The balding industry is worth billions of US dollars globally (Allied Analytics LLP, 2019; Conrad et al., 2010), with hair transplants alone projected to increase in worth from 8 to 12 billion US dollars by 2026 (Allied Analytics LLP, 2019). Whilst health psychology aims to promote people’s wellbeing, it may also have facilitated the growth, actions and, ultimately, harm caused by baldness-, tobacco-, and other-commercial industries (e.g. Craig et al., 2020; Curtis, 2002; Marks and Buchanan, 2020; Ogden, 2019; Pelosi, 2019). More specifically, psychology may have facilitated the commercial balding industry through the medicalization of baldness. Baldness (also known as androgenetic alopecia or AGA) typically refers to the common occurrence of loss of hair among men that is not caused by an illness (NHS, 2018). It results in no physically harmful or life-limiting consequences (Draper, n.d.; Gonul et al., 2018; NHS, 2018; Peled, 2004; Tang et al., 2000). Nonetheless, it is medicalized¹ where it is transformed into a disease largely on the premise that it is profoundly psychosocially distressing (British Association of Hair Restoration Surgeons, 2019; Cash, 2010). The disease status of baldness can then be used to promote “commercial interventions” (including pharmaceuticals, surgery, wigs, or other related products) as medical “treatments”. For example, the European Dermatology Forum guidance (Blumeyer et al., 2011; Kanti et al., 2018) provided to those who provide baldness commercial interventions (e.g. surgeons, dermatologists, etc. hereafter referred to as practitioners) refers to baldness using disease language and implicitly advocates for pharmaceutical and surgical interventions whilst also emphasizing the

¹Leeds Beckett University, UK
²University of Surrey, UK

Corresponding author: Glen S Jankowski, School of Social Sciences, Leeds Beckett University, Portland Way, City Campus, Leeds LS1 3HE, UK.
Email: g.jankowski@leedsbeckett.ac.uk
psychological impact of balding: “Independent of age and gender, patients diagnosed with androgenetic alopecia undergo significant impairment in their quality of life” (Blumeyer et al., 2011: s1). Yet this guidance relies on just two, heavily cited, studies (Alfonso et al., 2005; Cash et al., 1993) whose results do not actually support the assertion that baldness brings about significant psychological distress. Specifically Cash et al. (1993: 567) note “balding men actively cope with their distress” and Alfonso et al. (2005) actually found that >76% of participants never used baldness interventions, did not feel having more hair would make them more desirable to their partner and were not dissatisfied with their personal appearance. Despite claims that balding causes a significant psychosocial impact, the evidence of this is conflicting and poor quality. Specifically, studies often use non-validated measures, do not reference published norms or use a non-balding control group when assessing the impact among balding men impeding fair interpretation. Of those assessing the impact more soundly, some studies show no impact of balding (Cash et al., 1993; Passchier, 1998; Tas et al., 2018) with others showing an impact (Wang et al., 2018; Yamazaki et al., 2011).

Direct and indirect mechanisms for medicalizing baldness have been identified. For example, anti-baldness commercial campaigns indirectly medicalize baldness depicting it as something that is isolating, depressing, and stigmatized (Harvey, 2013; Moynihan et al., 2002). Baldness is also directly medicalized by using scientific, technical, and medical language to frame it as a “devastating disease” and indirectly by the promotion of pharmaceutical drugs (and sometimes hair transplant surgery) as “treatments” with no- or minimal-reference to their limitations (Conrad, 2007; Harvey, 2013; Moynihan et al., 2002). In addition, research has promoted baldness medicalization through the use of flawed methodologies and pharmaceutical influence (Jankowski, 2014).

There are several reasons why systematically assessing the medicalization of baldness through psychosocial research is important. First, the above medicalization evidence, whilst useful, is “selective and preliminary” (Moynihan et al., 2002: 900). Second, research like that on baldness has been “flooded” with conflicting findings to generate as much confusion about the state of illnesses, interventions, and benign bodily processes as possible, a systematic examination is thus necessary (Bero, 2017: 15). Third, balding men must give informed consent if electing to use commercial interventions and “informed consent means being informed about medicalization and disease mongering” (Moynihan et al., 2002: 900). Finally, research may be used to bolster the credentials and objectivity of baldness practitioners even if not being read directly by men themselves.

**The current study**

This study sought to systematically assess male baldness medicalization by extracting data from a recent systematic review (which synthesizes the findings and methods of the psychosocial impact of baldness research; Frith and Jankowski, 2020). In contrast the current study, focuses on key mechanisms of baldness medicalization and has the following aims:

1. To assess the extent of baldness commercial conflicts of interest
2. To assess if baldness is represented as a disease
3. To assess if intervention-orientated participants are disproportionately recruited
4. To assess if commercial intervention-sare advocated
5. To assess if intervention limitations are acknowledged

**Method**

**Search strategy and study selection**

This paper is based on a systematic review (registered here: Frith and Jankowski, 2020; https://osf.io/uvzp9), which examined the published evidence of baldness’psychosocial
impact among men. The Psychology Cross Search electronic database was systematically searched on the 9th November 2020 by combining terms for baldness, men, and psychosocial outcomes without date parameters but limited to English-language texts. The following inclusion criteria were applied: (i) the study included balding male participants; (ii) the study reported the outcomes of most of the male balding participants; and (iii) the publication reported original empirical research. Study selection was performed independently by both authors in three screening stages from titles to full text papers. Pilot screening and discussions to resolve uncertainties were also conducted.

Data extraction

For the purposes of this paper, data regarding indicators of medicalization (conflicts of interest, baldness representation, sample biases, and intervention implications) identified through previous research (Conrad, 2007; Harvey, 2013; Jankowski, 2014; Moynihan et al., 2002) were extracted from the 37 studies in the systematic review. To provide context, other data extracted includes study characteristics (e.g. geographic location, study design), sample details (sample size, mean age, and other demographics), and a study quality score (based on a modified AXIS tool; Downes et al., 2016) where scores 0–5 = Low; 6–10 = Moderate; and 11–14 = High). Narrative results are presented below to review the studies (in line with: Liu et al., 2018) and details are summarized in Table 1.

Data sharing statement

The authors confirm that the data supporting the findings of this study are available within the article (and/or) its supplementary materials which are available at the Open Science Framework (doi: 10.17605/OSF.IO/RZP47). These include the PRISMA study protocol of the systematic review and other associated files here: https://osf.io/rzp47/?view_only=ea64dbeaf 2787485a83e18ef0671721a7

Results

Disclosure of baldness commercial conflicts of interest

Seven studies reported no conflicts of interest or commercial funding (Gonul et al., 2018; Gupta et al., 2019; Mubki et al., 2019; Rahimi-Ardabili et al., 2006; Russo et al., 2019; Sawant et al., 2010; Tas et al., 2018), 12 did not disclose (Bade et al., 2016; Camacho and García-Hernández, 2002; Danyal et al., 2018; Franzoi et al., 1990; Ghimire, 2018; Karaman et al., 2006; Maffei et al., 1994; Molina-Leyva et al., 2016; Tahir et al., 2013; Tang et al., 2000; Wells et al., 1995; Yamazaki et al., 2011), and the remaining 18 indicated funding or some other potential conflict of interest.

As not all journals required these disclosures, closer inspection of the funding source, the author’s profiles and affiliations was conducted. In view of even subtle commercial influences in dermatology being (a) common (Batalla et al., 2011; Perlis et al., 2005), (b) leading to more commercially favorable results (Batalla et al., 2011; Perlis et al., 2005; Williams et al., 2006), and (c) yet often not being disclosed (Anstey, 2018; Batalla et al., 2011) and in line with best practice dermatological standards (Anstey, 2018; British Association of Dermatologists, 2016b), studies were deemed to likely have a conflict of interest if explicit evidence suggested at least one (co)author (or co(author)’s affiliated employer or the study’s commercial funders) provided baldness interventions.

