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**Nowoczesne strategie oceny typów skóry i edukacji zdrowotnej
w dermatologii i kosmetologii**

Modern strategies for skin type assessment and health education
in dermatology and cosmetology

Rozprawa doktorska na stopień doktora
w dziedzinie nauk medycznych i nauk o zdrowiu
w dyscyplinie nauki o zdrowiu
przedkładana Radzie Dyscypliny Nauk o Zdrowiu
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Wykaz zastosowanych skrótów

α_{raw} – współczynnika α Cronbacha oparty na kowariancjach

α_{std} – współczynnika α Cronbacha oparty na korelacjach

AAD – (ang. *American Academy of Dermatology*) – Amerykańska Akademia Dermatologii

ACI – współczynnik zgodności ACI Gwet’a

Accuracy – dokładność

AI – (ang. *artificial intelligence*) – sztuczna inteligencja

AMA – (ang. *American Medical Association*) – Amerykańskie Stowarzyszenie Medyczne

ANN – (ang. *artificial neural networks*) – sztuczne sieci neuronowe

BSTI – Baumann Skin Type Indicator – czteroliterowy kod Baumann

BSTQ – Baumann Skin Type Questionnaire – kwestionariusz typu skóry Baumann

CNN – (ang. *convolutional neural networks*) – konwolucyjne sieci neuronowe

COVID-19 – (ang. *coronavirus disease 2019*) – choroba zakaźna układu oddechowego wywołana zakażeniem wirusem SARS-CoV-2

DL – (ang. *deep learning*) – głębokie uczenie

G6 – współczynnik rzetelności Lambda 6 Guttmana

ICC3 – (ang. *Intraclass Correlation Coefficient*) – współczynnik korelacji wewnątrzklasowej

M – (ang. *Mean*) – średnia

ML – (ang. *machine learning*) – uczenie maszynowe

OECD – (ang. *Organisation for Economic Co-operation and Development*) Organizacja Współpracy Gospodarczej i Rozwoju

PRISMA – (ang. *Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) – wytyczne dotyczące raportowania wyników badań dla przeglądów systematycznych i metaanaliz

SARS-CoV-2 – (ang. *severe acute respiratory syndrome coronavirus 2*) – drugi koronawirus ciężkiego ostrego zespołu oddechowego

SD – (ang. *Standard Deviation*) – odchylenie standardowe

Sensitivity – czułość

Specificity – swoistość

SWiM – (ang. *Synthesis without meta-analysis*) – wytyczne dotyczące raportowania wyników badań (syntezy) bez metaanalizy w przeglądach systematycznych

UV – (ang. *Ultraviolet radiation*) – promieniowanie ultrafioletowe

WHO – (ang. *World Health Organization*) – Światowa Organizacja Zdrowia

Streszczenie w języku polskim

Rozprawa doktorska pt. „*Nowoczesne strategie oceny typów skóry i edukacji zdrowotnej w dermatologii i kosmetologii*” stanowi jednotematyczny cykl publikacji poświęconych tematyce konsultacji kosmetycznych na odległość, których kluczowym elementem jest diagnostyka kosmetyczna. Zdalna diagnostyka kosmetyczna pozwala na identyfikację typu skóry, co umożliwia precyzyjną ocenę jej potrzeb oraz dobór odpowiedniej pielęgnacji. Ponadto, pełni ważną rolę edukacyjną w zakresie promowania zdrowia skóry i profilaktyki przeciwnowotworowej.

Zdalna diagnostyka kosmetyczna opiera się na technologiach informatycznych, głównie na Internecie, co redukuje konieczność wizyt stacjonarnych. W czasie pandemii COVID-19 (coronavirus disease 2019) konsultacje na odległość umożliwiły utrzymanie dystansu społecznego. Obecnie wykorzystywane są w przypadku osób mających utrudniony dostęp do specjalisty, jednocześnie są wsparciem dla klinicystów.

W ramach jednotematycznego cyklu publikacji, stanowiących rozprawę doktorską, dokonano przeglądu literatury na temat znaczenia konsultacji na odległość w kosmetologii i dermatologii kosmetycznej. Omawiane w przeglądzie prace koncentrują się na teledermatologii (konsultacjach dermatologicznych), diagnostyce i leczeniu schorzeń dermatologicznych. Ponadto, na edukacji pacjentów w zakresie utrwalania prawidłowych zachowań pielęgnacyjnych, fotoprotekcyjnych oraz profilaktyce przeciwnowotworowej. Analiza omawianych w przeglądzie badań wykazała, iż tworzenie formularzy w zdalnym poradnictwie ułatwia udzielanie spersonalizowanych porad.

W kolejnej publikacji dokonano przeglądu literatury na temat potencjału i wpływu mediów społecznościowych na zmianę zachowań i podejmowanych aktywności w promocji zdrowia skóry. Dostępność mediów społecznościowych na całym świecie daje nieograniczone możliwości przekazywania i zarządzania informacjami. Wyszukiwanie literatury wykazało 1558 prac, z których 23 zostały zakwalifikowane do przeglądu. Trzy publikacje dotyczyły trądziku, 20 publikacji dotyczyło raka skóry, ochrony przeciwsłonecznej i opalania. Interwencje w mediach społecznościowych omówiono w 15 badaniach. Przegląd umożliwił identyfikację interwencji poznawczych i poznawczo-behawioralnych. W badaniach obserwacyjnych i interwencyjnych najczęściej poruszonymi tematami były: ekspozycja skóry na słońce, ochrona przed promieniowaniem UV i nowotworami skóry. Analiza badań obserwacyjnych wykazała, iż media społecznościowe,

według użytkowników, są wiarygodnym miejscem do pozyskiwania informacji na temat zdrowia skóry. Zaobserwowano tendencję wpływu mediów społecznościowych na zachowania użytkowników. Z badań przeanalizowanych w przeglądzie wynika, że częstsze korzystanie z mediów społecznościowych jest istotnie związane z częstszą ekspozycją na promieniowanie UV. Zidentyfikowano, że media społecznościowe skupiają się na wizualizacji. Zdjęcia i obrazy są istotnymi narzędziami wpływu na użytkowników. W badaniach interwencyjnych zauważalna jest tendencja zachęcania odbiorców do reagowania na zamieszczone posty i tworzenia własnych postów. Zaangażowanie użytkowników mediów społecznościowych mierzone jest ilością udostępnianych treści i przyczynia się do zmiany postaw i zachowań w zakresie profilaktyki skóry. Można wnioskować, że interwencje angażujące użytkowników mediów społecznościowych w generowanie treści zwiększają motywację do dbania o skórę.

W kolejnych publikacjach, włączonych do jednotematycznego cyklu publikacji, dokonano opracowania polskojęzycznej wersji kwestionariusza: Baumann Skin Type Questionnaire (BSTQ), wykorzystywanego do oceny typu skóry (tłusta lub sucha; wrażliwa lub odporna; z przebarwieniami lub bez przebarwień; pomarszczona lub napięta/bez zmarszczek). Kwestionariusz jest przydatnym narzędziem w zdalnym poradnictwie.

W publikacji dotyczącej opracowania i walidacji polskiej wersji kwestionariusza Typu Skóry Baumann (BSTQ), w wymiarach: tłusta lub sucha oraz wrażliwa lub odporna, wykazano, że polskojęzyczna adaptacja Kwestionariusza Typu Skóry Baumann (BSTQ) jest rzetelnym narzędziem do oceny typu skóry w powyższych wymiarach, wśród młodej kohorty. Do oceny rzetelności kwestionariusza zastosowano badanie zgodności wewnętrznej (wartość współczynnika alfa Cronbacha). W wymiarze skóra tłusta lub sucha wartości: $\alpha_{\text{raw}}=0,75$, $\alpha_{\text{std}}=0,74$ w teście oraz $\alpha_{\text{raw}}=0,77$, $\alpha_{\text{std}}=0,77$ w reteście, potwierdzone wartościami współczynnika rzetelności Lambda 6 Guttmana w teście $G6=0,79$ i w reteście $G6=0,81$. W przypadku oceny wymiaru skóra wrażliwa lub odporna wartości: $\alpha_{\text{raw}}=0,72$, $\alpha_{\text{std}}=0,74$ w teście oraz $\alpha_{\text{raw}}=0,78$, $\alpha_{\text{std}}=0,79$ w reteście, potwierdzone wartościami współczynnika rzetelności Lambda 6 Guttmana w teście $G6=0,81$ i w reteście $G6=0,85$. W obu wymiarach otrzymane wartości świadczą o dobrej zgodności wewnętrznej testu, czyli zadawalającej rzetelności kwestionariusza.

Kolejna publikacja dotyczyła opracowania i walidacji polskiej wersji kwestionariusza Typu Skóry Baumann (BSTQ) w zakresie oceny przebarwień oraz

zmarszczek. W publikacji dokonano oceny rzetelności kwestionariusza, stosując badanie zgodności wewnętrznej (wartość współczynnika alfa Cronbacha). Wykazano niską zgodność wewnętrzną (w wymiarze skóra z przebarwieniami lub bez przebarwień wartości: $\alpha_{\text{raw}}=0,55$, $\alpha_{\text{std}}=0,54$ w teście oraz $\alpha_{\text{raw}}=0,58$, $\alpha_{\text{std}}=0,54$ w reteście, potwierdzone wartościami współczynnika rzetelności Lambda 6 Guttmana w teście $G6=0,63$ i w reteście $G6=0,63$; w wymiarze skóra pomarszczona lub napięta: $\alpha_{\text{raw}}=0,33$, $\alpha_{\text{std}}=0,25$ w teście oraz $\alpha_{\text{raw}}=0,36$, $\alpha_{\text{std}}=0,33$ w reteście, co znalazło odzwierciedlenie w niskich wartościach współczynnika Lambda 6 Guttmana: $G6=0,47$ w teście i $G6=0,54$ w reteście).

Wykazano, że Kwestionariusz typu skóry Baumann (BSTQ) jest użytecznym narzędziem do oceny typu skóry, w wymiarach: skóra tłusta lub sucha oraz skóra wrażliwa lub odporna. Jego zastosowanie w przypadku oceny skóry, pod kątem przebarwień i zmian związanych z wiekiem, powinno być starannie przemyślane i potencjalnie uzupełnione o dodatkowe podejście diagnostyczne.

Streszczenie w języku angielskim (English summary)

The doctoral dissertation entitled "*Modern strategies for skin type assessment and health education in dermatology and cosmetology*" is a single-topic series of publications devoted to the topic of remote cosmetic consultations, the key element of which is cosmetic diagnostics. Remote cosmetic diagnostics allows for the identification of skin type, which allows for a precise assessment of its needs and the selection of appropriate care. In addition, it plays an important educational role in the promotion of skin health and cancer prevention.

Remote cosmetic diagnostics is based on information technology, mainly the Internet, which reduces the need for stationary visits. During the COVID-19 (coronavirus disease 2019) pandemic, remote consultations have made it possible to maintain social distance. They are currently used for people who have difficult access to a specialist, while at the same time they are support for clinicians.

As part of a single-topic series of publications constituting a doctoral dissertation, a review of literature on the importance of remote consultations in cosmetology and cosmetic dermatology was conducted. The works discussed in the review focus on teledermatology (dermatological consultations), diagnostics and treatment of dermatological conditions. In addition, on educating patients in the field of consolidating proper care behaviors, photoprotection and anti-cancer prevention. The analysis of the studies discussed in the review showed that creating forms in remote counseling facilitates the provision of personalized advice.

The next publication reviewed the literature on the potential and impact of social media on changing behaviors and activities in promoting skin health. The availability of social media worldwide provides unlimited opportunities for sharing and managing information. The literature search revealed 1558 papers, of which 23 were eligible for the review. Three publications concerned acne, 20 publications concerned skin cancer, sun protection and tanning. Social media interventions were discussed in 15 studies. The review allowed for the identification of cognitive and cognitive-behavioral interventions. In observational and interventional studies, the most frequently discussed topics were: skin exposure to the sun, protection from UV radiation and skin cancer. Analysis of observational studies showed that social media, according to users, is a reliable place to obtain information about skin health. A trend was observed in the influence of social media

on user behavior. The studies analyzed in the review showed that more frequent use of social media is significantly associated with more frequent exposure to UV radiation. It was identified that social media focuses on visualization. Photos and images are important tools for influencing users. In intervention studies, there is a noticeable tendency to encourage recipients to respond to posted posts and create their own posts. The engagement of social media users is measured by the amount of content shared and contributes to changing attitudes and behaviors in the field of skin prevention. It can be concluded that interventions involving social media users in generating content increase motivation to care for the skin.

In subsequent publications, included in the single-topic publication cycle, a Polish version of the Baumann Skin Type Questionnaire (BSTQ) was developed, used to assess skin type (oily or dry; sensitive or resistant; with or without discoloration; wrinkled or tight/wrinkle-free). The questionnaire is a useful tool in remote counseling.

In the publication concerning the development and validation of the Polish version of the Baumann Skin Type Questionnaire (BSTQ), in the dimensions: oily or dry and sensitive or resistant, it was shown that the Polish adaptation of the Baumann Skin Type Questionnaire (BSTQ) is a reliable tool for assessing skin type in the above dimensions, among a young cohort. The internal consistency test (Cronbach's alpha coefficient value) was used to assess the reliability of the questionnaire. In the dimension of oily or dry skin, the values: $\alpha_{\text{raw}}=0.75$, $\alpha_{\text{std}}=0.74$ in the test and $\alpha_{\text{raw}}=0.77$, $\alpha_{\text{std}}=0.77$ in the retest, confirmed by the values of the Lambda 6 Guttman reliability coefficient in the G6 test=0.79 and in the G6 retest=0.81. In the case of the assessment of the dimension sensitive or resistant skin, the values: $\alpha_{\text{raw}}=0.72$, $\alpha_{\text{std}}=0.74$ in the test and $\alpha_{\text{raw}}=0.78$, $\alpha_{\text{std}}=0.79$ in the retest, confirmed by the values of the Lambda 6 Guttman reliability coefficient in the G6 test=0.81 and in the G6 retest=0.85. In both dimensions, the obtained values indicate good internal consistency of the test, i.e. satisfactory reliability of the questionnaire.

The next publication concerned the development and validation of the Polish version of the Baumann Skin Type Questionnaire (BSTQ) in the assessment of discoloration and wrinkles. The publication assessed the reliability of the questionnaire using an internal consistency test (Cronbach's alpha coefficient value). Low internal consistency was demonstrated (in the dimension of skin with or without discoloration, values: $\alpha_{\text{raw}}=0.55$, $\alpha_{\text{std}}=0.54$ in the test and $\alpha_{\text{raw}}=0.58$, $\alpha_{\text{std}}=0.54$ in the retest, confirmed by the values of the Lambda 6 Guttman reliability coefficient in the test G6=0.63 and in the

retest $G6=0.63$; in the dimension of wrinkled or tense skin: $\alpha_{\text{raw}}=0.33$, $\alpha_{\text{std}}=0.25$ in the test and $\alpha_{\text{raw}}=0.36$, $\alpha_{\text{std}}=0.33$ in the retest, which was reflected in low values of the Lambda 6 Guttman coefficient: $G6=0.47$ in the test and $G6=0.54$ in the retest).

The Baumann Skin Type Questionnaire (BSTQ) has been shown to be a useful tool for assessing skin type, including oily or dry skin and sensitive or resistant skin. Its use in assessing skin for pigmentation and age-related changes should be carefully considered and potentially supplemented with additional diagnostic approaches.

Wstęp

Tło historyczne konsultacji na odległość

Najstarsza dostępna publikacja, dotycząca konsultacji diagnostycznych na odległość, zidentyfikowana w bazie PubMed, pochodzi z 1976 roku i została opublikowana w języku rosyjskim. Praca ta opisuje funkcjonowanie telekonsultacyjno-diagnostycznego centrum kardiologicznego oraz automatycznego systemu zarządzania leczeniem w kontekście kontroli stanów nagłych w kardiologii [1]. Publikacje dotyczące konsultacji na odległość w dermatologii i wenerologii oraz edukacji zdrowotnej pojawiły się 1978 roku. Publikacje zostały napisane w języku polskim i opublikowane w Przeglądzie Dermatologicznym. Jedna z prac dotyczyła poufnej konsultacji telefonicznej z wenerologii jako formy edukacji zdrowotnej [2], druga opisywała znaczenie epidemiologiczne i zdrowotno-edukacyjne poufnego poradnictwa telefonicznego w chorobach wenerycznych [3]. Zgodnie z PubMed, kolejne dwie publikacje opublikowano w 1980 roku, dotyczyły konsultacji na odległość w kardiologii, napisane w języku rosyjskim [4,5]. W latach 1980-1989 liczba publikacji na temat konsultacji diagnostycznych na odległość wynosiła 3 publikacje [4–6]. Dopiero w 1995 roku nastąpił wzrost publikacji (71 publikacji). W 1996 roku nastąpił ponad dwukrotny wzrost publikacji (144 publikacje). Zauważalna była tendencja wzrostowa: 1996 rok – 144 publikacje, 1997 rok – 171 publikacji, 1998 rok – 232 publikacje. Zgodnie z PubMed, w latach 1990-1999 liczba publikacji na temat konsultacji diagnostycznych na odległość wyniosła 853 publikacje. Wzrost liczby publikacji na temat konsultacji diagnostycznych na odległość jest wynikiem powszechnego dostępu do Internetu. Od 1993 roku nastąpił wykładniczy wzrost użytkowników Internetu na świecie (1993 r. – 14 121 924, 1994 r. – 25 437 639, 1995 r. – 44 866 595, 1996 r. – 77 583 866, 1997 r. – 120 992 212, 1998 r. – 188 507 628, 1999 r. – 281 537 652) [7]. W latach 2000-2009 liczba publikacji na temat konsultacji diagnostycznych na odległość wyniosła 2031 publikacji. Kontynuowany był wzrost użytkowników Internetu na świecie (2000 r. – 414 794 957, 2001 r. – 502 292 245, 2002 r. – 665 065 014, 2003 r. – 781 435 983, 2004 r. – 913 327 771, 2005 r. – 1 030 101 289, 2006 r. – 1 162 916 818, 2007 r. – 1 373 226 988, 2008 r. – 1 575 067 520, 2009 r. – 1 766 403 814) [7]. Zgodnie z PubMed, w latach 2010-2019 liczba publikacji na temat konsultacji diagnostycznych na odległość wyniosła 2413 (2010 r. – 218, 2011 r. – 240, 2012 r. – 205, 2013 r. – 252, 2014 r. – 203, 2015 r. – 306, 2016 r. – 265, 2017 r. – 259, 2018 r. – 226, 2019 r. – 239). W 2020 roku nastąpił znaczący wzrost publikacji na temat konsultacji diagnostycznych na

odległość, wynikający z ogłoszenia dnia 11 marca 2020 roku pandemii COVID-19 – *coronavirus disease 2019* i związanych z nią obostrzeń. W celu hamowania rozprzestrzeniania się wirusa Światowa Organizacja Zdrowia (*World Health Organization* – WHO) wprowadziła wytyczne, dotyczące bezpieczeństwa, m.in.: kwarantanna, dystans społeczny, zawieszenie wizyt lekarskich [8]. Zgodnie z PubMed (dostęp: 03.02.2025), liczba publikacji w 2020 roku wyniosła 539, w 2021 r. – 538. W 2022 roku nastąpił spadek publikacji na temat konsultacji diagnostycznych na odległość (2022 r. – 351, 2023 r. – 284, 2024 r. – 323). W latach 2020-2023 (w latach pandemii COVID-19), w bazie PubMed zidentyfikowano 1712 publikacji.

Konsultacje diagnostyczne na odległość jako forma telemedycyny

Konsultacje diagnostyczne na odległość to forma telemedycyny, są one sposobem wymiany informacji medycznych w celu poprawy stanu zdrowia pacjenta, podczas gdy pacjent i specjalista nie znajdują się w tym samym miejscu, o tym samym czasie [9]. Koncepcja ta została opracowana w celu zapewnienia opieki zdrowotnej pacjentom mieszkającym w odległych obszarach. Telemedycyna wiąże się z wykorzystaniem komunikacji wizualnej, dźwiękowej, transferu danych – informacji medycznych, umożliwia konsultacje na odległość, diagnostykę i leczenie [10]. Obejmuje szeroki zakres specjalności medycznych, służy poprawie opieki zdrowotnej, zdrowia publicznego i edukacji zdrowotnej z wykorzystaniem technologii telekomunikacyjnych [11,12].

W ochronie zdrowia, konsultacja diagnostyczna na odległość, nazywana jest teleporadą. Jest ona definiowana jako porada medyczna lub psychologiczna, realizowana na odległość z wykorzystaniem połączenia telefonicznego lub innych systemów teleinformatycznych [13].

Po ogłoszeniu w 2020 roku pandemii COVID-19, według raportu *OECD Health at a Glance: Europe 2024*, liczba stacjonarnych konsultacji w krajach Unii Europejskiej spadła prawie o 20% [14]. Między kwietniem 2020 r. a marcem 2021 r., najwyższy odsetek dorosłych osób korzystających z telekonsultacji (teleporad) w Unii Europejskiej zidentyfikowano w Hiszpanii (71,6%), potem w Słowenii (65,4%) i w Polsce (61,9%) [15].

W 2023 r. w Polsce, w podstawowej opiece zdrowotnej, udzielono 181,1 mln porad stacjonarnych i teleporad. W tym, w formie teleporad, zrealizowano 17,1 mln (9,5%), w 2022 r. odpowiednio 23,5 mln, 13,4%. W specjalistycznej opiece lekarskiej udzielono

131,2 mln porad stacjonarnych i teleporad. W tym, teleporad – 9,7 mln (7,4%). Porady dermatologiczne w 2023 r. stanowiły 5,1% specjalistycznych porad lekarskich [13].

Teledermatologia – rozwój i zastosowanie

Teledermatologia obejmuje wykorzystanie telemedycyny i obrazowania w celu świadczenia zdalnych usług dermatologicznych pacjentom z odległych terenów (np. obszarów wiejskich) [16]. Jest jedną z najszybciej rozwijających się gałęzi telemedycyny [17]. Dermatologia była jedną ze specjalności medycznych, w których telemedycyna była najbardziej energicznie wdrażana [10,18].

W następstwie pandemii COVID-19 wizyty z specjalistami uległy transformacji. Konsultacje diagnostyczne na odległość zyskały na znaczeniu [19]. Teledermatologia jest jednym z kluczowych narzędzi opieki dermatologicznej, umożliwiającym redukcję ryzyka zakażenia SARS-CoV-2. Wykorzystanie technologii telekomunikacyjnych umożliwiło wymianę informacji medycznych w celu diagnozy, konsultacji, terapii i edukacji [20]. Wymogi pandemii COVID-19 posłużyły jako katalizator przyspieszonego wdrożenia teledermatologii [21]. Globalne badanie Bhargava i wsp. [22], przeprowadzone wśród 733 dermatologów wykazało trzykrotny wzrost liczby lekarzy dermatologów, praktykujących teledermatologię podczas pandemii (75,2% wobec 26,1% przed pandemią). Wykazano 53% spadek konsultacji stacjonarnych i 49,1% wzrost konsultacji teledermatologicznych. WhatsApp był najpopularniejszą platformą (Europa: 62,4%, Azja: 62,6%, Ameryka Północna: 39,4%, Ameryka Środkowa/Południowa: 36,7%). Korzystanie z WhatsApp było bardziej powszechne w Europie i Azji niż w Ameryce Północnej i Ameryce Środkowej/Południowej ($p < 0,001$) [22]. Z ankiety przeprowadzonej przez *American Academy of Dermatology* (AAD), w 2020 roku, wśród 591 lekarzy dermatologów w Stanach Zjednoczonych wynika, że 14,1% z nich korzystało z teledermatologii przed pandemią, w porównaniu z 96,9% podczas pandemii (w tym 94,1% z teledermatologii w czasie rzeczywistym) [23].

Wyróżnia się dwa podstawowe modele teledermatologii: synchroniczny (real-time), umożliwiający konsultacje w czasie rzeczywistym, oraz asynchroniczny (store-and-forward), polegający na analizie wcześniej przesłanych materiałów [20,24].

Zaletami teledermatologii w czasie rzeczywistym, wpływającymi na wysoki poziom satysfakcji wśród pacjentów, jest redukcja czasu podróży, krótszy czas oczekiwania na wizytę oraz obniżenie kosztów [25]. W prospektywnym badaniu satysfakcji pacjentów

(n=334) Loane i wsp. [26] wykazali, że 85% badanych jest zadowolonych z wideokonsultacji, 88% uważało, że telekonsultacje umożliwiają zaoszczędzenie czasu.

Wykazano wysoki poziom satysfakcji z modelu store-and-forward [19]. Model store-and-forward wykorzystywany jest wśród pacjentów poddawanych zabiegom kosmetycznym i wymagających wizyt kontrolnych [27,28], pacjentom podlegającym miejscowemu leczeniu rogowacenia słonecznego [29], pacjentom wymagającym leczenia chorób przewlekłych takich jak łuszczyca [30,31], pacjentom z trądzikiem [32] oraz pacjentom wymagającym obserwacji po zabiegu usunięcia czerniaka [33].

Skuteczność i dokładność diagnostyczną teledermatologii wykazano w badaniu Patel i wsp. [34]. Zgodność diagnostyczna teledermatologii w porównaniu do diagnostyki stacjonarnej wyniosła 76,4% (n=1362). W badanej kohorcie wykryto 49 potwierdzonych biopsją nowotworów skóry (dokładność diagnostyczna: 61,2% - prawidłowa diagnoza, 14,3% inna diagnoza, ale prawidłowo sklasyfikowana jako nowotwór skóry, 24,5% - brak możliwości oceny) [34]. Potwierdzeniem powyższych badań są badania Taslidere i wsp. [35], oceniające skuteczność teledermatologii dziecięcej, w których wykazano 74,2% (n=93) zgodności pomiędzy diagnozą online a stacjonarną. Stwierdzono 100% zgodność w diagnozie trądziku i świerzbu, 91,7% w diagnozie brodawki, 72,7% w diagnozie atopowego zapalenia skóry, 25% w diagnozie kontaktowego zapalenia skóry [35]. W badaniu Heffner i wsp. [36], wykazano 83% zgodność diagnostyczną (n=135) modelu store-and-forward w porównaniu z diagnozą stacjonarną. Podobne wyniki otrzymano w badaniu Bernard i wsp. [37]: 77% zgodności diagnostycznej (n=50) oraz w badaniu High i wsp. [38], gdzie zgodność diagnostyczna wyniosła 81%-89% (n=92).

Ograniczona dostępność dermatologów i stacjonarnych usług opieki zdrowotnej przyczyniła się do rozwoju teledermatologii oraz aplikacji na smartfony, służących do samodiagnostyki [10]. Zauważalny jest trend adoptowania sztucznej inteligencji (AI) oraz metodologii maszynowego uczenia (ML), sztucznych sieci neuronowych (ANN), głębokiego uczenia (DL), konwolucyjnych sieci neuronowych (CNN) w teledermatologii [21,39,40]. Najbardziej popularnym zastosowaniem sztucznej inteligencji jest wykrywanie czerniaka [41]. Poza tym, jest ona wykorzystywana w ocenie zmian łuszczykowych [42], diagnostyce trądziku pospolitego [43], diagnostyce grzybicy paznokci [44].

W badaniu Esteve i wsp. [45] wykazano, że sztuczna inteligencja (wykorzystanie konwolucyjnych sieci neuronowych) posiada porównywalne kompetencje z lekarzami

dermatologami, do wykrywania i klasyfikacji nowotworów skóry. Fujisawa i wsp. [46] wykazali, że dokładność klasyfikacji złośliwych i łagodnych chorób nowotworowych skóry przez lekarzy dermatologów była statystycznie wyższa niż lekarzy w trakcie specjalizacji z dermatologii (odpowiednio 85,3% i 74,4%). Dokładność algorytmów sztucznej inteligencji była jeszcze wyższa (92,4%) [46]. Liu i wsp. [47] opublikowali wyniki szkolenia systemu głębokiego uczenia w zakresie identyfikacji 26 najczęstszych chorób skóry. Algorytm sztucznej inteligencji dokonał prawidłowego rozpoznania w 66%, lekarze dermatolodzy w 63%, lekarze podstawowej opieki zdrowotnej w 44%, pielęgniarki w 40% analizowanych przypadków (n=963). Otrzymane wyniki wskazują na potencjał sztucznej inteligencji w zakresie pomocy lekarzom podstawowej opieki zdrowotnej w diagnozowaniu chorób skóry [47]. Dokładność klasyfikacji raka podstawnokomórkowego skóry, znamion skórnych i rogowacenia łojotokowego przez AI wykazano w badaniu Olsen i wsp. [48] (odpowiednio: 99,45%, 123/124; 99,4%, 113/114; 100%, 123/123).

Według ankiety przeprowadzonej przez *American Medical Association* (AMA) [49] w sierpniu 2023 r., wśród 1081 lekarzy wykazano, że narzędzia sztucznej inteligencji były używane przez 38% lekarzy. Najczęstsze zastosowania: tworzenie instrukcji wypisu, planów opieki lub notatek o postępach (14%), dokumentacja kodów rozliczeniowych, kart medycznych lub notatek z wizyt (13%), usługi tłumaczeniowe (11%), diagnostyka wspomagająca (11%) [49].

Konsultacje diagnostyczne na odległość w dermatologii kosmetycznej

Telefonia stacjonarna, smartfony, Internet (komunikatory, poczta elektroniczna, platformy opieki nad pacjentem, aplikacje mobilne, media społecznościowe) są narzędziami komunikacji w konsultacjach diagnostycznych na odległość. Konsultacje diagnostyczne na odległość znajdują zastosowanie w dermatologii kosmetycznej. Dermatologia kosmetyczna koncentruje się na leczeniu schorzeń skóry, które nie stanowią bezpośredniego zagrożenia dla zdrowia fizycznego pacjenta, m.in.: trądzik, zmarszczki, przebarwienia. Schorzenia dermatologiczne związane z wyglądem mogą negatywnie wpływać na psychikę, prowadząc do obniżonej samooceny, spadku pewności siebie i długotrwałych skutków psychologicznych [21,50].

Konsultacje diagnostyczne na odległość wykorzystywane są do diagnostyki, ordynowania kosmetyków, leków oraz pełnią funkcję wizyt kontrolnych sprawdzających skuteczność zalecanej terapii (np. w przypadku leczenia trądziku [51]), stanowiąc uzupełnienie wizyt stacjonarnych. W medycynie estetycznej wykorzystywane są do

sprawdzenia, czy pacjent przestrzega zaleceń pozabiegowych. Podczas wizyt stacjonarnych, lekarz medycyny estetycznej informuje o zaleceniach pozabiegowych (stosowaniu produktów kosmetycznych, wykonywaniu masażu). Następnie wykorzystuje poradnictwo telefoniczne, przypomnienia i wysyła wiadomości tekstowe, w celu lepszego przestrzegania zaleceń przez pacjentów. Dzięki powyższym działaniom pacjenci doświadczają mniej działań niepożądanych niż pacjenci, którzy nie przestrzegają zaleceń oraz lepiej reagują na leczenie [52].

W przypadku konsultacji na odległość prowadzonych przez kosmetologa, kosmetolog przeprowadza wywiad, dokonuje oceny typu i kondycji skóry, zaleca spersonalizowany plan pielęgnacyjny oraz edukuje w zakresie prawidłowych zachowań pielęgnacyjnych i promocji zdrowia skóry. W niepokojących przypadkach kieruje do lekarza dermatologa. Działania edukacyjne promujące zdrowie skóry są kluczową strategią, która pomaga zapobiegać krótko- i długoterminowym uszkodzeniom skóry oraz zmniejsza ryzyko chorób skóry [53]. Kierowana jest do osób w różnych przedziałach wiekowych [53–55].

W ostatnich latach sztuczna inteligencja znalazła zastosowanie w dermatologii kosmetycznej, wspierając diagnostykę, dobór terapii i rozwój kosmetyków [21]. Opierając się na nieinwazyjnych parametrach biofizycznych, Seo i wsp. [56] stworzyli podstawy systemu analizy typu skóry, opartej na sztucznej inteligencji, zapewniając wartości referencyjne dla populacji koreańskiej. Badanie przeprowadzono na 434 zdrowych dorosłych z Korei Południowej. Klasyfikacja typów skóry składała się z pięciu głównych kategorii (wrażliwość, nawilżenie, przetłuszczanie się, elastyczność i odcień skóry) oraz pięciu odpowiadających im podkategorii (odpowiednio: rumień, szorstkość, rozszerzone ujścia mieszków włosowych, zmarszczki i pigmentacja) [56]. AI może stanowić narzędzie uzupełniające konsultacje kosmetyczne, umożliwia analizę postępów terapeutycznych i edukację pacjentów [40]. Shi i wsp. [57] stworzyli "*SkincareMirror*", system oparty na sztucznej inteligencji, który przewiduje wygląd osoby po zastosowaniu określonych produktów do pielęgnacji skóry. Interaktywne narzędzie edukacyjne, zapewnia użytkownikom spersonalizowaną wizualizację potencjalnych wyników, umożliwiając im podejmowanie świadomych decyzji, dotyczących schematu pielęgnacji skóry [57].

Pandemia COVID-19 zapoczątkowała drogę społeczeństwa do ery cyfrowej. Media społecznościowe nawet w erze sprzed pandemii COVID-19, odnotowywały wykładniczy wzrost liczby użytkowników (2017 r. – 2,73 mld; 2018 r. – 3,10 mld; 2019 r. – 3,51 mld).

W 2020 r. liczba użytkowników wyniosła 3,91 mld, w 2021 r. – 4,26 mld, w 2022 r. – 4,59 mld, w 2023 r. – 4,90 mld, w 2024 r. – 5,17 mld [58]. W lutym 2025 r. 5,24 mld ludzi, czyli 63,9% światowej populacji, korzystało z mediów społecznościowych [59]. Przewiduje się, że do 2027 r. liczba użytkowników będzie nadal rosła, do prawie sześciu miliardów. Facebook jest najpopularniejszym serwisem społecznościowym na świecie – ponad 3 mld aktywnych użytkowników miesięcznie [60]. Identyfikując użytkowników mediów społecznościowych w Polsce, stan na styczeń 2024 r. wyniósł 29 mln [61].

Media społecznościowe są jednym z najskuteczniejszych środków wykorzystywanych przez marki i właścicieli firm do reklamowania produktów i utrzymywania kontaktu z konsumentami. Posiadają ogromny potencjał w opiece zdrowotnej oraz edukacji konsumentów [62]. Media społecznościowe mogą być wykorzystywane w komunikacji pomiędzy specjalistą a pacjentem, jako narzędzie konsultacji diagnostycznych na odległość. W badaniu Gantenbein i wsp. [63] spośród 460 badanych, 82,4% korzystało z Internetu/mediów społecznościowych, w celu uzyskania informacji medycznych. Autorzy zidentyfikowali trzy najważniejsze potrzeby pacjentów: konsultacje online, dostęp do medycznych treści na YouTube oraz możliwość rozmowy ze specjalistą [63].

Treści dotyczące codziennych działań użytkowników mediów społecznościowych zostały skutecznie wykorzystane, do opracowania prototypu aplikacji, w badaniu Rew i wsp. [64]. Aplikacja umożliwia ocenę stanu skóry i udzielenie porad dotyczących wyboru produktów pielęgnacyjnych [64]. Firmy kosmetyczne tworzą quizy, dotyczące pielęgnacji skóry i włosów. Zawierają one pytania, dotyczące danych demograficznych pacjentów, charakterystyki skóry i włosów. Po wygenerowaniu wyników pacjenci otrzymują zalecenia produktowe i spersonalizowane schematy pielęgnacji [65].

Diagnostyka kosmetyczna stacjonarna i na odległość

Wielorakie pochodzenie etniczne oraz globalizacja powodują powstawanie zróżnicowanych fenotypów ludzkiej skóry wraz z ich szczególnymi i złożonymi potrzebami. Potrzeby te nie są statyczne, skóra stale poddawana jest zmianom chronologicznym i środowiskowym, dlatego ważne jest aby ponownie oceniać typ skóry na przestrzeni lat.

