC, Hultgren BA, Mallett KA, Turrisi R. Early detection of new melanomas by patients with melanoma and their partners using a structured skin self-examination skills training intervention: a randomized clinical trial. *JAMA Dermatol*. 2016;152(9):979-985. doi:10.1001/jamadermatol.2016.1985

8. Janda M, Loescher LJ, Banan P, Horsham C, Soyer HP. Lesion selection by melanoma high-risk consumers during skin self-examination using mobile teledermoscopy. *JAMA Dermatol*. 2014;150(6):656-658. doi:10.1001/jamadermatol.2013.7743

9. Murchie P, Allan JL, Brant W, et al. Total skin self-examination at home for people treated for cutaneous melanoma: development and pilot of a digital intervention. *BMJ Open*. 2015;5(8):e007993.

10. Manahan MN, Soyer HP, Loescher LJ, et al. A pilot trial of mobile, patient-performed teledermoscopy. *Br J Dermatol*. 2015;172(4):1072-1080. doi:10.1111/bjd.13550

11. Liamputtong P. *Research Methods in Health: Foundations for Evidence-Based Practice*. South Melbourne, Victoria, Australia: Oxford University Press; 2010.

12. Lim WY, Turner RM, Morton RL, et al. Use of shared care and routine tests in follow-up after treatment for localised cutaneous melanoma. *BMC Health Serv Res*. 2018;18(1):477. doi:10.1186/s12913-018-3291-7

13. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med*. 2014;89(9):1245-1251. doi:10.1097/ACM.0000000000000388

14. Bowen GA. Naturalistic inquiry and the saturation concept: a research note. *Qual Res*. 2008;8:137-152. doi:10.1177/1468794107085301

15. Bell KJL, Mehta Y, Turner RM, et al. Fear of new or recurrent melanoma after treatment for localised melanoma. *Psychooncology*. 2017;26(11):1784-1791. doi:10.1002/pon.4366

16. Braun V, Clarke C. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101. doi:10.1191/1478088706qp063oa

17. Bonner C, Jansen J, McKinn S, et al. How do general practitioners and patients make decisions about cardiovascular disease risk? *Health Psychol*. 2015;34(3):253-261. doi:10.1037/hea0000122

18. Weinstock MA, Martin RA, Risica PM, et al. Thorough skin examination for the early detection of melanoma. *Am J Prev Med*. 1999;17(3):169-175. doi:10.1016/S0749-3797(99)00077-X

19. Weinstock MA, Risica PM, Martin RA, et al. Reliability of assessment and circumstances of performance of thorough skin self-examination for the early detection of melanoma in the Check-It-Out Project. *Prev Med*. 2004;38(6):761-765. doi:10.1016/j.ypmed.2004.01.020

20. Yagerman S, Marghoob A. Melanoma patient self-detection: a review of efficacy of the skin self-examination and patient-directed educational efforts. *Expert Rev Anticancer Ther*. 2013;13(12):1423-1431. doi:10.1586/14737140.2013.856272