Studies that likely do not have conflict of interests

Six studies were authored or co-authored by a dermatologist but were not obviously associated with a clinic or practise providing baldness interventions (Camacho and García-Hernández, 2002; Danyal et al., 2018; Rahimi-Ardabili et al., 2006; Tas et al., 2018; Wang et al., 2018; Yamazaki et al., 2011). Two studies appeared to be authored by academics working for an academic institution (Franzoi et al., 1990; Wells...
| Study                   | Location                                      | Participant characteristics (mean age and standard deviation) | Quality score | Key results | Has a baldness-related commercial conflict of interest? | Discloses conflict of interest? | Recruits intervention orientated participants? | Indicates baldness is a disease? | Recommends commercial interventions? | Omits treatment limitations? |
|------------------------|------------------------------------------------|---------------------------------------------------------------|---------------|-------------|--------------------------------------------------------|--------------------------------|---------------------------------|--------------------------------|-------------------------------------|-----------------------------|
| Alfonso et al. (2005)  | Germany, France, Italy, Spain, and UK       | Seven hundred and twenty nine balding men recruited via market-research or through “random digit dialling” (p. 1830; n.r.) | 6             | Non validated | Merck funding                                        | Yes                           | No                             | Yes                           | Yes                                 | Yes                         |
| Bade et al. (2016)    | India                                         | Two hundred dermatology clinic patients ($M = 30.6$, $SD = 8.7$) | 8             | Worse DLQI* score | Probable†                                              | Journal appears not to require disclosures | Yes                             | Yes                           | Yes                           | Yes                             |
| Budd et al. (2000)    | France, Germany, Italy, and UK               | Seven hundred and ninety eight balding men recruited via their households (n.r.) | 6             | Non comparable | Merck funding                                         | Yes                           | No                             | Yes                           | Yes                                 | Yes                         |
| Camacho and García-Hernández (2002) | Spain                                      | One hundred dermatology clinic patients (n.r.) | 5             | Non validated | None found                                            | Journal appears not to require disclosures | Yes                             | Yes                           | N/A                             | Yes                         |
| Cash (1992)            | US                                             | One hundred and three balding men referred to the study via their hairdressers | 6             | Non comparable | Upjohn funding                                        | Yes                           | No                             | No                           | Yes                                 | Yes                         |
| Cash et al. (1993)    | US                                             | Sixty dermatology clinic patients ($M = 31.3$, $SD = n.r.$) | 7             | Normal anxiety, Normal self esteem                     | Upjohn funding                   | Yes                             | Yes                           | No                           | Yes                                 | Yes                         |
| Cash (2009)            | US, UK, France, Germany, Spain, Japan, and Korea | Six hundred and four balding men who were interested in hair loss services/products recruited via market research ($M = 37.1$, $SD = 6.6$) | 8             | Non validated | Merck funding                                         | Yes                           | Yes                           | Yes                           | Yes                                 | No                         |
| Danyal et al. (2018)  | Pakistan                                       | Sixty participants likely recruited from authors’ institution | 9             | Worse anxiety, Normal depression, Normal self-esteem | None found                      | Declares none                    | No                             | Yes                           | Yes                                 | Yes                         |
| DeMuro-Mercon et al. (1998) | Norway                                     | One thousand seven hundred and sixty one balding men recruited via their households (n.r.) | 6             | Non comparable | Merck funding                                         | Yes                           | No                             | No                           | N/A                                 | N/A                         |

Table 1. Summary of study characteristics, key results, quality assessment, and medicalization indicators (adapted from Frith and Jankowski, 2021).
### Table 1. (Continued)

| Study                             | Location                              | Participant characteristics (mean age and standard deviation) | Quality score | Key results | Has a baldness-related commercial conflict of interest? | Discloses conflict of interest? | Recruits intervention orientated participants? | Indicates baldness is a disease? | Recommends commercial interventions? | Omits treatment limitations? |
|-----------------------------------|---------------------------------------|---------------------------------------------------------------|---------------|-------------|--------------------------------------------------------|---------------------------------|----------------------------------------|----------------------------------|---------------------------------------|-------------------------------|
| Franzoi et al. (1990)             | US                                    | Fifty two balding men at a US airport (M = 43, SD = n.r.)       | 8             | Worse hair-specific Skindex-29 score                   | None found                          | Journal appears not to require disclosures | No                                | No                                     | N/A                               | N/A                           |
| Ghimire (2018)                    | Nepal                                 | One hundred and twenty hair transplant patients (M = 31.87, SD = 6.8) | 7             | Worse DLQI score                                      | Probable                             | Declares none                          | Yes                               | Yes                                     | Yes                              | N/A                           |
| Girman et al. (1998)              | US                                    | Approximately 191 balding men recruited via their households (n.r.) | 8             | Non validated                                         | Merck funding                        | Yes                                    | No                                | Yes                                     | Yes                              | N/A                           |
| Gonul et al. (2018)               | Turkey                                | Thirty hair transplant patients (M = 23.47, SD = 5.79)          | 6             | Non comparable                                        | Probable                             | Declares none                          | Yes                               | No                                     | N/A                           | N/A                           |
| Gosselin (1984)                   | UK                                    | Two hundred and four dermatology patients (M = 35.14, SD = 11.04) | 6             | Non comparable                                        | Tri Mil Trust/Institute of Trichologists funding | Yes                                    | Yes                               | Yes                                     | Yes                              | N/A                           |
| Gupta et al. (2019)               | India                                 | Two hundred dermatology patients (M = 32.0, SD = n.r.)          | 8             | Worse DLQI score                                      | Probable                             | Declares none                          | Yes                               | Yes                                     | Yes                              | No                            |
| Han et al. (2012)                 | South Korea                           | Nine hundred and ninety eight dermatology patients (M = 41.70, SD = 5.5) | 6             | Non comparable                                        | Probable                             | Journal appears not to require disclosures (does declare non-commercial funding in acknowledgements however) | Yes                               | Yes                                     | Yes                          | Yes                           |
| Karaman et al. (2006)             | Turkey                                | One hundred and seventy five balding men recruited from their workplaces (M = 34.82, SD = 9.62) | 7             | Non validated                                         | Probable                             | Journal appears not to require disclosures (n.r.) | Yes                               | No                                     | N/A                           | N/A                           |
| Kranz (2011)                      | Germany                               | One hundred and sixty balding men recruited from author's university (M = 24.4, SD = 2.56) | 10            | Worse self esteem                                     | L'Oreal shampoo samples used as participant incentives | Yes                               | No                                    | Yes                                     | Yes                              | No                            |
| Liu et al. (2019)                 | China                                 | Eight hundred and seventy five hair transplant patients (M = 30.85, SD = n.r.) | 8             | Normal self esteem                                     | Probable                             | Declares none                          | Yes                               | Yes                                     | Yes                              | Yes                           |
| Lulic et al. (2017)               | Japan, South Korea, Taiwan, Mexico, and Brazil | Eight hundred and thirty five balding men who had recently received hair loss services/products (n.r.) | 5             | Non validated                                         | GlaxoSmithKline funding              | Yes                                | Yes                                     | Yes                                     | Yes                              | No                           |
| Study                        | Location          | Participant characteristics (mean age and standard deviation) | Quality score | Key results | Has a baldness-related commercial conflict of interest? | Discloses conflict of interest? | Recruits intervention orientated participants? | Indicates baldness is a disease? | Recommends commercial interventions? | Omits treatment limitations? |
|------------------------------|-------------------|----------------------------------------------------------------|---------------|-------------|--------------------------------------------------------|-------------------------------|---------------------------------|---------------------------------|-----------------------------------|-----------------------------|
| Maffei et al. (1994)         | Italy             | Sixty four dermatology patients (n.r.)                          | 7             | Non comparable Worse Hair-specific Skindex-29 score  | Probable | Journal appears not to require disclosures | Yes | Yes | Yes | Yes | Yes |
| Molina-Leyva et al. (2016)   | Spain             | One hundred and ninety hair loss forum users (M = 26.3, SD = 5.4) | 8             | Non comparable Worse Hair-specific Skindex-29 score  | Probable | Journal appears not to require disclosures | Yes | Yes | Yes | No |
| Mubki et al. (2019)          | Saudi Arabia      | Ninety six dermatology patients (n.r.)                          | 10            | Non comparable | Probable | Declares none | Yes | Yes | Yes | Yes | No |
| Passchier et al. (2006)      | Netherlands       | One hundred sixty non-hair loss dermatology patients            | 6             | Non validated | Merck funding | Yes | No | Yes | Yes | Yes |
| Passchier et al. (1989)      | Netherlands       | Two hundred and one prospective or current minoxidil users (n.r.) | 7             | Non validated | Upjohn funding | Yes | Yes | Yes | N/A | No |
| Passchier et al. (1988)      | Netherlands       | Eighty five prospective or current minoxidil users (n.r.)       | 8             | Normal general mental health. Normal anxiety | Upjohn funding | Yes | Yes | Yes | N/A | Yes |
| Rahimi-Ardabili et al. (2006)| Iran              | One hundred and twenty eight dermatology patients (M = 25.8, SD = 4.4) | 10            | Normal depression | None found | Declares none | Yes | Yes | N/A | No |
| Russo et al. (2019)          | Italy             | Twenty three dermatology patients (M = 28.39, SD = 11.86)       | 6             | Normal anxiety. | Probable | Normal anxious. Probable | Declares none | Yes | Yes | Yes | N/A |
| Sawant et al. (2010)         | India             | Thirty seven dermatology patients                              | 7             | Non comparable | Probable | Declares none | Yes | Yes | N/A | N/A |
| Tabolli et al. (2013)        | Italy             | Two hundred and thirty seven dermatology patients (M = 31.53, SD = 10.57) | 7             | Worse general mental health | Giuliani SpA funding | Yes | Yes | Yes | Yes | N/A |
| Tahir et al. (2013)          | Pakistan          | Fifty three dermatology patients (n.r.)                          | 7             | Worse DLQI score | Probable | Journal appears not to require disclosures | Yes | Yes | Yes | N/A |
| Tang et al. (2000)           | Singapore         | One hundred balding men recruited via their households (n.r.) | 8             | Non validated | Probable | Journal appears not to require disclosures | No | No | Yes | Yes |
| Tas et al. (2018)            | Turkey            | Two hundred and eighty three dermatology patients (M = 23.16, SD = 6.34) | 9             | Normal anxiety. | None found | Normal anxiety. Normal depression. Normal self esteem | Declares none | Yes | No | Yes | Yes |
Table 1. (Continued)

| Study                        | Location       | Participant characteristics (mean age and standard deviation) | Quality score | Key resultsb | Has a baldness-related commercial conflict of interest? | Discloses conflict of interest? | Recruits Intervention orientated participants? | Indicates baldness is a disease? | Recommends commercial interventions? | Omitstreatment limitations? |
|------------------------------|----------------|---------------------------------------------------------------|---------------|--------------|-------------------------------------------------------|---------------------------------|-----------------------------------|---------------------------------|----------------------------------|---------------------------------|
| Van der Donk et al. (1991)   | Netherlands    | One hundred and sixty eight prospective or current minoxidil user (M = 35.0, SD = n.r.) | 9             | Normal anxiety | Upjohn funding                                        | Yes                             | Yes                               | Yes                             | N/A                              | Yes                             |
| Wang et al. (2018)           | China          | Three hundred and forty dermatology patients (n.r.)           | 8             | Worse general mental health                           | None found                        | Declares none                    | Yes                             | Yes                              | Yes                              | Yes                             |
| Wells et al. (1995)          | UK             | One hundred twenty two balding men recruited from UK public locations 4 | 8             | Normal depression                                      | None found                        | Journal appears not to require disclosures | No                             | No                               | N/A                              | N/A                             |
| Yamazaki et al. (2011)       | Japan          | Twenty seven prospective or current minoxidil users (M = 33.8, SD = n.r.) | 8             | Worse anxiety. Worse self esteem                       | None found                        | Journal appears not to require disclosures | Yes                            | Yes                              | Yes                             | Yes                             |