Klasyfikacja typów skóry jest ważna dla profesjonalistów, aby mogli zalecać odpowiednie produkty kosmetyczne, protokoły pielęgnacji skóry oraz zabiegi. Znajomość

typu skóry posiada znaczenie w przypadku wyboru odpowiedniej procedury, przewidzenia i uniknięcia reakcji skórnych oraz powikłań pozabiegowych. Wiedza na temat typu skóry wśród konsumentów umożliwia im samodzielny wybór właściwych produktów kosmetycznych. Stosowanie nieodpowiednich produktów może prowadzić do chorób skóry i zawieść oczekiwania konsumentów [66]. Sprawdzona metoda diagnozy typu skóry jest bardzo ważna, ponieważ pacjenci często błędnie określają typ swojej skóry. Potwierdzeniem jest badanie Youn i wsp. [67], w którym koreańskie kobiety w wieku 20-39 lat (n=94) subiektywnie oceniły swój typ skóry jako: tłusta, sucha lub normalna. Subiektywna ocena badanych została porównana z pomiarami sebimetrem. W badaniu wykazano, że grupa która deklarowała skórę tłustą (n=32), według pomiaru sebimetrem: 75% (n=24) posiadała skórę tłustą, a 25% (n=8) posiadała normalną. Wśród badanych, którzy deklarowali skórę normalną (n=31) zidentyfikowano, że: 35,5% (n=11) posiadała skórę normalną, a 64,5% (n=20) skórę tłustą. W przypadku respondentów deklarujących skórę suchą (n=31) wykazano, że: 9,7% (n=3) posiadała skórę suchą, natomiast 48,4% (n=15) normalną, 41,9% (n=13) tłustą [67]. W badaniu Le Fur i wsp. [68], przeprowadzonym wśród kobiet w wieku 20-50 lat (n=253) wykazano, że pomimo powszechnego przekonania, że sucha skóra wiąże się ze zmniejszoną produkcją sebum, poziom sebum u kobiet deklarujących suchą skórę oraz deklarujących normalną skórę, nie różni się.

Rynek przemysłu kosmetycznego opiera się na zasugerowanej w 1910 roku przez Helenę Rubinstein podstawowej klasyfikacji typów skóry: skóra sucha, tłusta, mieszana i wrażliwa. Jednak tak zawężona klasyfikacja nie odpowiada na rosnące potrzeby współczesnych pacjentów. Obecność niedoskonałości skóry pacjentów (defekty, problemy skórne) oraz rozbieżności pomiędzy subiektywnymi a obiektywnymi ocenami skóry rodzi potrzebę poszerzenia kategoryzacji typów skóry [69] oraz dogłębnego wywiadu i diagnostyki. Potrzeba poszerzenia klasyfikacji jest odpowiedzią na rosnące potrzeby rynku. Rynek produktów do pielęgnacji skóry w 2023 roku stanowił 40% światowego rynku kosmetycznego [70]. Od 2020 roku przychody rynku w Polsce wzrosły i przewiduje się, że w 2030 roku osiągną prawie 806 milionów dolarów [71].

Klasyfikacja typów skóry opiera się na kryteriach takich, jak: nawilżenie warstwy rogowej naskórka (*stratum corneum*), ocenie płaszcza hydrolipidowego (bariera hydrolipidowa), ocenie reakcji na słońce, pigmentacja i kolor skóry, ocenie wrażliwości i

oznak starzenia się skóry (zmarszczki, nierówna pigmentacja i tekstura oraz utrata elastyczności) [66].

W badaniach klinicznych wykorzystywane są nieinwazyjne instrumentalne metody parametryzacji i obrazowania skóry. Pomiary parametrów czynnościowych skóry wykonywane są w ściśle określonych warunkach (temperatura w pomieszczeniach pomiarowych: 20-24°C, stała wilgotność powietrza: 50-65%). Instrumentalne metody parametryzacji i obrazowania skóry to, m.in.: corneometer, tewameter, mexameter, cutometer, reviscometer, sebumeter, pH-meter, frictiometer, colorimeter, skin-visiometer. Techniki obrazowania wykorzystywane są do oceny morfologii skóry (fotografia kliniczna, dermatoskopia, konfokalna laserowa mikroskopia skanningowa, ultrasonografia wysokich częstotliwości) [66,72].

Poza nieinwazyjnymi instrumentalnymi metodami występują metody wizualne i dotykowe (badanie palpacyjne), skale wykorzystywane do oceny skóry i kwestionariusze wypełniane przez pacjentów. Metody wizualne polegają na obserwacji skóry pacjenta, ocenie jej wyglądu, tekstury i ewentualnych nieprawidłowości [66]. Oceniana jest obecność: chorobowych zmian skórnych, stanów zapalnych, wyprysków, rozszerzonych ujść mieszków włosowych, zaskórników, blizn, zmarszczek, unaczynienia, zaczerwienień, kolorytu skóry, plam pigmentacyjnych, przebarwień pozapalnych oraz łuszczenia się skóry. Do oceny wizualnej skóry pacjenta może być wykorzystywana lampa kosmetyczna wyposażona w szkło powiększające (powiększenie 3-5 krotne) oraz lampa Wooda. Metoda dotykowa wykorzystywana jest do oceny tekstury, elastyczności i grubości skóry. Grubość skóry określa się metodą wałeczkową. Ocenę wrażliwości skóry dokonuje się głównie na drodze wywiadu oraz wzrokowo, podczas wykonywania demakijażu pacjenta. Przy podejrzeniu występowania zwiększonej wrażliwości skóry dodatkowo można wykonać badanie dermografizmu, wykorzystując do tego plastikową szpatułkę [73]. Metody wizualna i dotykowa są metodami subiektywnymi, zależnymi od doświadczenia oceniającego, wykorzystywane są podczas diagnostyki stacjonarnej. Kwestionariusze oraz skale służące do wizualnej oceny skóry wykorzystywane są w badaniach oraz w praktyce dermatologicznej i kosmetycznej [66].

Wśród skal wykorzystywanych do oceny skóry można wyróżnić: skalę Fitzpatricka (umożliwia klasyfikację fototypu skóry pacjenta, opiera się na reakcji skóry na słońce); skalę Glogau (umożliwia klasyfikację stopnia fotostarzenia i obecności zmarszczek); system klasyfikacji typów skóry Roberta (ocenia cztery cechy skóry: fototyp,

fotostarzenie, przebarwienia i zdolność do bliznowacenia, wykorzystuje do tego skalę Fitzpatricka, skalę Glogau, skalę hiperpigmentacji Roberta oraz skalę blizn Roberta). System klasyfikacji Roberta umożliwia dobór zabiegów kosmetycznych i estetycznych, produktów leczniczych oraz pomaga przewidywać reakcję skóry po zabiegach estetycznych [66,72,74].

System klasyfikacji typów skóry, według Baumann, obejmuje ocenę czterech parametrów: nawilżenia, wrażliwości, pigmentacji oraz elastyczności [75]. Istnieje 16 możliwych fenotypów skóry Baumann, opartych na wymienionych parametrach [76]. Kwestionariusz Baumann (*Baumann Skin Type Questionnaire* – BSTQ) składa się z pytań, które umożliwiają kategoryzację skóry na: tłusta lub sucha, wrażliwa lub odporna, z przebarwieniami lub bez przebarwień, pomarszczona lub napięta/bez zmarszczek [77]. Kwestionariusz został zwalidowany pod kątem przetłuszczania się skóry. Rzetelność oceniono przy użyciu współczynnika α Cronbacha, który wyniósł: 0,78. W celu prawidłowej oceny przetłuszczania się skóry, opracowano sześciostopniową skalę i porównano z pomiarami sebumetru ($n=100$). Wykazano korelację, która wyniosła: 0,54, $p<0,01$. Kwestionariusz Baumann jest łatwym do wypełnienia kwestionariuszem, pozwalającym na określenie stopnia przetłuszczania się skóry [78]. BSTQ może być wykorzystywany podczas stacjonarnych wizyt i w formie online. Jest on wykorzystywany do diagnostyki typu skóry, doboru właściwych produktów kosmetycznych i zabiegów oraz jest formą edukacji pacjenta [76].

Według Baumann kwestionariusz wykazuje podobne wyniki wśród wszystkich grup etnicznych. Jest on ważnym narzędziem diagnostycznym wśród anglojęzycznych pacjentów w Stanach Zjednoczonych, Chinach i Korei. Nie jest wiadomo, czy kwestionariusz jest ważny w innym tłumaczeniu niż angielski [76].

Kwestionariusz został wykorzystany w badaniach Ahn i wsp. [69] oraz Lee i wsp. [79] do identyfikacji typu skóry koreańskiej populacji kobiet i mężczyzn. Badania te wykazały najczęstszy typ skóry w populacji koreańskiej oraz jego rozkład regionalny i wiekowy, czynniki wewnętrzne i zewnętrzne związane z typem skóry, przyczyniając się do poznania cech skóry w populacji [69,79].

Dostarczenie zwalidowanego i przetłumaczonego na język polski narzędzia BSTQ pozwoli na ograniczenie wykluczenia społecznego, spadek nierówności (dostępność online dla osób z odległych terenów, lokalnych społeczności), szybki dostęp, np. przez sieci

społecznościowe, czy inne narzędzia cyfrowe. Narzędzie wpisuje się w obecny trend telemedycyny. BSTQ umożliwia szybką i łatwą w zastosowaniu weryfikację typu skóry i jej problemów oraz posiada psychospołeczne oddziaływanie, a w efekcie może przyczynić się do korzystnej zmiany zachowań zdrowotnych społeczeństwa.

Cele pracy

Cel główny

Celem głównym rozprawy doktorskiej jest: ocena skuteczności teleporad w dermatologii i kosmetologii jako narzędzia wsparcia diagnostycznego i edukacyjnego, analiza wpływu mediów społecznościowych na edukację zdrowotną i zachowania pielęgnacyjne pacjentów oraz opracowanie i walidacja standaryzowanego narzędzia do oceny typów skóry.

Cele szczegółowe

1. Analiza zastosowania teleporad w diagnostyce i doborze pielęgnacji skóry.
2. Ocena efektywności i satysfakcji pacjentów z konsultacji online w zakresie dermatologii i kosmetologii.
3. Identyfikacja barier i możliwości optymalizacji zdalnej edukacji pacjentów w zakresie zdrowia skóry.
4. Ocena roli mediów społecznościowych jako źródła informacji o pielęgnacji skóry.
5. Identyfikacja skutecznych strategii edukacyjnych w mediach społecznościowych, prowadzących do zmiany postaw i nawyków użytkowników.
6. Ocena jakości i wiarygodności treści dotyczących dermatologii i kosmetologii dostępnych na platformach społecznościowych.
7. Przeprowadzenie procesu tłumaczenia, adaptacji kulturowej oraz walidacji polskiej wersji Baumann Skin Type Questionnaire (BSTQ).
8. Ocena rzetelności i powtarzalności narzędzia w populacji polskiej.
9. Ustalenie jego przydatności w diagnostyce kosmetycznej i dermatologicznej.

Publikacje włączone do jednotematycznego cyklu prac

Publikacja I

Brzozowska JM, Gotlib J. The importance of remote counseling in cosmetology and cosmetic dermatology. *Pol Merkur Lekarski*. 2023;51(1):74-87. doi: 10.36740/Merkur202301111. (*Punktacja MNiSW: 20 pkt.*)

Wstęp

Konsultacje na odległość są alternatywą dla standardowych wizyt lekarskich. Wykorzystywane są w medycynie do diagnostyki, rekomendacji leczenia, monitorowania pacjentów (wizyt kontrolnych) oraz do edukacji zdrowotnej. Telemedycyna wykorzystuje elektroniczne narzędzia telekomunikacyjne. Teledermatologia jest jedną z gałęzi telemedycyny. Wyróżnia się dwa podstawowe modele teledermatologii: store-and-forward technology oraz real-time (live-interactive) technology. W teledermatologii store-and-forward asystent medyczny, pielęgniarka lub lekarz podstawowej opieki zdrowotnej wykonuje kliniczne i dermatoskopowe zdjęcia zmian skórnych pacjenta w przychodni lub szpitalu, które są wysyłane wraz z historią kliniczną pacjenta do lekarza dermatologa znajdującego się w odległym miejscu. Powyższa technologia jest technologią asynchroniczną, realizowaną w oparciu o sieć przechowującą – przekazującą. W modelu teledermatologii real-time (live-interactive), konsultacja prowadzona jest w czasie rzeczywistym, przy wykorzystaniu sprzętu do wideokonferencji (procedura synchroniczna). Lekarz dermatolog rozmawia z pacjentem korzystając z wideokonferencji na żywo.

Konsultacje kosmetyczne realizowane są stacjonarnie i na odległość. Celem poradnictwa kosmetycznego jest ocena typu skóry, dobór kosmetyków oraz edukacja pacjenta w zakresie działań pielęgnacyjnych i profilaktycznych. Konsultacje diagnostyczne na odległość prowadzone są za pośrednictwem stron internetowych oferujących kosmetyki, mediów społecznościowych oraz za pośrednictwem stron internetowych należących do kosmetyków.

Cel

Celem przeglądu było zebranie, ocena i podsumowanie danych dotyczących konsultacji diagnostycznych na odległość w kosmetyce i dermatologii kosmetycznej.

Material i metody

W publikacji dokonano przeglądu literatury w bazie naukowej PubMed oraz przeprowadzono sondaż diagnostyczny wśród zadeklarowanych i zakwalifikowanych do badań osób, podano wstępne nieopublikowane wyniki autora (JMB). W bazie PubMed zidentyfikowano 490 rekordów. Usunięto duplikaty, przeanalizowano tytuły publikacji, streszczenia, słowa kluczowe, pełne i dostępne teksty artykułów. Publikacje podzielono na bloki tematyczne, wyeliminowano prace nie spełniające kryteriów kwalifikacji. Wykonano zbiorcze podsumowanie w formie narracyjnej 10 publikacji.

Wyniki

Analizowane w przeglądzie publikacje dotyczyły: poradnictwa telefonicznego (n=2), e-doradztwa (n=3), e-learningu (n=2), automatycznego doradztwa (n=2) i mobilnej aplikacji zdrowotnej (n=1). Tematyka analizowanych prac dotyczyła: trądziku (n=3), naczyniaka dziecięcego (n=2), atopowego zapalenia skóry (n=1), czerniaka (n=2; jedna z prac koncentrowała się na samobadaniu skóry w kierunku wykrycia czerniaka, druga na wczesnej diagnostyce i profilaktyce czerniaka wśród rodzeństwa osób, które zachorowały na czerniaka), ochrony przeciwsłonecznej i stopniu uszkodzenia skóry wywołanej oparzeniem słonecznym u dzieci (n=1) oraz różnych schorzeń dermatologicznych skóry (n=1). W analizowanych publikacjach konsultantami byli: lekarz dermatolog (n=5), pielęgniarka (n=2), edukator zdrowia (n=1), wirtualny konsultant (n=2). W edukacji pacjentów wykorzystano: mobilne aplikacje zdrowotne (n=1), materiały edukacyjne (n=2), e-learning (n=2).

Wyodrębniono trzy główne tematy: (1) – znaczenie poradnictwa zautomatyzowanego (automatyczne doradztwo – wirtualny doradca, e-learning) w profilaktyce skóry; (2) – znaczenie poradnictwa online (e-wizyty, e-mail) w profilaktyce skóry; (3) – znaczenie poradnictwa telefonicznego w profilaktyce skóry. Wykazano, że edukacja internetowa w zakresie dermatologii z wykorzystaniem strony internetowej z zautomatyzowanym poradnictwem przyczynia się do poprawy wiedzy na temat trądziku i krótkoterminowych zachowań związanych z pielęgnacją skóry. Może być skutecznym narzędziem w promowaniu zachowań pielęgnacyjnych wśród nastolatków z trądzikiem. Zidentyfikowano wzrost wiedzy na temat naczyniaka dziecięcego po zastosowaniu modułu e-learningowego. E-learning w połączeniu z e-konsultacjami (konsultacjami teledermatologicznymi) może przyczynić się do szybszego, bezpośredniego zgłoszenia się

do lekarza dermatologa oraz do wcześniejszego rozpoczęcia leczenia dzieci z naczyniakami dziecięcymi wysokiego ryzyka w wyspecjalizowanych ośrodkach.

Poradnictwo online wykorzystuje platformy opieki nad pacjentem (e-wizyty), pocztę elektroniczną (e-mail) i komunikatory internetowe. Skutecznie wykorzystywane jest w opiece kontrolnej nad pacjentami z trądzikiem (wizyty kontrolne online).

Wykazano, że spersonalizowane poradnictwo telefoniczne motywuje badanych do częstszego badania znamion (wykonywania badań przesiewowych w kierunku nowotworów skóry i samokontroli) oraz do regularnego stosowania kosmetyków przeciwsłonecznych. Spersonalizowane teleporady składają się z: wywiadu, rozmowy motywacyjnej, wyznaczenia celów, udostępnienia materiałów edukacyjnych, sesji doradczej z edukatorem zdrowia. Wykazano, że połączenie wczesnej edukacji matek z zindywidualizowanym poradnictwem telefonicznym i materiałami edukacyjnymi wpływa na wzrost wiedzy w zakresie ochrony przeciwsłonecznej dzieci.

Z pilotażowych badań (JMB) wynika, że wśród 46 respondentów badania w wieku 18-48 lat (37 kobiet, 9 mężczyzn), po dwunastotygodniowym procesie konsultacji kosmetycznych na odległość, 91,3% badanych zadeklarowało, że poświęca więcej czasu na pielęgnację skóry twarzy, 84,8% oceniło poprawę kondycji skóry. Poprawa nastąpiła w parametrach: nawilżenie skóry (52,2% badanych), rzadsze występowanie zmian zapalnych (52,2% badanych), gładkość skóry (41,3% badanych), zmniejszenie uczucia ściągnięcia i pieczenia (37% badanych), zmniejszenie liczby zaskórników (34,8% badanych). Po dwunastu tygodniach konsultacji, motywację do kontynuacji zaleceń kosmetycznych zadeklarowało 82,6% badanych. U 69,6% zwiększyło się zainteresowanie kosmetyką, u 30,4% pozostało na tym samym poziomie. 89,1% respondentów stwierdziło, iż poziom ich wiedzy na temat profilaktyki i pielęgnacji skóry wzrósł po konsultacjach na odległość. Mimo, że 89,1 % badanych uznało, że konsultacje na odległość są skuteczne, to 56,5% zadeklarowało że preferuje kontakt stacjonarny.

Wnioski

Analizowane w przeglądzie publikacje koncentrują się na konsultacjach dermatologicznych, w tym na diagnozie schorzenia i sposobach jego leczenia. Narzędzia komunikacji wykorzystywane w konsultacjach na odległość to: spersonalizowane poradnictwo telefoniczne, poradnictwo zautomatyzowane (wirtualny konsultant), moduł e-learningowy, poczta e-mail, internetowa platforma opieki nad pacjentem (e-wizyta), portal

edukacyjny. Celem ujętych w przeglądzie badań była: edukacja pacjentów w zakresie zdrowia skóry, utrwalenie prawidłowych zachowań pielęgnacyjnych i fotoprotekcyjnych. Prawidłowe zachowania pielęgnacyjne, powinny zaczynać się we wczesnym dzieciństwie i być kontynuowane w ramach rutynowej, profilaktycznej opieki zdrowotnej.

Wykazano, że tworzenie formularzy w konsultacjach diagnostycznych na odległość usprawnia udzielanie spersonalizowanych porad. Uzupełnienie konsultacji na odległość z e-learningiem, materiałami edukacyjnymi, portalem edukacyjnym i aplikacjami zdrowotnymi wpływa na edukację zdrowotną w dermatologii i kosmetologii. Sondaż diagnostyczny, jak i przegląd literatury potwierdził znaczenie i potrzebę zdalnego poradnictwa dermatologiczno-kosmetologicznego w zakresie edukacji, motywacji i profilaktyki skóry.

Publikacja II

Brzozowska JM, Gotlib J. Social Media Potential and Impact on Changing Behaviors and Actions in Skin Health Promotion: Systematic Review. *J Med Internet Res.* 2025 Jan 6;27:e54241. doi: 10.2196/54241. (*Punktacja MNiSW: 140 pkt., IF: 5,8*)

Wstęp

Media społecznościowe są wykorzystywane jako narzędzie wymiany informacji, rozrywki oraz jako narzędzie edukacji i interwencji cyfrowych. Celem działań edukacyjnych jest zwiększenie wiedzy na temat nowotworów skóry oraz zwiększenie świadomości na temat zagrożeń związanych z promieniowaniem UV. Efektem tych działań powinna być zmiana zachowań zdrowotnych (fotoprotekcja skóry, samobadanie skóry, kontrola zmian skórnych przez dermatologa). Działania interwencyjne podejmowane w mediach społecznościowych mają na celu zaangażowanie użytkowników w profilaktykę skóry. Media społecznościowe mogą być narzędziem motywującym do systematycznych działań pielęgnacyjnych i ochronnych.

Cel

Celem przeglądu było zebranie i podsumowanie badań oceniających wpływ mediów społecznościowych na działania związane z profilaktyką skóry, podejmowane przez użytkowników mediów społecznościowych.

Material i metody

Przegląd systematyczny przeprowadzono zgodnie z wytycznymi PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) oraz SWiM (*Synthesis without meta-analysis*). Przeszukano naukowe bazy danych: SCOPUS, Web of Science, PubMed, Academic Search Ultimate (za pośrednictwem EBSCO), Academic Research Source eJournals (za pośrednictwem EBSCO), ERIC (za pośrednictwem EBSCO), Health Source – Consumer Edition (za pośrednictwem EBSCO), Health Source: Nursing/Academic Edition (za pośrednictwem EBSCO). Wyszukiwanie uzupełniono o szarą literaturę: ProQuest Dissertations and Theses, OpenGrey, Grey Literature Report oraz MedNar. Publikacje zaimportowano do Mendeley Reference Manager i usunięto duplikaty. Selekcja badań składała się z dwóch etapów. Pierwszy etap został przeprowadzony przez jednego z autorów pracy (JMB), który wziął pod uwagę tytuł i streszczenie w celu zidentyfikowania i wykluczenia nieistotnych badań. Drugi autor (JG) dokonał przeglądu

losowo wybranej próby zawierającej 10% tytułów i streszczeń. W przypadku trudności zakwalifikowania publikacji na podstawie tytułu i streszczenia, dokonano oceny całego artykułu. Drugi etap selekcji polegał na analizie pełnych tekstów publikacji przez obu autorów niezależnie (JMB i JG) i uzasadnieniu powodów wykluczenia. Przy podsumowaniu ostatecznych wyników, w przypadku rozbieżnych decyzji, autorzy dochodzili do porozumienia na drodze dyskusji. Dodatkowo przeanalizowano piśmiennictwo zawarte w zakwalifikowanych publikacjach. Wszystkie badania oceniano przy użyciu kryteriów włączenia i wykluczenia. Zastosowano kryteria kwalifikacji: publikacje oparte na oryginalnych badaniach, badania prowadzone w mediach społecznościowych (m.in. Facebook, Instagram, Twitter [obecnie X], Pinterest, YouTube, TikTok, Snapchat), publikacje na temat pielęgnacji skóry, zdrowia skóry, chorób skóry, ochrony skóry oraz działań edukacyjnych z zakresu profilaktyki skóry. Z każdej z zakwalifikowanych publikacji wyodrębniono: autorów, rok publikacji, lokalizację geograficzną zbierania danych (kraj, w którym przeprowadzono badanie), rodzaj platformy mediów społecznościowych, formę informacji, liczbę i charakterystykę uczestników badania, rodzaj badania lub metody zbierania danych oraz główny temat i cel badania. Jeden z autorów (JMB) opracował formularz z pytaniami do zakwalifikowanych publikacji, w którym obaj autorzy niezależnie zapisywali swoje odpowiedzi (1. Jacy są autorzy i rok wydania publikacji; 2. Czy tematem badania jest interwencja?; 3. Czy w badaniu oceniany jest wpływ mediów społecznościowych na użytkowników?; 4. Czy badanie dotyczy kampanii na rzecz zdrowia publicznego?; 5. Czy w badaniu poruszany jest temat samobadania skóry?; 6. Czy w badaniu wspomina się o stosowaniu produktów kosmetycznych, np. kremów przeciwsłonecznych?; 7. Czy badanie zawiera analizę statystyczną?; 8. Jakie są główne wyniki badania?; 9. Jakie są wnioski lub opinie autorów na temat skuteczności strategii dostarczania informacji w mediach społecznościowych?). Jakość metodologiczna badań włączonych do przeglądu była oceniana oddzielnie przez obu autorów (JMB i JG), ich opinie zostały porównane. W przypadku odmiennych opinii, autorzy dyskutowali o swoich wątpliwościach i dochodzili do konsensusu. Do oceny ryzyka błędu systematycznego zastosowano: the Cochrane Collaboration's tool for risk of bias assessment for randomized controlled trials and quasi-experimental studies oraz the Center for Evidence-Based Medicine checklist for cross-sectional studies. Synteza wyników została przedstawiona w formie narracyjnej. Zastosowano model koncepcyjny oparty na pogrupowaniu zakwalifikowanych publikacji ze względu na rodzaj interwencji, jeśli została zastosowana.

Wyniki

Wyszukiwanie literaturowe wykazało 1558 prac (Scopus: n=485, 31,13%; Web of Science: n=305, 19,58%; PubMed: n=270, 17,33%; Academic Search Ultimate via EBSCO: n=234, 15,02%; Academic Research Source eJournals via EBSCO: n=26, 1,67%; ERIC via EBSCO: n=10, 0,64%; Health Source: Consumer Edition via EBSCO: n=35, 2,25%; Health Source: Nursing/Academic Edition via EBSCO: n=62, 3,98%; ProQuest Dissertations and Theses: n=22, 1,41%; OpenGrey: n=4, 0,26%; Grey Literature Report: n=0; MedNar: n=105, 6,74%). Po usunięciu 43,32% duplikatów (675/1558), pozostało 883 prace. Po przejrzaniu tytułów i streszczeń 883 prac, wykluczono 523 prace (59,2%) ze względu na to, iż nie były ściśle związane z tematem przeglądu, bądź były napisane w innym języku niż język angielski. Po analizie pełnych tekstów publikacji – 40,8% (360/883), wyeliminowano 339 publikacji ze względu na to, iż nie spełniały kryteriów włączenia (n=43, 12,7% komentarze; n=21, 6,2% prace poglądowe/przeglądy; n=1, 0,3% raport przypadku; n=2, 0,6% protokoły; n=14, 4,1% publikacje nie koncentrujące się na pielęgnacji skóry i promocji zdrowia skóry; n=90, 26,5% publikacje nie koncentrujące się na mediach społecznościowych; n=23, 6,8% publikacje dotyczące operacji plastycznych; n=32, 9,4% publikacje dotyczące marketingu produktów do pielęgnacji skóry w mediach społecznościowych; n=8, 2,4% publikacje dotyczące psychologicznego wpływu mediów społecznościowych – stany emocjonalne; n=4, 1,2% publikacje dotyczące wyszukiwania informacji w mediach społecznościowych; n=101, 29,8% publikacje dotyczące analizy postów w mediach społecznościowych). 21 publikacji spełniło kryteria kwalifikacji. Po szczegółowej analizie zakwalifikowanych publikacji, dodano dwie publikacje. Łącznie w przeglądzie uwzględniono 23 publikacje. Większość badań, uwzględnionych w przeglądzie, przeprowadzono za pośrednictwem Facebooka – 73,9% (17/23). Za pośrednictwem innych platform, procent wykorzystania był niższy: Instagram – 30,4% (7/23), Twitter – 30,4% (7/23), YouTube – 26,1% (6/23), Pinterest – 17,4% (4/23), Snapchat – 13% (3/23), Myspace – 8,7% (2/23), TikTok – 4,3% (1/23), WhatsApp – 4,3% (1/23), Thunderclap – 4,3% (1/23), Tumblr – 4,3% (1/23).

Większość badań dotyczyło nowotworów skóry, ochrony przeciwsłonecznej oraz opalania – 87% (20/23), trądziku – 13% (3/23). Skuteczność działań w mediach społecznościowych wykazało 65% (15/23) analizowanych badań. 17% (4/23) badań dotyczyło samobadania skóry, 43% (10/23) wspomniało o stosowaniu produktów kosmetycznych, 35% (8/23) badań zalecało stosowanie kremów fotoprotekcyjnych,

natomiast 43% (10/23) badań omawiało wpływ kampanii na rzecz zdrowia publicznego. Wśród 23, zakwalifikowanych w tym przeglądzie publikacji, interwencje w mediach społecznościowych były tematem 15 publikacji (65%), wśród których efekty poznawcze były oceniane w 4 pracach, natomiast zarówno efekty poznawcze i behawioralne były oceniane w 11 pracach.

W 2 omawianych w przeglądzie badaniach (9%, 2/23) wykazano, iż media społecznościowe są źródłem błędnych porad, dotyczących leczenia trądziku. Nie są one zgodne z wytycznymi *American Academy of Dermatology*. W badaniu Mingoia i wsp. wykazano, że poziom korzystania z mediów społecznościowych był istotnie i pozytywnie skorelowany z ekspozycją użytkowników na słońce ($p < 0,001$), oparzeniami słonecznymi ($p < 0,001$) i niezadowoleniem z odcienia skóry, a ujemnie skorelowany z ochroną przeciwsłoneczną ($p < 0,001$). Oznacza to, iż oglądanie i publikowanie zdjęć, udostępnianie treści i liczba polubień były istotnie powiązane z większą ekspozycją na słońce i niższą ochroną przeciwsłoneczną oraz z większym niezadowoleniem z odcienia skóry.

W kolejnych 2 badaniach wykazano, iż częstsze korzystanie z platform mediów społecznościowych, tj.: Twitter (obecnie X), Instagram, Snapchat i Pinterest związane jest z częstszym opalaniem (na zewnątrz i w solarium). Szeroko udostępniane treści w mediach społecznościowych wpływają na zaangażowanie w ryzykowne zachowania zdrowotne. W konsekwencji wpływa to na wiedzę, postawy i działania użytkowników. Pomimo wskazania negatywnego wpływu mediów społecznościowych zauważono, iż mogą być one skutecznym narzędziem informacyjno-edukacyjnym i interwencyjnym w kampaniach edukacyjnych na rzecz zdrowia skóry. W przeciwieństwie do powyższych badań, 2 kolejne publikacje wykazały, iż media społecznościowe mogą być czynnikiem motywacyjnym. Motywują pacjentów ze zmianami skórnymi do poszukiwania opieki dermatologicznej oraz do wizyty w klinice badań przesiewowych w kierunku diagnostyki czerniaka. W badaniu Guckian i wsp. 65% (162/249) respondentów regularnie korzystało z mediów społecznościowych, 33% (83/249) widziało posty w Internecie na temat zmian skórnych, w tym 10% (8/83) posty lekarzy, 36% (30/83) posty organów służby zdrowia i 37% (31/83) posty innych użytkowników. W badaniu Martel i wsp. wśród 145 badanych, którzy edytowali własne zmiany skórne, 128 (88,3%) edytowało trądzik i blizny po trądzikowe. Edycja potwierdza, wśród użytkowników, świadomość potrzeby opieki dermatologicznej.

Wykazano, że interwencje w mediach społecznościowych wykorzystywane są jako strategie edukacyjne. 48% badań (11/23) zastosowało interwencje edukacyjne, dotyczące

prewencji nowotworów skóry. W przeglądzie zwrócono uwagę na badania, które wykorzystywały strategie edukacyjne oraz dysonans poznawczy (13%, 3/23). Pierwsza publikacja miała na celu zmniejszenie pozytywnych postaw wobec opalania oraz poprawę umiejętności krytycznej analizy treści w mediach społecznościowych. Druga publikacja, dotycząca promowania bezpieczeństwa na słońcu, zachęcała badanych do tworzenia postów w mediach społecznościowych na temat zdrowej skóry, zdrowego stylu życia. W konsekwencji, przyczyniło się do wzrostu motywacji do stosowania odzieży ochronnej i kremów przeciwsłonecznych oraz zmniejszyło motywację do opalania. Celem kolejnej publikacji, dotyczącej interwencji opartej na dysonansie, było zaangażowanie respondentów w dyskusje grupowe związane z obrazem ciała. W badaniu Stapletona i wsp. wykazano, że posty były oglądane przez 91% uczestników (15/17), polubione przez 35% (6/17) i skomentowane przez 26% (4/17). Średni wskaźnik komentarzy był najwyższy (65%) w przypadku postów, które wywoływały komentarze poprzez bezpośrednie zadawanie pytań lub dyskusje w grupie. Średnie wskaźniki opalania w solarium w ciągu ostatniego 1 miesiąca, zgłoszone po interwencji, były niższe niż wskaźnik wyjściowy ($P = 0,08$, Cohen $d = 0,47$).

W badaniu Morrisona i wsp. zastosowano strategie edukacyjne w formie: humorystycznego filmu we współpracy z lekarzem, filmu z gwiazdą Instagrama, filmu opartego na faktach. Strategie przyczyniły się do wzrostu zaangażowania mierzonego liczbą komentarzy, reakcji i udostępnień. Filmy otrzymały 1288 komentarzy, 11415 reakcji i 4201 udostępnień. Odpowiednio, humorystyczny film we współpracy z lekarzem uzyskał największe zaangażowanie (1050 komentarzy, 7725 reakcji, 3875 udostępnień); film z gwiazdą Instagrama (216 komentarzy, 3569 reakcji, 256 udostępnień); film oparty na faktach uzyskał najmniejsze zaangażowanie (22 komentarze, 121 reakcji, 70 udostępnień).

W przypadku interwencji behawioralnych wykazano, że nastąpił wzrost motywacji do diagnostyki skóry i stosowania fotoprotekcji. Skuteczną interwencję, wśród 14514 badanych, wykazali Køster i wsp. w ramach kampanii edukacyjnej, dotyczącej korzystania z solarium. Z analizy danych wynika, że nastąpił spadek korzystania z solarium z 30% (marzec 2007 r.) do 23% (sierpień 2009 r.). W kolejnym badaniu, Buller i wsp., oceniono kampanię edukacyjną w mediach społecznościowych na rzecz zdrowia nastolatków, mającą na celu zmniejszenie pobłażliwości matek ($n=869$), dla opalania się w solarium ich nastoletnich córek. 76,4 % postów w kampanii otrzymało przynajmniej jeden ze wskaźników zaangażowania. Z czego, 68,2% postów otrzymało reakcję (polubienie,

smutek, złość) i 53,8% komentarzy od matek. Po 12 miesiącach ekspozycji na kampanię edukacyjną, matki z grupy interwencyjnej były mniej pobłażliwe wobec opalania się w solarium ich córek. Matki, które zgłosiły że ich córki nie korzystają z solarium, bardziej angażowały się w posty, niż matki które zgłaszały że ich córki korzystają z solarium (odpowiednio: 18% zaangażowanie, 7% zaangażowanie).

Wnioski

Badania obserwacyjne (35%, 8/23) wykazały, że media społecznościowe według użytkowników są wiarygodnym źródłem do pozyskiwania informacji na temat zdrowia skóry. Częstsze korzystanie z mediów jest istotnie związane z częstszą ekspozycją na promieniowanie UV.

Wizualizacja w mediach społecznościowych przyczynia się do podejmowania działań: korzystnych (w przypadku wystąpienia zmian skórnych) – poszukiwanie opieki dermatologicznej oraz niekorzystnych (pragnienie posiadania ładnej opalenizny) – zwiększona ekspozycja na promieniowanie UV. Wykazano, że wykorzystanie obrazów w komunikatach zdrowotnych może być skuteczne w kampaniach edukacyjnych na rzecz promocji zdrowia skóry.

Interwencyjne, angażujące użytkowników w reagowanie i generowanie treści, zwiększają motywację do prawidłowych zachowań zdrowotnych. Interwencje wzmacniające dysonans poznawczy mogą zmienić postawy i zachowania.

Brzozowska JM. Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – part one. *Advances in Dermatology and Allergology/Postępy Dermatologii i Alergologii.* 2025;42(2):190-196. doi:10.5114/ada.2025.149544. (Punktacja MNiSW: 70 pkt., IF: 1,4)

Wstęp

Baumann Skin Type System (BSTS) ocenia nawilżenie, wrażliwość, pigmentację i starzenie się (elastyczność) skóry. Klasyfikacja Baumann Skin Type identyfikuje 4 podstawowe, dychotomiczne parametry charakteryzujące skórę: tłusta lub sucha (O vs. D), wrażliwa lub odporna (S vs. R), z przebarwieniami lub bez przebarwień (P vs. N), pomarszczona lub napięta/bez zmarszczek (W vs. T). Istnieje 16 możliwych wariantów typu skóry (16 typów skóry Baumanna). Kwestionariusz typu skóry Baumann (BSTQ) składa się z 64 pytań. Wypełnienie kwestionariusza pozwala na uzyskanie czteroliterowego kodu BSTI (Baumann Skin Type Indicator). Czteroliterowy kod BSTI danej osoby opisuje jeden z 16 możliwych typów skóry Baumann. Wiedza na temat typu skóry umożliwia specjalistom oraz konsumentom dokonanie wyboru najbardziej odpowiednich produktów do pielęgnacji skóry oraz zabiegów.

