



## Reasons for indoor tanning use and the acceptability of alternatives: A qualitative study

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### ABSTRACT

**Rationale:** Using indoor tanning devices is associated with substantial health consequences, such as an increased risk of melanoma and other skin cancers. Many people including minors and some at high risk of skin cancer continue to use these devices. In the absence of effective restrictions on use, it is important that behaviour change interventions are designed to reduce indoor tanning.

**Objective:** To explore reasons for use of indoor tanning devices and the acceptability of alternatives in adult users residing in North-West England.

**Methods:** Participants were required to be current indoor tanners aged 18 years and above and were recruited online. Twenty-one participants took part in either a focus group or semi-structured interview. An inductive thematic analysis was conducted.

**Results:** Six themes were identified: psychological benefits; improving physical health; denial of health risks; alternatives do not meet psychological needs; alternatives do not meet physical needs; and perceived side-effects. Participants used indoor tanning devices to improve their self-esteem and to prevent sun damage to their skin (by gaining a 'base tan'). Participants appeared to justify their usage by responding defensively to avoid accepting they were at risk, exaggerating the benefits of indoor tanning, and discounting alternatives to indoor tanning. Alternatives to indoor tanning were perceived as risky for health, inadequate to provide the desired aesthetic, and incapable of meeting their self-esteem needs.

**Conclusions:** Interventions to reduce indoor tanning behaviour should increase sources of self-esteem other than appearance, increase media literacy and address defensive responses to information around indoor tanning and alternatives. Further research is needed to develop these interventions and assess their feasibility.

### 1. Introduction

Using indoor tanning devices has negative health effects, in particular the increased risk of developing skin cancers (World Health Organisation [WHO], 2017). Legislation ranging from modest regulations to outright bans (Gordon et al., 2020) has been introduced around the world to reduce these harmful effects. Despite this, individuals continue to use indoor tanning devices, suggesting the need for behaviour change interventions to successfully reduce usage and improve outcomes. Understanding people's reasons for indoor tanning, and the acceptability of alternatives, can aid successful intervention development.

Indoor tanning exposes individuals to high levels of ultraviolet

radiation: ultraviolet B (UVB) at levels of between 0.5 and 3.7 times, and ultraviolet A (UVA) radiation at levels of 3–26 times stronger than exposure to the sun (Nilsen et al., 2011). UVA rays penetrate the skin more deeply than UVB, and are associated with accelerated skin ageing, while UVB is more potent biologically, causing sunburn, eye inflammation, and transient immunosuppression and gene mutations that result in skin cancer (Torres et al., 2013; WHO, 2017). Ever-use of indoor tanning devices significantly increases by up to 50% an individual's risk of melanoma, and the two other main skin cancers, basal cell carcinoma, and squamous cell carcinoma (O'Sullivan et al., 2019). Use before the age of 35 years is associated with higher risk of skin cancers (Boniol et al., 2012; Wehner et al., 2012). Furthermore, there is

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a dose-response relationship for risk of melanoma with a 1.8% increase for each additional year of sunbed use (Bonniol et al., 2012). Melanoma, basal, and squamous cell cancers have a substantial impact on quality of life (Chernyshov et al., 2019; Gaulin et al., 2015). Melanoma is the most serious form of skin cancer, with a significantly increased risk of cancer related death (Cancer Research UK, 2020a; Cancer Research UK, 2020b; Giblin and Thomas, 2007).

Many countries have now introduced legislation to regulate the use of indoor tanning devices (WHO, 2017). Prohibiting unsupervised use, banning high-risk individuals (e.g., fair skinned, pregnant women), licensing devices, controlling irradiance limits, requiring protective equipment, training device supervisors, taxing, ensuring information provision and outright bans are strategies that have been applied with varying degrees of success across the world (Gordon et al., 2020; WHO, 2017). In the United Kingdom (UK) indoor tanning is prohibited in children and young people under the age of 18 years (Department of Health, 2011). However, it is estimated that roughly 10% of adults remain regular users; these adults are more likely to be female, aged <30 years, have lower socioeconomic status (Suppa et al., 2019; Thomson et al., 2010). Of particular concern, 40% are estimated to have fair skin and are therefore at greater risk of skin cancer (WHO, 2020) and there is no regulation of devices that are personally owned and used in the home. Therefore, current regulatory practices are insufficient on their own and intervention is required.