Notes:

bKey findings are reported when a study deployed a validated assessment and a nonbalding comparator sample or there were available published norms meaning balding male participant scores could be meaningfully interpreted. “Worse” indicates the study’s balding male participant had significantly worse scores on that construct compared to published norms or a comparable non balding participant sample. “Normal” indicate the study’s balding male participants had similar or better scores on the construct. Some studies used multiple assessments of the same constructs, here only the dominant finding is reported for example, Rahimi-Ardabili et al. (2006) assessed depression scores on two measures. They found normal scores on one measure and worse scores on another measure for 56% of balding male participants only. Therefore, “normal depression” is interpreted here. “Non validated” indicates study used only non-validated measures, often many single items (20+) assessing various experiences including dating experiences, treatment preferences, and personal confidence. We are unable to concisely summarize the results of these items here. “Non comparable” indicates study uses a measure where we cannot find any published norms to interpret scores and/or study fails to employ a sample of nonbalding participants to compare scores. Full results are synthesized in Frith and Jankowski (2021).

bUpjohn is a creator of a minoxidil treatment, Merck is the creator of Propecia® and Rogaine®, GlaxoSmithKline is the creator of Avodart®, Giuliani SpA is the creator of Bioscalin®, and the Tri Mil Trust/Institute of Trichologists offer a hair loss “treatment” clinic.

Notes:

n.r. = no participant information reported (e.g. age). The exact number of balding male participants are not reported in Girman et al. (1998). Authors note however that 30% of their male sample (total sample N = 273) were not balding. Some of Karaman et al.’s (2006) results are incomplete and only reported for both balding men (70%, n = 175) and nonbalding men (30%, n = 77) together. Fifteen participants (4%) in Wang’s et al. (2018) study were women (total sample N = 355) and their results are conflated with male balding participants (n = 340). Finally, the following studies divided their balding male participants into subgroups: Bade into (1) older (>31 years, n = 122) and (2) younger (21–3, n = 68); Cash (1992) into (1) modest balding (n = 63) and (2) extensive balding (n = 40); Danyal into (1) mild-moderate recession (n = 30, M = 22.3, SD = –) and (2) moderate–severe recession (n = 30, M = 23.97, SD = –); Gosselin into (1) weave (n = 103), weave-rejected (n = 50), and unconcerned (didn’t try weave, n = 51); Passchier into (1) completed questionnaire twice (current and retrospective views on baldness; n = 80; age M = 48.0, SD = 18.2) and (2) Current questionnaire only (n = 80, age M = 50.0, SD = 18.0); Sawar into (1) young (15–26 years; n = 23) and older (26+ years; n = 14); and Wells into (1) semi bald (n = 60, age M = 36.1, SD = 13.2) and (2) severer bald (n = 62, M = 37.3, SD = 12.8).

Key findings are reported when a study deployed a validated assessment and a nonbalding comparator sample or there were available published norms meaning balding male participant scores could be meaningfully interpreted. “Worse” indicates the study’s balding male participant had significantly worse scores on that construct compared to published norms or a comparable non balding participant sample. “Normal” indicate the study’s balding male participants had similar or better scores on the construct. Some studies used multiple assessments of the same constructs, here only the dominant finding is reported for example, Rahimi-Ardabili et al. (2006) assessed depression scores on two measures. They found normal scores on one measure and worse scores on another measure for 56% of balding male participants only. Therefore, “normal depression” is interpreted here. “Non validated” indicates study used only non-validated measures, often many single items (20+) assessing various experiences including dating experiences, treatment preferences, and personal confidence. We are unable to concisely summarize the results of these items here. “Non comparable” indicates study uses a measure where we cannot find any published norms to interpret scores and/or study fails to employ a sample of nonbalding participants to compare scores. Full results are synthesized in Frith and Jankowski (2021).
Table 1. (Continued)

1^N/A = not applicable, manuscript does not discuss treatments.
2^The Dermatology Quality of Life Index (DLQI; Finlay and Khan, 1994) assesses quality of life specific to dermatological conditions and is sometimes used to assess hair loss specific quality of life.
3^The Hair-specific Skindex-29 (Han et al., 2012) assess quality of life specific to hair loss.
4^The first author, Bade et al. (2016), of the research was a dermatologists providing baldness services at the time according to his dermatologist profile on Practo.com which states he has 10 years' experience (Bade, n.d.). It appears the Journal of Medical Science and Clinical Research did not require disclosures.
5^The author, Ghitire (2018), of the research was a hair transplant surgeon according to his dermatological clinic employer: “[He is] one of the pioneers in hair transplant surgery in Nepal who completed more than 1000 hair transplantation cases in more than 5 years of experience in Nepal” (Kavaran, n.d.: 12). In J Nepal Med Assoc the author indicates he has no conflicts of interest.
6^Four of the six authors of the research (Gonul et al., 2018) list their affiliation to a dermatology clinic. Currently this clinic offers baldness interventions (Dışkapı Yıldırım Beyazıt Training and Research Hospital, 2020). The authors declare they have no conflicts of interest in the journal: Anais Brasileiros de Dermatologia.
7^Gupta et al. (2019) was a hair transplant surgeon at the time of the research according to his dermatologist profile on Practo.com stating he has 11 years' experience providing services including baldness interventions (Gupta, n.d.). The authors declare no financial support, sponsorship, or conflict of interest in the journal: International Journal of Trichology.
8^The fourth author, Hoon Kang, of the research (Han et al., 2012) lists their affiliation to The Catholic University of Korea. On their webpage Kang is listed as providing “quick treatments” including “hair implants” (The Catholic University of Korea, n.d.: 5–6). The authors do not declare this, instead only acknowledging funding from the Korean Dermatological Association.
9^Multiple authors of the research (Karaman et al., 2006) list their affiliations to the dermatology department of Adnan Menderes University. It is unclear if this department offered any baldness interventions at the time. However, the first author, Gökşun Karaman indicates she has privately offered baldness interventions since at least 2016 (Karaman, n.d.). It appears the journal: International Journal of Dermatology did not require disclosures.
10^The third author, Xingdong Li, of the research (Liu et al., 2016) provided hair transplants as indicated by his stated affiliation to the “Kafuring Hair Transplant Hospital” and also as he is described, elsewhere, as the founder of a chain of 33 hair transplant hospitals in China (Barley Microneedle Hair Transplant Hospital, n.d.). The authors specifically note, however, that “None of the authors has a financial interest in any of the products or devices mentioned in this manuscript.” (p. 1441) in the journal: Journal of Cosmetic Dermatology.
11^The third author, Rinaldi (n.d.), of the research (Maffei et al., 1994) provided baldness interventions according to his CV which states he has almost 40 years of experience of trichology-related outpatient and surgical experience. In addition, he is currently the head of research and development of Guilliana-SpA a pharmaceutical company that produces baldness interventions (Rinaldi, n.d.). It appears the journal: Arch Dermatol did not require disclosures.
12^All authors of the research (Mubki et al., 2019) list their affiliations to dermatology clinics that “[provide] baldness and aesthetic treatments” (p. 31). The third author also cowrote a paper urging dermatologists to promote their cosmetic interventions including hair transplants to the wider public: “The responses demonstrate that the Saudi Arabian public is not aware of the full scope and practice of dermatologic surgery, especially as it pertains to cosmetic procedures. Therefore, this lack of knowledge must be addressed” (AlHargan et al., 2017: 6). The authors declare no conflicts of interest in the journal: Egyptian Journal of Dermatology and Venerology.
13^Three of the authors of the research (Russo et al., 2019) list their affiliation to a dermatology clinic. Currently this clinic provides baldness interventions (S. Orsola-Malpighi Polyclin, n.d.). The authors declare no conflicts of interest in the journal: Journal of the European Academy of Dermatology and Venerology.
14^Three of the authors of the research (Sawant et al., 2010) list their affiliation to a dermatology clinic. Currently this clinic provides baldness interventions (King Edward Memorial Hospital, n.d.). The authors declare no conflicts of interest in the International Journal of Trichology.
15^The second author, Dr. Shahbaz Aman, of the research (Tahir et al., 2013) is currently listed by a medical database (Ola Doc, n.d.) as having 28 years' experience as a dermatologist and as providing baldness interventions. The journal: Annals of King Edward Medical University does not appear to require disclosures.
16^Multiple authors of the research (Tang et al., 2000) list their affiliation to the National Skin Centre. Currently, this center provides baldness interventions (National Skin Centre, n.d.). In the author(s)' acknowledgements section of the journal: Singapore Medical Journal this probable conflict of interest is not acknowledged.
et al., 1995) In total these eight studies were deemed likely baldness commercial conflict of interest free.