Cel

Celem badania była walidacja skuteczności polskiej wersji językowej Kwestionariusza Typu Skóry Baumann (BSTQ) w wymiarach skóra tłusta lub sucha oraz skóra wrażliwa lub odporna.

Materiał i metody

Dwóch niezależnych tłumaczy przetłumaczyło kwestionariusz z języka angielskiego na język polski. Obie wersje porównano i opracowano jedną wersję z drobnymi modyfikacjami. Następnie kwestionariusz został przetłumaczony na język angielski przez niezależnego tłumacza. Porównano przetłumaczony kwestionariusz z oryginałem i stwierdzono, że obie wersje kwestionariusza pod względem merytorycznym są ze sobą spójne. Przyjęto założenie, że wersja przetłumaczona z oryginału na język polski została opracowana poprawnie.

Badanie walidacyjne przeprowadzono na 103 osobach. Respondenci wypełnili kwestionariusz dwukrotnie, dzień po dniu. Profil demograficzny próby badanej to populacja młodych dorosłych, w wieku 18-35 lat. Kobiety stanowią 98,06%. Badani

uczestniczyli w zajęciach praktycznych z zakresu kosmetologii pielęgnacyjnej twarzy. Kosmetolog podczas zajęć przeprowadził wywiad oraz dokonał oceny wzrokowej i palpacyjnej skóry twarzy badanych.

Dokonano analizy statystycznej. W celu oceny rzetelności kwestionariusza dokonano badania zgodności wewnętrznej za pomocą współczynnika α Cronbacha, opartego zarówno na kowariancjach (α_{raw}) jak i korelacjach (α_{std}). Dodatkowo obliczono współczynnik rzetelności Lambda 6 Guttmana ($G6$) – rzetelność połówkowa. Aby ocenić spójność i powtarzalność wyników w teście i reteście zastosowano współczynnik korelacji wewnątrzklasowej (ang. *Intraclass Correlation Coefficient* – $ICC3$) oraz współczynnik zgodności ACI Gwet'a. Ocenę skuteczności kwestionariusza w identyfikacji określonych typów skóry dokonano poprzez ocenę dokładności, czułości i swoistości.

Wyniki

Do oceny powtarzalności kwestionariusza (rzetelności test-retest) zastosowano współczynnik korelacji wewnątrzklasowej (ang. *Intraclass Correlation Coefficient* – $ICC3$). W wymiarze oceniającym skórę tłustą lub suchą otrzymano $ICC3=0,91$ (test: $M=27,10$, $SD=4,75$; retest: $M=26,67$, $SD=4,86$), natomiast w wymiarze oceniającym skórę wrażliwą lub odporną otrzymano $ICC3=0,96$ (test: $M=33,31$, $SD=7,22$; retest: $M=32,31$, $SD=7,71$). Otrzymane wyniki świadczą o bardzo dobrym poziomie wiarygodności w powtarzanych pomiarach (powtarzalności pomiaru). Ponadto, zgodność pomiędzy testem i retestem wykazano za pomocą statystyki ACI . W wymiarze odnoszącym się do skóry tłustej lub suchej wartość ACI wyniosła 0,69 ($CI\ 95\%=0,55-0,83$; $SE=0,07$; $p<0,001$). W przypadku oceny skóry wrażliwej lub odpornej wartość $ACI=0,74$ ($CI\ 95\%=0,61-0,87$; $SE=0,07$; $p<0,001$). W obu wymiarach wyniki wskazują na silną zgodność między początkowym testem a ponownym testem.

Do oceny rzetelności kwestionariusza zastosowano badanie zgodności wewnętrznej (szacowanie rzetelności na podstawie wartości współczynnika alfa Cronbacha). W wymiarze skóra tłusta lub sucha wartości: $\alpha_{\text{raw}}=0,75$, $\alpha_{\text{std}}=0,74$ w teście oraz $\alpha_{\text{raw}}=0,77$, $\alpha_{\text{std}}=0,77$ w reteście, potwierdzone wartościami współczynnika rzetelności Lambda 6 Guttmana w teście $G6=0,79$ i w reteście $G6=0,81$, świadczą o dobrej zgodności wewnętrznej testu, czyli zadawalającej rzetelności kwestionariusza w opisanym wymiarze. W przypadku oceny wymiaru skóra wrażliwa lub odporna wartości: $\alpha_{\text{raw}}=0,72$, $\alpha_{\text{std}}=0,74$ w teście oraz $\alpha_{\text{raw}}=0,78$, $\alpha_{\text{std}}=0,79$ w reteście, potwierdzone wartościami współczynnika

rzetelności Lambda 6 Guttmana w teście $G6=0,81$ i w reteście $G6=0,85$, również świadczą o dobrej zgodności wewnętrznej testu, czyli zadawalającej rzetelności kwestionariusza w wymiarze skóra wrażliwa lub odporna.

Analiza cech typu skóry oparta na oględzinach przeprowadzonych przez kosmetologa wykazała, że skóra tłusta jest dominującym typem skóry w badanej kohorcie (56,31%, $n=103$). Częstość ta wskazuje na predyspozycje genetyczne, albo czynniki środowiskowe, które sprzyjają wyższej produkcji sebum. Skórę wrażliwą zidentyfikowano u 54,37% badanych ($n=103$). Zarejestrowane obserwacje są traktowane jako rzeczywiste dane do analizy skuteczności BSTQ.

W celu oceny skuteczności kwestionariusza dokonano oceny dokładności, czułości i swoistości kwestionariusza w zakresie klasyfikacji typów skóry: tłusta lub sucha oraz wrażliwa lub odporna w porównaniu z obserwowanymi danymi – badaniem przedmiotowym (fizykalnym). W przypadku klasyfikacji skóry tłustej lub suchej kwestionariusz wykazuje wysoką dokładność (*Accuracy*=0,96, *CI* 95%=0,90-0,99, *Sensitivity*=0,95, *Specificity*=0,98 w teście oraz *Accuracy*=0,86, *CI* 95%=0,87-0,92, *Sensitivity*=0,81, *Specificity*=0,93 w reteście). W przypadku klasyfikacji skóry wrażliwej lub odpornej kwestionariusz wykazuje dobre wyniki, w teście i reteście, dokładność wynosi 86% (*Accuracy*=0,86, *CI* 95%=0,78-0,92, *Sensitivity*=0,98, *Specificity*=0,72 w teście oraz *Accuracy*=0,86, *CI* 95%=0,78-0,92, *Sensitivity*=0,89, *Specificity*=0,83 w reteście).

Wnioski

Kwestionariusz Typu Skóry Baumann (BSTQ) jest rzetelnym narzędziem do oceny typu skóry w zakresie: skóra tłusta lub sucha oraz skóra wrażliwa lub odporna wśród młodej kohorty.

Publikacja IV

Brzozowska JM. Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – part two. *Postępy Dermatologii i Alergologii/Advances in Dermatology and Allergology*. 2025. doi:10.5114/ada.2025.149555. (*Punktacja MNiSW: 70 pkt., IF: 1,4*)

Wstęp

Kwestionariusz typu skóry Baumanna (Baumann Skin Type Questionnaire – BSTQ) jest powszechnie stosowanym kwestionariuszem, który został opracowany w celu określenia typu skóry. Kwestionariusz pozwala na ocenę typu skóry: tłusta lub sucha, wrażliwa lub odporna, z przebarwieniami lub bez przebarwień oraz pomarszczona lub napięta. Ocena typu skóry za pomocą BSTQ nie wymaga użycia drogiego, skalibrowanego sprzętu i może być stosowana podczas konsultacji diagnostycznych na odległość.

Cel

Celem badania była walidacja skuteczności polskiej wersji językowej Kwestionariusza Typu Skóry Baumann (BSTQ) w wymiarach skóra z przebarwieniami lub bez przebarwień oraz skóra pomarszczona lub napięta/bez zmarszczek.

Materiał i metody

Dwóch niezależnych tłumaczy przetłumaczyło kwestionariusz z języka angielskiego na język polski. Obie wersje porównano i opracowano jedną wersję z drobnymi modyfikacjami. Następnie kwestionariusz został przetłumaczony na język angielski przez niezależnego tłumacza. Porównano przetłumaczony kwestionariusz z oryginałem i stwierdzono, że obie wersje kwestionariusza pod względem merytorycznym są ze sobą spójne. Przyjęto założenie, że wersja przetłumaczona z oryginału na język polski została opracowana poprawnie.

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Dokonano analizy statystycznej. W celu oceny rzetelności kwestionariusza dokonano badania zgodności wewnętrznej za pomocą współczynnika α Cronbacha, opartego zarówno na kowariancjach (α_{raw}) jak i korelacjach (α_{std}). Dodatkowo obliczono współczynnik rzetelności Lambda 6 Guttmana ($G6$) – rzetelność połówkowa. Aby ocenić spójność i powtarzalność wyników w teście i reteście zastosowano współczynnik korelacji wewnątrzklasowej (ang. *Intraclass Correlation Coefficient* – $ICC3$) oraz współczynnik zgodności ACI Gwet’a. Ocenę skuteczności kwestionariusza w identyfikacji określonych typów skóry dokonano poprzez ocenę dokładności, czułości i swoistości.

Wyniki

Do oceny powtarzalności kwestionariusza (rzetelności test-retest) zastosowano współczynnik korelacji wewnątrzklasowej (ang. *Intraclass Correlation Coefficient* – $ICC3$). W wymiarze oceniającym skórę z przebarwieniami lub bez przebarwień otrzymano $ICC3=0,91$ (test: $M=19,25$, $SD=4,56$; retest: $M=18,83$, $SD=4,42$), natomiast w wymiarze oceniającym skórę pomarszczoną lub napiętą otrzymano $ICC3=0,97$ (test: $M=45,06$, $SD=4,15$; retest: $M=44,93$, $SD=4,04$). Otrzymane wyniki świadczą o bardzo dobrym poziomie wiarygodności w powtarzanych pomiarach (powtarzalności pomiaru). Ponadto, zgodność pomiędzy testem i retestem wykazano za pomocą statystyki ACI . W wymiarze odnoszącym się do oceny skóry z przebarwieniami lub bez nich wartość ACI wyniosła 1,00 ($CI\ 95\%=1,00$; $p<0,001$). W przypadku oceny skóry pomarszczonej lub napiętej wartość $ACI=0,93$ ($CI\ 95\%=0,87-0,99$; $SE=0,03$; $p<0,001$). W obu wymiarach wyniki wskazują bardzo dobrą zgodność między początkowym testem a ponownym testem.

Do oceny rzetelności kwestionariusza zastosowano badanie zgodności wewnętrznej (szacowanie rzetelności na podstawie wartości współczynnika alfa Cronbacha). W wymiarze skóra z przebarwieniami lub bez przebarwień wartości: $\alpha_{\text{raw}}=0,55$, $\alpha_{\text{std}}=0,54$ w teście oraz $\alpha_{\text{raw}}=0,58$, $\alpha_{\text{std}}=0,54$ w reteście, potwierdzone wartościami współczynnika rzetelności Lambda 6 Guttmana w teście $G6=0,63$ i w reteście $G6=0,63$, wskazują na niską zgodność wewnętrzną. Najsłabszą zgodność wewnętrzną wykazano w wymiarze skóra pomarszczona lub napięta: $\alpha_{\text{raw}}=0,33$, $\alpha_{\text{std}}=0,25$ w teście oraz $\alpha_{\text{raw}}=0,36$, $\alpha_{\text{std}}=0,33$ w reteście, co znalazło odzwierciedlenie w najniższych wartościach współczynnika Lambda 6 Guttmana ($G6=0,47$ w teście i $G6=0,54$ w reteście).

Analiza cech typu skóry oparta na oględzinach, przeprowadzonych przez kosmetologa, wykazała brak obecności przebarwień u 83,50% badanych ($n=103$). Skórę

napiętą zidentyfikowano u 100% badanych. Zarejestrowane obserwacje są traktowane jako rzeczywiste dane do analizy skuteczności BSTQ.

W celu oceny skuteczności kwestionariusza dokonano oceny dokładności, czułości i swoistości kwestionariusza w zakresie oceny przebarwień oraz zmarszczek, w porównaniu z obserwowanymi danymi – badaniem przedmiotowym (fizykalnym). W przypadku klasyfikacji skóry z przebarwieniami lub bez przebarwień kwestionariusz wykazuje rozbieżności. Podczas, gdy dokładność pozostaje stała na poziomie 85% w przypadku przebarwień zarówno w teście początkowym jak i w reteście, czułość jest wyraźnie niska i wynosi 12%, a swoistość idealna, równa 100% (*Accuracy*=0,85, *CI* 95%=0,77-0,92, *Sensitivity*=0,12, *Specificity*=1,00 w teście oraz *Accuracy*=0,85, *CI* 95%=0,77-0,92, *Sensitivity*=0,12, *Specificity*=1,00 w reteście). Sugeruje to, że chociaż kwestionariusz jest skuteczny w identyfikacji osób bez przebarwień, ma on trudności z dokładnym wykryciem osób z przebarwieniami.

Największe ograniczenie obserwuje się w klasyfikacji skóry pomarszczonej lub napiętej, dokładność jest bardzo niska, wynosi 17%, a przy ponownym teście 18% (*Accuracy*=0,17, *CI* 95%=0,11-0,26 w teście; *Accuracy*=0,18, *CI* 95%=0,11-0,27 w reteście). Czułość również jest bardzo niska (*Sensitivity*=0,17 w teście; *Sensitivity*=0,18 w reteście), chociaż swoistość pozostaje na poziomie 100% (*Sensitivity*=1,00 w teście i reteście). Powyższe wyniki wskazują na poważne trudności w klasyfikacji skóry napiętej.

Wnioski

Kwestionariusz Typu Skóry Baumann (BSTQ) jest użytecznym narzędziem do oceny typu skóry w wymiarze skóra tłusta lub sucha oraz skóra wrażliwa lub odporna, natomiast jego zastosowanie w przypadku oceny skóry pod kątem przebarwień i zmian związanych z wiekiem powinno być starannie przemyślane i potencjalnie uzupełnione o inne podejście diagnostyczne (dodatkowe narzędzia diagnostyczne, ocena kliniczna) zanim specjalista podejmie decyzje, dotyczące zalecenia produktów kosmetycznych oraz zabiegów.

Podsumowanie

Obecnie coraz więcej dziedzin ludzkiego życia zależnych jest od technologii informacyjno-komunikacyjnych. Cykl publikacji stanowiący niniejszą pracę doktorską przedstawia przegląd piśmiennictwa, dotyczący konsultacji diagnostycznych na odległość w kosmetologii i dermatologii kosmetycznej oraz wpływ mediów społecznościowych na zmianę zachowań i działań w kontekście promocji zdrowia skóry. Pierwsza publikacja z cyklu wykazała, iż narzędzia komunikacji wykorzystywane w poradnictwie na odległość to, m.in.: spersonalizowane poradnictwo telefoniczne, poradnictwo zautomatyzowane przy wykorzystaniu wirtualnego konsultanta, moduły e-learningowe, materiały edukacyjne wysyłane na pocztę elektroniczną, komunikacja poprzez e-mail, internetowa platforma opieki nad pacjentem umożliwiająca umówienie e-wizyt, portal edukacyjny. Łączenie konsultacji na odległość z wizytami stacjonarnymi, e-learningu, materiałów edukacyjnych z e-konsultacjami, tworzenie aplikacji na telefony, regularny kontakt specjalisty z pacjentem może przyczynić się do lepszego utrwalenia i systematycznego stosowania prawidłowych zachowań pielęgnacyjnych. Opracowany przegląd zidentyfikował lukę naukową w obszarze konsultacji diagnostycznych na odległość, prowadzonych przez kosmetologa.

Druga publikacja z cyklu wykazała, iż media społecznościowe są platformą służącą do rozpowszechniania informacji zdrowotnych oraz tworzenia interwencji skierowanych do konkretnych grup. W publikacji zwrócono uwagę, zarówno na pozytywną, jak i negatywną stronę mediów społecznościowych. Przykładami negatywnej strony mediów społecznościowych były: porady dotyczące trądziku niezgodne z wytycznymi *American Academy of Dermatology* oraz generowane przez media ryzykowne zachowania związane z opaleniem bez ochrony przeciwsłonecznej, które w rezultacie mogą prowadzić do nowotworów skóry. Mimo to, większość badań (14/23, 61%) wykazało, iż interwencje w mediach społecznościowych posiadają pozytywny wpływ na promocję zdrowia skóry, zmieniają zachowania, działania, postawy i poziom wiedzy użytkowników.

Zaangażowanie użytkowników ma kluczowe znaczenie dla powodzenia interwencji. Ocena zaangażowania użytkowników w interwencje w mediach społecznościowych została przedstawiona w 35% (8/23) badań omówionych w przeglądzie. Zidentyfikowano w nich reakcję na posty na podstawie liczby polubień, komentarzy pod postami oraz udostępnień. Zaangażowanie w odpowiedzi na bodziec cyfrowy może przyczynić się do zmiany zachowań zdrowotnych.

Interwencje cyfrowe mają wiele zalet, takich jak duża liczba odbiorców, niskie koszty rozpowszechniania informacji oraz możliwość tworzenia indywidualnych treści i interakcji z innymi użytkownikami o podobnych doświadczeniach lub w podobnej sytuacji. Pozwala to na wzajemne wsparcie, wymianę informacji i możliwość konsultacji ze specjalistami. Działania w mediach społecznościowych powinny być również ukierunkowane na walkę z dezinformacją. Zamieszczane treści powinny być zgodne z medycyną opartą na dowodach naukowych oraz wytycznymi *American Academy of Dermatology*. Interwencje powinny zwiększać poziom wiedzy użytkowników mediów społecznościowych na temat zagrożeń związanych z niewłaściwą pielęgnacją skóry. Powinny zmienić ich pozytywne nastawienie do negatywnych zachowań zdrowotnych, takich jak nadmierne opalanie. Interwencje w mediach społecznościowych powinny również przyczyniać się do wzrostu asertywności wobec nieodpowiednich, szkodliwych treści, budowania poczucia własnej wartości u użytkowników oraz nauki krytycznej analizy udostępnianych treści. W przypadku opalania interwencje powinny opisywać alternatywne opcje, takie jak stosowanie bezpiecznych, nawilżających bronzarów. Interwencje behawioralne, dotyczące wyglądu oraz obrazu ciała, często wykorzystują techniki perswazji, które oparte są na teorii dysonansu poznawczego. Techniki te zachęcają uczestników do angażowania się w dyskusje i ćwiczenia poznawcze.

W badaniach zaprezentowanych w publikacji trzeciej oraz czwartej dokonano tłumaczenia, według międzynarodowych standardów, oraz walidacji Kwestionariusza Typu Skóry Baumann (BSTQ) w wymiarach: skóra tłusta lub sucha, wrażliwa lub odporna, z przebarwieniami lub bez przebarwień, pomarszczona lub napięta (bez zmarszczek). W publikacjach wykazano, że Kwestionariusz Typu Skóry Baumann (BSTQ) w polskiej adaptacji jest użytecznym narzędziem do oceny typu skóry, w wymiarach: skóra tłusta lub sucha oraz skóra wrażliwa lub odporna. Natomiast jego zastosowanie w przypadku oceny skóry, pod kątem przebarwień i zmian związanych z wiekiem, powinno być starannie przemyślane i potencjalnie uzupełnione o dodatkowe narzędzia diagnostyczne i ocenę kliniczną.

BSTQ może być wykorzystany w konsultacjach diagnostycznych na odległość. Wiedza na temat typu skóry umożliwia specjalistom oraz konsumentom dokonanie wyboru produktów do pielęgnacji skóry oraz zabiegów. Według Baumann [76] zadawanie pacjentom pytań o ich skórę jest formą edukacji. Kiedy pacjenci są proszeni o zaznaczenie w kwestionariuszu szeregu nawyków behawioralnych, takich jak: palenie, korzystanie z

łóżek opalających, spożywanie owoców i warzyw, stają się świadomi wpływu nawyków na zdrowie. Poprawia to komunikację między pacjentem a specjalistą [76].

Dysertacja, oprócz waloru teoretycznego, posiada walor praktyczny w postaci zwalidowanego kwestionariusza Baumann Skin Type Questionnaire (BSTQ) do określania typów skóry wśród młodych, dorosłych Polaków. Badania podjęte w ramach realizacji niniejszej pracy stanowią spójną całość, wpisują się w obecny trend badań nad nowoczesnymi strategiami oceny typów skóry i edukacji zdrowotnej w dermatologii i kosmetologii.

Propozycje kontynuacji badań

Badania są kontynuowane. Prace koncentrują się na badaniach interwencyjnych, oceniających rzeczywiste zmiany w zachowaniach pielęgnacyjnych pacjentów po zastosowaniu BSTQ (w wymiarach: skóra tłusta lub sucha oraz skóra wrażliwa lub odporna). Celem badania jest ocena skuteczności cyfrowej interwencji kosmetycznej w poprawie kondycji skóry, poziomu wiedzy i samooceny.

Planowana jest walidacja Kwestionariusza typu skóry Baumann (BSTQ) w wymiarach: skóra tłusta lub sucha oraz skóra wrażliwa lub odporna, w zróżnicowanej pod względem płci, grupie wiekowej powyżej 35-go roku życia. Opracowanie uzupełniającej metody zwiększającej skuteczność diagnostyki online w postaci Kwestionariusza diagnostyki typu skóry i zachowań pielęgnacyjnych dla populacji polskiej.

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THE IMPORTANCE OF REMOTE COUNSELING IN COSMETOLOGY AND COSMETIC DERMATOLOGY

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ABSTRACT

Remote consultations are used for diagnosis, treatment recommendations, patient monitoring and health education. The aim of the study was to collect, assess and summarise data regarding remote consultations in cosmetology and cosmetic dermatology. The study is an introduction to the authors' research into the importance of remote counseling in cosmetology. A review of the literature available on PubMed; a diagnostic survey was carried out among those declared and qualified for the study; the author's preliminary unpublished results are reported (JMB). A total of 490 publications were identified in a search of 20 October 2021. A summary of ten research papers was produced in the narrative form. In addition, an analysis of an unpublished diagnostic survey was carried out (JMB research, 2021, respondents n=95, full survey completed n=46). The analysed research papers discussed: telephone counseling (n=2), e-counseling (n=3), e-learning (n=2), automatic counseling (n=2), and mobile health applications (n=1). The aim of each of the research papers analysed in this review was to educate patients in the field of skin care and to consolidate proper skin care and photo-protection behaviours. The diagnostic survey, as well as the literature review, confirmed the importance of and need for remote counseling in cosmetology and cosmetic dermatology as regards education, motivation and prophylaxis.

KEY WORDS: remote consultation, remote counseling, cosmetology, cosmetic dermatology, skin health

INTRODUCTION

Remote consultations with the use of new technologies are becoming a viable alternative to standard face-to-face, in-person medical appointments in the doctor's office [1]. Technological developments may reduce the need for face-to-face appointments. Remote consultations allow to maintain social distance, which is an important factor preventing the spread of the coronavirus in the ongoing COVID-19 pandemic [2].

Telemedicine uses telecommunications technology (electronic communication tools) to exchange medical information for consultations, diagnosis, treatment recommendations, follow-up appointments (monitoring of diseases) or knowledge transfer (education). Tele dermatology is one of the branches of telemedicine. Teledermatological consultations may be carried out directly, through a conversation between the dermatologist and the patient (direct-to-consumer teledermatology) or in the form of a dialogue between a doctor of another specialty (usually primary care physician) and the patient [3,4].

We distinguish two main subtypes of teledermatology: store-and-forward methods and real-time, live-interactive methods. In the asynchronous procedure, implemented with the use of a storage and transfer network, a medical assistant, nurse, or primary care physician takes clinical and dermoscopic pictures of the patient's skin lesions in the clinic or hospital setting, which are then sent along with the patient's medical history to a dermatologist in a remote location [3,5,6]. In turn, live-

interactive teledermatology (real-time teledermatology) makes use of real-time consultations, with the use of video-conferencing devices (synchronous procedure) [3,7]. The dermatologist communicates with the patient using live videoconferencing [5]. This type of teledermatology usually takes place at the patient's primary health care centre, in the presence of a General Practitioner [6,8]. Moreover, there also exists a hybrid method that combines the two above-mentioned methods [6].

Tertiary teledermatology can also be distinguished, which involves specialist-to-specialist consultations (a general dermatologist consults a specialist dermatologist for difficult cases, e.g. a dermatologist consults a dermatopathologist) [6,9].

Cosmetology advice takes place in beauty salons, dermatological and aesthetic medicine practice as well as pharmacies offering assistance in skin type assessment and choice of cosmetics. The aim of these consultations is to assess skin type, select cosmetics and educate the patient in the field of skin care and preventive skin care activities. Online consultations by cosmetologists are available via websites offering cosmetics. Moreover, online consultations are also conducted by cosmetologists through their own websites, or via social networks in the form of care plans based on online consultations. In this review, we wanted to assess whether the above-mentioned activities are scientifically proven. We searched for publications on skin care and preventive skin care. At the same time, it was im-

portant for remote consultations to be carried out directly between the specialist and the patient, without involving a third party or visiting a consultation centre. Despite the fact that remote cosmetology counseling is mainly a commercial activity, we believe it has an impact on public health.

The main reasons behind this publication was the need for remote consultations triggered by the COVID-19 pandemic. The COVID-19 pandemic made face-to-face appointments impossible; therefore, in our view, it is important to develop and improve remote consultations through the use of different communication tools. Moreover, after lifting the COVID-19 pandemic restrictions, social distance and avoiding crowds are still required, so it reasonable to conduct appointments remotely, e.g. follow-up visits. The analysis of the results of the diagnostic survey (JMB research, 2021, n=95, questionnaire, interview), the experience gained at the Labestetico Cosmetology Centre (JMB) and a study of social media: Facebook, Twitter, Instagram, Pinterest, enabled us to notice a high number of questions related to skin care and choosing the right cosmetic products. Interviews with personnel at beauty salons and cosmetic consultants who provide advice on skin care and cosmetic selection in pharmacies led us to a conclusion that there is a need for advice on correct skin type assessment and care.

AIM

The primary aim of the study was to collect, assess and summarise data regarding remote consultations in cosmetology and cosmetic dermatology. Furthermore, the aim of this review was to answer the following questions:

1. What dermatological and cosmetic problems do direct (one-to-one) remote consultations involve?
2. What is the main purpose of remote consultations in cosmetology and cosmetic dermatology?
3. What communication tools are used during remote consultations in cosmetology and cosmetic dermatology?
4. What technological developments are used in remote consultations in the field of cosmetology and cosmetic dermatology?
5. Do remote consultations affect preventive skin care?
6. Are "remote dermoconsultations" described in scientific publications, i.e. remote consultations on skin diagnostics and care conducted by a cosmetologist?

MATERIALS AND METHODS

This paper summarizes the current knowledge on direct (one-to-one) remote consultations in cosmetology and cosmetic dermatology, using the publicly available scientific PubMed database and an unpublished original study (JMB), conducted in 2021 on a group of 95 eligible subjects. The paper presents a review based on international guidelines for reporting research results: Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) [10]. This paper is an introduc-

tion to research on the importance of remote counseling in cosmetology.

ELIGIBILITY CRITERIA

We searched for research papers discussing direct (one-to-one) remote consultations on cosmetology and cosmetic dermatology, i.e. research papers on skin diagnostics, choice of proper care, education in preventive skin care and the most common dermatological and cosmetic problems.

We took into account scientific publications that met the following criteria:

1. Scientific papers based on research work, randomized and nonrandomized trials, as well as case reports, qualitative research, observational studies, comparative studies, multicenter studies, or reviews.
2. Scientific papers on cosmetology, cosmetic dermatology.
3. Scientific papers involving specialist-to-patient direct (one-to-one) remote communication, i.e. the participants in the consultation were the patient and the specialist, or scientific papers describing self-diagnosis and self-improvement in preventive skin care using modern technological developments.
4. Papers in which remote consultations took place in a location convenient for the patient that did not require travelling to a primary care centre.

The exclusion criteria were as follows:

1. Scientific papers written in a language other than English.
2. Letters to the editor, commentaries, interviews.
3. Scientific papers not directly related to dermatology or cosmetology.
4. Scientific papers in which remote consultations in dermatology or cosmetology were not the main topic.
5. Scientific papers on store-and-forward teledermatology, real-time teledermatology in a primary care centre, or tertiary teledermatology.
6. Scientific papers on referrals in teledermatology.
7. Scientific papers on cost assessment in teledermatology.
8. Scientific papers on teledermatology in the medical education of doctors.
9. Scientific papers on the management of dermatological care.
10. Scientific papers on dermatological surgery, dermatopathology, or emergency dermatology.
11. Scientific papers on diagnostic reliability in teledermatology.
12. Scientific papers on the satisfaction of patients and dermatologists in one-to-one teledermatology.

We have also presented the results of an analysis of an unpublished diagnostic survey on a group of people, qualified according to the criteria established by the author (JMB) (age: 18 to 50 years, minimum secondary school education, not related to health sciences, medicine, pharmacy, or cosmetology). The analysis took into account:

1. level of knowledge of cosmetic preventive care.
2. level of motivation (self-discipline and willingness to follow cosmetic recommendations).
3. assessment of remote cosmetology consultations, also self-assessment (assessment of skin condition and self-esteem).

INFORMATION SOURCES, SEARCH STRATEGY, STUDY SCREENING METHODS AND SELECTION PROCESS

In this paper, the following research question was addressed: What is the existing scientific data on direct (one-to-one) remote consultations in the field of cosmetology and cosmetic dermatology? The literature in the PubMed scientific database was reviewed and analysed dated from the earliest available date until October 20, 2021.

The following query was formulated in the search engine of the PubMed scientific database:

((("distance consultation*" OR "remote consultation*" OR "remote counseling" OR "distance counseling" OR "remote advice" OR "e-consult*" OR "electronic consult*" OR "e-counseling" OR "electronic counseling" OR "online consult*" OR "online counseling" OR "email consult*" OR "email counseling" OR "telephone consult*" OR "telephone counseling" OR "video consult*" OR "video counseling" OR "virtual consult*" OR "virtual counseling") AND ("derma*" OR "cosmet*" OR "beauty"))

Research methodology involved a review by one of the researchers (JMB) of the literature in a publicly available scientific database – PubMed. The study was carried out in October 2021. All records received were analysed: from the year 1978 to October 2021. One of the authors (JMB) twice reviewed the titles, abstracts, keywords of all the scientific articles for the inclusion criteria. Duplicates were excluded from the study and thematic categories were established. All doubts regarding the inclusion criteria or categorization were discussed by the research team. The full texts of the remaining publications were analysed for eligibility. Research papers that met all the inclusion criteria were further analyzed by the author (JMB). Another researcher (JG) independently checked data consistency and assessed the correctness of the analysis. In the second phase of the study, the author's yet unpublished research (JMB) was analysed. The study was conducted in 2021 on a group of 95 eligible subjects. The study consisted of three stages. The first stage consisted of 1. a remote cosmetic interview (author's questionnaire), 2. a remote assessment of skin type (Baumann Skin Type questionnaire translated by J.M. Brzozowska), 3. assesment of the level of knowledge about preventive cosmetic care with the author's original questionnaire, 4. assessment of the level of self-esteem (SES Self-Esteem Scale questionnaire by M. Rosenberg in the Polish adaptation by I. Dzwonkowska, K. Lachowicz-Tabaczek and M. Łaguna). The second stage of the study consisted of monitoring the implementation of original cosmetic programmes adapted to the respondents' skin type (the study lasted 12 weeks). The cosmetic programme included information on the care for the di-

agnosed skin type, as well as procedures and products recommended for this skin type. The communication was conducted via email, Google Meet, Skype and mobile phone. Remote consultations were carried out over a 12-week period to monitor the progress in following the recommendations. The third stage verified the effect of: 1. educational, 2. motivational (self-discipline and willingness to follow the recommendations), 3. self-assessment (skin condition and self-esteem). The full remote consultation process was completed by 46 respondents.

DATA COLLECTION PROCESS, DATA EXTRACTION AND QUALITY ASSESSMENT

After entering a properly formulated query into the PubMed scientific database search engine, a total of 490 records were obtained. After the exclusion of the duplicates, 489 papers remained and were subsequently analysed. The literature review was based on the analysis of the publication title, summary, keywords, then the full, available text of the article.

At the initial stage, the following types of publications were excluded from the analysis: scientific publications written in a language other than English, letters to the editors, commentaries, interviews, papers not directly related to dermatology or cosmetology, (i.e. scientific articles in which there was no dermatological or cosmetic problem) and articles in which remote consultations on dermatology or cosmetology were not the main topic of the research paper. A total of 279 papers were obtained which were subsequently analysed and grouped into thematic categories depending on the main theme of the analysed publication. Then, research papers were excluded that concerned store-and-forward teledermatology, real-time teledermatology carried out in the patient's primary health care centre, or tertiary teledermatology. Moreover, the following publications were excluded from the study: publications regarding referrals in teledermatology, cost assessment in teledermatology, research papers on teledermatology in the medical education of doctors, management of teledermatological care, dermatological surgery, dermatopathology, emergency dermatology, patients or dermatologists satisfaction with one-to-one teledermatology. As a result, 10 research papers were found and their full texts were analysed for the purpose of this study. The stages of the research procedure are presented in Figure 1.

Due to the heterogeneity of the results standardised checklist tools were not used to assess the quality and risk of bias of individual studies.

THEMATIC SYNTHESIS

After the classification of research papers, 10 scientific articles were obtained that met all the criteria and were included in the final analysis. The subject matter of the research papers included in the final analysis varied. One of the authors (JMB) grouped them into thematic categories. Subsequently, a collective analysis in narrative form was performed.

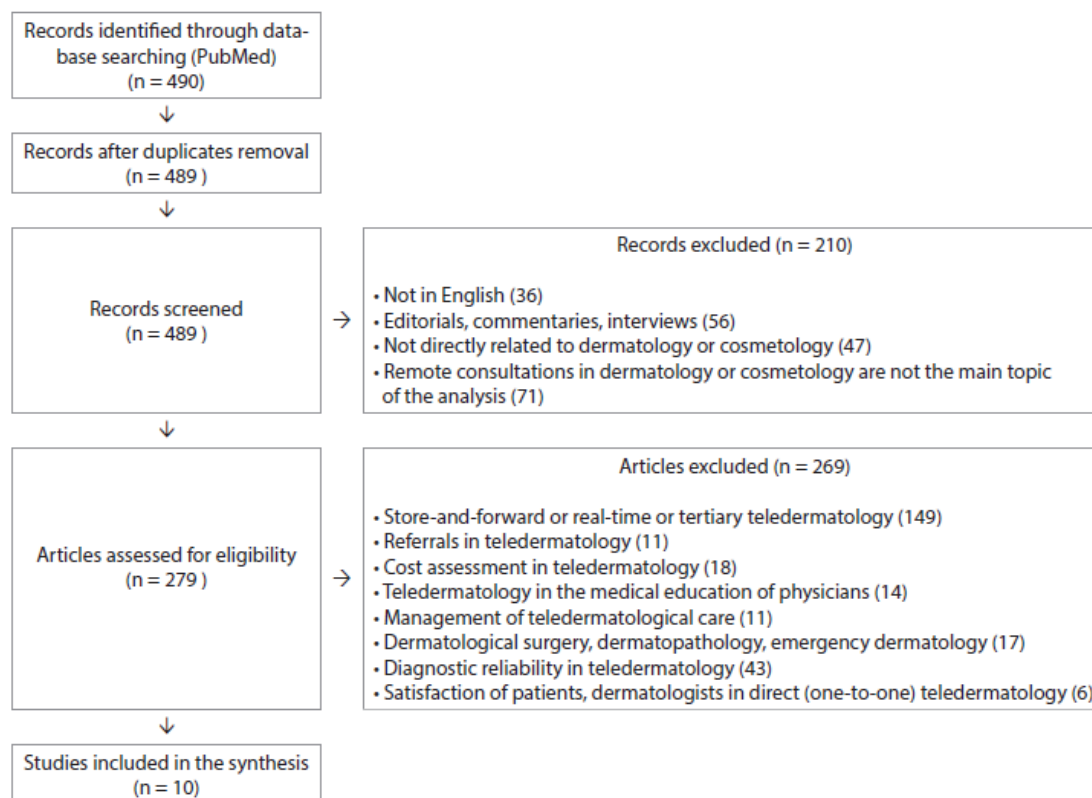


Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses diagram of systematic search and study (identification, screening, eligibility, included).

REVIEW

STUDY SELECTION AND STUDY CHARACTERISTICS

After duplicate removal, 489 records were obtained in the PubMed database search. The oldest research paper, dated 1978, was written in Polish on confidential telephone consultations in venereology and health education [11]. It was not until the year 1991 that another research paper appeared, while the year 1995 marked a gradual increase in the number of publications. The year 2020 saw a significant increase in the number of publications, probably due to the COVID-19 pandemic announced on 11 March 2020 and related restrictions. In order to contain the spread of the virus, the World Health Organization (WHO) implemented safety guidelines, including quarantine, social distancing or suspension of medical appointments [12], which resulted in an understandable dynamic increase in publications on remote consultations in this period.