For an intervention to be effective, it is important to understand and target the reasons adults use indoor tanning devices (Michie et al., 2011). Previous literature has reported that the majority of individuals who indoor tan do so to increase their attractiveness, with others reporting additional reasons such as protection from sunburn (e.g., getting a base tan), treatment of skin conditions (e.g., psoriasis, acne) and assimilation with peers as motivating factors (Eden et al., 2020; Suppa et al., 2019). The vast majority of individuals who indoor tan are also aware of the associated health risks (94%; Gajda et al., 2018), suggesting that traditional interventions aiming to increase knowledge of health risks are unlikely to reduce indoor tanning behaviour. For example, although a recent social media intervention study successfully increased discussion of associated health risks of indoor tanning between mothers and their teenage daughters, these discussions did not lead to a change in behaviour (Buller et al., 2021). Previous interventions have therefore mainly focused on increasing awareness of the associated appearance-damaging effects of artificial tanning device use (Williams et al., 2013). These interventions were successful in reducing indoor tanning visits, but only in those individuals who had low knowledge of the damaging effects, approximately 33% of those studied (Stapleton et al., 2010). It is important that other interventions are developed to reduce use in the majority who indoor tan despite being aware of the risks (Stapleton et al., 2010). However, research has yet to explore beyond the previously mentioned 'surface-level' reasons (e.g., that indoor tanning improves attractiveness), and understand why individuals hold these beliefs, and why reducing certain health risks (e.g., sunburn) are more important than others (e.g., skin cancer). Conducting further qualitative research presents a novel opportunity to aid our understanding of individuals' reasons and motivations behind these beliefs, which may result in improved targeting of interventions.

Increasing people's awareness of alternatives to tanning may reduce indoor tanning behaviours (Mahler et al., 2005). An intervention that provided information on appearance-based alternatives, such as exercise, fashion, and sunless tanning products, alongside health risk information was successful in reducing indoor tanning in female university students (Heckman and Manne, 2012). Furthermore, a recent meta-analysis found that this technique was the only one of the 22 assessed that was effective at reducing indoor tanning behaviour (Sheeran et al., 2020). However, few studies have examined the acceptability of available alternatives which meet other needs (e.g., relaxing activity, boosting well-being; Suppa et al., 2019). Exploring acceptability using qualitative methodology can provide a

comprehensive, nuanced understanding of important behaviours related to the acceptability of alternatives and ultimately their use (Sutton and Austin, 2015). This study aimed to explore reasons for use of indoor tanning devices and the acceptability of alternatives in adult users.

## 2. Methods

A qualitative, inductive design was used to identify adults' reasons for indoor tanning use, and the acceptability of alternatives. Ethical approval was gained from a University Research Ethics Committee (Ref: 2019-6326-9579).

### 2.1. Data collection

All focus groups and interviews were conducted in North-West England between July 2019 and January 2020, with adult users of indoor tanning devices. North-West England is a deprived area (Ministry of Housing, Communities & Local Government, 2019), with high density of indoor tanning devices and rates of use (Thomson et al., 2010; Walsh et al., 2009). Adults (i.e., aged  $\geq 18$  years) were eligible to take part if they were current indoor tanners. Participants were recruited in three ways: (1) via businesses offering indoor tanning who agreed to display leaflets in their premises, (2) a standardized online advertisement posted on social media, and (3) an advertisement posted on university staff and student systems at two universities. If interested, adults were asked to contact the researchers to arrange a focus group or interview.

Focus groups were conducted on a university campus, whereas interviews were conducted either face-to-face on campus, or via telephone. The optimum focus group size is 6–8 participants, but groups with fewer can be equally as successful when attendees engage in discussion (Gill et al., 2008). Individual interviews were offered to adults who felt uncomfortable to discuss their views in front of others, or who were unable to attend a focus group. Focus groups and interviews can be combined in this way successfully when epistemological assumptions are compatible (Lambert and Loiseau, 2008). A similar semi-structured topic guide was used for both focus groups and interviews (Table 1). Prompts generated from the literature were used where necessary to further explore reasons for use and alternatives. Two focus groups were conducted initially, followed by seventeen individual interviews. All focus groups and interviews were audio recorded and transcribed for analysis.

After contacting the researcher, eligible adults ( $N = 32$ ) were sent a participant information sheet and consent form to gain informed consent. Twenty-four adults returned their consent forms and a focus group or interview was scheduled. At the time of their interviews, three participants were unable to take part leaving a final sample of  $N = 21$ . Three

**Table 1**  
Focus group and interview topic guide.

Topics	Questions
<i>Reasons for indoor tanning use</i>	<ul style="list-style-type: none"> <li>• What are the reasons you use indoor tanning?               <ul style="list-style-type: none"> <li>◦ Prompts: aesthetics, perceived health and wellbeing, process utility, external influences, low perceived risk</li> </ul> </li> <li>• What do you value about indoor tanning?               <ul style="list-style-type: none"> <li>◦ Prompts: aesthetics, perceived health and wellbeing, process utility, external influences, low perceived risk</li> </ul> </li> <li>• Please could you rate your reasons in order of importance?</li> <li>• What would make you more/less likely to indoor tan?</li> </ul>
<i>Acceptability of alternatives</i>	<ul style="list-style-type: none"> <li>• If you could no longer use indoor tanning, what could you use as an alternative?               <ul style="list-style-type: none"> <li>◦ Prompts: fake tanning lotions, gradual tanning moisturisers, spray tans, towelettes, cosmetics, make-up, non-legal products</li> </ul> </li> <li>• Please could you rate how acceptable you find these alternatives?</li> <li>• Does [alternative] meet [X] need of indoor tanning that you mentioned earlier?</li> </ul>

researchers conducted focus groups (XX, YY, and ZZ), with two present per session. All interviews were conducted by one researcher (XX); XX was a research associate with experience of conducting focus groups and individual interviews. Student participants recruited through the university system received course credits to thank them for their participation, and all other participants received a shopping voucher.