Studies that likely had conflict of interests

Fifteen studies (41%) reported some commercial funding (or commercial incentives: Kranz, 2011) from companies that sold baldness products (e.g. Merck, The Upjohn Company, etc.; Alfonso et al., 2005; Budd et al., 2000; Cash, 1992, 2009; Cash et al., 1993; DeMuro-Merccon et al., 2000; Girman et al., 1998; Gosselin, 1984; Lulic et al., 2017; Passchier et al., 1988, 1989, 2006; Tabolli et al., 2013; van der Donk et al., 1991).

A further 14 studies (38%) very probably had at least one (co)author who directly (e.g. as a dermatologist or hair transplant surgeon) or indirectly (via their employer) provided baldness interventions at the time of the research. Seven of these studies appeared to contravene the disclosure requirements of their respective journals by not declaring these potential conflicts of interest. The journals were: Journal of Nepal Medical Association (Ghimire, 2018), Anais Brasileiros de Dermatologia (Gonul et al., 2018), International Journal of Trichology (Gupta et al., 2019), Journal of Cosmetic Dermatology (Liu et al., 2018), Egyptian Journal of Dermatology and Venereology (Mubki et al., 2019), Journal of the European Academy of Dermatology and Venereology (Russo et al., 2019), and International Journal of Trichology (Sawant et al., 2010). Perhaps indicating changing disclosure standards, the remaining studies appeared to publish in journals that did not require disclosures (Bade et al., 2016; Han et al., 2012; Karaman et al., 2006; Maffei et al., 1994; Molina-Leyva et al., 2016; Tahir et al., 2013; Tang et al., 2000). Perhaps the most explicit example of a hidden conflict of interest was from Liu et al. (2016: 1441) who stated in the Journal of Cosmetic Dermatology that “None of the authors has a financial interest in any of the products or devices mentioned in this manuscript.” However the study is co-authored by Xingdong Li, a hair transplant surgeon as indicated by his stated affiliation to the “Kafuring Hair Transplant Hospital” (Liu et al., 2016: 1441) and also as he is the founder of a chain of 33 hair transplant hospitals in China (Barley Microneedle Hair Transplant Hospital, n.d.). Thus Li explicitly does have a financial interest in hair transplant products and indeed could gain financially from any balding men reading his (co)authored work that states “Hair transplantation significantly elevated self-esteem level and increased satisfaction with appearance of AGA patients” (p. 1441) and “Cosmetic surgery is an effective way to improve patients’ appearance and psychological state” (p. 1446). Full details of these potential conflicts of interest and their disclosure is in Table 1.

To summarize, of the 37 studies, 29 (78%) likely had explicit conflicts of interest in that their funding or incentives were provided by a company who profited from the sale of baldness products or they were (co)authored by an individual whose employer provided baldness interventions.

Is baldness defined as a medical problem?

Five studies (14%) fully medicalized baldness referring to it as a disease (Passchier et al., 1989; Rahimi-Ardabili et al., 2006; Russo et al., 2019; Sawant et al., 2010; Tahir et al., 2013). Sixteen studies (43%) moderately medicalized baldness where they referred to it as a disorder or condition, participants as patients (even if not recruited in a medical setting) and/or described baldness as having an underlying genetic or hormonal basis (Bade et al., 2016; Budd et al., 2000; Cash, 2009; Danyal et al., 2018; Ghimire, 2018; Girman et al., 1998; Gupta et al., 2019; Han et al., 2012; Karaman et al., 2006; Kranz, 2011; Liu et al., 2018; Lulic et al., 2017; Maffei et al., 1994; Mubki et al., 2019; Tabolli et al., 2013). Six studies (16%) mildly medicalized baldness where it was not defined as a disease, condition or disorder but medical terms were used as context to baldness
such as “diagnosis,” “treatments,” or “suffering from” (Camacho and García-Hernández, 2002; Molina-Leyva et al., 2016; Passchier et al., 1988, 2006; van der Donk et al., 1991; Wang et al., 2018).

Ten studies (27%) did not medicalize baldness (Cash, 1992; Cash et al., 1993; DeMuro-Mercon et al., 2000; Franzoi et al., 1990; Gonul et al., 2018; Gosselin, 1984; Tabolli et al., 2013; Tang et al., 2000; Tas et al., 2018; Wells et al., 1995; Yamazaki et al., 2011). Six simply did not define baldness. Four included an acknowledgement that baldness was not a disease. Three did this explicitly. Specifically, Gonul et al. (2018: 651) noted that baldness “is biologically benign and is not a disease in the conventional sense,” Tang et al. (2000: 204) noted “it is not a disease in the medical sense of the word,” and Yamazaki et al. (2011: 773) noted that baldness “is not involved in systemic diseases.” One final study was more suggestive about the potential non-disease status of baldness, noting “it is a frequent complaint among adults, which mostly leads to cosmetic consequences” (Tas et al., 2018: 185).

Are intervention-orientated participants recruited?

One study (3%) did not report enough sampling details to determine if their participants were intervention orientated (n = 175; Karaman et al., 2006). Twenty-five studies (68%) representing 6,240 participants (59% of the entire sample) recruited participants who were explicitly seeking or undergoing interventions for baldness whether transplant, pharmaceutical, or cosmetic product (see Table 1). Participants from these studies were largely recruited from a dermatology clinic (e.g. Gonul et al., 2018) or through their interest in a minoxidil trial as advertised in local media (Passchier et al., 1988, 1989). Therefore, these participants were more likely to be baldness distressed than other bald men who did not take part in these studies.

Eleven studies (30%) recruited participants regardless of interest in baldness interventions forming a less biased assessment of the impact of baldness. Five of these samples were typically large, amounting to 3,604 participants (22% of the total participants) and were recruited in order to form a population representative sample (Alfonso et al., 2005; Budd et al., 2000; DeMuro-Mercon et al., 2000; Girman et al., 1998; Tang et al., 2000). The remaining six studies recruited participants through convenience sampling, and ostentatiously not because they were actively seeking or undergoing interventions (Cash, 1992; Danyal et al., 2018; Franzoi et al., 1990; Kranz, 2011; Passchier et al., 2006; Wells et al., 1995). These samples amounted to 565 participants (5% of the total sample). For example, two studies recruited participants observed by the researchers to have baldness (from a dermatology clinic but only if they attended for non-baldness related issues; Passchier et al., 2006 and from an airport; Franzoi et al., 1990). These 11 studies comprised a less biased assessment of baldness’ impact given most balding men do not seek out interventions (Alfonso et al., 2005; DeMuro-Mercon et al., 2000; Kranz, 2011; Tang et al., 2000).

Does this psychosocial impact research recommend commercial interventions?

More than a third of the studies (n = 14) did not make explicit intervention recommendations. Perhaps this was because of the brevity of the papers (Camacho and García-Hernández, 2002; DeMuro-Mercon et al., 2000; Franzoi et al., 1990; Ghimire, 2018; Girman et al., 1998; Gonul et al., 2018; Gosselin, 1984; Karaman et al., 2006; Passchier et al., 1988, 1989; Rahimi-Ardabili et al., 2006; Sawant et al., 2010; van der Donk et al., 1991; Wells et al., 1995). It would be a mistake nonetheless to consider these studies free of intervention implications as some were evaluation studies and reported beneficial effects of the intervention, even unduly. For example, Passchier et al. (1988) reported non-significant results as if
they were significant in their abstract (which is more often read than the body of the paper) for minoxidil: “More psychological improvement, with regard to hair problems, social discomfort, and self-esteem occurred in the minoxidil group than in the placebo group.” (p. 441) despite the results actually showing two or all (given the low t value) of these three benefits were non-significant (“the responders were more improved than the nonresponders with respect to self-esteem (t(83) = 1.87, p < 0.05), overall social discomfort (a trend: p < 0.10) and hair problems (NS)” (p. 444).

Of the remaining studies that recommended interventions (n = 23), one study was alone in advocating psychological therapy instead of cosmetic or other interventions on the basis that men who accepted their baldness showed less distress (4%; Kranz, 2011: 347): “Responsible practitioners and dermatologists might be correct when hesitating to medically or even surgically treat balding in young men. They should rather encourage their patients to come to terms with their baldness – not least because of limited treatment options on the one side and patient’s high expectations about treatment outcomes on the other side.”