A total of 10 scientific publications met all the eligibility criteria and were included in the summary. The publications had clearly defined objectives and research methodology. The first research paper dealing with the topic in question is dated 2004 [13]. However, the majority were published in 2010 ($n=2$) [14,15] and in 2015 ($n=2$) [16,17]. Most research papers were published in the USA ($n=5$) [13-15, 17, 18]. Three papers were published in

Europe, i.e. the Netherlands ($n=3$) [16, 19, 20] and one in Turkey [21]. One research paper was of Australian origin [22]. Seven out of ten papers involved a statistical analysis [13-15,17-20]. The analysed research involved various dermatological diseases. Most papers discussed acne ($n=3$) [14,15,17]. Two research papers discussed infantile haemangioma [19, 20]. One research paper dealt with atopic dermatitis [16]. Two publications discussed melanoma [18,22], of which one discussed the self-examination of the skin for melanoma [22], and the other the early diagnosis and prevention of melanoma among the siblings of melanoma patients [18]. Yet another work focused on sun protection behaviours and the degree of skin damage caused by sunburn in children [13]. The last investigated research paper discussed various dermatological diseases [21]. The analysed papers included advice by dermatologists [13,17,21], dermatological nurses [16], health educators [18], virtual consultants [14,15] and a mobile health application [22], among others. None of the research papers involved a consultation by a cosmetologist. Furthermore, none of the papers uses the phrase "dermoconsultations". Two papers discussed automatic counseling [14,15] and one discussed the use of a mobile health application [22]. In two papers, e-learning was the main topic [19,20]. Three subsequent publications discussed e-counseling [16,17,21] and two

papers dealt with telephone counseling [13,18]. Table 1 presents the general characteristics of the analysed publications, whereas detailed results of each study are presented in Table 2.

SYNTHESIS OF THE RESULTS

The scientific articles included in this review focused mainly on how remote counseling affects the change in the skin care behaviours of the respondents and how it educates respondents in skin health and care.

We identified three main topics: (1) the importance of automated counseling (automatic counseling – virtual counseling, e-learning) in preventive skin care; (2) the importance of online counseling (e-appointments, e-mail) in preventive skin care; (3) the importance of telephone counseling in preventive skin care.

HOW DOES AUTOMATED COUNSELING AFFECT PREVENTIVE SKIN CARE?

Acne vulgaris is a chronic inflammatory disease of the skin, often occurring among adolescents, in the treatment of which pharmacotherapy and education of the patient in the proper care of the affected skin areas are extremely important [14]. Tuong et al. [14] emphasise that proper education increases patient knowledge and contributes to changes in patient behaviour. Moreover, the researcher points out that the impact of education on patient outcomes is inadequately described in scientific publications. The researcher compared the effectiveness of the standard educational website with the website with automated counseling in improving patient outcomes (assessment of the total number of acne lesions), improving the quality of life among adolescents with acne (Children's Dermatology Life Quality Index – CDLQI) and improving skin care behaviours. The results have shown that the effects of online education in acne skin care using automated counseling did not differ significantly from the ones offered by the standard educational website in terms of reducing the severity of acne lesions and assessing the quality of life. Nevertheless, a higher percentage of the study participants who browsed the automated counseling website followed and maintained the recommended skin care regimen. Tuong et al. [14] note that online dermatology education using an automated counseling website contributes to the improvement of short-term skincare behaviours and may be an effective tool in promoting skin care behaviours among teenagers with acne. Moreover, the development of mobile phone applications and the combination of automated counseling sessions with regular in-office appointments may contribute to greater adherence to therapeutic recommendations, which may bring long-term benefits in the form of reducing the number of acne lesions and improving the condition of the skin [14].

In another publication, Tuong et al. [15] assessed the change in knowledge about acne among the surveyed youth. The researcher compared the effectiveness of standard online education (the respondents visited a standard website) with education consisting of visiting

an automated counseling website by another group of respondents. Acne knowledge has improved in both groups. After 12 weeks, the average improvement in knowledge was higher in the group using automated counseling than in the group using a standard website. According to Tuong et al. [15], online education for teenagers can be an effective method of improving knowledge about acne.

The e-learning modules are also used to increase knowledge about and understanding of a given health issue, i.e. enable the assessment and correct diagnosis of infantile haemangioma (a common benign vascular tumour occurring in children). In addition, e-learning modules paired with e-appointments (tele dermatological consultations) may contribute to faster direct reporting of children with a high-risk of infantile haemangioma to dermatologists and to earlier initiation of treatment in specialized centres [19,20].

The e-learning modules may provide information about a specific disease (infantile haemangioma), its complications and offer sample clinical cases. On the other hand, e-consultations are aimed directly at the patient; involve providing information about the skin lesion by the patient as well as sending a photo of the lesion to a specialist. The patient receives information about the diagnosis, risk of complications and the necessity of an in-person appointment with a specialist via e-mail within 5 working days [20].

Automated counseling in preventive skin care also involves the use of mobile health applications. Mobile health applications are used for self-examination of the skin. They help in the detection and monitoring of skin cancers, especially melanoma. Their task is to instruct the respondent how to properly perform skin self-examination. They enable performing mobile teledermoscopy and sending the obtained images of skin lesions to the dermatologist through the application [22].

HOW DOES ONLINE COUNSELING AFFECT PREVENTIVE SKIN CARE?

Online counseling enables remote patient care. It does not require the presence of the patient in the doctor's office. Communication between the patient and the specialist requires access to the Internet, mobile phone or digital camera. Online counseling is an alternative method of patient care with the use of patient care platforms (e-appointments), e-mail, or instant messaging.

The University Medical Centre Utrecht (UMC Utrecht) has developed a portal for patients and parents of children with atopic dermatitis. The above portal combines e-consultancy and online training provided by a dermatological nurse in the scope of diagnosis, monitoring and care of skin with atopic dermatitis [16].

Online counseling is used in the follow-up of patients with acne (online follow-up appointments). Direct online communication with the patient eliminates the need for an in-person appointment or the involvement of another doctor. It is convenient for both the specialist and the patient. It also saves time. Information from

digital images and patient responses from the survey are sufficient for dermatologists to make appropriate decisions regarding the treatment of patients with acne (providing advice and issuing electronic prescriptions) [17].

There are a large number of websites concerning health, beauty or skin care. One of the free of charge health-related websites has made it possible to ask dermatological questions. The most popular topics addressed: acne, hair diseases, pruritus, eczema, seborrhoeic dermatitis, psoriasis, superficial mycosis, and vitiligo. The respondents expected extensive information on a specific disease and methods of its treatment. Dermatologists provided information via e-mail regarding the diagnosis and treatment of a given dermatological disease. Among the advantages of online advice via e-mail there are the speed of this method (it does not require transport or arranging an appointment at the clinic) and its anonymity. The respondents do not provide detailed information about themselves, because it is not required. Appropriate forms are required in order to facilitate the online guidance service [21].

Similar conclusions can be reached after analysing our own research – the diagnostic survey mentioned at the beginning. The surveyed group, at a time interval of 12 weeks, after going through the process of remote consultation and following the recommendations, found that their knowledge had improved and that remote consultation was useful in preventive skin care. Communication was conducted via email, Google Meet, Skype and mobile phone. The results are presented in Table 3. Despite the high number of favourable opinions, it should be noted that the majority of the respondents (56.5%), given a choice between a face-to-face appointment in the office or a remote appointment option, preferred direct contact with the cosmetologist in the office. The respondents were aware of the fact that remote counseling in cosmetology and cosmetic dermatology (online and other modes) is necessary and legitimate, especially in the pandemic; nonetheless to them it was rather complementary to in-office appointments. The authors are well aware that the clinical role of remote counseling is limited and clinical guidelines are a set of recommendations for diagnostic and therapeutic management that support physicians in clinical decision-making. When the patient is ill, the final decisions are made by doctors based on their medical knowledge, experience and analysis of the specific case.

An unpublished original study (JMB) demonstrated that 91.3% of survey respondents (n=46) who participated in the full remote consultation process (12 weeks) began to spend more time on facial skin care. Nearly 85% of the respondents (84.8%, n=46) claimed that the condition of their skin improved (in parameters such as improved skin smoothness, improved skin hydration, reduced number of blackheads, reduced feeling of tightness, burning after washing facial skin, less frequent occurrence of inflammation (pimples)). In addition, 82.6% (n=46) of the respondents stated that they were motivat-

ed to follow the cosmetic recommendations. For 69.6% (n=46) of the respondents, their interest in cosmetics increased, and for 30.4% of the respondents it remained the same. On the other hand, 89.1% of the respondents (n=46) stated that their level of knowledge on prevention skin care and skin care in general increased after the remote consultation (see Table 3).

HOW DOES TELEPHONE COUNSELING AFFECT PREVENTIVE SKIN CARE?

Identifying and educating people at high risk of melanoma may reduce the incidence of melanoma. Promoting screening, self-examination of the skin and regular use of sunscreen seems to be a reasonable strategy to reduce the risk of skin cancer among the siblings of patients with newly diagnosed melanoma (first-degree relatives). It has been shown that personalized telephone counseling motivates the respondents to more frequently examine the moles on the body and to regularly use sunscreen. Personalized telephone counseling is based on motivational interviews, goal setting, sending individual educational materials to the respondents after the analysis of their responses from the survey, or conducting telephone counseling sessions with a health educator [18].

The aim of telephone counseling is to improve skin care behaviours through motivating patients to have screening for skin cancer performed by a dermatologist, performing skin self-control, i.e. careful observation of moles, and the use of sunscreens. During such phone calls, health educators emphasize the importance of sun protection. They also promote limiting time in the midday sun, wearing shirts with sleeves, hats, staying in the shade, avoiding sunbathing and frequent application of sunscreen with a sun protection factor (SPF) of 15 or more [18].

Other research papers also discuss education in the field of sun protection. Proper skin care behaviours, including good sun protection habits, should start in early childhood and be continued and taught as part of routine, preventive health care [13]. In the study by Steinberg Benjes et al. [13], within 24 to 48 hours after delivery, mothers received advice from the midwives regarding the sun protection of their newborn children. The midwives informed the mothers about a number of sun protection behaviours: avoiding the sun during peak hours, providing the child with as much shade as possible (avoiding excessive exposure to the sun), protection with caps, umbrellas, trousers and long-sleeved shirts, and the use of sunscreen. In order to retain and consolidate the information, the mothers received both a phone call from a dermatologist, lasting at least 15 minutes, and educational materials. During the phone conversation, the dermatologist informed about the benefits of sun protection, instructed how to properly use sun protection and protective clothing, and answered questions from the mothers. The study demonstrated an increase in the use of sunscreen. In this study, completing a questionnaire preceded telephone counseling and personalized educational materials being used. The survey as-

Table 1. Characteristics of the included research papers.

Author (year)	Country	Study design/ Method of data collection	Diagnosis	Telemedical procedures	Type of consultancy specialist	Number of participants (sample size)	Main topic
Steinberg Benjes L et al. (2004) [13]	USA	Randomized study	Sunburn (degree of skin damage)	Hospital education, tailored materials, telephone counseling	Maternity nurse, Dermatologist	108 mothers (92 of the mothers completed post-tests)	Educating mothers about sun protection of their children
Tuong W et al. (2015) [14]	USA	Randomized clinical trial, questionnaire	Acne (active mild to moderate acne)	Standard educational website, automated counseling website	Virtual counselor	98 high school students (59% female using standard website; 41% female using automated-counseling website; 39% male using automated-counseling website) [95 students completed the study]	Effect of automated online counseling on clinical outcomes and quality of life among adolescents with acne vulgaris
Tuong W et al. (2015) [15]	USA	Randomized controlled trial	Acne (mild-to-moderate acne vulgaris)	Standard educational website, automated counseling website	Virtual counselor	97 high school students (58% female using standard website; 42% female using automated-counseling website; 39% male using automated-counseling website) [95 students completed the study]	Comparing the effectiveness of automated online counseling to standard web-based education on improving acne knowledge
Van Os-Medendorp H et al. (2010) [16]	Netherlands	Business case analysis	Atopic dermatitis	Eczema portal that combines e-consulting, monitoring and online self-management training	Dermatology nurse	-	Online counseling for patients and parents of young children with atopic dermatitis (eczema portal; The Digital Eczema Centre)
Watson AJ et al. (2010) [17]	USA	A prospective, randomized controlled study	Acne (active mild to moderate facial acne)	Asynchronous, remote online visit (e-visit) platform	Dermatologist	151 patients (78% female, 22% male) 21 patients completed the study	Online follow-up in the management of acne
Geller AC et al. (2006) [18]	USA	Randomized controlled trial	Siblings of melanoma patients	Telephone counseling and individually tailored materials	Health educator	494 siblings (237 intervention siblings: 51.9% female, 48.1% male; 257 control siblings: 54.9% female, 45.1% male) 403 siblings remained in the study through at least 6 months	Telephone counseling in the prevention of melanoma

De Graaf M et al. (2014) [19]	Netherlands	Prospective study	Infantile haemangioma	E-learning, e-consult	E-learning, Dermatology	158 parents	E-learning in educating about infantile haemangioma
De Graaf M et al. (2013) [20]	Netherlands	Cross-sectional study, questionnaire	Infantile haemangioma	E-learning, e-consult	E-learning, Dermatology	224 parents (128 parents completed the study: 92.2% female, 7.8% male)	E-learning and e-consult in education about infantile haemangioma
Arican O (2007) [21]	Turkey	Retrospective investigation of dermatological questions	Different skin conditions (mainly: acne, hair diseases, pruritus, eczema, seborrheic dermatitis, psoriasis, superficial mycoses, vitiligo)	Free consultation page of the health site, email	Dermatology	607 questions from patients	Email counseling on dermatological diseases
Koh U et al. (2019) [22]	Australia	Online survey, focus group	Detection of melanoma	Mobile health app, mobile tele-dermoscopy	Mobile health app	88 online survey participants (81% female, 19% male) 28 focus group participants (39% female, 61% male)	Mobile teledermoscopy in skin self-examinations (detection of melanoma)

essed the degree of maternal education regarding the harmful effects of UV on the skin and maternal readiness to accept changes in photoprotective behaviours. The combination of mothers' early education, personalised telephone counseling and educational materials serves to broaden the knowledge on sunscreen protection in children [13].

DISCUSSION

PRINCIPAL FINDINGS

Despite the dynamic growth, in the year 2020, of publications on remote consultations, including publications on teledermatology, we have not noticed such a trend in the case of direct (one-to-one) remote consultations on cosmetology and cosmetic dermatology.

Our review shows the impact of remote consultations on education and taking new steps towards skin protection and care. The discussed research papers examine communication tools such as e-mail, telephone, online patient care platforms (e-appointments) as well as technological developments such as mobile applications for self-diagnosis (mobile teledermoscopy), or e-learning. The discussed research and publications promote activities affecting preventive skin care. The aim of each of the studies analyzed in this review was education in the field of skin health.

To our knowledge, this review is one of the first, to draw attention to the legitimacy of remote consultations in cosmetology and cosmetic dermatology. Moreover, it showed that education in the field of skin care is conducted mainly by dermatologists, dermatological nurses, health educators, virtual consultants or via mobile applications, educational materials and e-learning. However, it is not conducted by cosmetologists.

A study by Baumeister et al. [23] has shown that similarly to conventional face-to-face examinations, teledermatological examinations are sufficiently sensitive in detecting minimal skin lesions. However, it has also been shown that the symptoms of chronic diseases may be overestimated by patients. In addition, a study by Boyce et al. [24] suggests that patient-generated clinical images of melanocyte changes may become a viable alternative to traditional face-to-face diagnostics.

Remote consultations are used not only to diagnose the disease, but they also serve to conduct follow-up appointments to check the effectiveness of acne treatment [17]. Moreover, in aesthetic medicine, they are used to check whether the patient adheres to post-treatment recommendations [25]. During an in-person appointment, the aesthetic medicine doctors inform the patients about post-treatment recommendations, instruct them what should be used and how to perform a massage, among others. They then use telephone counseling, reminder postcards and text messages to improve patient adherence. Thanks to the above actions, patients have fewer adverse events than patients who do not follow the recommendations and they respond better to treatment in aesthetic medicine [25].

Table 2. Results of the included studies.

Author(year)	Summary of the most important results	Statistical analysis performed	Satisfaction rating	Education in the skin prophylaxis
Steinberg Benjes L et al. (2004) [13]	- Increase in sunscreen use from 34% to 93% ($p<0.001$) in both groups (Group I: mothers of infants receiving hospital education and Group II: mothers of infants receiving hospital education, adapted educational materials and telephone counseling); - Decrease in the use of protective clothing (hats, shirts) and keeping children in the shade in the second summer of life (mean child age: 18 months) compared to the first summer of life (mean child age: 6 months); - Sunburn or tanning occurred in 22% of children during the first summer of life, compared to 54% of children during the second summer of life ($p<0.001$).	+	-	+
Tuong W et al. (2015) [14]	- Improvement in the mean number of acne lesions (mean [SD]) was not significantly different between the standard educational website group and the automated counseling group (0.20 [9.26] vs. 3.90 [12.19]; $p=0.10$). This indicates that there was a greater mean improvement in total acne lesions in the automated counseling group compared to the group using the standard educational website. Nevertheless, this difference was not statistically significant; - The mean improvement in Children's Dermatology Life Quality Index (CDLQI) score for the group using the standard educational website was not significantly different from the improvement in the automated counseling group (0.17 [2.64] vs. 0.39 [2.94]; $p=0.71$); - After 12 weeks, a higher proportion of the group using automated counseling maintained the recommended skin care regimen for acne-prone skin, compared with the group using the standard educational website (43% vs. 22%; $\chi^2=4.81$; $p=0.03$).	+	-	+
Tuong W et al. (2015) [15]	- In the group using the standard educational website, there was a significant increase in knowledge after 12 weeks (baseline: 3.61 ± 1.22 vs. after 12 weeks: 5.46 ± 1.31; $p<0.001$); - In the automated counseling group, there was a significant increase in knowledge after 12 weeks (baseline value: 3.53 ± 1.50 vs. after 12 weeks: 6.49 ± 1.06; $p<0.001$); - After 12 weeks, mean knowledge improvement was higher in the automated counseling group (2.96 ± 1.85) than in the group using the standard educational website (1.85 ± 1.46; $d=0.67$; $p=0.002$).	+	+	+
Van Os-Medendorp H et al. (2010) [16]	- The business case analysis showed that the Digital Eczema Centre offers an opportunity to improve the care of patients with atopic dermatitis; - There was high patient satisfaction with a portal combining e-counseling, online nursing training, delivered by a dermatology nurse targeting patients and parents of children with atopic dermatitis.	-	+	+

Watson AJ et al. (2010) [17]	- The decrease in acne inflammatory lesions was similar in the e-appointment group to the group who visited a dermatologist in person (6.67 vs. 9.39; $p=0.49$); - Respondents and dermatologists reported comparable levels of satisfaction with care, regardless of the form of appointment ($p=0.06$; $p=0.16$).	+	+	+
Geller AC et al. (2006) [18]	- After 12 months, siblings of people diagnosed with melanoma who received an initial over-the-phone motivational talk, personalized educational materials, and three telephone counseling sessions with a health educator (intervention group) were more likely to perform skin self-examination (SSE) (OR – odds ratio, 1.76; 95% CI, 1.06-2.91); - A more than twofold increase in performing dermatological skin examination in both groups (intervention group and standard care group) compared to baseline; - After 12 months, two-thirds of siblings in both groups reported regular sunscreen use.	+	-	+
De Graaf M et al. (2014) [19]	- After e-learning on infantile haemangioma, the parents showed 96% consistency with the dermatologist in the correct diagnosis; - After e-learning, the parents showed 79% consistency with the dermatologist in the assessment of the risk of complications ($p<0.001$); - After e-learning, the parents showed 75% consistency with the dermatologist in the need to be seen by a specialist ($p<0.001$); - After e-learning, the parents showed 84% consistency with the dermatologist in the need for urgent specialist care ($p<0.001$).	+	-	+
De Graaf M et al. (2013) [20]	- 85.9% of the parents participating in e-learning and e-consultations agreed with the dermatologist's recommendations; - 91.3% of the parents found the e-learning and e-consultations to be useful educational tools; - 98.4% of the parents considered the information in the e-learning to be clear.	+	+	+
Arıcan O (2007) [21]	- The questions sent by e-mail through the free consultation website concerned requests for information about dermatological diseases and their treatment; - The topics of the questions were mainly: acne, eczema, hair diseases, psoriasis, seborrheic dermatitis, vitiligo, fungal infections; - The answers concerned diagnosis and treatment options.	-	-	+
Koh U et al. (2019) [22]	- Regular skin self-examination (SSE) was carried out by 64% of the participants of the online survey; - According to the survey participants, the main reasons for not performing skin self-examination were: – lack of confidence in performing the self-examination (25%), – assuming that the risk of melanoma is low (25%), – forgetting to do so (44%); - 95% of the participants of the online survey would consider sending photos of their skin lesions to their doctor via a mobile health app.	-	+	+

Source: compiled from literature [13-22].

The majority of the previous studies addressed patient satisfaction with teledermatology. A systematic review by Haderer et al. [5] on patient satisfaction with teledermatology has shown that patients are satisfied with store-and-forward and real-time teledermatology. The majority of the studies analyzed by Haderer et al. [5] involved store-and-forward teledermatology. Therefore, it may be presumed that direct (one-to-one) remote consultations on diagnostics and cosmetic education would also be assessed favourably by patients. In a study by Watson et al. [17], both dermatologists and patients reported comparable satisfaction with care, regardless of the type of appointment (in-patient appointments and online appointments: e-appointments). Other research on direct store-and-forward teledermatology [26] and research on teleconsultations in cosmetic dermatology also confirms a high level of satisfaction with the service [27].

On the other hand, a study by Stadler et al. [28] shows that most patients prefer traditional face-to-face consultations rather than consultations over the phone. Yet, the respondents were interested in remote consultations as an additional service. This was also confirmed by the research conducted, where 56.5% of the respondents prefer direct contact with a cosmetologist in the office (JMB, research 2021, n=46).

The emotional impact of direct (one-to-one) remote consultations on the consultants themselves should also be taken into consideration. In a study by Gimeno-Vicente [29], WhatsApp was the preferred remote consultation method for patients. Unfortunately, 31% of dermatologists in this study reported a negative emotional impact of WhatsApp consultations on their lives. Over 82% of dermatologists (82.3%) would prefer not to receive such messages [29]. Similarly, a study by Ögüt et al. [30] has shown that requests for online consultations directed at personal social media accounts and instant messengers may lead to professional burnout among dermatologists. To sum up, remote consultations have their advantages: shorter appointment waiting time, no need to travel, safety during the pandemic, but they also have their disadvantages.

Consultations on skin diagnostics and skin care are conducted in dermatological clinics, aesthetic medicine clinics, cosmetic clinics and pharmacies. A study by Al-Taie et al. [31] has shown that dermatological and gynaecological issues constituted the majority of medical conditions (51.4% and 44.6%, respectively) reported to clinical pharmacists in online pharmacies. A study by Manahan et al. [32] confirms that pharmacists provide advice on the treatment of skin diseases. Five out of the 33 patients in this study were offered teledermatology service. Two out of 5 patients agreed to the teledermatology service, while all pharmacists participating in this study (n=20) were willing to continue education and were in favour of teledermatology services [32].

Patient education as well as patient motivation are extremely important aspects of remote counseling [13]. Motivational strategies have been successfully used

during telephone counseling on smoking cessation or screening for cervical cancer [33,34]. Remote counseling was also successfully used in the case report by Brzozowska [35], where remote consultations were used to monitor the use of preparations used to relieve the symptoms of keratosis pilaris.

There are but a few studies on direct (one-to-one) remote consultations in cosmetology and cosmetic dermatology. This review shows that the research conducted so far focuses mainly on teledermatology as well as diagnosis and treatment of dermatological diseases. In our opinion, the number of research studies on remote consultations in the field of skin care and preventive skin care is insufficient. In addition, there are no studies assessing the effectiveness of remote consultations conducted by cosmetologists.

In our opinion, despite its limitations, remote counseling in cosmetology and cosmetic dermatology, has an impact on clinical practice, as it is an educational tool on UV protection as well as diagnostics and skin care, among others. It contributes to the elimination of skin care errors that may contribute to skin dryness, acne exacerbation or atopic dermatitis. It enables the diagnosis of skin type, the selection of appropriate cosmetic procedures and products. In remote counseling, the cosmetologist serves as a health educator as well as the first person who may spot worrying clinical signs and refer the patient to the right specialist. Furthermore, remote counseling is a motivational tool for increased control of nevi (cancer prevention). It can be part of a screening programme. It can serve as a motivational tool for systematic skin care contributing, among other things, to improving appearance, well-being, and skin condition, to slowing down skin ageing processes, to alleviating acne or to minimising the possibility of recurrence of acne after dermatological treatment. Remote counseling can be useful as a form of follow-up and a reminder for patients to adhere to post-treatment care. It may also be used to discuss proper preparation for a treatment procedure. Moreover, the use of remote counseling is reasonable in the case of people with disabilities, mobility problems and those living in remote areas with underdeveloped infrastructure. In our opinion, remote counseling in cosmetology and cosmetic dermatology could be used in oncology patients undergoing neoplastic treatment. Remote oncological cosmetology would be a form of supportive therapy, a form of initiative and assistance in cosmetological care for patients with various stages of cancer. The primary goal of remote oncological cosmetology would be to improve the quality of life and mental state of patients.

FUTURE RESEARCH PROPOSITIONS

Creating a universal assessment form may facilitate remote counseling [21]. Moreover, an appropriately designed questionnaire allows for more personalized advice [13]. It would be reasonable to create a questionnaire that will allow to assess the type of skin, skincare

Table 3. Results of opinions by categories: knowledge (K), motivation (M), assessment (A) of the importance of remote counseling in cosmetology and cosmetic dermatology, n=46

Category	Question asked after 12 weeks of remote consultations, n=46	Yes	No
K	Do you feel that your level of knowledge about prophylaxis and skin care has increased after the remote consultation?	89.1%	10.9%
M	Are you motivated to follow your cosmetic recommendations?	82.6%	17.4%
A	Has your interest in cosmetics increased?	69.6%	30.4%
A	Do you feel more cared for?	87%	13%
A	Has there been an improvement in your wellbeing?	87%	13%
A	Has your self-esteem increased i.e. do you think you look better and feel more confident?	76.1%	23.9%
A	Do you think remote consultations are effective?	89.1%	10.9%
A	Do you think distance consultations are useful in preventive skin care?	91.3%	8.7%

behaviour and knowledge about preventive skin care. Such a form should take into account, among others, the place of residence, lifestyle, work, diet, hormonal changes, age, gender, comorbidities, or medicines used. Moreover, it should enable the selection of a personalized care plan.

The Baumann Skin Type Indicator (BSTI) is a generally available questionnaire assessing skin type. It is a questionnaire evaluating four main skin parameters: 1) oily or dry, 2) sensitive or resistant, 3) pigmented or non-pigmented, and 4) wrinkle-prone or tight. The obtained responses allow for the assessment of the skin phenotype called the Baumann Skin Type®. There are 16 combinations of skin types based on the four above-mentioned parameters. Unfortunately, The Baumann Skin Type Indicator questionnaire has only been validated for English speakers from the USA, China and Korea [36]. The authors see a need to validate the above questionnaire into other languages.

It would be reasonable to create mobile applications and devices for regular skin self-examination, control of skin moles (mobile teledermoscopy), or for the assessment of the degree of skin hydration in order to select the right cosmetics. In addition, mobile applications should perform an educational function, reminding about routine care and enabling contact with a cosmetologist or a dermatologist. The above actions may improve the detection of skin neoplasms, better selection of cosmetics, or minimize the number of in-office appointments in the pandemic.

Moreover, the effectiveness of combining remote consultations with visits to beauty salons should be assessed. It should also be assessed whether regular contact with a specialist – a cosmetologist contributes to better adherence to the recommendations and regularity of skin care.

In our opinion, new data should be provided and research developed in the field of remote consultations in cosmetology. Future studies would need to expand the literature review to include the following scientific databases: Embase, Cochrane Library, Web of Science, Scopus in order for the researchers to be able to draw more extensive conclusions.

LIMITATIONS

First of all, we only analysed research papers written in English, therefore we might have omitted research on the subject in question written in another language. Secondly, we analyzed original research papers, while excluding letters to the editors, which might have mentioned direct (one-to-one) remote consultations in the field of cosmetology and cosmetic dermatology. Moreover, one limitation of this review is that the analyzed research usually involved specific populations, e.g. adolescents, mothers, people with higher education, thus the results obtained cannot be generalized to the entire population.

CONCLUSIONS

This review discusses the importance of remote counseling in promoting skin care and prophylactic behaviours. The analyzed research papers focus mainly on dermatological consultations which involve the diagnosis of the disease and methods of its treatment as well as on patient education regarding reinforcing proper skincare and photoprotective behaviours. Our review has shown various communication tools used in remote counseling, i.e. personalized telephone counseling, automated counseling using a virtual consultant, e-learning modules, educational materials sent via e-mail, e-mail communication, an online patient care platform through which an e-appointment can be made, or educational portals. Moreover, the above analysis has shown that creating forms for remote counseling facilitates the provision of personalized advice. Moreover, combining remote consultations with in-office appointments, e-learning, educational materials with e-consultations, creating mobile applications, as well as regular contact between the specialist and the patient may contribute to better habit formation and proper systematic skin care.

The study by Tuong et al. [14] has shown that automated counseling contributes to following the recommended acne skin care regimen. Therefore, it may be surmised that the above counseling increases patient self-discipline. A reduction in the number of acne lesions has also been noted [14]. This was also confirmed in a study by Watson et al. [17] on e-appointments. Further-

more, Steinberg Benjes et al. [13] and Geller et al. [18] have demonstrated an increase in sunscreen use after remote counseling. The study by Geller et al. [18] has also shown an increased frequency of skin self-examination and a twofold increase in performing a follow-up skin examination with a dermatologist. A preliminary analysis of the results of the author's unpublished study (JMB) also showed an improvement in skin condition as assessed by respondents and an increased motivation to follow cosmetic recommendations. In our opinion, remote counseling may be a motivational tool for regular in-office appointments and can serve a complementary function in patient care. We would like to emphasize the educational, motivational and preventive importance of dermatological-cosmetic counseling. Nevertheless, it is important to bear in mind the limitations of remote consultations. These limitations include: quality of the patient's photographs, accuracy of the provided infor-

mation, quality of the questionnaires, medical and legal liability as well as the financial aspect.

In our opinion, there is a noticeable lack of research and scientific evidence confirming the effectiveness of remote consultations conducted by cosmetologists. During remote consultations with the patient, the cosmetologist obtains the patient's medical history, evaluates the condition and type of skin, recommends a personalized care plan, chooses cosmetic products, teaches proper skincare behaviours and educates the patient in the field of preventive health care. In justified cases, the cosmetologist refers the patient to a dermatologist.

To our knowledge, this review is one of the first to prove that remote counseling in cosmetology has been underrepresented in scientific research. There is also a need to expand the literature review to include the following scientific databases: Embase, Cochrane Library, Web of Science, and Scopus.

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Review

Social Media Potential and Impact on Changing Behaviors and Actions in Skin Health Promotion: Systematic Review

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Abstract

Background: Social media is used as a tool for information exchange, entertainment, education, and intervention. Intervention efforts attempt to engage users in skin health.

Objective: This review aimed to collect and summarize research assessing the impact of social media on skin health promotion activities undertaken by social media users.

Methods: In accordance with the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines, the following scientific databases were searched: Scopus, Web of Science, PubMed, Academic Search Ultimate (via EBSCO), Academic Research Source eJournals (via EBSCO), ERIC (via EBSCO), Health Source: Consumer Edition (via EBSCO), and Health Source: Nursing/Academic Edition (via EBSCO). Using ProQuest Dissertations and Theses, OpenGrey, Grey Literature Report, and MedNar, the search was supplemented with gray literature. Articles on skin care, skin health, skin diseases, skin protection, and educational activities promoting healthy skin on social media were selected for review (search date: February 6, 2023). The following qualification criteria were used: original research; research conducted on social media; and research topics regarding educational activities in skin health promotion, skin care, skin health, skin diseases, and skin protection. To assess the risk of bias, the following tools were used: the Cochrane Collaboration tool for risk-of-bias assessment (randomized controlled trials and quasi-experimental studies) and the Centre for Evidence-Based Medicine checklist (cross-sectional studies).

Results: Altogether, 1558 works were considered, of which 23 (1.48%) qualified, with 3 (13%) studies on acne and 20 (87%) on skin cancer, sunscreen, and tanning. Social media interventions were dealt with in 65% (15/23) of the studies. The review made it possible to investigate cognitive and cognitive-behavioral interventions. In both observational and interventional studies, the most frequently discussed topics were skin exposure and protection against UV radiation and skin cancer. The analyzed research showed that social media is a source of information. Visualization has a strong impact on users. The involvement of social media users is measured through the amount of content shared and contributes to changing attitudes and behaviors regarding skin health.

Conclusions: This review outlined the impact of social media, despite its heterogeneity, on users' skin health behaviors, attitudes, and actions. It identified strategies for digital interventions to promote skin health. In health sciences, a standardized tool is needed to assess the quality of social media digital interventions. This review has several limitations: only articles written in English were considered; ongoing studies were omitted; and there was a small number of interventional studies on acne and a lack of research on daily skin care, education, and antiaging activities on social media. Another limitation, resulting from the topic being too broad, was a failure to perform quantitative data analysis, resulting in the studies that qualified for the review being heterogeneous.

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KEYWORDS

skin; social media; prevention; behavioral intervention; skin cancer; sun protection; acne

Introduction

Background

For many people, social media platforms are now an integral part of daily life. Social media browsing is the most popular online activity. According to the statistics, >4.26 billion people used social media in 2021, and this number is likely to grow to almost 6 billion in 2027 [1]. In April 2023, a total of 4.8 billion people, or 59.9% of the world's population, were social media users [2].

Social media is a powerful means of communication, mainly used for an exchange of information and for entertainment. In addition, companies use it for marketing purposes to promote products and services. Currently, there is also a noticeable trend to develop educational platforms, especially on health education. According to Savas et al [3], because of an increase in the number of patients looking for medical information, physicians can use social media such as Facebook as a significant educational tool. Gantenbein et al [4] argue that medical information available on the internet and social media could be useful for most dermatological patients. The authors identified the most important needs of patients: online consultations, medical content on YouTube, and a possibility to chat with a specialist [4]. In turn, according to Banerjee et al [5], social media is a platform for increasing people's commitment and providing information about UV protection, skin cancer prevention, and its early detection.

The aforementioned research confirms the informational and educational role of social media. The aim of information activities is to increase knowledge about skin cancer and increase awareness of the risks of UV radiation. The effect of these activities should be a change in health behaviors (regular skin photoprotection, regular skin self-examination, and regular monitoring of skin lesions by a physician). Engagement in systematic activities by social media users is crucial.

In addition to its educational role, social media is a tool that supports life and work. Rew et al [6] created a prototype of an application based on content concerning social media users' daily activities. The application can assess the condition of the skin and provides advice on improving it, with suggestions for care products.

In addition, social media can be a motivational tool by motivating systematic care and protection activities aimed at healthy and well-groomed skin.

Focusing mainly on the analysis of social media content, previous reviews have discussed their impact on skin care [7] and skin cancer prevention [8]. They have also discussed the effects of social networking sites on health behavior change [9] and on available digital interventions, mainly stressing the importance of sun protection and skin self-examinations [10].

Unlike previous systematic reviews, we sought to understand the nature of motivation to act. We were interested in the

following aspects: (1) What dermatological problem that is talked about on social media is the main area of interest for researchers? (2) What drives social media audiences to take goal-directed actions? (3) What is the level of involvement of social media users in achieving this goal? (4) What contributes to perseverance in pursuing a goal? The goal is healthy and well-groomed skin. To achieve this goal, health behavior changes must be made.

We wanted to draw attention to the role of social media as a tool for collecting data and a tool that encourages users to take actions to care for their skin (including preventing the development of skin cancer and alleviating the symptoms of dermatological diseases).

The main parts of skin health preventive measures are promoting skin care, skin protection, and control routines. The involvement and motivation of social media users is important. Therefore, research is needed to conduct a systematic review that evaluates the impact and effectiveness of social media in this field. In addition, such research should not only focus on the information provided by social media but also try to engage users in actions aimed at skin health.