## 2.2. Data analysis

Data were analysed using inductive thematic analysis (Table 2; Braun and Clarke, 2006). The data collected during focus groups and interviews were weighted equally; as each focus group had only two participants, the potential influence of the data collection method was likely to be small. No differences were noted in the data or participant characteristics when comparing the collection methods. One researcher (XX) completed the coding process independently using Microsoft Word, and then discussed codes and agreed themes with another (YY). XX was a Research Associate with experience of conducting qualitative interviews, but without prior experience of the research topic. Inductive thematic analysis was appropriate to address the research questions; in particular, little research has been conducted on the acceptability of alternatives to indoor tanning devices, and this form of analysis allows flexibility and freedom from theoretical constraints (Braun and Clarke, 2006). The analysis was conducted concurrently with data collection, and after interviewing the nineteenth participant, the researchers considered that no new information was emerging. A further two interviews were conducted to confirm this, and indeed no new data emerged. The sample size was deemed appropriate to summarise the experience of adult indoor tanning users.

## 3. Results

### 3.1. Participant demographics

Twenty-one indoor tanners participated in either a focus group (two groups,  $n = 4$ ), face-to-face interview ( $n = 1$ ) or telephone ( $n = 16$ ) interview. Demographic information can be found in Table 3. Nineteen participants had used at least one alternative product at least once. Of these participants, all had used sunless tanning creams ( $n = 19$ ) and the majority had used spray tans ( $n = 15$ ). The participants who had never used alternative tanning products ( $n = 2$ ) were male.

### 3.2. Analyses

Three themes are presented to illustrate why people use indoor tanning devices: 'psychological benefits', 'improving physical health', and 'denial of health risks'. Individuals perceive that indoor tanning makes them appear more attractive, which increases their self-esteem and mood; prolonged use can result in a tanned look becoming adopted as part of their identity which encourages maintenance of the

**Table 2**  
Steps of analysis.

Step	Description
1	One researcher immersed themselves in the dataset by reading and re-reading transcripts.
2	One researcher generated initial codes by assigning meaning to interesting words and phrases within the dataset. This process was carried out with the view of identifying reasons for indoor tanning use and understanding the acceptability of alternatives. These initial codes were reviewed by a second researcher.
3	Semantically similar codes were combined by one researcher to develop potential themes (i.e. underlying patterns that are present throughout the data set).
4	Potential themes were discussed and reviewed by both researchers to ensure that the themes represented the data set.
5	The themes were refined and clear definitions and names were set.

**Table 3**

Demographic information.<sup>a</sup> Number of participants scoring  $\geq 2$  on The Behavioural Addiction Indoor Tanning Screener (BAITS; Stapleton et al., 2016).

Demographic Information	Focus Group Participants ( $n = 4$ )	Interview Participants ( $n = 17$ )
<b>Demographics</b>		
Gender		
Male	1	2
Female	3	15
Age		
Range	23–26	19–58
M (SD)	25.50 (1.73)	28.07 (10.98)
Ethnicity		
White/White British	4	14
Mixed (White and Black Caribbean)	0	2
Asian British (Pakistani)	0	1
Occupation		
Student	0	9
Administrative	0	6
Healthcare and Social Assistance	2	0
Sales or Support Professional	0	2
Professional	2	0
<b>Indoor tanning behaviours</b>		
Age at first use		
Range	18–26	15–27
M (SD)	21.75 (3.30)	18.18 (2.60)
Annual frequency		
Range	5–30	1–100
M (SD)	16.25 (11.09)	14.82 (23.06)
Lifetime frequency		
Range	10–100	2–1000
M (SD)	41.25 (40.08)	122.47 (254.85)
Addiction Prevalence <sup>a</sup>	0	8
<b>Use of alternatives</b>		
Annual frequency		
Range	0–50	0–50
M (SD)	12.50 (25.00)	15.59 (13.09)
Lifetime frequency		
Range	0–100	0–100
M (SD)	25.75 (49.51)	44.29 (36.01)

behaviour. Individuals also often perceive that indoor tanning devices improve physical illness symptoms and prevent harmful effects of later exposure to natural sunlight. It appears that the denial of health risks associated with indoor tanning alleviates the internal conflict of knowingly engaging in a risky behaviour and valuing aesthetics and psychological benefits above long-term health.

Three themes are presented to describe attitudes towards the acceptability of alternatives to indoor tanning: 'alternatives do not meet psychological needs', 'alternatives do not meet physical needs', and 'perceived side-effects'. Although the majority of participants had used a variety of alternative tanning products, none were perceived to be comparable to indoor tanning devices in terms of their aesthetic, price, process, perceived side-effects, and compatibility with their identity. The themes are described in more detail below. Excerpts are included to support theme descriptions.