Five studies (22%) explicitly advocated counseling or contact with a professional psychologist but only as an adjunct to commercial (cosmetic or surgical) interventions (Mubki et al., 2019; Russo et al., 2019; Tahir et al., 2013; Tas et al., 2018; Wang et al., 2018). Ten studies (43%) advocated psychological support as an adjunct to commercial interventions but not from a professional psychologist or counselor (Bade et al., 2016; Cash, 1992, 2009; Cash et al., 1993; Danyal et al., 2018; Gupta et al., 2019; Han et al., 2012; Lulic et al., 2017; Molina-Leyva et al., 2016; Tabolli et al., 2013). The psychological support recommended was typically poorly defined (e.g. “an empathic understanding of these patients’ concerns is essential to effective management”; Cash, 1992: 930 and “Psychosocial measures need to be installed”; Danyal et al., 2018: 406). One of the few more concrete suggestions was “a brief, structured patient questionnaire” to screen participants (Cash, 2009: 1819) however no further recommendations indicated what practitioners should do after screening balding men (e.g. whether to refuse them intervention). Other studies (e.g. Lulic et al., 2017) noted physicians should make time for discussions with men affected psychologically, usually in terms of intervention expectations and decisions (i.e. not necessarily dealing with psychosocial issues and assuming intervention is the correct approach). Furthermore, some of these studies recommended or implied commercial interventions were the routes to resolve psychological issues associated with baldness (Cash, 1992; Danyal et al., 2018; Han et al., 2012). For example: “Cosmetic treatments may also be used as a remedy for the psychological concern arising due to baldness” (Danyal et al., 2018: 406).

Seven studies (30%) explicitly recommended commercial interventions. This was unspecified as just “treatments” (Alfonso et al., 2005; Maffei et al., 1994; Passchier et al., 2006), surgery, drug therapy, wigs, and hair styling (Budd et al., 2000), cosmetic surgery (Liu et al., 2018), finasteride and minoxidil (Tang et al., 2000), and finasteride (Yamazaki et al., 2011). Commercial interventions were occasionally implicitly recommended: “The present study suggests that oral finasteride improves the QOL of patients but does not necessarily alleviate their anxieties. The guidelines for the treatment of AGA should take account of the patients’ QOL” (Yamazaki et al., 2011: 777). More often this was explicit. For example, Passchier et al. (2006: 228) noted: “For those who have problems, a prompt communication between the man and a dermatologist should be encouraged after the discovery, as there are now effective treatment options available for baldness and the earlier the treatment, the better.”

Does this psychosocial impact research acknowledge intervention limitations?

Of the 25 studies that included a reference to interventions, eight (32%; Bade et al., 2016; Cash, 2009; Kranz, 2011; Lulic et al., 2017;
Molina-Leyva et al., 2016; Mubki et al., 2019; Passchier et al., 1989; Rahimi-Ardabili et al., 2006) gave some space to reporting limitations (e.g. cost, potential inefficacy, or side effects). This was usually less space than intervention benefits, but it was nonetheless more than other studies. For example, in their introduction Bade et al. (2016: 12900) noted “In many cases the results of treatment are unsatisfactory while on the other hand, people have high expectations, hence counselling is very important in these cases.” Kranz (2011) and Mubki et al. (2019) noted the general limitations of interventions, Lulic et al. (2017) assessed the importance of “potential side effects” (unspecified) and cost of interventions on decision making, Molina-Leyva et al. (2016) reported on the sexual dysfunction side effects of finasteride, Passchier et al. (1989: 12) acknowledged a “transient and partial libido loss” in 9.4% of participants who had taken minoxidil and Rahimi-Ardabili et al. (2006) reported on the side effects of finasteride. Finally, Cash (2009: 1818) reported that previous research had found finasteride and minoxidil efficaciousness was only “relatively high.”

Three studies acknowledged intervention limitations but only for fringe or historical interventions in contrast to finasteride, minoxidil, or surgery (12%; Gupta et al., 2019; Han et al., 2012; Tang et al., 2000). For example, Tang et al. (2000: 405) noted the potential ineffectiveness and cost of interventions but only of “herbs, hair centers. . .[and] traditional Chinese medicine” and instead advocated for the “effective help available (e.g. topical minoxidil(16) or oral finasteride(17)).” Han et al. (2012: 317) warned against “inappropriate and unproven therapies that are available in nonmedical settings. . . Therefore, it is necessary to provide patients with correct information that is medically approved.” Gupta et al. (2019: 150–151) acknowledged that the “history of the treatment of AGA has more than its fair share of trichocquackery,” but continued to advocate for commercial interventions.

Fourteen studies did not report any limitations when mentioning interventions (56%; Alfonso et al., 2005; Budd et al., 2000; Camacho and García-Hernández, 2002; Cash, 1992; Cash et al., 1993; Danyal et al., 2018; Liu et al., 2018; Maffei et al., 1994; Passchier, 1998; Passchier et al., 2006; Tas et al., 2018; van der Donk et al., 1991; Wang et al., 2018; Yamazaki et al., 2011). These studies implied commercial interventions were universally beneficial and the default, responsible, response to baldness (e.g. by assessing how much awareness men had around interventions, Budd et al., 2000) and urged future to research to explore what “is needed into the factors affecting men’s willingness to seek treatment for baldness” (Alfonso et al., 2005: 1835). Other studies noted only benefits of these commercial interventions: “Consequently, an improvement in alopecia induced by medical treatment could reduce the psychopathologic reactive symptoms by restoring the body image and its interpersonal correlates” (Maffei et al., 1994: 871) and “Cosmetic surgery is an effective way to improve patients’ appearance and psychological state” (Liu et al., 2018: 1446).

**Discussion**

Commercial influences on health are increasingly widespread (de Lacy-Vawdon and Livingstone, 2020; Kickbusch et al., 2016) and psychology’s facilitation of this has come under recent scrutiny (Cosgrove and Wheeler, 2013; Marks and Buchanan, 2020; Ogden, 2019; Pelosi, 2019). The medicalization of baldness represents another way psychology facilitates commercial influences of health, through the claim that baldness is psychologically devastating and thus comprises a medical disorder requiring commercial interventions to remedy (Conrad, 2007; Harvey, 2013; Jankowski, 2014; Moynihan et al., 2002). This study sought to systematically explore the mechanisms through which baldness is medicalized in research assessing its psychosocial impact.

**The dominance of baldness commercial conflicts of interest**

The medicalization of baldness may arise indirectly from commercial conflicts of interest...
where the framing of baldness, the implications, and the conclusions in research are more commercially favorable. Analyses of dermatology research (Batalla et al., 2011; Perlis et al., 2005; Williams et al., 2006) and other research (Cosgrove and Wheeler, 2013; Lundh et al., 2017) shows commercial influences are significantly related to results and recommendations that promote commercial interventions. This is supported by one baldness study’s candid admission that commercial influence means one will “present a [less] balance[d] picture of the likely effects of treatment” (Passchier et al., 1989: 330). Most studies had commercial conflicts of interest (n = 29; 78%), although 11 of these studies did not disclose, confirming previous reports that regulation (such as disclosure) is minimal or ineffective (Anstey, 2018; Batalla et al., 2011; Cosgrove and Wheeler, 2013; John et al., 2019; Stoll et al., 2020). One common commercial funder of the research is Merck who have created fake academic journals, have forced researchers to sign gagging clauses and have made extensive efforts to hide product side effects (Edwards, 2009; Goldacre, 2012; Levine, 2019). However, pharmaceutical bodies are not the only vested interests in this research. Notably many of the authors provide baldness services themselves (e.g. transplants). Commercial conflicts of interest pervade baldness media and forums (Cosmeticium, 2019; Harvey, 2013; Rockn routlaw, 2019) healthcare (Fabbri et al., 2017; Goldacre, 2012) and psychology (Conrad, 2007; Cosgrove and Wheeler, 2013). The commercial funding behind most of this research compellingly demonstrates corporate determination of health, a challenge to health psychology’s aims of promoting a healthier society.

**The disease framing of baldness**

Just three studies had an explicit acknowledgement that baldness was not a disease. The rest either did not define baldness or, directly, medicalized it (e.g. definitionally). The importance of the use of medicalized language is demonstrated by a recent review (Nickel et al., 2017) which found that when more medicalized or specific terms were deployed, individuals were more favorable to invasive diagnoses or interventions and rated the condition as more severe and experienced more anxiety. The disease framing of baldness is one key direct mechanism in which corporations are determining health, in this case misrepresenting baldness as a disease.

**The dominance of intervention-orientated participants**

Of the studies reporting sample details, the majority (67%) recruited male participants who were already seeking baldness services or products. Whilst this may have been for pragmatic reasons, these participants may also be: “more concerned about the impact of alopecia on their everyday life [relative to other balding men]” as some acknowledged (Molina-Leyva et al., 2016: 46). However, research on representative samples of balding men has found between 75% and 95% have not used or sought baldness interventions previously (Alfonso et al., 2005; DeMuro-Mercon et al., 2000; Kranz, 2011; Tang et al., 2000). By using balding men who are already seeking intervention, and thus more likely to be distressed than balding men not seeking interventions (given distress in representative sample studies is relatively low; e.g. Alfonso et al., 2005; Kranz, 2011), the research indirectly medicalizes baldness by associating it with profound psychological distress requiring medical “treatments” to remedy.