This review helps understand and explores what is already known about social media potential and its impact on users' skin care behaviors and skin health preventive measures. This study suggests the need to optimize social media interventions and develop new studies that will assess long-term change in skin health behaviors. In addition, by increasing the importance of skin protection and its diseases, this review has practical significance. The results of this research can be helpful in practice and in research investigating the role of social media in preventive health care. This review may support the work of dermatologists, cosmetologists, and health educators because it provides information they need, sometimes on complex topics, in a simple and easily available way.

The novelty of this review is that, through the heterogeneity of the research, a broader view of the impact of social media on skin health behaviors is presented. This study provides new observations about the prespecified desired outcome to be achieved. It complements the theory of engagement with digital interventions.

This study differs from previous ones in that it presents social media as an important digital stimulus. It affirms the integration of motivation into specific physical, affective, and cognitive action. The empirical observations concerning, on the one hand, the demonization of the effects of the sun on the skin and, on the other, the image of an attractive tan, which occur in a cause-effect conflict, are surprising.

This review proves that the image, not just the content, is of great importance. There is a noticeable trend in which the image becomes more important than scientific reports. This review also presents the negative side of social media.

Objectives

This paper presents a systematic review of the literature investigating the role of social media platforms as an educational and intervention tool in promoting preventive skin health measures. The aim of this review was to collect and summarize research assessing the impact of social media on skin health promotion activities undertaken by social media users. In the analyzed studies, we focused on the reception of information about the skin (eg, skin cancer, acne, and tanning) by social media users. The literature review comprised (1) studies assessing the impact of the content of social media on its users, (2) social media intervention studies, and (3) studies determining the impact of posts generated by users on their health decisions and their self-monitoring.

The following research questions were formulated:

1. What are the existing data on the use of social media as an educational intervention tool in skin health preventive measures?
2. What activities on social media can be effective in promoting skin health?
3. What intervention strategies are disseminated via social media and what is their role in promoting skin health?

Methods

Design

This systematic review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines [11,12] and with the Synthesis Without Meta-Analysis reporting guideline [13]. The PRISMA guidelines ensure the highest quality in scientific research. To more fully present the results of the review, a narrative form was additionally adopted.

Information Sources and Search Strategies

This review was conducted using the following databases: Scopus, Web of Science, PubMed, Academic Search Ultimate (via EBSCO), Academic Research Source eJournals (via EBSCO), ERIC (via EBSCO), Health Source: Consumer Edition (via EBSCO), and Health Source: Nursing/Academic Edition (via EBSCO). In addition, the search was supplemented with gray literature using ProQuest Dissertations and Theses, OpenGrey, Grey Literature Report, and MedNar. A reference list search for relevant articles was also conducted.

The search strategy was first constructed by the authors and then consulted with a librarian experienced in scientific information extraction. The developed phrase was as follows:

((*"social media"* OR *"Facebook"* OR *"Instagram"* OR *"Twitter"* OR *"Pinterest"* OR *"YouTube"* OR *"TikTok"* OR *"SnapChat"*) AND (*"skincare"* OR *"skin care"* OR *"skin health"* OR *"skin diagnosis"* OR *"skin type"* OR *"beautician"* OR *"cosmetologist"* OR *"cosmetician"* OR *"cosmetic consultation"* OR *"cosmetic dermatology"* OR *"cosmetic product"* OR *"dermocosmetic"* OR *"cosmetic procedure"* OR *"skin cleans"* OR *"skin moistur"* OR *"skin massage"* OR *"facial cleans"* OR *"facial moistur"*

OR *"facial massage"* OR *"photoprotection"* OR *"sunscreens"* OR *"sun protection"* OR *"skin hydration"* OR *"skin rejuvenation"* OR *"skin cancer"* OR *"skin prevention"* OR *"acne"* OR *"rosacea"* OR *"anti-acne"* OR *"anti-aging"* OR *"anti-wrinkle"* OR *"skin aging"* OR *"oily skin"* OR *"dry skin"* OR *"combination skin"* OR *"sensitive skin"* OR *"pigmented skin"* OR *"pimple"* OR *"pustule"* OR *"papules"* OR *"blackheads"*))

The search was conducted on February 6, 2023, and on the same day, the records were imported from the databases into the Mendeley reference manager (Elsevier). The search was not limited to a period to obtain as many results as possible.

Study Selection

After applying the search strategy, the studies were imported and saved to the Mendeley reference manager, and then duplicates were removed. The selection of the studies consisted of 2 stages. The first stage was conducted by one of the authors (JMB), who considered the title and abstract to identify and exclude irrelevant studies. To reach a mutual agreement, the other author (JG) reviewed a randomly selected sample containing 10% of the titles and abstracts. When, based on the title and abstract, the decision whether to include a work was difficult, the full article was then downloaded. The second stage of the selection consisted of an analysis of the full texts of the articles by each author (JMB and JG) separately to determine whether they could be included, and the reasons for exclusion were listed. When the decision to include or exclude a study was unclear, the authors clarified ambiguities and different opinions through discussions. This stage of the article selection process required both authors to be present to resolve voting conflicts. All studies were assessed using the inclusion and exclusion criteria described in the next section.

Inclusion and Exclusion Criteria

All the inclusion and exclusion criteria were defined a priori (Textbox 1).

In particular, the following papers were excluded during the first stage of the selection process: papers written in a language other than English, papers not related to topics of skin care and skin health promotion on social media, conference papers, information from beauty and health blogs, posters of prevention campaigns, and interviews and articles from popular science magazines advertising a specific cosmetic brand. In addition, articles on social media safety rules, product protection, ethics, diet, COVID-19, and tele-dermatology and materials related to patient consent to post photos on social media were eliminated. During the second stage, articles were allocated to the following groups: articles fully meeting the inclusion criteria, comments, case studies, review papers, research protocols, papers in which skin care and skin health preventive measures were not the main topic, papers in which social media was not the main topic (eg, it was used to recruit study participants or to disseminate survey results), papers on plastic surgery and body image perception on social media, papers on social media marketing (eg, dealing with the impact of advertisements encouraging consumers to purchase cosmetic products or with methods of promoting the sale of cosmetic products or assessing the satisfaction with

cosmetic products and with brand image building of skin care products), papers on the psychological effects of social media (eg, self-acceptance of social media users; self-confidence; and the relationship among emotions, emotional states, and the use of social media), papers on social media search for medical information by dermatology patients, and papers focusing exclusively on the analysis of the content most frequently shared on social media (ie, posts and videos).

Articles with educational value and assessing the impact of social media skin-related information on its users were included. This review also included studies that investigated social media interventions (articles on behavioral interventions aimed at skin health promotion, which were included during the primary analysis) and studies that investigated the impact of social media data on users (articles on skin health promotion, which were included during the secondary analysis).

Textbox 1. Inclusion and exclusion criteria.

Inclusion criteria
• Papers based on original research (ie, research articles) • Papers on skin care, skin health, skin diseases, and skin protection and papers on educational activities directed at skin health preventive measures • Papers on social media (eg, Facebook, Instagram, Twitter [subsequently rebranded X], Pinterest, YouTube, TikTok, and Snapchat)
Exclusion criteria
• Papers written in a language other than English • Review papers • Comment papers • Case studies • Conference papers • Clinical trial reports • Information from beauty and health blogs, popular science magazines, interviews, and posters from prevention campaigns • Papers in which social media coverage of skin care, skin health, and preventive actions were not the main topic

Data Extraction

Research information from the included articles downloaded during the search process was rechecked by both authors (JMB and JG) to ensure that it met the inclusion criteria. The following details were extracted from each paper: authors, year of publication, geographic location of data collection (country where the research took place), type of social media platform,

form of information, number and characteristics of study participants, type of study or data collection methods, and main topic and purpose of the research ([Multimedia Appendix 1 \[14-36\]](#)). In addition, one author (JMB) developed a form with questions ([Textbox 2](#)) in which both authors independently recorded their responses (summarized in [Multimedia Appendix 2 \[14-36\]](#)). The PRISMA checklist is provided in [Multimedia Appendix 3](#).

Textbox 2. Questions related to qualified publications.

What are the authors and the year of publication?
• Is intervention a topic of the study? • Does the study evaluate the impact of social media on users? • Does the study deal with public health campaigns? • Does the study mention skin self-examination? • Does the study mention the use of cosmetic materials (eg, sunscreen)? • Does the study contain a statistical analysis? • What are the main results of the study? • What are the conclusions or opinions of the authors on the effectiveness of information delivery strategies on social media?

Quality Assessment

The methodological quality of each study included in this review was assessed separately by both authors (JMB and JG), and their opinions were compared. In case of disagreement, the authors discussed their doubts and came to a consensus. The

Cochrane Collaboration tool for risk-of-bias assessment was used to assess the risk of bias in randomized controlled trials and quasi-experimental studies [37]. A total of 6 domains were evaluated, with the plus sign (+) representing a low risk of bias, the en dash (–) representing a high risk of bias, and both (+ and –) representing an unclear risk of bias. Blinding of participants

and staff was not assessed as this was considered impossible in some studies. A study that received a score of ≥ 4 plus signs was considered to be of high quality.

For cross-sectional studies, the Centre for Evidence-Based Medicine checklist for critical appraisal was used [38]. It consists of 12 questions with possible answers of “yes,” “cannot tell,” or “no.” A cutoff value of 75% was used for the assessment. This means that, with ≥ 9 affirmative responses, the study was considered to be of high quality. Otherwise, the study was considered to be of low quality.

Data Synthesis Strategy

A narrative synthesis of the included studies was performed in accordance with the recommendations by Popay et al [39]. During data analysis, the authors considered the possibility of classifying the included publications according to the health problem. However, after reanalysis of the selected publications, the authors decided that a better conceptual model was to group them according to the type of intervention, if it was used.

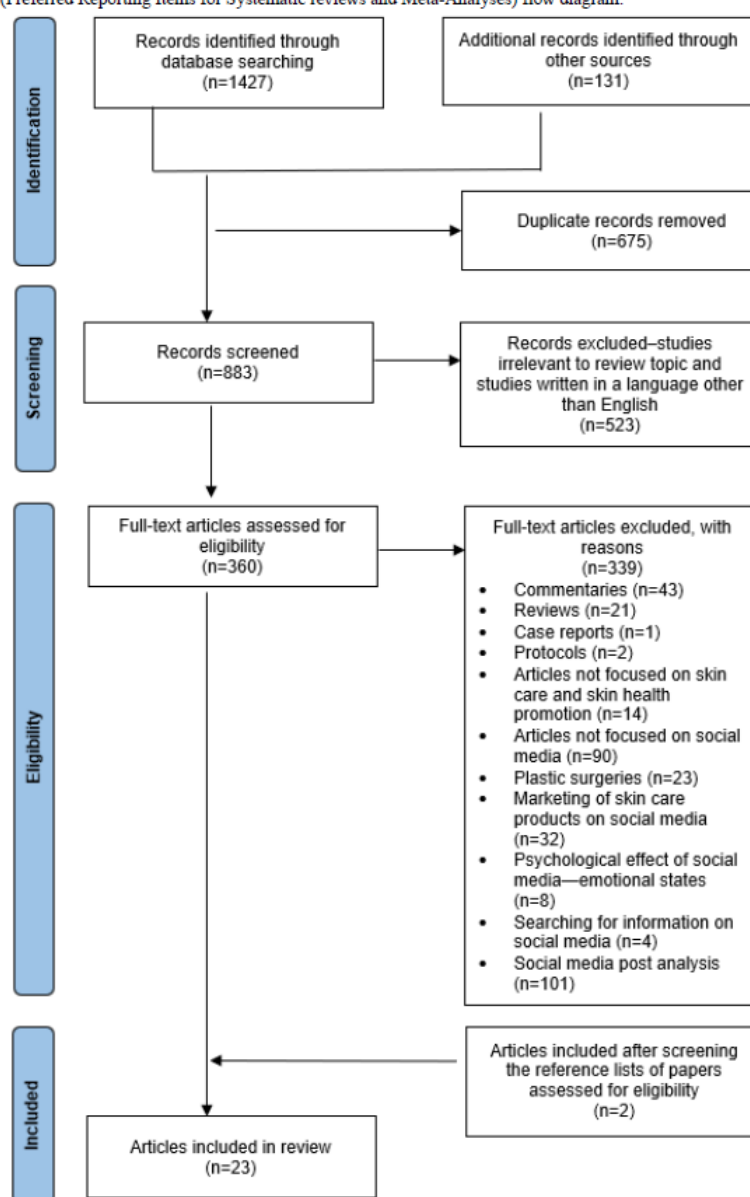
Results

Search Results

A literature search revealed 1558 records (Scopus: $n=485$, 31.13%; Web of Science: $n=305$, 19.58%; PubMed: $n=270$, 17.33%; Academic Search Ultimate via EBSCO: $n=234$, 15.02%; Academic Research Source eJournals via EBSCO:

$n=26$, 1.67%; ERIC via EBSCO: $n=10$, 0.64%; Health Source: Consumer Edition via EBSCO: $n=35$, 2.25%; Health Source: Nursing/Academic Edition via EBSCO: $n=62$, 3.98%; ProQuest Dissertations and Theses: $n=22$, 1.41%; OpenGrey: $n=4$, 0.26%; Grey Literature Report: $n=0$; MedNar: $n=105$, 6.74%). During the identification stage, 91.59% (1427/1558) of the records were obtained from scientific databases, and 8.41% (131/1558) of the records were obtained from gray literature. After removing 43.32% (675/1558) of duplicates, 883 records remained. After reviewing the titles and abstracts of these 883 records, 523 (59.2%) were excluded because they were irrelevant to the review topic or were written in a language other than English. A total of 40.8% (360/883) of the publications were selected for full-text download. After analyzing the full texts of the articles, 339 were excluded ($n=43$, 12.7% comments; $n=21$, 6.2% reviews; $n=1$, 0.3% case reports; $n=2$, 0.6% protocols; $n=14$, 4.1% articles not focused on skin care and skin health promotion; $n=90$, 26.5% articles not focused on social media; $n=23$, 6.8% articles about plastic surgeries; $n=32$, 9.4% articles about marketing of skin care products on social media; $n=8$, 2.4% articles about the psychological effect of social media—emotional states; $n=4$, 1.2% articles about searching for information on social media; and $n=101$, 29.8% articles about social media post analysis). These studies did not meet the inclusion criteria. A total of 21 articles met the inclusion criteria. In addition, after a detailed analysis of the eligible studies and their references, 2 publications were added. In total, 23 publications were included in this review (Figure 1).

Figure 1. PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) flow diagram.



Study Characteristics

The detailed characteristics and main results of the studies included in this systematic review are presented in [Multimedia Appendix 1](#) [14-36] and [Multimedia Appendix 2](#) [14-36]. Most of the research was conducted using Facebook. Of the 23 studies, most (n=14, 61%) were conducted in the United States [14-27], with a smaller number conducted in other countries: the United Kingdom (n=3, 13%) [28-30], Australia (n=3, 13%) [31-33], the Netherlands (n=1, 4%) [34], Denmark (n=1, 4%) [35], and Saudi Arabia (n=1, 4%) [36]. The highest number of

studies was published in 2022 (5/23, 22%) [16,17,21,22,36], 17% (4/23) of the studies were published in 2020 [19,27,28,30], 13% (3/23) were published in 2019 [20,26,32], 13% (3/23) were published in 2018 [14,18,24], 13% (3/23) were published in 2017 [29,31,34], 9% (2/23) were published in 2021 [15,25], 9% (2/23) were published in 2011 [33,35], and 4% (1/23) were published in 2016 [23]. The oldest included publications dated back to 2011 (2/23, 9%) [33,35].

The vast majority of the studies were on skin cancer, sunscreen, and tanning (20/23, 87%), with only 13% (3/23) of the studies

on acne [19,27,36]. A total of 17% (4/23) of the studies dealt with skin self-examination [18,19,30,34]. On the other hand, 43% (10/23) of the studies mentioned the use of cosmetic products [14,18,21,22,25,27,28,31,33,36], whereas 35% (8/23) of the studies recommended sunscreen use [14,18,21,22,25,28,31,33]. In addition, 43% (10/23) of the studies discussed the impact of public health campaigns [15-17,20,22,28-30,33,35]. It is worth noting that several publications discussed the results of the same research (eg, 3/23, 13% of the studies by Buller et al [15-17])

Among the 23 studies included in this review, social media interventions were the topic of 15 (65%) [15,18,20-22,24,25,28,29,32-35], among which cognitive effects were assessed by Agha-Mir-Salim et al [28], Damude et al [34], Gough et al [29], and Mingoia et al [32]. On the other hand, both cognitive and behavioral effects were assessed in the

studies by Buller et al [15-17], Coups et al [18], Koster et al [35], Morrison et al [20], Myrick et al [21], Pagoto et al [22], Potente et al [33], Stapleton et al [24], and Vraga et al [25]. Comparison groups were used by Agha-Mir-Salim et al [28], Buller et al [15-17], Gough et al [29], Koster et al [35], Mingoia et al [32], Morrison et al [20], Myrick et al [21], Pagoto et al [22], Potente et al [33], and Vraga et al [25].

Quality Appraisal

The risk-of-bias assessment for randomized controlled trials is summarized in Table 1. A total of 35% (8/23) of the studies turned out to be of high quality [15-17,20,22,25,28,32], and 4% (1/23) of the studies were of low quality [29]. A total of 57% (13/23) of cross-sectional studies were of high quality [14,18,19,21,23,24,26,27,30,31,33,35,36], and 4% (1/23) of cross-sectional studies were of low quality [34]. A summary is provided in Multimedia Appendix 2 [14-36].

Table 1. Cochrane risk-of-bias assessment.

Study	Random sequence generation	Allocation concealment	Blinding of participants and personnel or blinding of outcome assessment	Incomplete outcome data	Selecting reporting	Other bias
Agha-Mir-Salim et al [28], 2020	— ^a	— ^b	—	+	+	+
Buller et al [15], 2021	+	+	+	+	+	— (publishing the results of the same study multiple times)
Buller et al [17], 2022	+	+	+	+	+	— (publishing the results of the same study multiple times)
Buller et al [16], 2022	+	+	+	+	+	— (publishing the results of the same study multiple times)
Gough et al [29], 2017	+	—	—	+	+	— (IP addresses were not checked for duplicate users)
Mingoia et al [32], 2019	+	+	—	+	+	+
Morrison et al [20], 2019	+	+	+	+	+	+
Pagoto et al [22], 2022	+	+	+	+	+	+
Vraga et al [25], 2022	+	+	+	+	+	+

^aHigh risk of bias.

^bLow risk of bias.

Data Synthesis

Overview

Among the assumptions we made for this review was that skin health promotion on social media is a broad concept that includes regular activities aimed at protecting the skin against the risk of developing skin cancer, as well as promoting skin care that can ensure good skin condition, prevent skin diseases, slow down the skin aging process, and keep the skin looking nice, which can contribute to one's well-being. However, most of the studies included in this review (20/23, 87%) focused on behaviors associated with skin cancer risk and prevention (exposure to and skin protection from UV radiation). Skin cancer

was the main area of interest for researchers, undoubtedly because it is a high-profile problem. There were not enough studies on other skin conditions to draw firm conclusions about the effects of social media. Nevertheless, it is possible to analyze and compare the effect of information and motivational activities on social media on the engagement of users and their behavior changes and actions taken. This will enable social media moderators to develop overall motivational intervention strategies.

This review included observational studies in which social media was used as a tool to disseminate information about the skin, as well as intervention studies in which social media content was manipulated. Despite the fundamental differences in the

methodology of these 2 types of research, the main goal was the same—skin health promotion. Due to differences in research methodology, comparison and summary were difficult.

The results are presented in the following sections in narrative form. A division was made into studies that did not use an intervention and studies that did use an intervention. Then, to synthesize and integrate the results well and draw consistent conclusions, observational studies and then interventional studies were summarized and compared. Attention was drawn to the limitations of observational studies compared to interventional studies.

Assessing the Impact of Social Media on Skin Care and Skin Health Promotion Without an Intervention

The studies included in this review argued that social media is a useful source of knowledge about skin health. According to Bahaj et al [36], most individuals aged between 18 and 25 years choose social media as their first source of acne treatment advice. However, much of social media advice does not follow the current guidelines of the American Academy of Dermatology [40]. The aforementioned authors also found that 74.1% of those social media users had a college degree. There was a positive link between educational attainment and willingness to use social media for advice ($P=.002$). In addition, a significant link between the severity of acne and search for treatment advice on social media was found ($P<.001$) [36].

Similarly, in the study by Yousaf et al [27] with 130 participants with acne, 45% ($n=58$) of them used social media for advice on its treatment. Of these 58 participants, 72% were women ($n=42$), who were 75% more likely to use social media for advice on acne treatment (prevalence ratio=1.75, 95% CI 1.11-2.76; $P=.01$). In addition, only 31% of the respondents who consulted their problem on social media managed their condition in line with the American Academy of Dermatology clinical guidelines [27]. However, both Bahaj et al [36] and Yousaf et al [27] observed that the advice available on social media did not comply with the guidelines of the American Academy of Dermatology [40]. In the study by Basch et al [14] on skin cancer and tanning, it was found that people who did not fully adhere to proper sunscreen behavior were more likely than those who followed sun protection rules to believe that social media was an accurate source of health information (10.5% vs 3.3%; $P=.046$) or a helpful source of health information (62.5% vs 46.7%; $P=.02$).

According to Mingoia et al [31], the level of social media use was significantly and positively correlated with users' sun exposure ($P<.001$), sunburn ($P<.001$), and dissatisfaction with skin tone and negatively correlated with sun protection ($P<.001$). This meant that viewing photos, posting photos, sharing content, and the number of likes were significantly linked with greater sun exposure, lower sun protection, and greater dissatisfaction with skin tone. It is worth mentioning that the aforementioned study drew attention to the fact that women, to a greater extent than men, are image oriented and more attracted to visualization on social media. For them, the use of images in health messages may be effective in preventive skin health care campaigns [31].

In the study by Stapleton et al [23], 45.8% of participants had a college degree, and 14.8% had a bachelor's degree or higher (a sample of 463 participants). The authors found that higher rates of indoor tanning were associated with Twitter (subsequently rebranded X) and Instagram use among a sample of young adult women. As a result, the authors argued that the aforementioned social media platforms could be a valuable way to provide information about skin cancer prevention among compulsive indoor tanners [23].

In contrast, the sample in the study by Willoughby and Myrick [26] consisted of 502 female college students aged between 18 and 29 years, and it was found that participants who reported more frequent use of social media were more likely to sunbathe outside. Thus, the researchers found that greater use of visual social media platforms such as Instagram, Snapchat, and Pinterest was likely to increase tanning [26].

According to the studies by Bahaj et al [36], Yousaf et al [27], Basch et al [14], Mingoia et al [31], Stapleton et al [23], and Willoughby and Myrick [26], widely shared social media content could influence engagement in risky health behaviors, affecting users' knowledge, attitudes, and actions. Despite the negative impact of social media, the authors noted that it could be a powerful informational, educational, and intervention tool for preventive skin health care campaigns. In addition, the identification of the target group of health advice recipients made it possible to fight disinformation using specific prevention channels (ie, social media platforms). In contrast to the aforementioned studies, the studies by Guckian et al [30] and Martel et al [19] mainly pointed to the positive impact of social media.

Guckian et al [30] found that interventions via social media could have a positive impact on health-related behaviors. According to the authors, social media could motivate patients with distressing cutaneous lesions to visit melanoma screening clinics. However, the authors found that the most common motivating reason for visiting a melanoma screening clinic was skin self-examination. In this study, 65% (162/249) of the patients were regular users of social media, 33% (83/249) saw posts on the internet about cutaneous lesions, 10% (8/83) saw posts from physicians, 36% (30/83) saw posts from health authorities, and 37% (31/83) saw posts from other people (social media users). In addition, 33% (83/249) of patients searched for information about their cutaneous lesions on the internet, whereas one patient did so on social media. In addition, 24% (6/25) of patients said that more posts on cutaneous lesions should be shared [30].

Martel et al [19] found that social media use could be a motivating factor. According to the authors, editing one's own cutaneous lesions on social media, in particular acne and acne scars, contributed to an increase in users' awareness and encouraged them to seek dermatological care. Of 145 people who edited their skin lesions, as many as 128 (88.3%) edited acne and acne scars. This editing increased their awareness of the need for dermatological care ($P=.02$) [19].

Assessing the Impact of Social Media on Skin Care and Skin Health Promotion After an Intervention

Comparative Studies on the Role of Digital Social Media Interventions and Traditional Media in Health Promotion

The study by Agha-Mir-Salim et al [28] was one of those comparing the effects of digital interventions with those of printed materials. The research involved the SunSafe campaign that aimed to raise awareness of sun exposure risk, melanoma, and the need for sun protection among individuals aged 18 to 29 years. Using flyers and Facebook, the authors found that, after the intervention, the average knowledge score improved in both groups (Facebook=1.82; flyers=3.04; $P<.001$). However, printed flyers turned out to be more effective than Facebook posts (95% CI 0.35-2.09; $P=.006$) [28].

Social Media Interventions as an Educational Strategy

Damude et al [34] assessed the knowledge of patients with melanoma about their illness and their opinion on multiple ways of providing information. YouTube instructional videos presented in the research were designed to stress the need for self-examination of the skin and lymph nodes and demonstrate how to do this properly. It turned out that 63% of patients preferred to receive information in multiple ways, 92% of them preferred verbal instructions from their physician, 62% preferred educational YouTube videos, and 43% preferred to receive instructions via brochures. In addition, the authors concluded that there was an urgent need for educational activities focused on melanoma and for supplementing the methods of education with instructional YouTube videos [34].

In the study on skin cancer prevention by Gough et al [29], a trend toward increasing knowledge about preventive actions in response to social media educational interventions was observed. Those interventions increased awareness that fair-skinned people required the most protection and that skin cancer was the most common form of cancer, with melanoma being its most serious type. In addition, the authors noted a trend of increasing awareness of sun and UV ray exposure, skin cancer risk, and the need for sun protection.

Using an educational strategy and cognitive dissonance, Mingoia et al [32] investigated the effects of a social media intervention on the opinion that *tanned skin is desirable and beneficial for appearance*. The educational strategy was aimed at reducing positive attitudes toward sunbathing and improving the ability to critically analyze social media content [32].

The study by Pagoto et al [22] is another example of a dissonance-based social media intervention to promote sun safety. The intervention involved encouraging survey respondents to create social media posts on healthy skin or a healthy lifestyle. According to the authors, participants in the healthy skin intervention group reported a higher motivation to use protective clothing and sunscreen and a decreased motivation to tan. The authors suggested that this intervention, encouraging social media content creation and response, should enhance cognitive dissonance and affect social norms, which in turn might change attitudes and behaviors concerning tanning [22].

The study by Stapleton et al [24] is another example of a dissonance-based intervention focusing on healthy body image. As part of this intervention, a group of Facebook users was encouraged to publish posts and share their opinions on them. The aim of the dissonance-inducing intervention approach was to engage participants in group discussions related to body image [24].

The topic of skin cancer prevention and the use of tanning beds was also addressed by Morrison et al [20]. To educate the audience, the authors used 3 different short videos aimed at discouraging indoor tanning. The first was a humorous video created in collaboration with a physician, the second was a music video with an Instagram star, and the third one was based on facts about skin cancer. The humorous video received the highest engagement, measured via the number of comments, reactions, and shares, whereas the fact-based video received the lowest engagement [20].

Moreover, in the study by Potente et al [33], an ironic music video was also used, the aim of which was to engage young people in skin cancer prevention. Different forms of entertainment, education, and marketing were used on social media to change attitudes and behaviors regarding sun protection [33].

In contrast to the aforementioned studies, Vraga et al [25] used a video with incorrect information about sunscreen and skin cancer. The results indicated that the disinformation video, compared to an educational video, increased belief in sunscreen myths ($P<.001$) and decreased intent to use sunscreen ($P<.01$) [25].

In the study by Myrick et al [21], an intervention focusing on appearance and self-control-related emotions was used. The results indicated that the intervention focused on appearance contributed to a reduction in the time spent viewing Instagram images of tanned women. In contrast, after the intervention involving self-control emotions, an increase in anticipated pride and in a positive attitude toward solar safety was observed [21].

Digital Interventions on Social Media Based on Social Cognitive Theory, Transportation Theory, and Diffusion of Innovations Theory

Buller et al [15-17] conducted a year-long social media health campaign to reduce mothers' permissiveness of indoor tanning with their teenage daughters. Mothers became less lenient toward indoor tanning with their teenage daughters immediately after the campaign and 6 months after it ended [15,16]. According to the researchers, social media campaigns could motivate mothers to communicate with their daughters and share posts about the danger of indoor tanning [15]. In turn, Buller et al [17] measured engagement levels by measuring reactions (eg, sadness and number of likes) and mothers' comments on posts related to the campaign. They noted that users reacted with comments to 76.4% of posts. Immediately after the campaign ended and 32 months after, mothers who posted reactions or comments were less liberal about indoor tanning with their teenage daughters than mothers who did not engage with the posts [17].

Social Media Behavioral Interventions

In the study by Coups et al [18], a behavioral intervention was conducted via Facebook targeting young patients with melanoma and their families. The content of the intervention consisted of daily posts about skin cancer risk, total cutaneous exam, skin self-examination, and preventive measures (ie, sun protection). Preliminary analyses by the researchers showed an increase in intentions to use the total cutaneous exam, skin self-examination, and sun protection. In addition, Coups et al [18] found that posts that included personal stories, quizzes, skin care exercises, and an opportunity to ask a question to a specialist were perceived by survey respondents as particularly engaging.

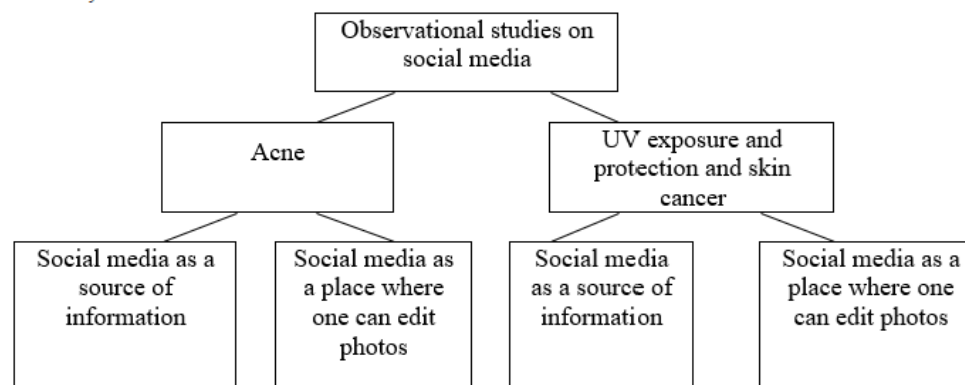
An effective intervention was also demonstrated in the study by Køster et al [35], who reported that, in effect, the use of tanning beds decreased in parallel with antisun campaign activities, with an odds ratio of 0.61 (95% CI 0.54–0.69). The campaign was mainly conducted on social media but also in youth magazines and on the radio. It was supplemented with a music video available on the internet and television on skin damage and the negative effects of using cosmetic beds. In addition, respondents to the postcampaign survey were in favor of legislative changes to restrict the access of children and teenagers aged <18 years to tanning salons [35].

Result Summary

To sum up, social media is a place where observational studies and interventional studies can be carried out. Unlike interventional studies, observational studies do not assess cause and effect relationships, require a large sample, and carry a high risk of error. In both observational and interventional studies, the most frequently discussed topics were skin exposure to and protection against UV radiation and skin cancer. Only 13% (3/23) of observational studies focused on acne [19,27,36]. No skin care studies were found that met the inclusion criteria. Observational studies conducted on social media showed that social media is a source of information [14,23,26,27,30,36] and a place where one can edit one's own photos [19,31]. Observational studies on acne showed that dissatisfaction with the appearance of the skin (presence of skin lesions) stimulates individuals to use social media. In the case of observational studies on exposure and protection against UV radiation, it was shown that the use of social media increases dissatisfaction with appearance and, consequently, increases exposure to UV radiation.

Visualization in social media has a strong impact on users. Showing images contributes to taking actions that are both beneficial (in the presence of skin lesions)—seeking dermatological care—and unfavorable (the desire to have a nice tan)—increased exposure to UV radiation (Figure 2).

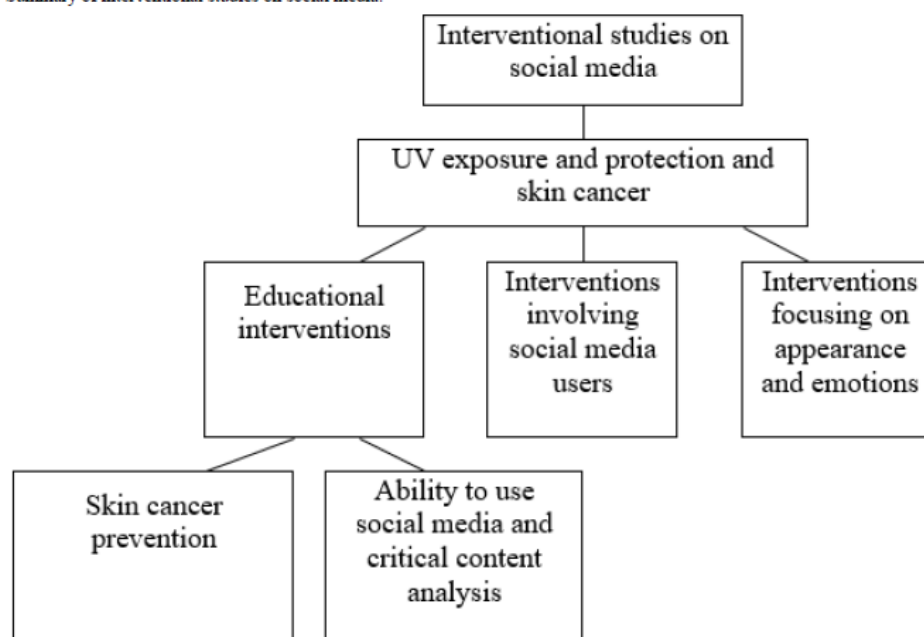
Figure 2. Summary of observational studies on social media.



The analyzed social media intervention studies mainly concerned skin exposure to and protection against UV radiation, tanning, skin self-examination, and skin cancer. Most studies (11/23, 48%) used educational interventions on skin cancer prevention [15–18,20,25,28,29,33–35]. One study used an educational intervention on social media literacy and critical content analysis [32]. A total of 13% (3/23) of the studies examined social media users' involvement in generating social media content [15–17,22,24]. These studies pointed out that social media is a motivating factor. Motivation is the readiness to take a specific action, triggered by a need. To take action, one needs the right attitude and the internal conviction that the action is advisable. The aim of educational interventions was to change attitudes toward skin health promotion. However, interventions encouraging participants to create content on social media were intended to engage participants to increase the effectiveness of

the intervention and the belief in its purposefulness. A total of 9% (2/23) of the studies focused primarily on body image rather than skin health issues [21,24]. The study by Myrick et al [21] discussed a psychological approach to appearance and emotion self-control (Figure 3). Both in observational and interventional studies, attention was paid to visualization on social media (images, photos, and videos). In addition, attention was paid to the involvement of social media users, which was measured via the amount of content shared, comments, likes, and photos published. Intervention studies showed that educational strategies based on humorous films, interesting personal stories, and opportunities for discussion were more engaging for participants. In observational studies, it was not possible to measure the level of persistence in following recommendations (eg, regular photoprotection). Interventional studies provided this possibility, and their results can be checked after a period.

Figure 3. Summary of interventional studies on social media.



Discussion

Principal Findings

The results of this review indicate that social media is a platform for disseminating health messages on an ongoing basis and for creating interventions targeted at specific groups. However, research on social media impact on education, attitudes, behaviors, and actions concerning skin health promotion was inconclusive and varied. Some studies (2/23, 9%) stressed the negative side of social media, noting that, for example, its acne advice was inconsistent with current guidelines [27,36]. Others (4/23, 17%) drew attention to the fact that social media can promote risky health behaviors concerning sunbathing without sunscreen, which may result in skin cancer [14,23,26,31]. On the other hand, without focusing on digital interventions, some of the studies included in this review (2/23, 9%) dealt with a positive impact of social media on skin care, skin protection, and skin health promotion. They noted that social media increases users' self-awareness and motivates them to take care of their skin [19,30]. According to Benetoli et al [41], social media has positively affected users' interaction with health care professionals. As a result, patients feel more confident and more assertive in their decision-making [41]. Most of the studies discussed in this review (14/23, 61%) argued that social media interventions resulted in positive effects on preventive skin health measures, changing users' behaviors, actions, attitudes, and knowledge levels [15-18,20-22,24,28,29,32-35]. Therefore, it is reasonable to ask how to make social media interventions effective and how to achieve a long-term change in user behaviors.