### 3.3. Why do people use indoor tanning devices?

#### 3.3.1. Theme 1 – psychological benefits

Adults who used indoor tanning devices reported several improvements to their psychological wellbeing. Using indoor tanning devices was perceived to increase their attractiveness, in particular making them look "healthier" (P9), "radiant" (P3), "slimmer" (P6), "toned" (P13), reducing spots and improving their overall skin complexion. Perceived increases in attractiveness resulted in improved self-esteem. This was highly valued by users and was often cited as the most important reason for indoor tanning.

"I just feel better when I've got a tan, if I'm going on holiday and I'm going to be in a bikini, I feel skinnier when I've got a tan, I just feel better when I've got a tan, it's the look of it, just feeling, looking well" (P5)

Many participants reported feeling under pressure from society to have a tanned appearance, which increased their need to indoor tan. In particular, it was discussed that women were expected to look glamorous, and that ensuring that they had tanned skin was a key component. Indoor tanning use was perceived to be a common behaviour among peers, and many users attended indoor tanning facilities with their partners, friends or family members. Despite reporting an increasing societal shift towards women looking more 'natural' in recent years, the pressure to have tanned skin to some extent remained, as this was still perceived to represent health and wealth. The pressure to have a tanned appearance was higher during the summer, as participants were going on holiday or attending more social events, with some participants reporting that they would wear less revealing clothes or even miss events if they had not indoor tanned.

"I think there's a pressure for people from society from social media and celebrities to look in a specific way, and as a young person you're completely more vulnerable to that and it is to look tanned because then you're seen as, I suppose, having money or being able to enjoy your life being outside, so people are more willing to do that quickly and cheaply and that is by using a sunbed" (P1)

Men were considered by women to be under less pressure from society to have tanned skin, but were still perceived to look more toned and attractive after using indoor tanning devices. Both men and women received compliments, in person and via social media, on their appearance after tanning which reinforced their belief that tanned skin is more attractive, and increased their self-esteem further. Some individuals rejected the notion that they used indoor tanning to fit in with society, but acknowledged that this may have an influence on what they perceive as attractive.

"I feel like I feel better, like while I feel better in myself I don't really care what society shows, ...if I felt like I looked better more pale then I would follow that, but like also like those like society, culture, could unconsciously portray like what I think" (P15)

For a small number of participants, such as those who were of mixed ethnicity (Black Caribbean and White) or those who had used indoor tanning devices regularly from a young age, a tanned appearance went beyond improving attractiveness and self-esteem, and was seen to form part of their identity (e.g., increased the visibility of their ethnicity). These individuals were motivated to continue indoor tanning to maintain their tanned appearance year-round, and the idea of quitting indoor tanning was highly distressing.

"Because I'm mixed race I should be a nice, say, caramel colour. When winter kicks in I go very pale, yellowy, grey, it's a vile colour ... [tanning] gives me more confidence, I know, I feel I look prettier, more acceptable, not just to the outside world but myself, because it helps me be the colour that I am originally meant to be, which is when you're a black person born in England, well mixed race, this is one of problems I have, we don't get sun all year round [...] I've got to get my family to participate in this then, because this [study] is really important. I'm just going to go home, go, "My God, they're going to ban it [indoor tanning]," if she doesn't get enough people to call in, it's going to get banned" (P8)

Lastly, it is important to note that the process of indoor tanning was often enjoyable for users, providing a chance to relax in addition to gaining a tanned appearance in a short period of time. Many participants enjoyed the warm sensation, particularly in winter months. A small number of individuals believed indoor tanning resulted in an energy

boost and increased their happiness. Although enjoying the process in itself was not cited as a reason for use, it did encourage individuals to use indoor tanning over alternative tanning products to gain their desired appearance.

"I mean [I] do find while using the sunbed that it's nice, peaceful, quiet time just to reflect on things, probably the only time I get to myself to be quiet where no one's there, it's lovely and quiet yeah, and I can feel the heat on my skin so I do enjoy that" (P16)

### 3.3.2. Theme 2 – improving physical health

Adults who use indoor tanning devices also reported benefits to their physical health. The most commonly endorsed reason was to prevent sunburn; many individuals used indoor tanning devices before exposing themselves to natural sunlight as they believed that gaining a "base tan" (P7) would stop their skin from burning. This was important to participants in order to prevent them from experiencing the unpleasant sensation of sunburn, but it was also believed to reduce the harms associated with sunburn.

"If you get burnt, a, you kill your skin, which is probably more cancerous than going on a sunbed, I reckon, because your skin's peeling off and you're probably going red, but you're turning a small tan into a bigger tan, it's probably much healthier. Plus there's less pain, you know you're not getting pain" (P4)

Some users also believed that using indoor tanning could reduce cold and flu symptoms and increase vitamin D; these were seen as additional benefits rather than a sole purpose for use. Users who were aware that these beliefs were erroneous believed that others may endorse potential health benefits as reasons for use to ease the guilt experienced when actively participating in a behaviour that poses a health risk to improve their appearance.