**Commercial interventions might themselves induce poor quality of life**

Of the studies that made an intervention recommendation (n = 24), 96% recommended commercial (cosmetic, pharmaceutical, or surgical) interventions. This is notable since this research is designed to assess the psychosocial impact of baldness, often on the presumption this is profound, and yet only one study recommended psychosocial interventions (Kranz, 2011). Of the studies discussing interventions (n = 30),
just eight (27%) including any acknowledge-
ment of the limitations inherent in these inter-
ventions (albeit briefly). The remainder of the
studies discussed interventions uncritically giv-
ing all or most of the space to discussing their
benefits. This biased intervention portrayal
indirectly medicalizes baldness by promoting
commercial interventions as life-saving bald-
ness “treatments”. This is concerning since all
interventions, including regulatory-approved
ones (finasteride and minoxidil), can be ineffi-
cacious, harmful, and expensive (NICE, 2018).
Surgery carries risk of infection and evidence
mounts for the existence of “postfinasteride
syndrome” (Diviccaro et al., 2020; Ganzer
and Jacobs, 2018; Ganzer et al., 2015) which refers
to the profound and irreversible sexual, mental,
and unwanted appearance changes (e.g. develop-
ment of male breast tissue) some men experi-
ence even after no longer taking finasteride. A
concerted effort to discredit men reporting these
side effects has been noted (Diviccaro et al.,
2020; Ganzer et al., 2015; Rahimi-Ardabili
et al., 2006).

Whilst baldness distress is overstated in
research and elsewhere (Frith and Jankowski,
2021; Harvey, 2013), a minority of balding
men may be significantly distressed. It is pos-
sible commercial baldness interventions, if
safely administered and monitored, provide
meaningful benefits to these men. Nonetheless,
bald men should be offered a menu of
responses, including not intervening, when
considering their baldness. In addition, it is
important that robust psychological work
which seeks to understand, and alleviate, this
distress is available. As Peled (2004: 1) notes,a medical professional who himself is bald:
“Certainly, the safest and least invasive way to
address the psychosocial impact of baldness is
through psychosocial counselling.” This might
include psychosocial interventions to promote
appearance acceptance (e.g. via FaceIt@ Home, Bessell et al., 2012, https://www.facei-
tonline.org.uk/).

It is possible that medicalization of baldness
itself causes distress rather than baldness per se.
Kranz (2011) found balding men who did not
seek commercial interventions for their baldness
were statistically less distressed than those who
did. The harmful effects of some interventions,
notably finasteride, may induce distress among
balding men that was not present before, directly
through side effects and indirectly via the way
they are promoted (by portraying baldness as an
isolating and suicide-inducing condition tying
into a wider ‘appearance potent’ culture that
includes the valorization of a full head of hair;
Harvey, 2013; Jankowski et al., 2014). In other
words, distress may occur because of this cul-
ture rather than baldness itself and thus, notably,
not be alleviated by baldness products or ser-
VICES but rather wider, cultural, change. Other
tentative support that medicalization promotes
baldness distress comes from the acknowledg-
ment from cosmetic and baldness professionals
(British Association of Plastic Reconstructive
and Aesthetic Surgeons, n.d.) that some young
men are becoming distressed from balding, that
they do not have, due to aggressive social mar-
keting of commercial interventions, and that
balding men may experience less distress at the
moment of discovering their baldness than later
on (e.g. Alfonso et al., 2005) potentially because
they are not yet exposed to pervasive baldness
medicalization.

**Limitations**
The data reviewed was based on the published
literature. Medicalization occurs outside of this
(not least in unpublished and published informa-
tion sources such as gray literature, anti-
baldness product reviews, social media, etc).
For example, Dorfman et al. (2018) found that
the majority of plastic surgery social media
posts by cosmetic surgeons were explicitly self-
promotional (67%) rather than educational
(33%) and the regulation of this is minimal
(British Association of Hair Restoration
Surgeons, n.d.). The assessment of medicaliza-
tion should seek to document and challenge
this. Further we have not tracked medicaliza-
tion in relation to the development and release
of baldness products (such as the development
of finasteride, hair transplants, etc.) through
research, which is the research balding men are more likely to access (Harvey, 2013).

**Conclusion**

The results of this review show systematically that the research assessing the psychosocial impact of balding on men is largely conducted by those with commercial vested interests in baldness products and services and this research medicalizes baldness by defining it as a disease, via selective sampling of “intervention-oriented” men, and through the implicit and explicit advocacy of cosmetic and pharmaceutical products/services. Such medicalization, through psychosocial research, often by psychology authors, must be challenged if balding men are to provide informed consent in responding to their baldness.

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**ORCID iD**

Glen S Jankowski https://orcid.org/0000-0003-0349-9356

**Supplemental material**

Supplemental material for this article is available online.

**Notes**

1. This refers to the “transformation of ordinary processes of life into medical phenomena [through] the invisible and unregulated attempts to change public perceptions about health and illness to widen markets” (Moynihan et al., 2002: 898–900). Medicalization was first identified in the 1970s by sociologists and disability rights activists (Conrad, 2007; Zola, 1972). Key examples of medicalization include mental disorders that have limited evidence bases (Cosgrove and Wheeler, 2013), non-complicated childbirth and appearance “defects” (Conrad, 2007). Medicalization has been criticized for being poorly specified and for pathologizing expansions in medicine as inherently harmful; criticisms that are addressed by Conrad et al. (2010) and Hofmann (2016).

2. Similar, albeit qualified, statements are made in other guidance. For example, the patient information leaflet guidance from the British Association of Dermatologists (2016a: 1) notes “Hair loss may cause significant psychosocial difficulties” and guidance from the Asian Consensus Committee (Lee et al., 2013: 1029) notes: “Androgenetic alopecia is often associated with a poor self-image and low self-respect.” Neither statement cites evidence.

3. Alfonso et al.’s (2005) findings are further misrepresented in the guidance by noting that: “Men who treated their baldness successfully reported psychosocial benefits with improvements for self-esteem and personal attractiveness” (Kanti et al., 2018: 2). This fails to note that 38%–80% of Alfonso et al.’s (2005) participants did not “treat baldness successfully”. Even among those who did, many (37%–62%) did not report psychosocial benefits.

4. This depiction is bolstered by research on balding stigmatization; some of which supports the idea that baldness is associated with some negative connotations (such as aging), while some show neutral or positive connotations (for a review see: Henss, 2001). This campaign and research promotes the idea baldness needs to be changed rather than stigma and fails to account for research showing baldness stigma may not translate into meaningful behaviors (Sigelman et al., 1990), may be mitigated when individuating information about the balding person is available (Kranz et al., 2019) or by other aspects of appearance such as facial hair or glasses (Blaker et al., 2020; Muscarella and Cunningham, 1996).

5. Table 1 lists these key findings from the research and a fuller synthesis of findings is available in Frith and Jankowski (2021).

6. The AXIS tool is a widely used risk of bias assessment that is appropriate for cross-sectional studies. It was developed via a systematic review of existing tools, a Delphi survey, and expert consultation (Downes et al., 2016).
It is open access, has accessible guidance and is flexible in allowing modifications. Key tool criteria include whether the sample size is justified, whether attrition is noted and whether basic data is adequately described. The overall quality score of each study is presented in Table 1 and full details of each criteria are provided in our supplemental file: https://docs.google.com/spreadsheets/d/1-qg34Q_ejA7xkHshS-Basb3omvcbe4Q5RUOc90-e3KA/edit?usp=sharing

7. All potential conflicts of interests involve (co)authors of the research where publicly available information indicates they or their employer currently provides baldness interventions. It is likely this was also true at the time the studies were published given (a) some studies list the employer as the authors’ affiliation (Gonul et al., 2018; Han et al., 2012; Karaman et al., 2006; Liu et al., 2018; Mubki et al., 2019; Russo et al., 2019; Sawant et al., 2010; Tang et al., 2000), (b) some profiles of the (co)authors explicitly indicate years of experience that precedes the study publication dates (Bade et al., 2016; Ghimire, 2018; Gupta et al., 2019; Maffei et al., 1994; Molina-Leyva et al., 2016; Tahir et al., 2013), and (c) most of these studies were published relatively recently (since 2010; two studies were not; Maffei et al., 1994; Tang et al., 2000).

8. In this context, research focusing on the genetic and hormonal basis of baldness can be read as medicalizing because the research fails to note—as Conrad (2002) points out—how other aspects of the body may have genetic or hormonal bases though this does not make them a disease (e.g. eye color or moderate mood fluctuations).