Agha-Mir-Salim et al [28] investigated the effects of social media digital interventions and found that Facebook was less

effective than printed materials in improving awareness of skin cancer and the need for sun protection. However, without information about the level of audience engagement measured through the number of posts and reactions to them, it is difficult to explain the reasons why flyers were more effective than Facebook [28].

User engagement is critical to the success of social media interventions. The assessment of user engagement with social media interventions was presented in 35% (8/23) of the studies, determining the reactions to posts using the number of likes, comments under posts, and shares [17,18,20,22,24,29,32,33]. In addition, the concept of social media engagement plays a key role in health psychology [42]. Systematic reviews evaluating strategies that promote technology-based engagement have shown a potential positive impact of these strategies on health behaviors [43-47]. The success of social media engagement is based on its effect on society. Psychological factors and neural mechanisms are important [48]. Nahum-Shani et al [48] explain how positive engagement develops in response to a digital stimulus facilitating behavior change. By describing the neural basis of decision-making (by explaining its application to digital interventions), the researchers extend the concepts by Samanez-Larkin and Knutson [49] (affect-integration-motivation), creating the concepts of affect-integration-motivation and attention-context-translation of motivation to behavior. These additional elements can be used for targeted engagement of social media users with digital interventions [48].

Behavioral interventions through social media have many advantages, such as a large audience, low costs of disseminating information, and a possibility to create individual content and interact with other users with similar experiences or in a similar

situation. This allows for mutual support, the exchange of information, and an opportunity to interact with health professionals by consulting specialists and obtaining answers [18].

In the observational studies on acne by Bahaj et al [36] and Yousaf et al [27], the authors pointed out that much of the advice available on social media is not consistent with the guidelines of the American Academy of Dermatology. In addition, in the observational study on skin cancer by Basch et al [14], it was shown that people who believed that social media was an accurate source of health information were more likely to fail to follow proper sun protection practices. The aforementioned study showed that social media can increase belief in health myths. The study by Vraga et al [25] showed that videos with erroneous information had a stronger impact on users than educational videos. Social media actions should also be aimed at combating misinformation. The content posted should be in agreement with evidence-based medicine and with the guidelines of the American Academy of Dermatology. In addition, interventions should increase the knowledge of social media users about the dangers of improper skin care and change their positive attitude toward inappropriate activities such as too much tanning. Social media interventions should also contribute to an increase in assertiveness toward inappropriate, harmful content, building self-esteem in users and teaching critical analysis of the content shared. In the case of tanning, interventions should describe alternative options, such as the use of safe moisturizing bronzers.

It seems that effective interventions should not only aim at the health consequences of poor skin care and poor skin protection but also focus on monitoring skin texture. In addition, they should make an effort to shape social norms regarding attractiveness (ie, by questioning the ideal of tanned skin and promoting sun protection). The use of dissonance induction approaches in interventions also seems to be important. The goal of those approaches is to encourage participants to persuade others to engage in appropriate behaviors [22].

Behavioral health interventions concerning appearance and body image often use persuasive techniques based on cognitive dissonance theories. Those techniques encourage participants to engage in discussions and cognitive exercises. Participants endorse views that contradict their previous beliefs and, in the end, accept these views as their own [24]. According to the dissonance theory, when there is a conflict between a belief (eg, a perfect tan is good) and behaviors (eg, persuading others that a perfect tan must be avoided and sunscreen should be used), psychological discomfort (cognitive dissonance) is the result, which motivates an individual to change their original beliefs (ie, the person is motivated to use sunscreen because tanned skin is less important than healthy skin) [22,50]. The effectiveness of cognitive dissonance interventions has been confirmed in studies on eating disorders [51] and perfect tans [52].

Pagoto et al [53] proposed a methodology for adaptation of social media behavioral interventions. It requires that parameters be defined to determine whether the intervention is based on social media completely or partially. The objective of a social

network should be defined, too. First, it should be decided whether the main objective of the intervention is to engage users, disseminate information, or both. The type of intervention should be related to the objective. One-way communication is adopted mainly for public health campaigns. In 2-way communication, the content is generated by both the intervention moderators and the audience. Two-way communication allows for discussions and for help with problem-solving and behavioral advice. When designing interventions, it is important to choose the social networking platform and the target population. Another important element when designing an intervention is content conversion, with short, catchy posts, videos, photos, graphics, and links to articles. When the main focus of the intervention is user engagement, a plan should be constructed. It should include the size of the group, the frequency of posting, and the number of engaged participants, and it should specify whether the posts are automated. In the design of interventions, it is also reasonable to create chat groups or use microcounseling, which involves the intervention moderator initiating the discussion. The engagement plan may also include recruiting friends or family members for the intervention. In addition, it is important to train users on how to clarify expectations and encourage them to express their opinions and publish posts [53].

Almost all the intervention studies analyzed in this review (13/15, 87%) were conducted after Pagoto et al [53] developed their methodology for adapting social media interventions. After analyzing the presented interventions, it can be assumed that the authors followed some of the advice by Pagoto et al [53] when designing their interventions. Intervention studies that focus on engaging participants have found greater intervention effectiveness.

In summary, the analysis of the studies included in this review indicates that, when designing social media interventions for skin health, it is necessary to pretest them in a pilot project with comparison groups, including control groups, and measure user engagement on a regular basis. In addition, designing interventions requires focusing on the content that is designed to engage the audience. Absorbing content should not only be educational but also entertaining and discourage abnormal health behaviors. The content should be focused on the benefits according to positive psychology (to increase its attractiveness); it should focus on thinking about the future using goal setting and motivation (to have nice and healthier skin). It is also reasonable to include personal stories, exercises to engage the audience, and various puzzles. When designing interventions, the theories of social psychology they are based on should be considered.

The results of this review may be useful in creating future skin health promotion programs on social media. It is aimed at all those who are ready to broaden their knowledge and effectively engage in activities related to skin care and skin protection.

This study aimed to fill the research gap in assessing the usefulness of social media for skin health promotion. Its main assumption was that it would contribute to the discussion on the importance of the information provided about the skin and

its impact on changing the attitudes and behaviors of recipients of this information.

Strengths and Limitations

As with any other study, this review had its limitations. The first one was that only articles written in English were analyzed, which meant that important publications written in other languages were not included. The second limitation was the omission of studies that were in progress (not completed). One of them was a Facebook intervention targeted at patients with melanoma and their families (randomized controlled trial) as the report on its results was expected to be completed by November 2023 [54]. Therefore, its analysis was not possible, and this review should be updated at a later time. The third limitation is the small number of interventional studies on acne and a lack of research on rosacea and atopic dermatitis, common conditions dealt with in dermatological and cosmetology clinics. In addition, there was a lack of research on daily skin care, education, and antiaging activities on social media. Some papers, such as those dealing with social media posts on esthetic medicine and more or less invasive plastic surgery, were not included in this review. This prevented a broader analysis and assessment of the impact of social media on users' skin care and health activities. The last limitation was the failure to undertake a quantitative data analysis because of too broad a topic, which resulted in the heterogeneity of the studies that qualified for analysis.

Despite its limitations, this paper presents an up-to-date review of social media impact on users' behavior change and the implementation of interventions mainly in the field of skin cancer prevention. In addition, this review identifies research gaps and topics worth focusing on and indicates what should be improved when conducting social media research.

Conclusions and Practical Implications

Social media remote consultations and digital interventions with the use of new technologies in education and research are a relatively new method of skin health promotion. Despite the limited number of studies and their heterogeneity, this review outlined the impact of social media on user behaviors, attitudes, and actions in terms of skin health. It provided insights into social media importance and identified strategies for digital interventions to promote health. In addition, this review underlines the need to conduct research on skin health promotion via social media and on new methods motivating users to take an active role. There is no doubt that more high-quality studies, consistent and with logical conclusions, on social media using standardized interventions are needed.

The observational studies analyzed in this review (8/23, 35%) showed that social media, according to social media users, is a reliable place to obtain information on skin health. Moreover, there was a noticeable tendency of social media influencing the behavior of social media users. On the basis of unpublished own research (by author JMB), of 150 surveyed social media users (people aged ≤ 25 years), in 2021, a total of 62% (93 people) believed that information from social media regarding skin cancer prevention, skin care and treatment of acne, and antiaging was very important to them. For 44% of respondents

(66 people), information on social media influenced their behavior. In a repeated study in 2023, as many as 86% of respondents (129 people) stated that information on skin cancer prevention, skin care and treatment of acne, and antiaging was very important to them. However, 74% of respondents (111 people) stated that information on social media influenced their behavior.

The studies analyzed in this review showed that more frequent use of social media is significantly associated with more frequent exposure to UV radiation. Social media focuses on visualization. Photos and images are a powerful tool to influence users. In intervention studies, there was a noticeable tendency to encourage people to react to posts and create their own. It can be assumed that interventions involving social media users in generating content increase their motivation to take care of their skin. The aim of social media interventions should be education on promoting skin health based on visualization and motivating social media users to take care of their skin (using photoprotection, limiting sunbathing, using protective clothing, conducting skin self-examinations, and having regular skin checkups with a dermatologist).

The availability of social media worldwide provides unlimited possibilities for transmitting and managing information. Analyzing posts and evaluating user engagement by measuring the number of likes, comments, and followers can be a powerful tool for gathering knowledge and studying patients' opinions. After becoming familiar with the expectations of social media users and assessing information resources and their quality and credibility, appropriately targeted actions should be taken to educate, encourage, and motivate users to be active in skin care and skin health promotion in everyday life.

Social media has become a tool supporting the life and work of society. The model of Society 1.0 was based on hunting, Society 2.0 was based on agriculture, Society 3.0 was based on industry, and Society 4.0 is based on information. Social media implements the assumptions of the Society 4.0 model through information activities. The vision of Society 5.0 is a balance between technological progress and human needs. Model 5.0 enables the collection of data (eg, on health status) from patients on an ongoing basis. Social media can be a tool for digital interventions and for Society 5.0 implementation. The implementation of Digital Society 5.0 depends not only on the cooperation between countries but also on combined efforts of various branches of medicine, business, and science, which is the basis for creating innovations at both the national and global level. Innovations are not possible without cooperation; the use of global data (big data); and the coordination of many data systems and knowledge platforms, including social media.

Proper and specialized use of social media by dermatologists, pharmacists, cosmetologists, and health educators can increase awareness concerning skin condition and skin health preventive measures. It can encourage users to conduct a skin self-examination and visit a dermatologist. This review could also enable dermatologists, cosmetologists, pharmacists, and health educators to understand social media potential and its impact on users. This review presents social media use for intervention studies and indicates its educational and

motivational role in actions related to skin health. In addition, those actions have a clinical significance as social media increases user awareness of skin health promotion. As a result, users are not reluctant to seek medical help. Therefore, this review could be a basis for further research on the role of social media interventions in skin health promotion (including sun protection; mole control; and proper skin care for various dermatological diseases, such as acne, rosacea, or atopic dermatitis). It seems that social media, compared to traditional forms of mass communication, has the potential to make a change in skin care and health behaviors and activities among a larger population.

First, future studies should focus on effective social media strategies to promote skin health. Second, research assessing the effects of health and skin care recommendations would be

useful. Third, studies assessing the short-term engagement of social media users would be of practical importance, as well as research assessing their commitment to long-term health and skin care habits. The results of this review, in addition to its theoretical value, could have potential applications in online dermatological and cosmetology consultations and in prohealth campaigns concerning increasingly common skin diseases such as acne and melanoma.

This research dealt with studies investigating individually developed social media strategies. It seems that it would still be appropriate to standardize tools assessing the quality of digital health interventions on social media. Such standardization would be helpful both in the design of new digital interventions and in the evaluation of existing ones.

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Authors' Contributions

JMB contributed to work concept and design, data collection and analysis, visualization, writing the original draft, reviewing and editing the manuscript, critical review, and final approval. JG contributed to data collection and analysis and critical review.

Conflicts of Interest

None declared.

Multimedia Appendix 1

Characteristics of the included studies.

[\[DOCX File, 67 KB-Multimedia Appendix 1\]](#)

Multimedia Appendix 2

Findings of the included studies.

[\[DOCX File, 67 KB-Multimedia Appendix 2\]](#)

Multimedia Appendix 3

PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) checklist.

[\[DOCX File, 31 KB-Multimedia Appendix 3\]](#)

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Abbreviations

PRISMA: Preferred Reporting Items for Systematic reviews and Meta-Analyses

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Multimedia Appendix 1

Characteristics of the included studies.

[DOCX File , 67 KB-Multimedia Appendix 1]

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Table 2. Characteristics of included studies.

Author (year)	Country	Platform – Type of social media	Type of data	Patient population (n)	Patient age (years)	Study design; Type of study; Assessment tool	Main topic	Aim(s)
Agha-Mir-Salim et al. (2020) [28]	United Kingdom	Facebook	Posts; Printed leaflets	279	18-29-year-old university students or graduates	Randomized controlled trial; Skin Cancer Questionnaire and Sun Knowledge Questionnaire	Skin cancer/ Melanoma; Sun exposure; Sun knowledge	Evaluating the effectiveness of Facebook, compared to leaflets, in raising awareness of melanoma and harmful sun-related behavior
Bahaj et al. (2022) [36]	Saudi Arabia	Instagram YouTube Snapchat Twitter TikTok WhatsApp Facebook	Not specified	4227 participants having experienced acne	At least 13 years old	Cross-sectional study; Online survey	Acne	Assessing the impact of social media on acne management among the Saudi Arabian population
Basch et al. (2018) [14]	United States	Not specified	Posts	258	college students	Cross-sectional study; Survey (questions were adapted from the Health Information National Trends Survey questionnaire and from prior study on sun safety)	Skin cancer; Sun protection; Tanning behavior	Exploring factors related to sun protection and tanning behaviors and examining the influence of social media use and information-seeking behaviors on sun protection actions
Buller et al. (2021) [15]	United States	Facebook	Posts; Videos	Mothers (n=869) with daughters aged 14-17 (n=469)	Mothers – not specified; daughters – 14-17 year-old	Randomized controlled trial; Surveys	Skin cancer; Indoor tanning	An evaluation of a social media campaign aimed at reducing mothers' leniency towards their teenage daughters' indoor tanning

Buller et al. (2022) [16]	United States	Facebook	Posts; Videos	Mothers (n=869) with daughters aged 14-17 (n=469)	Mothers – not specified; daughters – 14-17 year-old	Randomized controlled trial; Measurement of reactions (like, sad, etc) and comments	Skin cancer; Indoor tanning	Assessment of the effects of mothers' involvement on social media campaigns aimed at limiting indoor tanning of their adolescent daughters
Buller et al. (2022) [17]	United States	Facebook	Posts; Videos	Mothers (n=869) with daughters aged 14-17 (n=469)	Mothers – not specified; daughters – 14-17 year-old	Randomized controlled trial; Surveys	Skin cancer; Indoor tanning	Examining the long-term effects of a social media campaign for mothers to reduce their adolescent daughters' indoor tanning.
Coups et al. (2018) [18]	United States	Facebook	Posts	48 young-onset melanoma patients and their 40 family members	Not specified	Pilot and Feasibility Study; Web-based or pencil and paper baseline survey	Skin cancer/Melanoma; Sun protection; Total cutaneous exam; Skin self-exam	Examining the development, feasibility, and preliminary impact of a family-focused Facebook intervention to increase engagement in total cutaneous exam, skin self-exam, and sun protection behaviors
Damude et al. (2017) [34]	The Netherlands	YouTube	Videos	100 melanoma patients	range 20-86 (median age was 60)	19-item, web-based questionnaire	Melanoma	Investigating knowledge of Dutch melanoma patients and their opinions on the information provision and educational value of YouTube videos
Gough et al. (2017) [29]	United Kingdom	Twitter Thunderclap	Message frames (informative, story, shock, humor); posts	337 participants pre campaign; 429 participants post intervention	At least 18 years old	Quasi-experimental feasibility study; Pre- and post campaign Web-based survey	Skin cancer	Assessment of the feasibility of designing, implementing, and evaluating a social media-enabled intervention for skin cancer prevention
Guckian et al. (2020) [30]	United Kingdom	Facebook Instagram Twitter Pinterest	Posts	249	Patients of different ages (≥ 18 years old)	Pilot study; Cross-sectional study; Quantitative and Qualitative data; Questionnaire	Skin cancer	Identifying the impact of social media on patient presentation to a melanoma screening clinic

Køster et al. (2011) [35]	Denmark	MySpace; YouTube; Facebook	Posts; Articles in magazines; Music video in Internet and television; Radio	14514	15-59 year-old	Multicenter study; Cross-sectional study; Four questionnaires	Skin cancer; Indoor tanning beds	Assessment of the impact of anti sunbed campaign activities on the use of tanning beds
Martel et al. (2020) [19]	United States	Instagram	Photograph editing	257	Undergraduate students	Survey	Skin lesions; Acne/acne scars; Seeking dermatologic care	Evaluating the impact of photo editing on seeking dermatological care
Mingoia et al. (2017) [31]	Australia	Not specified	Posts (pictures, text)	1856 South Australian	Secondary school students (adolescents)	Cross-sectional study; Survey	Skin cancer; Sun exposure; Sun protection	Assessing the relationship between social media use and dissatisfaction with skin tone, sun exposure, and sun protection
Mingoia et al. (2019) [32]	Australia	Facebook	Posts	84 women	18-29 year-old	Pilot study; Randomized Controlled Trial; Modified version of the Media Attitudes Questionnaire (MAQ); 7-item tanning attitudes scale; Socio-cultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4); Physical Appearance Comparisons Scale (PACS); Modified version of the Skin Tone Rating Scale	Skin cancer; Tan	Evaluating the effectiveness of a social media literacy intervention delivered via Facebook to reduce positive attitudes towards tanning and improve ability to approach social media critically
Morrison et al. (2019) [20]	United States	Facebook	3 videos	7216	Women aged 18-34 in six states	Pilot study; Randomized controlled trial;	Skin cancer; Indoor tanning	Primary aim was to develop engaging skin cancer prevention

					(Alabama, Alaska, Arkansas, Georgia, Kentucky, and Tennessee)	Number of individuals exposed, frequency, duration of views, engagement – number of likes, shares, comments and 3 questions		videos and measure the video reach and engagement; Secondary aim was to assess the impact of prevention videos on self-reported outcomes related to melanoma risk
Myrick et al. (2022) [21]	United States	Instagram	Posts	120 women	18-22 year-old	Online questionnaire and Qualtrics questionnaire	Skin cancer; Tan; Sun-safety attitudes	Assessment of the ability of digital sun-safety interventions to affect self-control-related emotions and visual attention to subsequent tan -ideal images and sun-safety attitudes
Pagoto et al. (2022) [22]	United States	Facebook; Twitter	Posts	66 tanners	18-30 year-old	Pilot and Feasibility Study; Randomized controlled trial	Skin cancer; Healthy Skin; Healthy Lifestyle	Evaluating the feasibility and acceptability of a dissonance-based social media intervention in which young adults were encouraged to create social media content aimed at promoting sun safety in young adult tanners
Potente et al. (2011) [33]	Australia	YouTube MySpace Facebook	Video	1588 (627 respondents exposed to the video; 961 respondents not exposed to the video)	14-24 years	Online surveys and thematic analysis of online conversations; social media monitoring tools: Radian 6 and Google Insights	Skin cancer; Sun protection	Creative communication strategy that uses entertainment-education and social media marketing to engage youth in skin cancer prevention
Stapleton et al. (2016) [23]	United States	Facebook Pinterest Twitter Instagram	Not specified	463 non-Hispanic white participants	Women aged 18–25 years	Cross-sectional study; Survey	Skin cancer; Indoor tanning; Tanning bed	Examining the association between use of social media sites and indoor tanning behavior

Stapleton et al. (2018) [24]	United States	Facebook	Posts	17 young women	18 to 25 year-old women	Formative study; Baseline survey and follow-up survey	Skin cancer; Indoor tanning beds; Body acceptance	Healthy body image intervention (behavioral intervention) via Facebook targeting users of indoor tanning beds to reduce their risk of skin cancer – assessment of engagement and acceptability
Vraga et al. (2022) [25]	United States	Facebook	Videos	2173 recruited participants (1348 eligible participants)	adults	Randomized controlled trial; Questionnaire	Skin cancer; Sunscreen	Assessment of the effects of a news literacy video and real-time corrections to video misinformation related to sunscreen and skin cancer
Willoughby et al. (2018) [26]	United States	YouTube, SnapChat, Instagram, Twitter, Pinterest, Facebook	Not specified (visual-oriented social media platforms)	502	college-aged women; from 18 to 29 aged	Online survey	Tanning behaviors (indoor and outdoor tanning)	The role of specific media types in potentially promoting indoor or outdoor tanning
Yousaf et al. (2020) [27]	United States	YouTube Instagram Pinterest Facebook Twitter Snapchat Tumblr	Not specified	130	Patients of different ages	Cross-sectional study; survey	Acne	Assessing the impact of social media use on acne treatment

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Multimedia Appendix 2

Findings of the included studies.

[DOCX File , 67 KB-Multimedia Appendix 2]

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Table 3. Findings of included studies.

Author (year)	Intervention	Assessment of the impact of social media	The impact of public health campaigns	Skin self-examination	Use of cosmetic preparations	Statistical analysis performed	Main finding(s)	Conclusion/Opinion of the author(s) of the study regarding the effectiveness of the strategy for providing information on social media	Quality appraisal
Agha-Mir-Salim et al. (2020) [28]	+	+	+	-	+	+	- After the SunSafe campaign, there was a statistically significant increase in the level of knowledge (Facebook = 1.82, leaflets = 3.04, $P < 0.001$); - The improvement in the knowledge score from leaflets was statistically significantly greater than from Facebook (95% confidence interval: 0.35-2.09, $P = 0.0059$); - Participants with lighter skin color had higher levels of knowledge about skin cancer and sun exposure at baseline ($P = 0.005$, $P < 0.05$)	Printed leaflets have a greater impact on raising awareness than online platforms such as Facebook among young adults in the UK, so traditional media should not be neglected in health promotion.	high
Bahaj et al. (2022) [36]	-	+	-	-	+	+	- The majority of social media users were between 18 and 25 years old and chose social media as their first approach for acne advice; - The most frequent social media recommendation chosen was to increase water intake; - There was a significant association between the use of social media for advice and gender (p-value < 0.001), education level (p-value = 0.002), and severity of acne (p-value < 0.001)	Social media has had a significant impact on acne treatment, however, much of the advice recommended is not consistent with current guidelines	high

Basch et al. (2018) [14]	-	+	-	-	+	+	- Females (odds ratio [OR] 0.42, 95% CI 0.22-0.81) and believers that sun tan improves appearance (OR 0.25, 95% CI 0.10-0.66) were less likely to have "high" sun protection behaviors	Incorporating personal stories and graphic images into skin cancer prevention messages can improve message retention, but knowledge alone does not necessarily influence behavior, so effective interventions focused on skin cancer prevention and sun protection behavior must be multifaceted	high
Buller et al. (2021) [15]	+	+	+	-	-	+	- At 12-month follow-up, intervention-group mothers were less permissive about indoor tanning by daughters (unadjusted means = 1.70 [95% CI: 1.59, 1.80] v. 1.85 [1.73, 1.97] [5-point Likert scale], b = -0.152) than control-group mothers; - At 12-month follow-up, intervention-group mothers reported more communication about avoiding indoor tanning with daughters (4.09 [3.84, 4.35] v. 3.42 [3.16, 3.68] [sum of 7 yes/no items], b = 0.213) than control-group mothers	A social media campaign may be an effective strategy to convince mothers to withhold permission for indoor tanning	high
Buller et al. (2022) [16]	+	+	+	-	-	+	- 76.4% of posts received a reaction and/or comment; - Mothers who engaged with indoor tanning posts were less permissive of daughters' indoor tanning immediately at the conclusion of the campaign (permit indoor tanning: -0.39, p<0.05; facilitate indoor tanning: -0.29, p<0.05) and 6 months after intervention (permit indoor tanning: -0.32, p<0.05; facilitate indoor tanning: -0.31, p<0.05) than mothers who did not engage with posts	Engagement with posts is essential to the success of a social media campaign for preventing indoor tanning	high
Buller et al. (2022) [17]	+	+	+	-	-	+	- Intervention-group mothers were less permissive of indoor tanning by daughters (unstandardized coefficient=-0.17, 95% confidence interval [CI], -0.31, -0.03) than control-group mothers; - Intervention-group mothers had greater self-efficacy to refuse daughter's indoor tanning requests (0.17, 95% CI, 0.06, 0.29) and lower indoor tanning intentions themselves (-0.18,	A social media campaign led to a lasting reduction in mothers' leniency towards their daughters' indoor tanning	high

							95% CI, -0.35, -0.01) than control-group mothers; - Intervention-group mothers were more supportive of bans on indoor tanning by minors (0.23, 95% CI, 0.02, 0.43) than control-group mothers; - Intervention-group daughters expressed less positive indoor tanning attitudes than controls (-0.16, 95% CI, 0.31, -0.01)		
Coups et al. (2018) [18]	+	+	-	+	+	+	- Among the 5 consecutive groups conducted, engagement, as measured by comments and likes in response to postings about skin cancer, skin cancer risk factors, total cutaneous exam (TCE), skin self-exam (SSE), and sun protection, increased across the groups; - Participants positively evaluated the intervention content and approach; - Preliminary analyses indicated increases in TCE, SSE, and sun protection intentions	A Facebook intervention is a potentially feasible and effective method for increasing sun protection and skin cancer surveillance among people at increased risk for melanoma	high
Damude et al. (2017) [34]	+	+	-	+	-	+	- Orally delivered information regarding warning signs, severity, treatment possibilities, and importance of self-inspection was clearest for patients, compared to information in the melanoma brochure; - According to 77% of patients, YouTube videos regarding self-inspection of the skin and regional lymph nodes had additional value	YouTube videos are an easily accessible and complementary method of patient education	low
Gough et al. (2017) [29]	+	+	+	-	-	-	- Greater awareness that skin cancer is the most common form of cancer (pre intervention: 28.4% [95/335] vs. post intervention: 39.3% [168/428] answered "True"); - Melanoma is most serious skin cancer (49.1% [165/336] vs 55.5% [238/429]); - Improved attitudes toward ultraviolet (UV) exposure and skin cancer with a reduction in agreement that respondents "like to tan" (60.5% [202/334] vs. 55.6% [238/428])	Social media are an inexpensive, effective method for delivering public health messages	low

Guckian et al. (2020) [30]	-	+	+	+	-	+	- Self-examination of lesions was the most common motivator for attending a melanoma screening clinic; - 1 person described social media as a motivating factor; - 30 people saw posts from health authorities about skin cancer	Current information delivery strategies are not of the required quality to reach target populations	high
Køster et al. (2011) [35]	+	+	+	-	-	+	- The odds ratio (OR) for being a sunbed user in 2009 when compared with 2007 was 0.61 (0.54-0.69); - in the age group of 15-19 years, the OR was 0.42 (0.30-0.69); - In 2009 23% of Danes (33% of 15-19-year-olds) reported sunbed use within the past 12 months; - In 2009 of Danes more than 50% had experienced sunburn caused by a sunbed	The use of tanning beds decreased in parallel with the anti sunbed campaign on social media (the biggest change occurred in the 15-19 age group)	high
Martel et al. (2020) [19]	-	+	-	+	-	+	- 145/228 (63.6%) edited a skin lesion, 104/228 (45.6%) whitened teeth, 70/228 (30.7%) altered the size of their body; - Of those who edited skin lesions, 128/145 (88.3%) edited acne/acne scars; - Those who felt the editing made them more aware of their skin lesions were significantly more likely to feel they needed to see a dermatologist (P=0.02, 95% CI)	Editing photos of skin lesions/acne scars on Instagram may be a motivating factor to seek dermatological care	high
Mingoia et al. (2017) [31]	-	+	-	-	+	+	- Behavior related to tanning (viewing pictures, posting pictures, and liking or sharing content) were significantly associated with more skin tone dissatisfaction, more sun exposure and less sun protection	Posting photos, posting text, viewing photos, viewing text, and liking or sharing tan-related posts on social media are associated with skin cancer risk factors	high
Mingoia et al. (2019) [32]	+	+	-	-	-	+	- Significantly decreased positive tanning attitudes in the intervention group compared to the control group; - Improved media literacy skills in both groups; - Intervention group participants reported significantly less internalization of a tanned ideal, appearance comparisons, tanning intentions than control group participants	The social media literacy intervention is a strategy to reduce the harmful impact of social media messages about tanning, which to skin cancer prevention	high

Morrison et al. (2019) [20]	+	+	+	-	-	+	- The videos received 1288 comments, 11415 reactions and 4201 shares; - The parody song had the highest engagement (1050 comments, 7725 reactions, 3875 shares); - The fact-based video had the lowest engagement (22 comments, 121 reactions, 70 shares); - A greater proportion of the intervention group responded “yes” to recalling seeing a skin cancer prevention video (82/428, 19.2%), compared to the control group (31/449, 6.9%) – difference was statistically significant (N=877, OR=3.19, 95%CI 2.06–4.93, $p<0.0001$)	Social media advertising can reach target populations and provides an opportunity for targeted public health interventions	high
Myrick et al. (2022) [21]	+	+	-	-	+	+	- Women who first viewed the appearance benefits intervention story spent less time visually fixated on Instagram images of tan women than did those who viewed the self-control emotions intervention or control message ($p = 0.005$, $\eta^2p = 0.087$); - Interactions between the intervention conditions and feelings of anticipated pride on both visual attention and sun-safety attitudes	Depending on the emotional responses at Instagram generates, it may promote sun safety attitudes	high
Pagoto et al. (2022) [22]	+	+	+	-	+	+	- Retention was 100%; - Most Healthy Skin (88%) and Healthy Lifestyle participants (91%) created ≥ 1 post; - At 4 weeks, Healthy Skin participants reported greater declines in motivation to tan indoors ($p = 0.0017$) and outdoors ($p = 0.0003$); - At 4 weeks, Healthy Skin participants reported greater increases in motivation to wear sunscreen ($p = 0.0009$) and protective clothing ($p = 0.0342$); - At 4 weeks, Healthy Skin participants reported greater declines in intentions to tan outdoors in the next year ($p = 0.0286$)	A dissonance-based, social media sun safety intervention is feasible and acceptable	high
Potente et al. (2011) [33]	+	+	+	-	+	+	- 25% of people who watched the video passed it on to their friends; - 44% said the film changed their feelings about sun protection;	Entertaining, peer-to-peer messages can be used to engage youth with an important health	high

							- 19% of spontaneous online comments reported an intention to change sun protection behavior	message for skin cancer prevention	
Stapleton et al. (2016) [23]	-	+	-	-	-	+	- Frequency of use of Facebook or Pinterest was not associated with past 12-month indoor tanning; - Higher rates of indoor tanning were associated with use of Twitter and Instagram among a national sample of young adult women	Twitter and Instagram can be a valuable way to spread skin cancer prevention information to social media users using indoor tanning	high
Stapleton et al. (2018) [24]	+	+	-	-	-	+	- The study had a high retention rate (94%, [16/17]); - Average rates of past 1-month indoor tanning reported following the intervention were lower than the baseline rate (P=0.08, Cohen d=0.47)	An intervention approach using dissonance-inducing content shows potential value for indoor tanning, body image, and skin cancer prevention	high
Vraga et al. (2022) [25]	+	+	-	-	+	+	- Video misinformation heightened beliefs in sunscreen myths and reduced acceptance of sunscreen facts and intentions to wear sunscreen compared to a promotional video; - Real-time user corrections were partially successful in reducing the effects of the misinformation video on beliefs but not intentions	Exposure to a news literacy video did not inoculate people to the misinformation. The ability to correct video misinformation on health issues is important.	high
Willoughby et al. (2018) [26]	-	+	-	-	-	+	- Greater magazine use predicted increased indoor tanning; - Social media use predicted outdoor sunbathing frequency; - Greater use of social media (Instagram, SnapChat and Pinterest) predicted increased sunbathing	Health communicators should consider specific channels for prevention efforts, particularly social media for targeting sunbathers	high
Yousaf et al. (2020) [27]	-	+	-	-	+	+	- 45% consulted social media for acne treatment advice; - Social media users often tried an OTC (Over the Counter) treatment (81%) or dietary modification (40%); - 31% of participants consulting social media made changes fully aligned with AAD (American Academy of Dermatology) clinical guidelines	Social media influences acne treatment. Social media users use social media for acne treatment advice. Dermatologists should respond to misinformation	high

(+) – measures used by the authors

(-) – measures not used by the author

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Multimedia Appendix 3

PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) checklist.

[DOCX File , 31 KB-Multimedia Appendix 3]

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PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	1 page
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	1-2 page
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	2-3 page
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	3-4 page
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	5-6 page
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	4-5 page
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	4-5 page
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	5 page
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	5 page
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	6 page
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	8 page

Section and Topic	Item #	Checklist item	Location where item is reported
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	21 page
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	21 page
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	8 page
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	6 page
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	7, 9-20 page
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	6, 8, 21 page
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	32 page
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	-
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	21 page
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	21 page
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	7 page (Fig. 1), 21 page
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	6, 21 page
Study characteristics	17	Cite each included study and present its characteristics.	22 page
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	22-23 page
Results of	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect	9-20 page

Section and Topic	Item #	Checklist item	Location where item is reported
individual studies		estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	(Table 1, 2)
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	22-23 page (Table 3)
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	14-20 page (Table 2)
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	21-28 page
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	-
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	-
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	-
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	29-32 page
	23b	Discuss any limitations of the evidence included in the review.	32 page
	23c	Discuss any limitations of the review processes used.	32 page
	23d	Discuss implications of the results for practice, policy, and future research.	33-34 page
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Not registered
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Not registered
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Not registered
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	None

Section and Topic	Item #	Checklist item	Location where item is reported
Competing interests	26	Declare any competing interests of review authors.	None declared
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Data in the manuscript

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

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Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – part one

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Abstract

Introduction: Baumann Skin Type Questionnaire (BSTQ) is a widely used questionnaire, that was designed to determine baseline skin type in dermatology. The self-reported BSTQ, consisting of four parts: oily vs. dry skin, sensitive vs. resistant skin, pigmented vs. non-pigmented skin and wrinkled vs. tight skin, can provide significant guidance for consumers and professionals to select and recommend the most appropriate skin care products and skin care protocols.

Aim: Translation and validation of the Polish version of the Baumann Skin Type Questionnaire (BSTQ) – oily vs. dry skin and sensitive vs. resistant skin.

Material and methods: Both forward and backward translation of the English version of the BSTQ was performed. The study was conducted on 103 individuals. The respondents completed the questionnaire twice, 1 day after the other. Moreover, the subjects participated in practical classes of facial care cosmetology which allowed for conducting interviews and skin examinations by a cosmetology expert.

Results: The Polish version of the BSTQ demonstrated high test-retest reliability (reproducibility) in the dimension assessing oily or dry skin as well as sensitive or resistant skin ($ICC3 = 0.91$; $ICC3 = 0.96$, respectively) and good internal consistency, corroborated by Guttman's Lambda 6 reliability (oily vs. dry: $\alpha_{\text{raw}} = 0.75$, $\alpha_{\text{std}} = 0.74$, $G6 = 0.79$; retest: $\alpha_{\text{raw}} = 0.77$, $\alpha_{\text{std}} = 0.77$, $G6 = 0.81$; sensitive vs. resistant: $\alpha_{\text{raw}} = 0.72$, $\alpha_{\text{std}} = 0.74$, $G6 = 0.81$; retest: $\alpha_{\text{raw}} = 0.78$, $\alpha_{\text{std}} = 0.79$, $G6 = 0.85$).

Conclusions: The Polish version of the BSTQ (oily vs. dry skin and sensitive vs. resistant skin) showed high reliability, good internal consistency and high accuracy and consistency. It can be used for assessment of oily or dry skin and sensitive or resistant skin.

Key words: Baumann questionnaire, skin type, validation, oily skin, dry skin, sensitive skin.

Introduction

The first classification of skin types was proposed in 1910 by Helena Rubinstein. Skin types according to Helena Rubinstein are: dry, oily, combination, sensitive. This classification is still the current and widely used classification in the cosmetics industry. In 2006, Leslie Baumann expanded the classification of skin types by including: skin pigmentation and wrinkles. The Baumann Skin Type System (BSTS) assesses skin: hydration, sensitivity, pigmentation and aging (elasticity). The Baumann Skin Type classification is based on 4 basic, dichotomous parameters characterizing the skin: oily or dry (O vs. D), sensitive or resistant (S vs. R), pigmented or non-pigmented (P vs. N), wrinkled or tight/unwrinkled (W vs. T). There are 16 possible skin type variations (16 Baumann Skin Types). However, the Baumann Skin Types (BST) are not

always static, they can vary with hormone fluctuation, pregnancy, menopause, stress, medications, lifestyle changes and climate. Therefore it is important to re-evaluate the skin type over any changes in life. The Baumann Skin Type Questionnaire (BSTQ) is an instrument developed by Leslie Baumann in 2006 to assess the skin type. The Baumann Skin Type Questionnaire is consisted of 64 questions. The 64-item self-administered questionnaire enables deriving a four-letter BSTI code (Baumann Skin Type Indicator). An individual's BSTI four-letter code describes one of 16 possible Baumann Skin Types. Knowledge about skin type helps consumers and physicians select the most suitable skin care products for each skin type. Besides appropriate skin management, it also assists physicians in diagnosing and treating various skin conditions. Physicians can confidently recommend topi-

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cal formulations which are the most appropriate for their patients' skin type [1–4].