"People say it's a thing [increase vitamin D], but I just don't, I don't really buy it, because I don't really see how it would be, like it's not, I just feel that's a bit of an excuse, saying like that's a reason for it, I don't think that's right...yeah I think it's just something people say to make themselves feel better, not true...because they're trying to like make up reasons in their head why it's ok to do it" (P10)

### 3.3.3. Theme 3 – denial of health risks

Some individuals actively avoided health risk information as they feared that if they knew more about the health risks they would stop indoor tanning. Other participants displayed selective seeking of health risk information as they reported that they were aware of the health risks of using indoor tanning devices but they used the devices without actively accessing credible health risk information. Instead, to assess risk, they would rely on their personal beliefs, and what they heard from their peers, family members or wider society through television and social media.

"Because [I] kind of never acknowledge, kind of, I am a little bit concerned, but then like as far as it goes, when you know exactly what might happen to you or exactly how you're putting your health in danger, if I probably knew more about it I would be less likely to actually go there" (P11)

Individuals denied the severity of the health risks; users perceived the legal status of indoor tanning devices and others' use as reassurance that health risk information was exaggerated. Indoor tanning was often viewed as less risky than other commonly performed behaviours, such as drinking alcohol or smoking. Individuals also used an optimistic bias and denied their personal susceptibility to the health risk. Participants often believed their usage was below a harmful threshold, particularly in comparison to others' use. Individual factors, such as personality (e.g., perceived low susceptibility for addiction that would significantly

increase usage) and skin type (e.g., skin that doesn't burn easily) were perceived to protect against associated harms.

"I think because I don't go so frequently it's sort of, you know how people might look at cigarettes like oh I'm not going to get cancer if I just smoke every so often, but like if you smoke 50 a day then yeah you're probably going to get lung cancer, so I think people might look at tanning like that, oh I don't go like five times a day so I'm going to be fine, I'm immune" (P2)

A small number of participants engaged in skin-checking behaviours to reduce their concerns about health risks. These techniques allowed participants to continue using indoor tanning devices without experiencing excessive anxiety or other negative emotions. Some individuals simply accepted that their reasons for using indoor tanning devices, such as experiencing psychological and physical health benefits, were more important to them than avoiding the health risks.

### 3.4. How acceptable are alternatives to indoor tanning?

Almost all participants had used at least one alternative tanning product. Participants discussed both appearance-based (e.g., instant fake tan, gradual tanning moisturisers, make-up or cosmetic products, medicated skin creams and non-legal products such as tablets, nasal sprays or injections) and other alternatives (e.g., exercise, sauna, protective sun-screen, vitamin D supplements and sunbathing in natural sunlight) in relation to whether these could meet their psychological and physical needs usually gained by indoor tanning. No participants stated that they had used a non-legal product. Participants were often worried about the side-effects of using appearance-based alternatives and preferred to indoor tan for this reason.

#### 3.4.1. Theme 1 – alternatives do not meet psychological needs

Participants used indoor tanning devices to meet psychological needs, particularly to increase their self-esteem and fit in with their peers by gaining a desired aesthetic, and to enjoy the relaxing process. Appearance-based alternatives, such as fake tanning products, were perceived as ineffective compared to indoor tanning; these products could not produce the desired aesthetic in order to increase self-esteem, were expensive and laborious rather than relaxing to use, and posed potential conflicts with identity. Very few participants discussed other alternatives that could meet their psychological needs.

**3.4.1.1. Self-esteem.** Indoor tanning devices were used to gain a desired aesthetic that increased self-esteem; participants considered that alternative products could not meet these needs. Alternative tanning products were often described as "orange" (P17), "streaky" (P6), "patchy" (P14) and short-lived. As previously mentioned, having a tanned appearance was particularly important to users when going on holiday; alternative tanning products were not appropriate for this as their effects were diminished by use of sun-protection cream and going swimming. For individuals who endorsed the benefit of indoor tanning on their complexion including spots, alternative tanning products were seen as harmful, and prescribed medications were rarely perceived to be as effective. Therefore, individuals felt that they could not gain the same increase in self-esteem by using alternative products as they experienced through indoor tanning.

"I think actually that's probably the reason why I would use sunbeds over like self-tanning, because it does just look more natural on the skin, cos it is, it's like a normal tan basically" (P9)

However, some individuals believed that alternative tanning products were acceptable in some instances. For social events, some individuals aimed to gain a darker tanned appearance to increase their self-esteem by using instant fake tan products. Women perceived make-up to be suitable for gaining a tanned appearance on their face but

not body. Gradual tanning moisturisers were believed to provide the closest aesthetic to the "natural tan" (P5) afforded by indoor tanning devices. A small number of participants discussed that exercise could also provide a toned look, and that saunas may result in improved skin complexion and reduce spots, outcomes that were ascribed to indoor tanning to increase their self-esteem.