References
Alfonso M, Richter-Appelt H, Tosti A, et al. (2005) The psychosocial impact of hair loss among men: a multinational European study. Current Medical Research & Opinion 21(11): 1829–1836.
AlHargan AH, Al-Hejin NR and AlSufyani MA (2017) Public perception of dermatologic surgery in Saudi Arabia: An online survey. Dermatology Online Journal 23(5): 1–7.
Allied Analytics LLP (2019) Hair restoration services market by service type, gender, and service provider: Global opportunity analysis and industry forecast, 2019–2026. Available at: https://www.researchandmarkets.com/reports/4844574/hair-restoration-services-market-by-service-type (accessed 13 February 2021).
Anstey A (2018) Our judgement is influenced by conflict of interest. British Journal of Dermatology 178(6): 1229–1232.
Bade R, Bhosie D, Bhagat A, et al. (2016) Impact of androgenic alopecia on the quality of life in male subjects: Results of an observational study from tertiary care hospital. Journal of Medical Science and Clinical Research 4(10): 12900–1207.
Barley Microneedle Hair Transplant Hospital (n.d.) About us. Available at: https://www.barleyhair.com/about-us/ (accessed 10 May 2021).
Batalla A, García-Doval I, Aranegui B, et al. (2011) Who funds research by Spanish dermatologists? Comparative analysis of articles published in 2008. Actas Dermo-Sifiliográficas (English Edition) 102(7): 517–526.
Bero L (2017) TRD Lisa Bero interview transcript. Available at: /trd-lisa-bero-interview-transcript (accessed 30 April 2021).
Bessell A, Brough V, Clarke A, et al. (2012) Evaluation of the effectiveness of Face IT, a computer-based psychosocial intervention for disfigurement-related distress. Psychology, Health & Medicine 17(5): 565–577.
Blaker NM, Spisak BR, Tybur JM, et al. (2020) Cue masking and cultural signals: Testing context-specific preferences for bald(ing) leaders. Journal of Experimental Social Psychology 88: 103936.
Blumeyer A, Tosti A, Messenger A, et al. (2011) Evidence-based (S3) guideline for the treatment of androgenic alopecia in women and in men. Journal der Deutschen Dermatologischen Gesellschaft = Journal of the German Society of Dermatology: JDDG 9(Suppl 6): S1–S57.
British Association of Dermatologists (2016a) Male pattern hair loss (Androgenetic Alopecia). Available at: https://www.bad.org.uk/shared/get-file.ashx?id=3831&itemtype=document (accessed 22 December 2020).
British Association of Dermatologists (2016b) Policy for declaring conflicts of interest for British Association of Dermatologists’ clinical guideline Authors. British Association of Dermatologists. Available at: https://www.bad.org.uk/shared/get-file.ashx?itemtype=document&id=3827 (accessed 10 May 2021).
British Association of Hair Restoration Surgeons (2019) HTS for MPHL / FPHL should not be considered cosmetic surgery: Position statement. Available at: https://www.bahrs.co.uk/content/large/documents/position_statements/htascosmeticctreatmentv3.pdf (accessed 15 October 2020).

British Association of Hair Restoration Surgeons (n.d.) BAHRS standards. Available at: https://www.bahrs.co.uk/about-us/bahrs-standards/ (accessed 22 December 2020).

British Association of Plastic Reconstructive and Aesthetic Surgeons (n.d.) Indications for hair transplant surgery. bapras.org.uk. Available at: https://www.bapras.org.uk/media-government/media-resources/press-releases/indications-for-hair-transplant-surgery (accessed 9 February 2021).

Budd D, Himmelberger D, Rhodes T, et al. (2000) The effects of hair loss in European men: A survey in four countries. European Journal of Dermatology: EJD 10(2): 122–127.

Camacho FM and García-Hernández M (2002) Psychological features of androgenetic alopecia. Journal of the European Academy of Dermatology and Venereology: JEADV 16(5): 476–480.

Cash TF (1992) The psychological effects of androgenetic alopecia in men. Journal of the American Academy of Dermatology 26(6): 926–931.

Cash TF (2009) Attitudes, behaviors, and expectations of men seeking medical treatment for male pattern hair loss: results of a multinational survey. Current Medical Research and Opinion 25(7): 1811–1820.

Cash TF (2010) Attitudes and practices of dermatologists and primary care physicians who treat patients for MPHL: Results of a survey. Current Medical Research and Opinion 26(2): 345–354.

Cash TF, Price VH and Savin RC (1993) Psychological effects of androgenetic alopecia on women: Comparisons with balding men and with female control subjects. Journal of the American Academy of Dermatology 29(4): 568–575.

Conrad P (2007) The Medicalization of Society: On the Transformation of Human Conditions into Treatable Disorders. Baltimore, MD: Johns Hopkins University Press.

Conrad P, Mackie T and Mehrotra A (2010) Estimating the costs of medicalization. Social Science & Medicine 70(12): 1943–1947.

Cosgrove L and Wheeler EE (2013) Industry’s colonization of psychiatry: Ethical and practical implications of financial conflicts of interest in the DSM-5. Feminism & Psychology 23(1): 93–106.

Cosmeticium (2019) Are hair transplantation reviews and comments reliable? Cosmeticium. Available at: https://cosmeticium.com/are-hair-transplantation-reviews-reliable/ (accessed 30 March 2020).

Craig R, Pelosi A and Tourish D (2020) Research misconduct complaints and institutional logics: The case of Hans Eysenck and the British Psychological Society. Journal of Health Psychology 26(2): 296–311.

Curtis A (2002) The century of the self. BBC Four. Available at: http://topdocumentaryfilms.com/the-century-of-the-self/ (accessed 9 October 2014).

Danyal M, Shah SIA and Hassan MSU (2018) Impact of androgenetic alopecia on the psychological health of young men. Pakistan Journal of Medical and Health Sciences 12(1): 406–410.

de Lacy-Vawdon C and Livingstone C (2020) Defining the commercial determinants of health: A systematic review. BMC Public Health 20(1): 1022.

DeMuro-Mercon C, Rhodes T, Girman CJ, et al. (2000) Male-pattern hair loss in Norwegian men: A community-based study. Dermatology (Basel, Switzerland) 200(3): 219–222.

Diviccaro S, Melcangi RC and Giatti S (2020) Postfinasteride syndrome: An emerging clinical problem. Neurobiology of Stress 12: 100209.

Dorfman RG, Vaca EE, Mahmood E, et al. (2018) Plastic surgery-related hashtag utilization on Instagram: Implications for education and marketing. Aesthetic Surgery Journal 38(3): 332–338.

Downes MJ, Brennan ML, Williams HC, et al. (2016) Development of a critical appraisal tool to assess the quality of cross-sectional studies (AXIS). BMJ Open 6(12): e011458.

Draper L (n.d.) Male pattern hair loss – Superdrug™ online doctor. Available at: https://onlinedoctor.superdrug.com/male-pattern-baldness.html (accessed 6 April 2020).

Edwards J (2009) Merck created hit list to ‘Destroy,’ ‘Neutralize’ or ‘Discredit’ dissenting doctors. CBS News. Available at: https://www.cbsnews.com/news/merck-created-hit-list-to-destroy-neutralize-or-discredit-dissenting-doctors/ (accessed 10 January 2019).
Fabbri A, Grundy Q, Mintzes B, et al. (2017) A cross-sectional analysis of pharmaceutical industry-funded events for health professionals in Australia. *BMJ Open* 7(6): 1–8.

Franzoi SL, Anderson J and Frommelt S (1990) Individual differences in men’s perceptions of and reactions to thinning hair. *The Journal of Social Psychology* 130(2): 209–218.

Frith H and Jankowski GS (2020) Psychosocial impact of androgenetic alopecia on men: A systematic review & meta analysis. *OSF*. Available at: https://osf.io/uvzp9 (accessed 15 December 2020).

Frith H and Jankowski GS (2021) Psychosocial impact of androgenetic alopecia on men: A systematic review & meta analysis. [Unpublished Manuscript].

Ganzer CA and Jacobs AR (2018) Emotional consequences of finasteride: Fool’s gold. *American Journal of Men’s Health* 12(1): 90–95.

Ganzer CA, Jacobs AR and Iqbal F (2015) Persistent sexual, emotional, and cognitive impairment post-finasteride: A survey of men reporting symptoms. *American Journal of Men’s Health* 9(3): 222–228.

Ghimire RB (2018) Impact on quality of life in patients who came with androgenetic alopecia for hair transplantation surgery in a clinic. *JNMA Journal of the Nepal Medical Association* 56(212): 763–765.

Girman CJ, Rhodes T, Lilly FR, et al. (1998) Effects of self-perceived hair loss in a community sample of men. *Dermatology (Basel, Switzerland)* 197(3): 223–229.

Goldacre B (2012) *Bad Pharma: How Drug Companies Mislead Doctors and Harm Patients*. London, UK: Fourth Estate.

Gonul M, Cemil BC, Ayvaz HH, et al. (2018) Comparison of quality of life in patients with androgenetic alopecia and alopecia areata. *Anais brasileiros de dermatologia* 93(5): 651–658.

Gosselin C (1984) Hair loss, personality and attitudes. *Personality and Individual Differences* 5(3): 365–369.

Gupta S, Goyal I and Mahendra A (2019) Quality of life assessment in patients with androgenetic alopecia. *International Journal of Trichology* 11(4): 147–152.

Han S-H, Byun J-W, Lee W-S, et al. (2012) Quality of life assessment in male patients with androgenetic alopecia: Result of a prospective, multicenter study. *Annals of Dermatology* 24(3): 311–318.

Harvey K (2013) Medicalisation, pharmaceutical promotion and the Internet: A critical multimodal discourse analysis of hair loss websites. *Social Semiotics* 23(5): 691–714.

Henss R (2001) Social perceptions of male pattern baldness. A review. *Dermatology and Psychosomastics/Dermatologie und Psychosomatik* 2(2): 63–71.

Hofmann B (2016) Medicalization and overdiagnosis: Different but alike. *Medicine, Health Care and Philosophy* 19(2): 253–264.

Jankowski GS (2014) Hair loss websites and research: A hard sell masquerading as support? *Journal of Aesthetic Nursing* 3(6): 294–295.