Furthermore, the knowledge of the skin type is important for professionals before performing medical, aesthetic and cosmetic procedures. It enables practitioners to select the most appropriate procedure, predict or avoid skin reactions and post-procedure complications [5].

One of the common cosmetic complaint is the overproduction of sebum [6]. Sensitive skin is a more complex phenomenon, quite difficult to characterize and it is becoming increasingly common [1, 7].

In the cosmetics market, there is a basic division of cosmetic products for three different skin types: oily, dry or normal. Therefore, the consumer must assess whether they have dry, oily or normal skin. In addition, cosmetic companies offer skin care products for sensitive skin, couperose skin, anti-aging and brightening products. The large selection of skin care products can confuse consumers and lead to making the wrong choice. Studies have shown that patients incorrectly assess their sebum secretion levels and in some cases believe they have oily skin even though they actually have dry skin [8, 9]. Due to difficulties in proper diagnosis of the skin type by patients, it is advisable to use a validated questionnaire for this purpose.

Aim

Originally the Baumann Skin Type Questionnaire (BSTQ) was created in English. It is valid for English-speaking patients online, and in doctors' offices in the USA, China and Korea. BSTQ is a comprehensive questionnaire consisting of four parts: part one – oily vs. dry skin, part two – sensitive vs. resistant skin, part three – pigmented vs. non-pigmented skin and part four – wrinkled vs. tight skin [3].

Due to the fact that there is no Polish version of the questionnaire available, translation and validation of the questionnaire (part one: oily vs. dry skin and part two: sensitive vs. resistant skin) were undertaken in this study. This will enable the use of the BSTQ in further studies, in clinical practice both in dermatological and aesthetic medicine, cosmetology offices, beauty salons, during dermoconsultations in pharmacies and in remote consultations among subjects speaking Polish.

The primary objective of this study was to validate the effectiveness of the Polish language version of the Baumann Skin Type Questionnaire (BSTQ). This research aimed to ascertain the performance of the questionnaire in determining skin types according to the oily/dry, sensitive/resistant among a predominantly young adult Polish population.

Material and methods

The Polish language version of the BSTQ has been translated and validated. The consent of the Research Ethics Committee of the University of Economics and Human Sciences in Warsaw was obtained (number

02/07/2024). BSTQ in English was published with the key in 2006 in the book: "The Skin Type Solution". The book was recognized as a national bestseller in the United States [4]. The questionnaire has attracted considerable interest and its slightly different versions can be found on the Internet.

BSTQ is used to assess skin type. The questionnaire assesses four main skin parameters: 1) oily or dry, 2) sensitive or resistant, 3) pigmented or non-pigmented, and 4. wrinkled or tight. This study discusses part one and part two of the questionnaire. The first part of the questionnaire assesses sebum production and skin hydration. It consists of 11 questions. The questions are single-choice. Each answer a is given 1 point, for answer b 2 points, for answer c 3 points, for answer d 4 points, and for answer e 2.5 points. Scoring of 27–44 indicates oily skin (O Skin Type), while scoring of 11–26 indicates dry skin (D Skin Type). The second part of the questionnaire assesses the skin's tendency to develop pimples, redness, erythema and itching, all symptoms of sensitive skin. It consists of 18 questions. The scoring principle is the same as in the previous part, additionally, if a dermatologist diagnoses acne, rosacea, contact dermatitis or eczema, 5 points should be added to the score. If any of the above conditions was diagnosed by a doctor of another specialty, 2 points should be added to the score. Scoring of 30–72 indicates sensitive skin (S Skin Type), while scoring of 18–29 indicates resistant skin (R Skin Type) [3, 4].

Translation and validation process

The preparation of the Polish language version began with two versions of translations from English into Polish. Two independent translators translated the English version of the BSTQ into Polish. Then, the translated versions of the questionnaire were compared by a cosmetologist and a uniform version of the questionnaire was created with a minor modification. The minor modification consisted of supplementing the questionnaire with a short instruction for completion and clarifying some questions and answers for better understanding. In the next stage, another independent translator, who was not familiar with the original version of the BSTQ, performed a back translation from Polish into English. In the last stage, the original version of the BSTQ questionnaire was compared with the back translation of the Polish version (consultation with a native speaker). It was found that both versions of the questionnaire are consistent with each other in terms of content. It was assumed that the version translated from the original into Polish was created correctly.

After the translation process, the validation was performed. The questionnaire was tested on a group of 103 individuals. The participants of the study were students of cosmetology. Study participants gave written, voluntary, informed consent to participate in the study. The respondents completed the questionnaires in paper form. The questionnaire was completed by 101 women

and 2 men aged 18–35 years. In order to determine test-retest reliability the respondents were asked to complete the questionnaire twice. The repeated measurement method (test-retest) was performed day after day. Due to the relatively large number of questions in the questionnaire, it is likely that the learning effect – memorizing previous answers – can be omitted.

The study respondents participated in practical classes of facial care cosmetology, which allowed for conducting interviews, skin examinations – visual and palpation skin assessment by a cosmetology expert. During 10 meetings, at weekly intervals, various facial skin care treatments were performed, which allowed for assessing the skin's reaction to the cosmetic preparations used.

Statistical analysis

The statistical significance was determined with an α level of $\alpha = 0.05$. Numerical data were summarized using the mean (M) and standard deviation (SD), while categorical data were reported as counts (n) and percentages (%). To evaluate the consistency of numerical results across test and retest measures, the intraclass correlation coefficient using a fixed effects model, ICC_3 , as described by Shrout and Fleiss in 1979 [10], was employed. For categorical data, the agreement was assessed using Gwet's ACJ agreement metric, developed by Gwet in 2008 [11].

The reliability of internal consistency was assessed through several statistical methods. Cronbach's α , both based on covariances (α_{cov}) and correlations (α_{cor}), initially introduced by Cronbach in 1951, was utilized [12]. Additionally, Guttman's Lambda 6 reliability index, G_6 , as outlined by Kline in 1986, and the average interitem correlation (r_{ij}) were calculated [13]. The study also incorporated the index of the quality of the test, S/N , following the methodologies proposed by Cronbach and Gleser in 1964 and further refined by Revelle and Condon in 2019 [14, 15]. The standard error of Cronbach's alpha, α_{se} , was calculated using the approach established by Duhachek and Iacobucci in 2004 [16]. Overall performance was estimated using accuracy, sensitivity and specificity metrics using equations (1)–(3). The global accuracy rate was calculated, accompanied by a 95% confidence interval (95% CI) for this rate, employing the binomial test.

$$Accuracy_i = \frac{TP_i + TN_i}{TP_i + TN_i + FP_i + FN_i} \quad (1)$$

$$Sensitivity_i = \frac{TP_i}{TP_i + FN_i} \quad (2)$$

$$Specificity_i = \frac{TN_i}{TN_i + FP_i} \quad (3)$$

where TP_i – true positives for class i ; TN_i – true negatives for class i ; FP_i – false positives for class i ; FN_i – false negatives for class i .

Characteristics of the applied statistical tool

Analyses were conducted using the R Statistical language (version 4.3.1; R Core Team, 2023) on Windows 10 Pro 64 bit (build 19045) [17], using the packages *irrCAC* (version 1.0; Gwet (2019) [18]), *caret* (version 6.0.94; Kuhn, 2008) [19], *report* (version 0.5.7; Makowski *et al.*, 2023) [20], *gtsummary* (version 1.7.2; Sjoberg *et al.*, 2021) [21], *readxl* (version 1.4.3; Wickham, Bryan, 2023) [22], *dplyr* (version 1.1.3; Wickham *et al.*, 2023) [23], *tidyr* (version 1.3.0; Wickham *et al.*, 2023) [24] and *psych* (version 2.3.9; Revelle, 2023) [25].

Characteristics of the sample

Table 1 offers a detailed summary of the demographic data, medical history, dermatological conditions, and cosmetic experiences of the study cohort, comprising 103 participants.

Table 1. Characteristics of the studied sample

Characteristic	n (%)
Demography	
Age:	
18–35	103 (100.00)
Gender:	
Female	101 (98.06)
Male	2 (1.94)
Nationality of participants:	
Polish	81 (78.64)
Ukrainian	18 (17.48)
Other	4 (3.88)
Medical history:	
Systemic diseases:	
Diabetes	1 (0.97)
Depressive-anxiety states	1 (0.97)
No	101 (98.06)
Melanoma in the family	10 (9.71)
Dermatological conditions:	
Eczema	10 (9.71)
Acne	24 (23.30)
Contact dermatitis	7 (6.80)
Cosmetic experience:	
Declared feeling of skin tightening/tension after makeup removal	46 (44.66)

The demographic profile of the study sample reveals a predominantly young adult population, with all participants aged between 18 and 35 years. The gender distribution is notably skewed, with females representing 98.06% of the cohort, suggesting that the findings may be more reflective of female skin health and cosmetic experiences. The majority of participants are of Polish nationality, accounting for 78.64%, followed by Ukrainians at 17.48%, and a small fraction categorized as other nationalities, which constitutes 3.88%.

In terms of medical history, the presence of systemic diseases is minimal, with only two participants reporting conditions such as diabetes and depressive-anxiety states, each affecting 0.97% of the sample. This indicates a generally healthy cohort in terms of chronic systemic conditions. A notable $n = 10$ (9.71%) of participants have a family history of melanoma, which could be significant in studies focusing on genetic predispositions to skin conditions.

The dermatological profile shows that $n = 24$ (23.30%) of the participants suffer from acne, making it the most common skin condition within the group, followed by eczema and contact dermatitis, affecting $n = 10$ (9.71%) and 6.80% of the sample, respectively. This suggests a moderate prevalence of common dermatological issues among the participants.

Nearly half of the study participants (44.66%) have reported experiencing skin tightening or tension after makeup removal, indicating that a significant portion of the cohort may have skin sensitivity issues related to cosmetic use. This finding is particularly relevant for cosmetic and dermatological research focusing on product sensitivity and skin barrier function.

Results

Analysis of numerical outcomes and consistency evaluation for test-retest measurements of the Baumann Skin Type Questionnaire

Table 2 provides the results of numerical outcomes for each dimension assessed by the Baumann Skin Type Questionnaire, along with a detailed analysis of the consistency in results across test-retest measurements.

This evaluation captures the distribution of mean scores (M) and their standard deviations (SD), offering a precise depiction of participant responses across two

distinct skin type dimensions: oily or dry skin and sensitive or resistant skin. The table further assesses the reliability of these measurements through $ICC3$ values, complemented by 95% confidence intervals (95% CI) and p -values (p), thus underscoring the robustness of the questionnaire in producing consistent and reproducible results. The accompanying statistical parameters, including degrees of freedom ($df1$ and $df2$) and F -values, provide additional validation of the statistical processes employed in this consistency check.

In the dimension assessing oily or dry skin, the mean scores are closely aligned between the test ($M = 27.10$ with a $SD = 4.75$) and the retest ($M = 26.67$, $SD = 4.86$), yielding an $ICC3 = 0.91$. This suggests an outstanding level of reliability in repeated measurements, which is crucial for dermatological studies where skin condition variability might impact longitudinal assessments.

Similarly, the sensitive or resistant skin dimension reported even higher reliability ($ICC3 = 0.96$), with mean scores of $M = 33.31$ ($SD = 7.22$) during the test and $M = 32.31$ ($SD = 7.71$) at retest. The slight variations in mean scores are overshadowed by the high ICC value, reflecting robustness in the test's ability to consistently classify this skin dimension over time.

In summary, the results in Table 2 explicitly demonstrate high consistency in the scores between the initial test and the retest, as evidenced by the $ICC3$ values exceeding 0.90 in the two dimensions indicated. These are supported by narrow 95% confidence intervals, indicating a high level of precision in the estimates of agreement.

For detailed descriptive statistics and the agreement rates pertaining to individual items within a specific dimension of the Baumann Skin Type Questionnaire, please refer to Supplementary Table S1.

Analysis of the internal reliability for test-retest measurements of the Baumann Skin Type Questionnaire

A meticulous analysis of the internal consistency of numerical scores for individual questions within distinct dimensions of the Baumann Skin Type Questionnaire, measured both at the test and retest stage presented in Supplementary Table S2.

The dimension *Oily or Dry Skin* shows a based upon the covariances (α_{12}) and correlations (α_{12}) scores of

Table 2. Distribution of overall numerical results in each dimension with estimates of agreement for test-retest measurements, $df1 = 102$, $df2 = 22$, $F = 22$

Test dimension	N	Test part numeric score M (SD)		Agreement between test-retest		
		Test	Retest	ICC3	95% CI	P-value
I – Oily or dry skin	103	27.10 (4.75)	26.67 (4.86)	0.91	0.87–0.94	< 0.001
II – Sensitive or resistant skin	103	33.31 (7.22)	32.31 (7.71)	0.96	0.94–0.97	< 0.001

ICC3 – single fixed raters.

0.75 and 0.74, respectively, during testing, which slightly improve in the retest phase to 0.77. This indicates a good level of internal consistency, corroborated by Guttman's Lambda 6 reliability ($G6$) values of 0.79 initially and 0.81 at retest, suggesting robust item correlations.

Initial testing for *Sensitive or Resistant Skin* dimension reveals α_{res} and α_{sd} scores of 0.72 and 0.74, respectively. These scores increased to 0.78 and 0.79 at retest, alongside an improvement in $G6$ from 0.81 to 0.85, indicating an enhanced internal consistency upon retesting.

The Baumann Skin Type Questionnaire shows high reliability. Clinicians can confidently use these classifications to recommend specific skin care products and treatments. For instance, patients identified with consistently oily skin could be advised on appropriate astringents or mattifying products, while those with sensitive skin might benefit from hypoallergenic or fragrance-free formulations.

Comprehensive evaluation of skin type results and agreement for test-retest measurements of the Baumann Skin Type Questionnaire

The results presented in Table 3 delineate a systematic evaluation of the consistency and accuracy in classifying skin types using the Baumann Skin Type Questionnaire across two measurement points. This table elucidates both the distribution of skin type classifications and the agreement rates between initial testing and retesting sessions. Each segment of the questionnaire – focusing on characteristics such as oily or dry skin, sensitivity – undergoes scrutiny to determine both the stability of the classification over time and the precision of each category's assessment.

The agreement between measures, quantified through the ACI statistic, is complemented by standard error and confidence interval metrics, offering a robust statistical framework to understand the reliability of the questionnaire.

The data presented in Table 3 reveal significant consistency across all dimensions of skin type assessment, with ACI values indicating agreement between initial testing and retesting sessions, which underscores the

reliability of this questionnaire in clinical and research settings.

In the dimension addressing oily or dry skin, the ACI value is 0.69, with a confidence interval ranging from 0.55 to 0.83, signalling substantial agreement. The slight shift in percentage points between the test and retest for dry and oily classifications suggests a minor variability in participant responses or in the interpretative consistency of the questionnaire over time.

The assessment of sensitive versus resistant skin shows an ACI of 0.74, with a confidence interval from 0.61 to 0.87, indicating a higher level of agreement. This dimension shows a notable shift in classifications from resistant to sensitive between the two sessions, perhaps reflecting a subjective interpretation of skin sensitivity symptoms by the participants, which may slightly vary over time.

The slight variability observed in some dimensions may indicate the need for further refinement of the questionnaire or training for participants in identifying and reporting subtle skin condition changes.

Evaluation of skin type results via visual inspection

The analysis of the skin type characteristics based on visual inspection conducted by a specialist, as detailed in Table 4, offers significant insights into the distribution and prevalence of various skin conditions within a sample size of 103 individuals. This assessment mirrors the structure of the Baumann Skin Type Questionnaire and encompasses two distinct dimensions. The observations recorded are treated as actual data for subsequent analyses, ensuring a rigorous and structured approach to understanding skin type distributions within the observed cohort.

Starting with the distribution between oily and dry skin types, there is a noticeable inclination towards oily skin, which affects 56.31% of the sample. This prevalence suggests either genetic predispositions or environmental factors that favour higher sebum production. Conversely, the cohort exhibits a nearly balanced division between sensitive and resistant skin types, with 54.37% identified as sensitive.

Table 3. The results of skin types and consistency assessment for test-retest measurements

Questionnaire part	Test part score, n (%)		Agreement between measures			
	Test, n1 = 103	Retest n2 = 103	ACI	SE	95% CI	P-value
I – Oily or dry skin:			0.69	0.07	0.55–0.83	< 0.001
Dry	47 (45.63)	53 (51.46)				
Oily	56 (54.37)	50 (48.54)				
II – Sensitive or resistant skin:			0.74	0.07	0.61–0.87	< 0.001
Resistant	35 (33.98)	45 (43.69)				
Sensitive	68 (66.02)	58 (56.31)				

Table 4. Characteristics of skin types based on visual inspection across two dimensions, $N = 103$

Characteristic	<i>n</i> (%)
Oily or dry skin:	
Dry	45 (43.69)
Oily	58 (56.31)
Sensitive or resistant skin	
Resistant	47 (45.63)
Sensitive	56 (54.37)

Table 5. Performance metrics for skin type classification (estimated vs. observed), $N = 103$

Skin type	Measure	Positive class	Accuracy	95% CI	Sensitivity	Specificity
Oily or dry skin	Test	Oily	0.96	0.90–0.99	0.95	0.98
	Retest		0.86	0.87–0.92	0.81	0.93
Sensitive or resistant skin	Test	Sensitive	0.86	0.78–0.92	0.98	0.72
	Retest		0.86	0.78–0.92	0.89	0.83

Evaluation of the Baumann Skin Type Questionnaire: performance metrics across different skin type classifications

The following table, designated as Table 5, presents a detailed analysis of the performance metrics for skin type classification using the Baumann Skin Type Questionnaire compared with validation by the observed data.

This assessment encompasses dimensions of skin types, including oily versus dry and sensitive versus resistant skin. The metrics provided in the table, such as accuracy, confidence intervals (95% CI), sensitivity, and specificity, are pivotal for understanding the effectiveness of the questionnaire in accurately classifying different skin conditions. Each dimension is tested and retested to evaluate the consistency and reliability of the questionnaire over repeated measures.

This rigorous analysis is crucial for dermatological research and practice, as it helps in verifying the utility of the questionnaire as a diagnostic tool in clinical settings.

For the classification of oily versus dry skin, the questionnaire demonstrates high accuracy and consistency. The initial test shows an accuracy of 96% with confidence intervals tightly ranged between 90% and 99%, accompanied by high sensitivity and specificity values of 95% and 98%, respectively. The retest, while showing a slight decrease in accuracy to 86%, still maintains strong sensitivity and specificity, indicating reliable reproducibility over time.

In the dimension of sensitive versus resistant skin, the questionnaire also shows commendable performance, with both initial testing and retesting reflecting an accuracy of 86%. The sensitivity in the initial test is notably high at 98%, though it slightly decreases in the retest to 89%. Specificity shows a substantial increase from 72% to 83% on retest, suggesting an improvement

in the ability to correctly identify non-sensitive skin over repeated measures.

The results presented above proved that the Baumann Skin Type Questionnaire exhibits strong performance in classifying oily versus dry and sensitive versus resistant skin types.

The full Polish version of the BSTQ will be available in part two of the article (Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – part two).

Discussion

A proper skin type classification is very important both for consumers and professionals. It enables to select the most appropriate skin care products, skin care protocols, aesthetic and cosmetic procedures. However, its importance in clinical research cannot be forgotten. The aim of correct and careful skin type classification is improving clinical approach to skin condition [5, 26].

Studies show that patients cannot correctly self-diagnose their own skin type, therefore it is advisable to use the Baumann Skin Type Questionnaire for that purpose [3, 9, 27]. A properly validated questionnaire is an important complementary diagnostic instrument in clinical practice.

This study describes a detailed process of development and validation of the Polish language version of the BSTQ (part one: oily vs. dry skin and part two: sensitive vs. resistant skin). Comparing to the original version of the BSTQ regarding skin oiliness, the translated Polish language version showed similar internal consistency reliability (value of Cronbach α coefficient = 0.78 vs Polish language version: $\alpha_{\text{test}} = 0.75$, $\alpha_{\text{retest}} = 0.74$ in test and in retest: $\alpha_{\text{test}} = 0.77$, $\alpha_{\text{retest}} = 0.77$) [6]. Cronbach α coefficient of at least 0.7 indicates sufficient questionnaire internal consistency [12].

The main limitations were the validation of the BSTQ on an undifferentiated study sample and the results may be different for the entire Polish population. It would be reasonable to revise the questionnaire in the future with a larger and more diverse group in terms of age and gender.

Conclusions

The Baumann Skin Type Questionnaire, when evaluated for classification performance across various skin type dimensions, provides a robust tool in diagnosing oily or dry skin and sensitive or resistant skin. Specialists can confidently use these classifications to recommend specific skin care products and treatments.

Funding

No external funding.

Ethical approval

The consent of the Research Ethics Committee of the University of Economics and Human Sciences in Warsaw was obtained (number: 02/07/2024).

Conflict of interest

The author declares no conflict of interest.

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Appendices

Appendix A. Descriptive statistics and the agreement rates pertaining to individual items of the Baumann Skin Type Questionnaire

Table A.1 Descriptive statistics and the agreement rates pertaining to individual items within a specific dimension of the Baumann Skin Type Questionnaire

Item ID	Gwet's AC1 results for raw ¹ responses				Descriptive statistics ² for converted numerical responses	
	AC1	SE	CI 95%	p	M (SD) _{test}	M (SD) _{retest}
<i>Dimension I Oily or dry skin</i>						
Q1	0.81	0.04	0.72 – 0.90	< 0.001	2.60 (1.09)	2.50 (1.02)
Q2	0.74	0.05	0.64 – 0.84	< 0.001	2.30 (0.64)	2.10 (0.62)
Q3	0.86	0.04	0.79 – 0.94	< 0.001	2.70 (0.85)	2.70 (0.83)
Q4	0.58	0.06	0.47 – 0.70	< 0.001	2.30 (0.71)	2.40 (0.78)
Q5	0.84	0.04	0.77 – 0.92	< 0.001	2.30 (0.73)	2.20 (0.68)
Q6	0.93	0.03	0.87 – 0.99	< 0.001	2.60 (0.90)	2.50 (0.93)
Q7	0.68	0.06	0.57 – 0.79	< 0.001	2.10 (0.67)	2.20 (0.70)
Q8	0.71	0.05	0.60 – 0.81	< 0.001	2.20 (0.73)	2.20 (0.77)
Q9	0.63	0.06	0.51 – 0.74	< 0.001	3.00 (0.76)	2.80 (0.88)
Q10	0.63	0.06	0.52 – 0.75	< 0.001	2.70 (0.97)	2.50 (0.88)
Q11	0.78	0.05	0.68 – 0.87	< 0.001	2.40 (0.63)	2.50 (0.65)
<i>Dimension II Sensitive or resistant skin</i>						
Q1	0.69	0.06	0.58 – 0.80	< 0.001	2.40 (0.99)	2.30 (10.02)
Q2	0.60	0.06	0.49 – 0.71	< 0.001	1.90 (0.74)	1.80 (0.81)
Q3	0.91	0.04	0.85 – 0.97	< 0.001	2.0 (1.10)	1.90 (1.09)
Q4	0.86	0.04	0.78 – 0.93	< 0.001	1.50 (0.73)	1.40 (0.73)
Q5	0.76	0.05	0.67 – 0.85	< 0.001	1.60 (0.76)	1.60 (0.72)
Q6	0.89	0.03	0.82 – 0.96	< 0.001	1.70 (0.95)	1.50 (0.89)
Q7	0.97	0.02	0.93 – 1.00	< 0.001	1.30 (0.62)	1.30 (0.61)
Q8	0.77	0.05	0.67 – 0.86	< 0.001	1.50 (0.74)	1.50 (0.75)
Q9	0.84	0.04	0.76 – 0.92	< 0.001	2.20 (0.84)	2.20 (0.82)
Q10	0.81	0.04	0.73 – 0.90	< 0.001	1.80 (0.82)	1.80 (0.83)
Q11	0.92	0.03	0.87 – 0.98	< 0.001	1.40 (0.80)	1.40 (0.77)
Q12	0.59	0.06	0.47 – 0.71	< 0.001	2.70 (1.00)	2.50 (0.98)
Q13	0.78	0.05	0.69 – 0.88	< 0.001	2.10 (0.96)	2.00 (0.94)
Q14	0.70	0.05	0.60 – 0.80	< 0.001	1.70 (0.81)	1.70 (0.84)
Q15	0.80	0.05	0.71 – 0.89	< 0.001	1.80 (0.84)	1.80 (0.81)
Q16	0.72	0.05	0.62 – 0.82	< 0.001	1.70 (0.80)	1.70 (0.84)
Q17	0.98	0.01	0.95 – 1.00	< 0.001	1.10 (0.30)	1.10 (0.33)
Q18	0.79	0.05	0.70 – 0.88	< 0.001	1.50 (0.63)	1.40 (0.56)
Q19	0.96	0.02	0.92 – 1.00	< 0.001	1.50 (2.30)	1.38 (2.23)

¹ In the letter form (A, B, C, D or E)

² after converting the raw results (A – 1 point, B – 2 pts, C – 3 pts, D – 4 pts, E – 2.5 pts).

Appendix B. Assessment of internal consistency reliability

Table B.1. Internal consistency reliability of numerical scores and descriptive statistics within dimensions of the Baumann skin type questionnaire

<i>Dimension</i>	<i>Measure</i>	<i>Reliability metrics</i>						<i>Descriptive statistics</i>	
		α_{raw}	α_{std}	$G6$ (<i>smc</i>)	r_M	S/N	α_{SE}	M	SD
I – Oily or dry skin	test	0.75	0.74	0.79	0.21	2.90	0.03	2.50	0.43
I – Oily or dry skin	retest	0.77	0.77	0.81	0.24	3.40	0.03	2.40	0.44
II – Sensitive or resistant skin	test	0.72	0.74	0.81	0.14	2.80	0.04	1.80	0.34
II – Sensitive or resistant skin	retest	0.78	0.79	0.85	0.18	3.80	0.03	1.70	0.37

Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – part two

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Abstract

Introduction: Skin type assessment is important because it is a guidance for specialists and consumers to select and recommend the most appropriate skin care products and protocols. One easy-to-administer instrument used for skin type classification is the Baumann Skin Type Questionnaire.

Aim: Translation and validation of the Polish version of the Baumann Skin Type Questionnaire (BSTQ) – pigmented or non-pigmented and wrinkled or tight skin.

Material and methods: Both forward and backward translation of the English version of the BSTQ was performed. The study was conducted on 103 individuals. The respondents completed the questionnaire twice, one day after the other. The subjects participated in practical classes of facial care cosmetology which allowed for conducting interviews and skin examinations by a cosmetology expert.

Results: The Polish version of the BSTQ demonstrated high test-retest reliability (reproducibility) in the dimension evaluating skin with or without hyperpigmentation as well as wrinkled or tight skin ($ICC3 = 0.91$; $ICC3 = 0.97$, respectively). Moreover, an excellent level of agreement between initial test and retest (pigmented vs. non-pigmented: $AC1 = 1.00$, 95% CI: 1.00; wrinkled vs. tight: $AC1 = 0.93$, 95% CI: 0.87–0.99). However, the Polish version of the BSTQ demonstrated a low internal consistency, corroborated by low Guttman's Lambda 6 reliability (pigmented vs. non-pigmented: $\alpha_{raw} = 0.55$, $\alpha_{std} = 0.54$, $G6 = 0.63$; retest: $\alpha_{raw} = 0.58$, $\alpha_{std} = 0.54$, $G6 = 0.63$; wrinkled vs. tight: $\alpha_{raw} = 0.33$, $\alpha_{std} = 0.25$, $G6 = 0.47$; retest: $\alpha_{raw} = 0.36$, $\alpha_{std} = 0.33$, $G6 = 0.54$).

Conclusions: The use of the BSTQ in assessing the skin for hyperpigmentation and age-related changes should be complemented by another diagnostic approach – clinical assessment before starting treatment or anti-aging interventions.

Key words: Baumann questionnaire, skin type, validation, pigmented skin, wrinkled skin

Introduction

Various criteria are used to determine the skin type e.g. the moisture content in the stratum corneum is checked, sun reaction, pigmentation, depigmentation, sensitivity, skin colour, presence of skin aging signs (wrinkles), lack of elasticity and uneven texture. There are many methods for skin type classification which evaluate different skin parameters: visual and tactile methods, non-invasive instrumental methods – non-invasive bioengineering tools (such as corneometer, tewameter, sebumeter, cutometer etc.), imaging techniques (such as dermatoscopy, ultrasounds, confocal microscopy etc.), artificial intelligence-based analysis and methods such as self-reported instruments e.g. the Baumann Skin Type System, the Fitzpatrick Skin Phototype Classification, the Roberts Skin Type Classification

System and visual rating scales e.g. the Glogau Scale, the Griffiths Photonumeric Scale, the Score of Intrinsic and Extrinsic Aging [1, 2].

Skin type diagnosis using a self-reported instrument such as the Baumann Skin Type Questionnaire does not require the use of expensive, calibrated equipment and can be used in remote consultations. The questionnaire allows for an assessment of the skin type: oily/dry, sensitive/resistant, pigmented/non-pigmented and wrinkled/tight. In this part I will discuss dichotomous parameters characterizing the skin: pigmented or non-pigmented (P vs. N), wrinkled or tight (W vs. T). Together with the dichotomous parameters: oily or dry (O vs. D), sensitive or resistant (S vs. R) they form an individual's BSTI four-letter code (Baumann Skin Type Indicator) describes one of 16 possible Baumann Skin Types [3, 4].

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Skin type assessment is important because it is a guidance for specialists and consumers to select and recommend the most appropriate skin care products and protocols. Additionally, it is important in clinical research [2].

Aim

The primary objective of this study was to validate the effectiveness of the Polish language version of the Baumann Skin Type Questionnaire (BSTQ). This research aimed to ascertain the performance of the questionnaire in determining skin types according to the hyperpigmentation/no hyperpigmentation and wrinkled/tight dimensions among a predominantly young adult Polish population.

Material and methods

The Polish language version of the BSTQ has been translated and validated. The author of the questionnaire (Leslie Baumann) consented to the use of the questionnaire for scientific research. The consent of the Research Ethics Committee of the University of Economics and Human Sciences in Warsaw was obtained (number 02/07/2024). BSTQ in English was published with the key in 2006 in the book "The Skin Type Solution". The book was recognized as a national bestseller in the United States [3]. The questionnaire has attracted considerable interest and its slightly different versions can be found on the Internet.

BSTQ is used to assess skin type. The questionnaire assesses four main skin parameters: 1. oily or dry (O/D), 2. sensitive or resistant (S/R), 3. pigmented or non-pigmented (P/N), and 4. wrinkled or tight (W/T). This study discusses part three and part four of the questionnaire.

The third part of the questionnaire assesses the tendency of the skin to produce melanin. It consists of 11 questions, the questions are single-choice. For each answer a you get 1 point, for answer b 2 points, for answer c 3 points, for answer d 4 points, and for answer e 2.5 points. Question 11 is a question that requires an affirmative or negative answer. In the case of an affirmative answer, i.e. having dark spots on the skin in places exposed to the sun, you should add 5 points to the result. Scoring of 31–45 points means pigmented skin (P Skin Type), while scoring of 10–30 points means non-pigmented skin (N Skin Type). The fourth part of the questionnaire assesses the tendency to form wrinkles, as well as how wrinkled the skin is now. It consists of 21 questions, the scoring principle is the same. Question 21 is a question that requires an affirmative or negative answer. In the case of an affirmative answer, i.e. age 65 or older, you should add 5 points to the result. Scoring of 41–85 indicates wrinkled skin (W Skin Type), while scoring of 20–40 indicates tight skin (T Skin Type). Each part defines a skin parameter (O/D; S/R; P/N; W/T). When combined, a skin phenotype is obtained, called the Baumann Skin Type.

There are 16 Baumann skin types based on 4 parameters [3, 4].

Translation and validation process

The preparation of the Polish language version began with two versions of translations from English into Polish. Two independent translators translated the English version of the BSTQ into Polish. Then, the translated versions of the questionnaire were compared by a cosmetologist and a uniform version of the questionnaire was created with a minor modification. The minor modification consisted of supplementing the questionnaire with a short instruction for completion and clarifying some questions and answers for better understanding. In the next stage, another independent translator, who was not familiar with the original version of the BSTQ, performed a back translation from Polish into English. In the last stage, the original version of the BSTQ questionnaire was compared with the back translation of the Polish version (consultation with a native speaker). It was found that both versions of the questionnaire are consistent with each other in terms of content. It was assumed that the version translated from the original into Polish was created correctly.

After the translation process, the validation was performed. The questionnaire was tested on a group of 103 individuals. The participants of the study were students of cosmetology. Study participants gave written, voluntary, informed consent to participate in the study. The respondents completed the questionnaires in paper form. The questionnaire was completed by 101 women and 2 men aged 18–35 years. In order to determine test-retest reliability the respondents were asked to complete the questionnaire twice. The repeated measurement method (test-retest) was performed day after day. Due to the relatively large number of questions in the questionnaire, it is likely that the learning effect – memorizing previous answers – can be omitted.

The study respondents participated in practical classes of facial care cosmetology, which allowed for conducting interviews, skin examinations – visual and palpation skin assessment by a cosmetology expert. During 10 meetings, at weekly intervals, various facial skin care treatments were performed, which allowed for assessing the skin's reaction to the cosmetic preparations used.

Statistical analysis

The statistical significance was determined with an alpha level of $\alpha = 0.05$. Numerical data were summarized using the mean (M) and standard deviation (SD), while categorical data were reported as counts (n) and percentages (%). To evaluate the consistency of numerical results across test and retest measures, the intraclass correlation coefficient using a fixed effects model, ICC3, as described by Shrout and Fleiss in 1979 [5], was em-

played. For categorical data, the agreement was assessed using Gwet's ACJ agreement metric, developed by Gwet in 2008 [6].

The reliability of internal consistency was assessed through several statistical methods. Cronbach's α , both based on covariances (α_{cov}) and correlations (α_{cor}), initially introduced by Cronbach in 1951, was utilized [7]. Additionally, Guttman's Lambda 6 reliability index, G_6 , as outlined by Kline in 1986, and the average interitem correlation (r_{av}) were calculated [8]. The study also incorporated the index of the quality of the test, S/N , following the methodologies proposed by Cronbach and Gleser in 1964 and further refined by Revelle and Condon in 2019 [9, 10]. The standard error of Cronbach's alpha, α_{se} , was calculated using the approach established by Duhachek and Iacobucci in 2004 [11]. Overall performance was estimated using accuracy, sensitivity and specificity metrics using equations (1)–(3). The global accuracy rate was calculated, accompanied by a 95% confidence interval (95% CI) for this rate, employing the binomial test.

$$Accuracy_i = \frac{TP_i + TN_i}{TP_i + TN_i + FP_i + FN_i} \quad (1)$$

$$Sensitivity_i = \frac{TP_i}{TP_i + FN_i} \quad (2)$$

$$Specificity_i = \frac{TN_i}{TN_i + FP_i} \quad (3)$$

where TP_i – true positives for class i ; TN_i – true negatives for class i ; FP_i – false positives for class i ; FN_i – false negatives for class i .

Characteristics of the applied statistical tool

Analyses were conducted using the R Statistical language (version 4.3.1; R Core Team, 2023) on Windows 10 Pro 64 bit (build 19045) [12], using the packages *irrCAC* (version 1.0; Gwet (2019) [13], *caret* (version 6.0.94; Kuhn, 2008) [14], *report* (version 0.5.7; Makowski *et al.*, 2023) [15], *gtsummary* (version 1.7.2; Sjoberg *et al.*, 2021) [16], *readxl* (version 1.4.3; Wickham, Bryan, 2023) [17], *dplyr* (version 1.1.3; Wickham *et al.*, 2023) [18], *tidyr* (version 1.3.0; Wickham *et al.*, 2023) [19] and *psych* (version 2.3.9; Revelle, 2023) [20].

Characteristics of the sample

Table 1 offers a detailed summary of the demographic data, medical history, dermatological conditions, and cosmetic experiences of the study cohort, comprising 103 participants.