"I would use, yeah gradual tanner and maybe just as a more like natural tan, and then maybe if I really wanted to be tanned for one event I'd get like actual fake tan and maybe get a spray tan" (P9)

**3.4.1.2. Process.** Many individuals enjoyed the process of using indoor tanning devices, but did not enjoy using alternative tanning products. Using instant fake tans was regarded as unacceptable for a variety of reasons: they either required exposure of their bodies to another person, or were difficult to apply evenly alone, and all had an unpleasant smell and left residue on clothing and bedding. The daily application of gradual tanning moisturisers required for maximum effect was not acceptable, with participants finding the process laborious. Individuals believed they could gain instantaneous improvements in appearance (e.g., slimmer look, improved complexion) from indoor tanning, but these effects would take much longer to achieve through exercise or using saunas. Indoor tanning devices were also readily available and easy to access in comparison to gyms and saunas.

"I didn't enjoy the procedure [spray tan], I think I've done it a couple of times, but it's not something I'd do again, I'd rather just stand under a lamp and be left to daydream and you know it's like so intrusive spray tanning, I don't like it" (P8)

Additionally, many participants believed it was more expensive to increase their self-esteem by using alternatives rather than indoor tanning devices. Indoor tanning sessions were often heavily discounted, and encouraged individuals to bulk buy, making the individual sessions cheaper. A gym membership with access to a sauna was perceived to be very expensive. In relation to tanning, the longevity of the tan was also acknowledged; in comparison to alternative tanning products, indoor tanning was described as providing a long-lasting tan which required minimal upkeep, which reduced perceptions of costliness.

"When I go on the sunbeds I buy in bulk, it always seems that the sunbed's cheaper than the self-tanning products, cos you can go through them quite fast and they're quite expensive" (P7)

**3.4.1.3. Conflict with identity.** Some individuals reported that alternative tanning products were not acceptable because they conflicted with aspects of their identity. In particular, many participants viewed themselves as health-conscious, and would not knowingly use a product they believed to be damaging to their health (e.g., non-legal products) for vanity. Some participants also believed alternative products such as tanning wipes were more harmful to the environment than indoor tanning, and therefore would not use them. For men, indoor tanning was viewed as the only acceptable method to gain a tanned appearance, as using alternative products was perceived as "feminine". However, using gyms and saunas did not conflict with any of these aspects of identity, but were only discussed by a small number of participants.

"I'd rather be pale than use fake tan, that's a bit too far, that's like makeup isn't it, and the smell, it stinks as well, it smells like biscuits, like digestive biscuits the smell...yeah I think it's more feminine yeah" (P18)

#### 3.4.2. Theme 2 – alternatives do not meet physical needs

Participants used indoor tanning devices to meet physical needs, particularly to prevent sunburn by developing a 'base tan', increasing their vitamin D, and to reduce cold and flu symptoms. Alternatives, such

as protective sunscreen and saunas were not perceived to meet these needs; these products conflicted with their desire to be tanned and were perceived as less available than indoor tanning devices. Vitamin D supplements were perceived as an acceptable alternative to meet this need, but were only discussed by participants who did not use indoor tanning devices for this reason.

**3.4.2.1. Conflict with desire to be tanned.** Participants who indoor tanned to gain a 'base tan' were unmotivated to use protective sunscreens instead to prevent their skin from burning when exposed to the sun. This was because they believed that these products were either ineffective, or that sunscreens would prevent them from gaining a tanned appearance. Participants using alternative tanning products, such as fake or spray tans, were also reluctant to use sunscreens as this damaged the aesthetic of their tan.

"when you go away on holiday you're sort of like 'well no don't put sun cream on me, I won't get my tan' sort of thing" (P2)

**3.4.2.2. Perceived low availability.** Some participants used indoor tanning devices to reduce cold and flu symptoms and increase their vitamin D. The alternatives discussed to meet these needs were using saunas, sunbathing in natural sunlight or taking vitamin D supplements. Saunas were viewed to be particularly expensive, relatively difficult to find, and difficult to attend for one-off sessions. As participants were living in North-West England, they reported the opportunity to increase their vitamin D by sunbathing in natural sunlight was low. Vitamin D supplements were only reported as an alternative by participants who were not using indoor tanning devices for this purpose.

"If you google saunas you're not really going to get anything, with sunbeds you'll get five or six things turn up...it's not going to be as readily available" (P4)

### 3.4.3. Theme 3 – perceived side-effects

Many individuals were concerned with the perceived side-effects of alternative tanning products. In particular, our participants reported avoiding non-legal products due to concerns with unknown aesthetic implications and health risks. Individuals with skin conditions were particularly reluctant to use new products due to unknown side-effects. Some individuals believed that sunbathing in natural sunlight, the chemicals in alternative tanning products and even sunscreens would be more harmful than using indoor tanning devices. Other alternatives such as using saunas, exercising or taking vitamin D supplements were not raised as having side-effects.