John LK, Loewenstein G, Marder A, et al. (2019) Effect of revealing authors’ conflicts of interests in peer review: Randomized controlled trial. *BMJ* 367: l5896.

Kanti V, Messenger A, Dobos G, et al. (2018) Evidence-based (S3) guideline for the treatment of androgenetic alopecia in women and in men – Short version. *Journal of the European Academy of Dermatology and Venereology: JEADV* 32(1): 11–22.

Karaman GC, Dereboy C, Dereboy F, et al. (2006) Androgenetic alopecia: Does its presence change our perceptions? *International Journal of Dermatology* 45(5): 565–568.

Kickbusch I, Allen L and Franz C (2016) The commercial determinants of health. *The Lancet Global Health* 4(12): e895–e896.

Kranz D (2011) Young men’s coping with androgenetic alopecia: Acceptance counts when hair gets thinner. *Body Image* 8(4): 343–348.

Kranz D, Nadarevic L and Erdfelder E (2019) Bald and bad? Experimental evidence for a dual-process account of baldness stereotyping. *Experimental Psychology* 66(5): 331–345.

Lee WS, Lee HJ, Choi GS, et al. (2013) Guidelines for management of androgenetic alopecia based on BASP classification – The Asian Consensus Committee guideline. *Journal of the European Academy of Dermatology and Venereology: JEADV* 27(8): 1026–1034.

Levine D (2019) U.S. court let Merck hide secrets about popular drug’s risks. *Reuters*, 11 September. Available at: https://www.reuters.com/investigates/special-report/usa-courts-secrecy-propecia/ (accessed 12 April 2020).
Liu F, Miao Y, Li X, et al. (2018) The relationship between self-esteem and hair transplantation satisfaction in male androgenetic alopecia patients. *Journal of Cosmetic Dermatology* 18(5): 1441–1447.

Liu LY, King BA and Craiglow BG (2016) Health-related quality of life (HRQoL) among patients with alopecia areata (AA): A systematic review. *Journal of the American Academy of Dermatology* 75(4): 806–812.

Lulic Z, Inui S, Sim W-Y, et al. (2017) Understanding patient and physician perceptions of male androgenetic alopecia treatments in Asia-Pacific and Latin America. *The Journal of Dermatology* 44(8): 892–902.

Lundh A, Lexchin J, Mintzes B, et al. (2017) Industry sponsorship and research outcome. *Cochrane Database of Systematic Reviews* 2(2): MR000033.

Maffei C, Fossati A, Rinaldi F, et al. (1994) Personality disorders and psychopathologic symptoms in patients with androgenetic alopecia. *Archives of Dermatology* 130(7): 868–872.

Marks DF and Buchanan RD (2020) *King’s College London’s Enquiry into Hans J Eysenck’s ‘Unsafe’ Publications Must Be Properly Completed*. London: SAGE Publications.

Molina-Leyva A, Caparros-Del Moral I, Gomez-Avivar P, et al. (2016) Psychosocial impairment as a possible cause of sexual dysfunction among young men with mild androgenetic alopecia: A cross-sectional crowdsourcing web-based study. *Acta Dermatovenerologica Croatica: ADC* 24(1): 42–48.

Moynihan R, Heath I and Henry D (2002) Selling sickness: The pharmaceutical industry and disease mongering. *BMJ: British Medical Journal* 324(7342): 886–891.

Mubki TF, Dayel SAB, AlHargan AH, et al. (2019) Quality of life and willingness-to-pay in patients with androgenetic alopecia. *Egyptian Journal of Dermatology and Venerology* 39(1): 31.

Muscarella F and Cunningham MR (1996) The evolutionary significance and social perception of male pattern baldness and facial hair. *Ethology & Sociobiology* 17(2): 99–117.

National Skin Centre (n.d.) Dermatologists. Nsc.Com. Available at: https://www.nsc.com.sg/patient-guide/our-doctors/pages/dermatologists.aspx (accessed 10 May 2021).

NHS (2018) Hair loss. Available at: https://www.nhs.uk/conditions/hair-loss/ (accessed 17 March 2020).

NICE (2018) Scenario: Management: Alopecia, androgenetic – Male. Available at: https://cks.nice.org.uk/topics/alopecia-androgenetic-male/management/management/ (accessed 30 December 2020).

Nickel B, Barratt A, Copp T, et al. (2017) Words do matter: A systematic review on how different terminology for the same condition influences management preferences. *BMJ Open* 7(7): e014129.

OlaDoc (n.d.) Prof. Dr. Shahbaz Aman—Dermatologist at Derma Laser Center (New Garden Town). OlaDoc.Com. Available at: https://oladoc.com/pakistan/lahore/dr/dermatologist/shahbaz-aman/1866 (accessed 10 May 2021).

Ogden J (2019) Do no harm: Balancing the costs and benefits of patient outcomes in health psychology research and practice. *Journal of Health Psychology* 24(1): 25–37.

Passchier J (1998) Quality of life issues in male pattern hair loss. *Dermatology (Basel, Switzerland)* 197(3): 217–218.

Passchier J, Van der Donk J, Dutrée-Meulenberg R, et al. (1988) Psychological characteristics of men with alopecia androgenetica and effects of treatment with topical minoxidil an exploratory study. *International Journal of Dermatology* 27: 441–446.

Passchier J, Rijpma SE, Dutrée-Meulenberg RO, et al. (1989) Why men with hair loss go to the doctor. *Psychological Reports* 65(1): 323–330.

Passchier J, Erdman J, Hammiche F, et al. (2006) Androgenetic alopecia: Stress of discovery. *Psychological Reports* 98(1): 226–228.

Peled JU (2004) Psychosocial counseling may be best treatment for hair loss. *American Family Physician* 69(6): 1362.

Pelosi AJ (2019) Personality and fatal diseases: Revisiting a scientific scandal. *Journal of Health Psychology* 24(4): 421–439.

Perlis CS, Harwood M and Perlis RH (2005) Extent and impact of industry sponsorship conflicts of interest in dermatology research. *Journal of the American Academy of Dermatology* 52(6): 967–971.

Rahimi-Ardabili B, Pourandarjani R, Habibollahi P, et al. (2006) Finasteride induced depression: A prospective study. *BMC Clinical Pharmacology* 6: 7.
Rocknroutlaw (2019) Forum update: Aug 19, 2019 – Upgrade coming. hairlosstalk.com. Available at: https://www.hairlosstalk.com/interact/threads/forum-update-aug-19-2019-upgrade-coming.124449/page-5 (accessed 30 March 2020).

Russo PM, Fino E, Mancini C, et al. (2019) HrQoL in hair loss-affected patients with alopecia areata, androgenetic alopecia and telogen effluvium: The role of personality traits and psychosocial anxiety. Journal of the European Academy of Dermatology and Venereology: JEADV 33(3): 608–611.

S. Orsola-Malpighi Polyclinic (n.d.) Dermatology [AOSP.bo.it]. Available at: http://www.aosp.bo.it/content/dermatologia-patrizi (accessed 10 May 2021).

Sawant N, Chikhalkar S, Mehta V, et al. (2010) Androgenetic alopecia: Quality-of-life and associated lifestyle patterns. International Journal of Trichology 2(2): 81–85.

Sigelman L, Dawson E, Nitz M, et al. (1990) Hair loss and electability: The bald truth. Journal of Nonverbal Behavior 14(4): 269–283.

Stoll M, Hubenschmid L, Koch C, et al. (2020) Voluntary disclosures of payments from pharmaceutical companies to healthcare professionals in Germany: A descriptive study of disclosures in 2015 and 2016. BMJ Open 10(9): e037395.

Tabolli S, Sampogna F, Pietro C, et al. (2013) Health status, coping strategies, and alexithymia in subjects with androgenetic alopecia. American Journal of Clinical Dermatology 14(2): 139–145.

Tahir K, Aman S, Nadeem M, et al. (2013) Quality of life in patients with androgenetic alopecia. Annals of King Edward Medical University 19(2): 150–150.

Tang PH, Chia HP, Cheong LL, et al. (2000) A community study of male androgenetic alopecia in Bishan, Singapore. Singapore Medical Journal 41(5): 202–205.

Tas B, Kulacaoglu F, Belli H, et al. (2018) The tendency towards the development of psychosexual disorders in androgenetic alopecia according to the different stages of hair loss: A cross-sectional study. Anais brasileiros de dermatologia 93(2): 185–190.

van der Donk J, Passchier J, Dutree-Meulenberg RO, et al. (1991) Psychologic characteristics of men with alopecia androgenetica and their modification. International Journal of Dermatology 30(1): 22–28.

Wang X, Xiong C, Zhang L, et al. (2018) Psychological assessment in 355 Chinese college students with androgenetic alopecia. Medicine 97(31): e11315.

Wells PA, Willmoth T and Russel RJH (1995) Does fortune favor the bald? Psychological correlates of hair loss in males. British Journal of Psychology 86(3): 337.

Williams HC, Naldi L, Paul C, et al. (2006) Conflicts of interest in dermatology. Acta Dermato-Venereologica 86(6): 485–497.

Yamazaki M, Miyakura T, Uchiyama M, et al. (2011) Oral finasteride improved the quality of life of androgenetic alopecia patients. The Journal of Dermatology 38(8): 773–777.

Zola IK (1972) Medicine as an institution of social control. The Sociological Review 20(4): 487–504.