"When I try new like fake tanning products I'm actually quite careful cos I've got eczema and spots so if I were to use them I wouldn't know how it would affect my skin" (P12)

"I don't wear make-up or anything, and I don't like using that fake tan too much, a couple of times a week is okay, but it's not something you could use on a daily basis, for my skin, there's too much chemicals in it again you know? So yeah, definitely health-wise, chemical-wise, and just the after-effects on my skin, it's not something I would be happy to use continuously" (P8)

## 4. Discussion

The aim of this study was to understand adults' reasons for indoor tanning and the acceptability of alternatives. The key reasons for using indoor tanning devices were to improve self-esteem (through enhanced appearance) and to prevent sun damage (by gaining a 'base tan'). Participants seemed to justify their usage by using a range of defensive responses to avoid accepting they were at risk (e.g., avoiding health risk

information, denial of severity of consequences), to exaggerate benefits of indoor tanning (e.g., physical benefits) and through discounting alternatives to indoor tanning (e.g., exaggerating the prevalence and severity of health risks of the alternatives). These findings can inform future public health policy, research, and behaviour change interventions.

Regarding the key reasons for use – aiming to gain a desired aesthetic is common in adult indoor tanners (Eden et al., 2020). Additionally in this study, users stated that their motivation to gain this aesthetic arose from associated increases in self-esteem; participants felt worthier and more attractive with a tanned appearance. Previous research supports this finding, reporting that satisfaction with physical appearance is associated with higher levels of self-esteem in children, adolescents and adults (Alm and Laftman, 2018; Franklin et al., 2006; Frederick et al., 2016). In Europe, tanned skin has been preferable to being pale for roughly 100 years, beginning when it became associated with good health, privilege, fashion, and celebrity (Hsin-Yu et al., 2018). This study has highlighted how some participants felt that tanned skin formed part of their identity, a novel finding not reported by previous studies of indoor tanning. This suggests that participants may have internalised positive tanning beliefs by adopting them as personal standards that influence their behaviour (Thompson et al., 2004), or have expectations that their skin should be a certain colour because of their race. These findings suggest that self-esteem and identity are appropriate targets for intervention.

People commonly avoid accepting the health risks of many different behaviours (Epton and Harris, 2008; Harris and Epton, 2009; Napper et al., 2009; Epton et al., 2015) not only indoor tanning. For example, many people smoke cigarettes, drink excessive alcohol, have a poor diet and are inactive despite ubiquitous information stating their risks. People are fundamentally motivated to view themselves as reasonable and moral people who make adaptive decisions (Steele, 1988), whilst simultaneously engaging in a dangerous practices (e.g., for appearance-based reasons; Carpenter, 2018). To reduce the dissonance caused by performing risky behaviours but believing themselves to be adaptive, people use many different strategies such as: avoiding health risk information, displaying selectivity in the information accessed in order to maintain beliefs, denying the severity of the health consequences, and optimistic bias by denying their personal susceptibility to the associated health risks (Blumberg, 2000; Carpenter, 2018).

Individuals also discussed using indoor tanning devices to gain physical benefits, such as protection against sunburn and improving illness symptoms. UV-induced tans offer a sun protection factor (SPF) of 3–4 (when at least SPF 30+ is recommended; Sivamani et al., 2009), and the likelihood of catching a cold for example, is not reduced by indoor tanning (de Gruijl and Pavel, 2012). Therefore, it may be that individuals have consciously or sub-consciously exaggerated the physical benefits they experience from indoor tanning, as a defensive response to mitigate the increased health risk. This exaggeration of benefits may also be due to a desire not to be socially labelled as 'vain' (Webster et al., 2014).

In our study, both appearance-based and other alternatives were regarded as unacceptable to users of indoor tanning devices. Alternative tanning products were most frequently discussed, and were perceived as inadequate in providing the desired aesthetic, and therefore could not meet self-esteem needs. Although there are established health risks of non-legal products such as tanning injections (O'Leary et al., 2014), there is no evidence that legal sunless tanning products or sun protection creams are harmful (Cancer Research UK, 2019; Green and Williams, 2007). Therefore, the derogation of alternative products could be explained again by defensive responses to justify indoor tanning (Carpenter, 2018). Moreover, the concern about health risks of alternative products was in contrast to their lack of concern about the health risks of indoor tanning. It seemed that the lack of acceptability of alternatives was not always a concern as some participants reported regularly using alternative tanning products for certain events, and reported that a

'natural tan' could be achieved by gradual tanning moisturisers. A minority of people believed other alternatives such as exercise and saunas could produce similar effects to indoor tanning devices, but required far greater time and effort.

The findings of this study are valuable for intervention design. The focus of interventions to reduce indoor tanning should address the identity and self-esteem needs of indoor tanners and should also consider the likelihood of tanners responding defensively to information around indoor tanning and alternatives. Media literacy training can be used to counterbalance internalisation of positive tanning beliefs prevalent in the media that can lead to a tanning identity (McWhirter and Hoffman-Goetz, 2015; Mingoia et al., 2017). Being able to think critically about the influence of media on behaviour (i.e., 'media literacy') reduces the likelihood of internalising positive tanning beliefs, and reduces social comparisons with social media models (Mingoia et al., 2020). Therefore, future interventions may also be more effective by developing reliable methods to increase media literacy, that may then reduce individuals' desire for a tanned appearance, rather than attempting to change long-standing beauty ideals directly. In support of this, a successful web-based media literacy intervention recently reported that media realism completely mediated the intervention effects (Cho et al., 2020). For individuals who feel that having lighter skin conflicts with their racial identity, interventions could support them to find other ways to maintain this, such as promoting diversity in social networks and role models and engaging in cultural events and practices (Crawford and Alaggia, 2008; Rockquemore and Brunson, 2002).

Self-affirmation (i.e., recognising and asserting one's value) is a successful technique for shifting self-esteem focus in adolescence (Armitage, 2011), the time when most users begin indoor tanning (Lostritto et al., 2012). Self-esteem can be determined by internal (e.g., independent thinking, moral compass and productivity) and external (e.g., affluence, fame, and social standing) sources (Campbell et al., 2010). Self-affirmation interventions that attempt to shift individuals' self-esteem focus from physical appearance to other areas, such as competence and productiveness in work and hobbies, could reduce the need to indoor tan. Self-affirmation can also be used to reduce defensive responding to health risk information and biased information processing around alternatives to indoor tanning; a meta-analysis found that inducing self-affirmation when delivering health information promotes message acceptance, intentions, and behaviour (Epton et al., 2015). Additionally, as previous interventions aiming to reduce indoor tanning have included prompts to use alternatives (Heckman and Manne, 2012), it is important that risk perceptions and disadvantages of these are addressed and adequately rebalanced to improve the likelihood of behaviour change (Hanghoj, 2013).

Other aspects of alternative tanning products, such as price and an association with femininity also reduced perceptions of acceptability. It is therefore recommended that indoor tanning session discounts should be banned and taxation on indoor tanning increased (to reduce the discrepancy between the price of an 'indoor' or 'fake' tan). As it is likely that increasing media literacy and reducing internalised positive tanning beliefs may take some time, concessions should be offered for appearance-based and other safe alternatives, and sunless tanning products should be developed and marketed for men to reduce indoor tanning. Promoting statistics on social approval and usage of alternative tanning products in particular populations (e.g., young adults, men) may also increase perceptions of acceptability and ultimately reduce indoor tanning (Yamin et al., 2019).

#### 4.1. Limitations

This study has some limitations. First, our sample was limited to adults who lived in North-West England, meaning the findings may only reflect indoor tanning behaviours in this region. However, given the seeming universality of themes identified in the present study, consistent with previous studies, we believe the majority of the opinions

expressed are likely to be widely applicable to other adult indoor tanners. There was a wide spectrum of frequency of indoor tanning within the sample, ranging from infrequent to intense use, further suggesting that the findings are applicable to indoor tanners residing in other areas of the UK and elsewhere. Second, using both focus groups and interviews can be criticised in relation to a potential clash in associated epistemological perspectives and indicate a lack of trustworthiness in the findings (Lambert and Loiseau, 2008). However, a realist approach was adopted during analysis, allowing both sets of data to be combined and weighted equally. Using both methods increased the inclusivity of the study by allowing adults who felt uncomfortable discussing their views in front of others, or who were unable to attend a focus group, to take part (Ryan, 2013). No differences were noted in the data or participant characteristics when comparing the collection methods.

Future research is necessary to further understand indoor tanning behaviours and especially the acceptability of alternatives. A quantitative investigation of alternatives to indoor tanning discussed in this study could further improve our understanding of individuals' attitudes towards, and capability, opportunity and motivation to use both appearance and other alternatives. The findings also suggest several improvements to interventions that aim to reduce indoor tanning behaviours including techniques to increase media literacy, shift an individual's focus on physical appearance for self-esteem to other sources, reduce defensive responding, and address concerns about alternatives. A randomised controlled trial of these methods is needed and if these approaches are effective they could be adopted by public health campaigns to maximise reach and effectiveness.

## 5. Conclusion

In conclusion, this study aimed to understand adults' reasons for indoor tanning use and the acceptability of alternatives. Participants reported found both appearance-based and other alternatives are not considered as viable options to meet the perceived psychological and physical needs gained from indoor tanning. Interventions have the potential to reduce indoor tanning behaviour by rebalancing sources of self-esteem, increasing media literacy and addressing defensive responses to information around indoor tanning and alternatives. Future research is necessary to determine the effectiveness of these intervention methods, and their findings can be used to inform future public health campaigns.

## Author credit statement

Dr Stephanie Lyons methodology, formal analysis, writing - original draft and writing - review & editing, Dr Tracy Epton conceptualisation, methodology, writing - review & editing, and funding acquisition. Professor Adele Green conceptualisation, review and edited the draft writing - review & editing. Professor Paul Lorigan conceptualisation, review and edited the draft writing - review & editing, and funding acquisition. Ashley Ferguson methodology, writing - review & editing,

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