The demographic profile of the study sample reveals a predominantly young adult population, with all participants aged between 18 and 35 years. The gender distribution is notably skewed, with females representing

98.06% of the cohort, suggesting that the findings may be more reflective of female skin health and cosmetic experiences. The majority of participants are of Polish nationality, accounting for 78.64%, followed by Ukrainians at 17.48%, and a small fraction categorized as other nationalities, which constitutes 3.88%.

In terms of medical history, the presence of systemic diseases is minimal, with only two participants reporting conditions such as diabetes and depressive-anxiety states, each affecting 0.97% of the sample. This indicates a generally healthy cohort in terms of chronic systemic conditions. A notable $n = 10$ (9.71%) of participants have a family history of melanoma, which could be significant in studies focusing on genetic predispositions to skin conditions.

The dermatological profile shows that $n = 24$ (23.30%) of the participants suffer from acne, making it the most common skin condition within the group, followed by eczema and contact dermatitis, affecting $n = 10$ (9.71%) and 6.80% of the sample, respectively. This suggests a moderate prevalence of common dermatological issues among the participants.

Nearly half of the study participants (44.66%) have reported experiencing skin tightening or tension after

Table 1. Characteristics of the studied sample, $N = 103$

Characteristic	n (%)
Demography	
Age	
18–35	103 (100.00)
Gender	
Female	101 (98.06)
Male	2 (1.94)
Nationality of participants	
Polish	81 (78.64)
Ukrainian	18 (17.48)
Other	4 (3.88)
Medical history	
Systemic diseases	
Diabetes	1 (0.97)
Depressive-anxiety states	1 (0.97)
No	101 (98.06)
Melanoma in the family	10 (9.71)
Dermatological conditions	
Eczema	10 (9.71)
Acne	24 (23.30)
Contact dermatitis	7 (6.80)
Cosmetic experience	
Declared feeling of skin tightening/tension after makeup removal	46 (44.66)

Table 2. Distribution of overall numerical results in each dimension with estimates of agreement for test-retest measurements, $df1 = 102$, $df2 = 22$, $F = 22$

Test dimension	N	Test part numeric score M (SD)		Agreement between test-retest		
		Test	Retest	ICC3	95% CI	P-value
III – Skin with or without hyperpigmentation	103	19.25 (4.56)	18.83 (4.42)	0.91	0.87–0.94	< 0.001
IV – Wrinkled or tight skin	103	45.06 (4.15)	44.93 (4.04)	0.97	0.95–0.98	< 0.001

ICC3 – single fixed raters.

makeup removal, indicating that a significant portion of the cohort may have skin sensitivity issues related to cosmetic use. This finding is particularly relevant for cosmetic and dermatological research focusing on product sensitivity and skin barrier function.

Results

Analysis of numerical outcomes and consistency evaluation for test-retest measurements of the Baumann Skin Type Questionnaire

Table 2 provides the results of numerical outcomes for each dimension assessed by the Baumann Skin Type Questionnaire, along with a detailed analysis of the consistency in results across test-retest measurements.

This evaluation captures the distribution of mean scores (M) and their standard deviations (SD), offering a precise depiction of participant responses across two distinct skin type dimensions: presence or absence of hyperpigmentation, and wrinkled or tight skin. The table further assesses the reliability of these measurements through ICC3 values, complemented by 95% confidence intervals (95% CI) and p -values (p), thus underscoring the robustness of the questionnaire in producing consistent and reproducible results. The accompanying statistical parameters, including degrees of freedom ($df1$ and $df2$) and F -values, provide additional validation of the statistical processes employed in this consistency check.

For the dimension evaluating skin with or without hyperpigmentation (part III of the BSTQ), the ICC3 value stands at 0.91, reinforcing the consistency of the questionnaire (I – Oily or dry skin: ICC3 = 0.91; II – Sensitive or resistant skin: ICC3 = 0.96 – data from the article: Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – Part One). The mean scores observed were $M = 19.25$ ($SD = 4.56$) in the test and $M = 18.83$ ($SD = 4.42$) in the retest, suggesting a stable measurement across sessions despite the slight variation in scoring.

The highest reliability is noted in the wrinkled or tight skin dimension (part IV of the BSTQ), with an ICC3 of 0.97. The mean scores are nearly identical between the test ($M = 45.06$ with $SD = 4.15$) and the retest ($M = 44.93$

with $SD = 4.04$), underscoring the exceptional repeatability of this particular assessment.

In summary, the results in Table 2 explicitly demonstrate high consistency in the scores between the initial test and the retest, as evidenced by the ICC3 values exceeding 0.90 in all dimensions. These are supported by narrow 95% confidence intervals, indicating a high level of precision in the estimates of agreement.

For detailed descriptive statistics and the agreement rates pertaining to individual items within a specific dimension of the Baumann Skin Type Questionnaire, please refer to Supplementary Table S1.

Analysis of the internal reliability for test-retest measurements of the Baumann Skin Type Questionnaire

The *Skin with or without Hyperpigmentation* dimension shows lower internal consistency with α_{test} scores of 0.55 initially and 0.58 at retest. These values are notably lower than other dimensions (I-oily or dry skin: $\alpha_{\text{test}} = 0.75$, retest $\alpha_{\text{test}} = 0.77$; II-sensitive or resistant skin: $\alpha_{\text{test}} = 0.72$, retest $\alpha_{\text{test}} = 0.78$ – data from the article: Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – Part One), reflected also in the lowest $G6$ scores of 0.63.

The weakest internal consistency is observed in *Wrinkled or Tight Skin* dimension, with very low α_{test} scores of 0.33 initially, slightly rising to 0.36 at retest. The $G6$ scores also reflect low reliability, ranging from 0.47 to 0.54.

Overall, while the Baumann Skin Type Questionnaire is reliable for certain skin assessments (oily or dry skin, sensitive or resistant skin), its comprehensive efficacy across all dimensions warrants further examination and possible adjustments to ensure uniform high reliability across all skin types.

For dimensions with lower reliability (e.g., wrinkled or tight skin), clinicians should be cautious in basing treatment decisions solely on these results. They might use supplementary diagnostic tools or clinical judgments to confirm these assessments before proceeding with anti-aging treatments or interventions.

Table 3. The results of skin types and consistency assessment for test-retest measurements

Questionnaire part	Test part score, n (%)		Agreement between measures			
	Test n1 = 103	Retest n2 = 103	ACI	SE	95% CI	P-value
III – Skin with or without hyperpigmentation:			1.00	0.00	1.00–1.00	< 0.001
Hyperpigmentation	2 (1.94%)	2 (1.94%)				
No hyperpigmentation	10 (98.06%)	10 (98.06%)				
IV – Wrinkled or tight skin:			0.93	0.03	0.87–0.99	< 0.001
Tight	17 (16.50%)	18 (17.48%)				
Wrinkled	86 (83.50%)	85 (82.52%)				

Comprehensive evaluation of skin type results and agreement for test-retest measurements of the Baumann Skin Type Questionnaire

The results presented in Table 3 delineate a systematic evaluation of the consistency and accuracy in classifying skin types using the Baumann Skin Type Questionnaire across two measurement points. This table elucidates both the distribution of skin type classifications and the agreement rates between initial testing and retesting sessions. Each segment of the questionnaire – focusing on characteristics such as hyperpigmentation and the presence of wrinkles – undergoes scrutiny to determine both the stability of the classification over time and the precision of each category's assessment.

The agreement between measures, quantified through the ACI statistic, is complemented by standard error and confidence interval metrics, offering a robust statistical framework to understand the reliability of the questionnaire.

The data presented in Table 3 reveal significant consistency across all dimensions of skin type assessment, with ACI values indicating strong agreement between initial testing and retesting sessions, which underscores the reliability of this questionnaire in clinical and research settings.

Notably, the evaluation of skin with or without hyperpigmentation exhibits a perfect agreement, with an ACI of 1.00 and a confidence interval exactly fixed at 1.00. This indicates an absolute consistency in the classification of this trait, suggesting that such conditions are distinctly observable and less susceptible to subjective interpretation or temporal change.

For the dimension of wrinkled or tight skin, the ACI value is high at 0.93, with a confidence interval from 0.87 to 0.99. This suggests an excellent level of agreement and points to the reliable assessment of aging-related skin changes, which are likely to be more stable and consistently identifiable characteristics over short periods.

Evaluation of skin type results via visual inspection

The analysis of the skin type characteristics based on visual inspection conducted by a specialist, as detailed in Table 4, offers significant insights into the distribution and prevalence of various skin conditions within a sam-

ple size of 103 individuals. This assessment mirrors the structure of the Baumann Skin Type Questionnaire and encompasses two distinct dimensions. The observations recorded are treated as actual data for subsequent analyses, ensuring a rigorous and structured approach to understanding skin type distributions within the observed cohort.

The evaluation of hyperpigmentation shows a significant skew towards individuals without this condition, where 83.50% of the cohort do not exhibit hyperpigmentation. Remarkably, the entire sample has tight skin, a 100% prevalence that could be reflective of the age demographic or other factors that are not explicitly detailed in the dataset. This uniformity may suggest a lack of variability in age.

Evaluation of the Baumann Skin Type Questionnaire: performance metrics across different skin type classifications

The following table, designated as Table 5, presents a detailed analysis of the performance metrics for skin type classification using the Baumann Skin Type Questionnaire compared with validation by the observed data.

This assessment encompasses dimensions of skin types, including skin with or without hyperpigmentation and wrinkled versus tight skin. The metrics provided in the table, such as accuracy, confidence intervals (95% CI), sensitivity, and specificity, are pivotal for understanding the effectiveness of the questionnaire in accurately classifying different skin conditions. Each dimension is

Table 4. Characteristics of skin types based on visual inspection across two dimensions, N = 103

Characteristic	n (%)
Skin with or without hyperpigmentation	
Hyperpigmentation	17 (16.50)
No hyperpigmentation	86 (83.50)
Wrinkled or tight skin	
Tight	103 (100.00)

Table 5. Performance metrics for skin type classification (estimated vs. observed), $N = 103$

Skin type	Measure	Positive class	Accuracy	95% CI	Sensitivity	Specificity
Skin with or without hyperpigmentation	Test	Hyperpigmentation	0.85	0.77–0.92	0.12	1.00
	Retest		0.85	0.77–0.92	0.12	1.00
Wrinkled or tight skin	Test	Tight	0.17	0.11–0.26	0.17	1.00
	Retest		0.18	0.11–0.27	0.18	1.00

tested and retested to evaluate the consistency and reliability of the questionnaire over repeated measures.

This rigorous analysis is crucial for dermatological research and practice as it helps in verifying the utility of the questionnaire as a diagnostic tool in clinical settings.

The questionnaire's efficacy in identifying skin with or without hyperpigmentation and wrinkled versus tight skin demonstrates significant disparities. While the accuracy remains consistent at 85% for hyperpigmentation in both test and retest, the sensitivity is markedly low at 12%, though specificity is perfect at 100%. This suggests that while the questionnaire is highly effective at identifying individuals with no hyperpigmentation, it struggles to accurately detect those with hyperpigmentation.

The most considerable limitation is observed in the classification of wrinkled versus tight skin, where the accuracy is exceptionally low (17% and 18% for test and retest, respectively). Both sensitivity and specificity calculations indicate a severe underperformance in accurately classifying the tight skin, with sensitivity especially low, although specificity remains at 100%.

In conclusion, while the Baumann Skin Type Questionnaire exhibits strong performance in classifying oily versus dry and sensitive versus resistant skin types (data from the article: Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – Part One), it shows significant weaknesses in accurately classifying skin with or without hyperpigmentation and particularly in distinguishing between wrinkled and tight skin.

The Polish version of the BSTQ is shown in Appendix C.

Discussion

The Baumann Skin Type Questionnaire is an easy-to-administer questionnaire that allows for the assessment of skin type for the purpose of recommending skin care products and procedures. In addition, it can be useful in screening and recruiting individuals for research trials [21]. Questions in the questionnaire regarding behavioural habits (e.g. smoking, sunbathing, consumption of vegetables and fruits) contribute to the patients' consideration that these habits may affect skin health. This helps to open up communication between the patient and the professional. BSTQ is not only a diagnostic instrument but also an educational strategy to initiate discussions about skin care [4, 22, 23].

In my opinion, it is important that before a cosmetic or aesthetic procedure, the patient should complete a questionnaire assessing skin type and the Cosmetic Procedure Screening Questionnaire, which screen patients suspected to be suffering from body dysmorphic disorder – BDO (validation of the Polish language version in 2021) [24].

Due to the development of the cosmetics industry, dermatology and the growing need for personalized and more tailored skin care, there is a growing need for an intuitive skin type classification system [25, 26]. BSTQ was used in the study by Ahn *et al.* [25] which identified the most characteristic skin features of Korean women. According to the authors, the obtained results allow for the provision of more individualized skin care for various skin conditions [25]. In the another article, the skin type of the Korean male population has been characterised [26]. However, Cho *et al.* [27] claim that there is a lack of sufficient validation for the Asian population. The researchers investigated the relationship between the results from the modified BSTQ and the measurements from digital photography skin analyzer [27]. Choi *et al.* [28] proposed the modified version of the BSTQ, whereas Cho *et al.* [27] established the optimized BSTQ based on dermatological assessment of the Asian population.

This study describes a detailed process of development and validation of the Polish language version of the BSTQ (part three: pigmented vs. non-pigmented skin and part four: wrinkled vs. tight skin). The Polish version of the BSTQ (pigmented vs. non-pigmented and wrinkled vs. tight) showed very good test-retest reliability (reproducibility) and an excellent level of agreement between initial test and retest ($ICC3 = 0.91$, $AC1 = 1.00$, 95% CI: 1.00 and $ICC3 = 0.97$, $AC1 = 0.93$, 95% CI: 0.87–0.99, respectively). However, BSTQ demonstrated a low internal consistency, corroborated by low Guttman's Lambda 6 reliability (pigmented vs. non-pigmented: $\alpha_{\text{raw}} = 0.55$, $\alpha_{\text{std}} = 0.54$, $G6 = 0.63$; retest: $\alpha_{\text{raw}} = 0.58$, $\alpha_{\text{std}} = 0.54$, $G6 = 0.63$; wrinkled vs. tight: $\alpha_{\text{raw}} = 0.33$, $\alpha_{\text{std}} = 0.25$, $G6 = 0.47$; retest: $\alpha_{\text{raw}} = 0.36$, $\alpha_{\text{std}} = 0.33$, $G6 = 0.54$). In addition, comparison of the questionnaire results and the examination of the respondents' skin revealed discrepancies. The questionnaire's efficacy in identifying skin without hyperpigmentation is good while it struggles to accurately detect individuals with hyperpigmentation (Accuracy: 85%, Sensitivity: 12%, Specificity: 100% in test and retest). Presumably, this may be due to the fact that some respondents, despite having post-inflammatory hy-

perpigmentation, claimed that they did not have any hyperpigmentation (they associated the hyperpigmentation only with sun-related hyperpigmentation). This may indicate the need to improve and clarify the questionnaire in this dimension. The most considerable limitation is observed in the classification of wrinkled versus tight skin (*Accuracy*: 17%, *Sensitivity*: 17%, *Specificity*: 100% in test and *Accuracy*: 18%, *Sensitivity*: 18%, *Specificity*: 100% in retest). The author of the original questionnaire in section wrinkled vs. tight skin measures tendency to wrinkle as well as whether the skin is wrinkled now or not. Due to the fact that the study group consisted of young people, visual and palpation assessment of the facial skin showed that the subjects had tight skin. Measuring the tendency to wrinkle is difficult. The results show that it seems reasonable to introduce changes in the structure of the questionnaire in this dimension.

The main limitation was the validation of the BSTQ on young cohort comprising mainly women.

Overall, while the Baumann Skin Type Questionnaire is reliable for assessment of oily versus dry skin and sensitive versus resistant skin (data from the article: Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – Part One), its comprehensive efficacy across all four dimensions (with pigmented or non-pigmented skin and wrinkled or tight skin) warrants further examination and possible adjustment to ensure uniform high reliability across all skin types.

The questionnaire in the dimensions: oily or dry skin and sensitive or resistant skin can be used as an individual diagnostic tool for assessing skin type. On the other hand, the questionnaire in the dimensions: skin with or without hyperpigmentation and wrinkled or tight skin has the potential and can be useful as a supplement to the clinical interview. In addition, it can be a tool indicating the need for skin care, which motivates the patient to start talks with the clinician.

Conclusions

These findings suggest that while the questionnaire can be a useful tool for certain dermatological assessments (oily versus dry and sensitive versus resistant skin types – data from the article: Baumann Skin Type Questionnaire (BSTQ): creation and validation of the Polish language version – Part One), its application should be carefully considered and potentially supplemented with other diagnostic approaches, particularly when assessing skin for hyperpigmentation and age-related changes.

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Ethical approval

The consent of the Research Ethics Committee of the University of Economics and Human Sciences in Warsaw was obtained (number: 02/07/2024).

Conflict of interest

The authors declare no conflict of interest.

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Appendices

Appendix A. Descriptive statistics and the agreement rates pertaining to individual items of the Baumann Skin Type Questionnaire

Table A.1. Descriptive statistics and the agreement rates pertaining to individual items within a specific dimension of the Baumann Skin Type Questionnaire

Item ID	Gwet's ACI results for raw ³ responses				Descriptive statistics ⁴ for converted numerical responses	
	ACI	SE	CI 95%	p	M (SD) _{test}	M (SD) _{retest}
<i>Dimension III Skin with or without hyperpigmentation</i>						
Q1	0.74	0.05	0.65 – 0.84	< 0.001	1.95 (1.00)	1.80 (0.92)
Q2	0.89	0.04	0.82 – 0.96	< 0.001	1.88 (0.99)	1.90 (0.98)
Q3	0.89	0.04	0.83 – 0.96	< 0.001	1.89 (0.75)	1.90 (0.75)
Q4	0.77	0.05	0.67 – 0.87	< 0.001	1.57 (0.95)	1.50 (0.86)
Q5	0.75	0.05	0.66 – 0.85	< 0.001	1.86 (0.82)	1.80 (0.84)
Q6	0.92	0.03	0.87 – 0.98	< 0.001	1.12 (0.40)	1.00 (0.25)
Q7	0.82	0.04	0.73 – 0.90	< 0.001	1.78 (0.93)	1.80 (0.92)
Q8	0.85	0.04	0.77 – 0.93	< 0.001	2.27 (0.72)	2.30 (0.69)
Q9	0.82	0.04	0.74 – 0.91	< 0.001	2.31 (0.64)	2.30 (0.56)
Q10	0.97	0.02	0.94 – 1.00	< 0.001	1.69 (0.56)	1.70 (0.50)
Q11	0.90	0.04	0.83 – 0.98	< 0.001	0.92 (1.95)	0.87 (1.91)
<i>Dimension IV Wrinkled or tight skin</i>						
Q1	0.93	0.03	0.87 – 0.99	< 0.001	2.10 (0.63)	2.10 (0.62)
Q2	0.93	0.03	0.88 – 0.99	< 0.001	1.60 (0.69)	1.60 (0.69)
Q3	0.85	0.04	0.77 – 0.93	< 0.001	2.00 (0.83)	1.90 (0.76)
Q4	0.84	0.04	0.76 – 0.92	< 0.001	2.10 (0.71)	2.00 (0.61)
Q5	0.92	0.03	0.86 – 0.98	< 0.001	2.30 (0.53)	2.30 (0.48)
Q6	0.90	0.03	0.83 – 0.97	< 0.001	2.10 (0.55)	2.10 (0.58)
Q7	0.96	0.02	0.92 – 1.00	< 0.001	2.30 (0.53)	2.20 (0.45)
Q8	0.76	0.05	0.66 – 0.86	< 0.001	2.10 (1.07)	2.00 (0.91)
Q9	0.72	0.05	0.62 – 0.83	< 0.001	2.20 (1.05)	2.10 (0.93)
Q10	0.86	0.04	0.78 – 0.94	< 0.001	2.20 (0.58)	2.20 (0.62)
Q11	0.95	0.03	0.89 – 1.00	< 0.001	1.60 (0.70)	1.60 (0.61)
Q12	0.95	0.03	0.89 – 1.00	< 0.001	2.20 (0.95)	2.30 (0.87)
Q13	0.73	0.05	0.63 – 0.84	< 0.001	1.40 (0.73)	1.40 (0.73)
Q14	0.98	0.02	0.95 – 1.00	< 0.001	2.30 (1.04)	2.30 (1.02)
Q15	0.90	0.03	0.83 – 0.97	< 0.001	2.70 (1.01)	2.60 (1.00)
Q16	0.90	0.03	0.84 – 0.97	< 0.001	3.20 (0.93)	1.70 (0.70)
Q17	0.85	0.04	0.76 – 0.93	< 0.001	1.60 (0.70)	1.70 (0.70)
Q18	0.88	0.04	0.81 – 0.95	< 0.001	2.20 (0.68)	2.20 (0.72)
Q19	0.95	0.02	0.91 – 1.00	< 0.001	3.00 (0.63)	3.00 (0.60)
Q20	0.99	0.01	0.97 – 1.00	< 0.001	3.00 (0.45)	3.90 (0.41)
Q21	1.00	0.00	1.00 – 1.00	< 0.001	0.00 (0.00)	0.00 (0.00)

³ In the letter form (A, B, C, D or E)

⁴ after converting the raw results (A – 1 point, B – 2 pts, C – 3 pts, D – 4 pts, E – 2.5 pts).

Appendix B. Assessment of internal consistency reliability

Table B.1. Internal consistency reliability of numerical scores and descriptive statistics within dimensions of the Baumann skin type questionnaire

Dimension	Measure	Reliability metrics						Descriptive statistics	
		α_{raw}	α_{std}	$G6$ (smc)	r_M	S/N	α_{SE}	M	SD
III – Skin with or without hyperpigmentation	test	0.55	0.54	0.63	0.11	1.20	0.06	1.80	0.36
III – Skin with or without hyperpigmentation	retest	0.58	0.54	0.63	0.11	1.20	0.06	1.80	0.35
IV – Wrinkled or tight skin	test	0.33	0.25	0.47	0.02	0.33	0.09	2.30	0.21
IV – Wrinkled or tight skin	retest	0.36	0.33	0.54	0.02	0.48	0.09	2.10	0.19

Appendix C. Polish version of Baumann Skin Type Questionnaire (BSTQ) in the adaptation by Justyna Martyna Brzozowska

Kwestionariusz Typu Skóry wg Baumann (w adaptacji J.M. Brzozowskiej)

Kwestionariusz do określenia Typu Skóry wg Baumann pozwala określić typ Twojej skóry na podstawie wybranych przez Ciebie odpowiedzi.

Zastosuj się do zaleceń zawartych w pytaniu, po czym podkreśl lub zakreśl właściwą dla Ciebie odpowiedź. Nie zostawiaj żadnych pytań bez odpowiedzi.

CZĘŚĆ PIERWSZA

TLUSTA (O) vs. SUCHA (D)

Ta część kwestionariusza ocenia poziom produkcji sebum oraz nawilżenie Twojej skóry. Badania pokazują, że często mylimy się w ocenie, czy nasza skóra jest tłusta, czy sucha. Nie pozwól, aby Twoje wcześniejsze przekonania lub opinie innych osób miały wpływ na Twoje odpowiedzi.

- Po umyciu twarzy nie nakładaj żadnego kremu nawilżającego, kremu z filtrem, toniku, pudru ani innych produktów. Po 2-3 godzinach spójrz w lustro przy jasnym oświetleniu. Twoje czoło i policzki są:
 - Bardzo szorstkie, łuszczące się lub szare
 - Napięte
 - Dobrze nawilżone, bez widocznego odbicia światła
 - Błyszczące, z wyraźnym odbiciem światła
- Na zdjęciach Twoja twarz wygląda na błyszczącą:
 - Nigdy, lub nigdy nie zauważyłeś/łaś błyszczczenia
 - Czasami
 - Często
 - Zawsze
- Dwie do trzech godzin po nałożeniu podkładu (bez pudru), Twój makijaż wygląda:
 - Łuszczy się lub zbiera w zmarszczkach
 - Gładko
 - Błyszcząco

- d. Tworzą się smugi i błyszczy
 - e. Nie używam podkładu do twarzy
4. W środowisku o niskiej wilgotności, jeśli nie stosujesz kremu nawilżającego ani kremu z filtrem, Twoja skóra twarzy:
- a. Jest bardzo sucha lub pęka
 - b. Jest napięta
 - c. Jest normalna
 - d. Wygląda na błyszczącą lub nigdy nie czuję potrzeby nawilżenia
 - e. Nie wiem
5. Spójrz w lusterko powiększające. Ile masz dużych porów, o średnicy główki szpilki lub większych?
- a. Żadnego
 - b. Kilka w strefie T (czoło i nos)
 - c. Wiele
 - d. Mnóstwo!
 - e. Nie wiem (Uwaga: proszę sprawdzić ponownie i zaznaczyć odpowiedź e tylko, jeśli naprawdę nie możesz tego określić.)
6. Jak określiłbyś/łabyś swoją skórę twarzy?
- a. Sucha
 - b. Normalna
 - c. Mieszana
 - d. Tłusta
7. Gdy używasz mydła lub żelu, który mocno się pieni, Twoja skóra twarzy:
- a. Jest sucha lub pęka
 - b. Jest lekko sucha, ale nie pęka
 - c. Jest normalna
 - d. Jest tłusta
 - e. Nie używam mydła ani innych środków, które się pienią (Uwaga: jeśli dlatego, że wysuszają skórę, wybierz odpowiedź a.)
8. Jeśli nie nawilżysz skóry, Twoja skóra twarzy jest napięta:
- a. Zawsze
 - b. Czasami
 - c. Rzadko
 - d. Nigdy
9. Masz zatkane pory (zaskórniki otwarte lub zaskórniki zamknięte):
- a. Nigdy
 - b. Rzadko
 - c. Czasami
 - d. Zawsze
10. Twoja twarz jest tłusta w strefie T (czoło i nos):
- a. Nigdy
 - b. Czasami
 - c. Często
 - d. Zawsze
11. Dwie do trzech godzin po nałożeniu kremu nawilżającego Twoje policzki są:
- a. Bardzo szorstkie, łuszczące się lub szare
 - b. Gładkie

- c. Lekko błyszczące
- d. Błyszczące i śliskie, lub nie używam kremu nawilżającego

Punktacja O vs. D:

Przypisz sobie 1 punkt za każdą odpowiedź a, 2 punkty za każdą odpowiedź b, 3 punkty za każdą odpowiedź c, 4 punkty za każdą odpowiedź d i 2,5 punktu za każdą odpowiedź e.

Wpisz swój wynik O/D tutaj: _____

Jeśli Twój wynik wynosi między 34 a 44 punkty, masz bardzo tłustą skórę.

Jeśli Twój wynik wynosi między 27 a 33 punkty, masz lekko tłustą skórę.

Jeśli Twój wynik wynosi między 17 a 26 punktów, masz lekko suchą skórę.

Jeśli Twój wynik wynosi między 11 a 16 punktów, masz suchą skórę.

Jeśli uzyskałeś/łaś wynik między 27 a 44 punkty, Twoja skóra należy do typu O (skóra tłusta).

Jeśli uzyskałeś/łaś wynik między 11 a 26 punktów, Twoja skóra należy do typu D (skóra sucha).

CZĘŚĆ DRUGA

WRAŻLIWA (S) vs. ODPORNA (R)

Ta część kwestionariusza ocenia tendencję Twojej skóry do pojawiania się wyprysków, zaczerwienień, rumienia i swędzenia – wszystkich oznak wrażliwej skóry.

1. Czerwone krosty na Twojej twarzy pojawiają się:
 - a. Nigdy
 - b. Rzadko
 - c. Przynajmniej raz w miesiącu
 - d. Przynajmniej raz w tygodniu
2. Produkty do pielęgnacji skóry (w tym produkty oczyszczające, kremy nawilżające, toniki, makijaż) powodują u Ciebie wypryski, wysypkę, swędzenie lub pieczenie:
 - a. Nigdy
 - b. Rzadko
 - c. Często
 - d. Zawsze
 - e. Nie stosuję żadnych produktów na twarz.
3. Czy kiedykolwiek rozpoznano u Ciebie trądzik lub trądzik różowaty?
 - a. Nie
 - b. Znajomi i bliscy mówią, że to mam.
 - c. Tak
 - d. Tak, w ciężkiej postaci
 - e. Nie jestem pewny/a
4. Jeśli nosisz biżuterię, która nie jest wykonana z 14-karatowego złota, jak często pojawia się u Ciebie wysypka?
 - a. Nigdy
 - b. Rzadko
 - c. Często
 - d. Zawsze
 - e. Nie jestem pewny/a
5. Kremy przeciwsłoneczne powodują u Ciebie swędzenie, pieczenie, wypryski lub zaczerwienienie skóry:
 - a. Nigdy
 - b. Rzadko
 - c. Często

- d. Zawsze
 - e. Nigdy nie używam kremu przeciwsłonecznego.
6. Czy kiedykolwiek rozpoznano u Ciebie atopowe zapalenie skóry, egzemę lub kontaktowe zapalenie skóry (alergiczna wysypka)?
- a. Nie
 - b. Znajomi mówią, że to mam.
 - c. Tak
 - d. Tak, w ciężkiej postaci
 - e. Nie jestem pewny/a
7. Jak często masz wysypkę pod pierścionkami?
- a. Nigdy
 - b. Rzadko
 - c. Często
 - d. Zawsze
 - e. Nie noszę pierścionków.
8. Perfumowane płyny do kąpieli, olejki do masażu lub balsamy do ciała powodują u Ciebie wypryski, swędzenie lub uczucie suchości skóry:
- a. Nigdy
 - b. Rzadko
 - c. Często
 - d. Zawsze
 - e. Nigdy nie używam tego typu produktów (Uwaga: wybierz odpowiedź d, jeśli ich nie używasz, ponieważ powodują wyżej wymienione problemy.)
9. Czy możesz bez problemu używać mydła dostępnego w hotelach na ciało lub twarz?
- a. Tak
 - b. Zazwyczaj nie mam problemów.
 - c. Nie, moja skóra swędzi, czerwienieje lub pojawiają się wypryski.
 - d. Nigdy bym go nie użył/a, miałem/am zbyt wiele problemów w przeszłości!
 - e. Zawsze noszę swoje mydło, więc nie jestem pewny/a.
10. Czy u kogoś z Twojej rodziny rozpoznano atopowe zapalenie skóry, egzemę, astmę i/lub alergie?
- a. Nie
 - b. U jednego członka rodziny, o którym wiem
 - c. U kilku członków rodziny
 - d. Wielu członków rodziny ma atopowe zapalenie skóry, egzemę, astmę i/lub alergie.
 - e. Nie jestem pewny/a
11. Co się dzieje, gdy używasz perfumowanych detergentów do prania lub płynów do płukania tkanin?
- a. Nic się nie dzieje ze skórą.
 - b. Moja skóra jest lekko sucha.
 - c. Moja skóra swędzi.
 - d. Moja skóra swędzi i pojawia się wysypka.
 - e. Nie jestem pewny/a lub nigdy ich nie używałem/am.
12. Jak często Twoja twarz i/lub szyja czerwienieją po umiarkowanym wysiłku fizycznym, stresie i/lub silnych emocjach, takich jak gniew?
- a. Nigdy
 - b. Czasami

- c. Często
 - d. Zawsze
13. Jak często czerwieniejesz i dostajesz rumieńców po spożyciu alkoholu?
- a. Nigdy
 - b. Czasami
 - c. Często
 - d. Zawsze, lub nie piję z powodu tego problemu
 - e. Nigdy nie piję alkoholu.
14. Jak często czerwieniejesz i dostajesz rumieńców po spożyciu pikantnych lub gorących potraw lub napojów?
- a. Nigdy
 - b. Czasami
 - c. Często
 - d. Zawsze
 - e. Nigdy nie jem pikantnych potraw (Uwaga: jeśli nie jesz pikantnych lub gorących potraw z powodu rumieńców, wybierz d.)
15. Ile widocznych czerwonych lub niebieskich popękanych naczynek masz (lub miałeś/aś przed leczeniem) na twarzy i nosie?
- a. Brak
 - b. Niewiele (jedno do trzech na całej twarzy, w tym na nosie)
 - c. Kilka (cztery do sześciu na całej twarzy, w tym na nosie)
 - d. Dużo (ponad siedem na całej twarzy, w tym na nosie)
16. Twoja twarz wygląda na czerwoną na zdjęciach:
- a. Nigdy, lub nigdy tego nie zauważyłem/am
 - b. Czasami
 - c. Często
 - d. Zawsze
17. Ludzie pytają, czy jesteś poparzony/a (czy spaliłeś/aś się na słońcu), nawet gdy tak nie jest:
- a. Nigdy
 - b. Czasami
 - c. Często
 - d. Zawsze
 - e. Zawsze jestem poparzony/a (spalona/y na słońcu). (Bardzo brzydko!)
18. Masz zaczerwienienia, swędzenie lub opuchliznę od makijażu, kremów przeciwsłonecznych lub produktów do pielęgnacji skóry:
- a. Nigdy
 - b. Czasami
 - c. Często
 - d. Zawsze
 - e. Nie używam tych produktów (Uwaga: odpowiedz d, jeśli ich nie używasz z powodu zaczerwienienia, swędzenia lub opuchlizny.)

Czy zdiagnozowano u Ciebie trądzik, trądzik różowaty, kontaktowe zapalenie skóry lub egzemę?

- Tak, dermatolog zdiagnozował powyższe schorzenie/a
- Tak, lekarz innej specjalności niż dermatologia zdiagnozował powyższe schorzenie/a
- Nie

Punktacja S vs. R:

Przypisz sobie 1 punkt za każdą odpowiedź a, 2 punkty za każdą odpowiedź b, 3 punkty za każdą odpowiedź c, 4 punkty za każdą odpowiedź d i 2,5 punktu za każdą odpowiedź e.

Wpisz swój wynik S/R tutaj: _____

Jeśli kiedykolwiek dermatolog rozpoznał u Ciebie trądzik, trądzik różowaty, kontaktowe zapalenia skóry lub egzemę, dodaj 5 punktów do swojego wyniku. Jeśli inny lekarz rozpoznał u Ciebie te schorzenia, dodaj 2 punkty do swojego wyniku.

Jeśli Twój wynik wynosi między 34 a 72 punkty, masz bardzo wrażliwą skórę.

Jeśli Twój wynik wynosi między 30 a 33 punkty, masz lekko wrażliwą skórę. Stosując się do zaleceń może sprawić, że Twoja skóra stanie się bardziej odporna (typ R).

Jeśli Twój wynik wynosi między 25 a 29 punktów, masz dość odporną skórę.

Jeśli Twój wynik wynosi między 18 a 24 punkty, masz bardzo odporną skórę. (Masz szczęście!)

Jeśli uzyskałeś/aś wynik między 30 a 72 punkty, Twoja skóra należy do typu S (skóra wrażliwa).

Jeśli uzyskałeś/aś wynik między 18 a 29 punktów, Twoja skóra należy do typu R (skóra odporna).

CZĘŚĆ TRZECIA**SKÓRA O WYSOKIEJ PIGMENTACJI – Z PRZEBARWIENIAMI (P) vs. O NISKIEJ PIGMENTACJI – BEZ PRZEBARWIEŃ (N)**

Ta część ocenia tendencję Twojej skóry do produkcji melaniny, pigmentu skóry, który odpowiada za ciemniejsze odcienie skóry, a także za ciemne plamy, piegi i ciemne obszary po urazach.

Melanina może Ci pomóc opalić się, zamiast poparzyć słońcem.

1. Po pojawieniu się krosty lub wrastającego włosa, pozostaje po nim ciemna brązowa/czarna plamka:
 - a. Nigdy lub nie zauważyłem/am
 - b. Czasami
 - c. Często
 - d. Zawsze
 - e. Nigdy nie mam krost, ani wrastających włosów.
2. Po skaleczeniu, jak długo pozostaje brązowy (nie różowy) ślad?
 - a. Nie mam brązowych śladów lub nie zauważyłem/am.
 - b. Tydzień
 - c. Kilka tygodni
 - d. Miesiące
3. Ile ciemnych plam pojawiło się na Twojej twarzy podczas ciąży, stosowania pigułek antykoncepcyjnych lub hormonalnej terapii zastępczej (HTZ)?
 - a. Żadnych
 - b. Jedna
 - c. Kilka
 - d. Dużo
 - e. To pytanie mnie nie dotyczy (ponieważ jestem mężczyzną lub nigdy nie byłam w ciąży lub nie brałam pigułek antykoncepcyjnych ani HTZ, lub nie jestem pewny/a, czy mam ciemne plamy).
4. Czy masz jakieś ciemne plamy na górnej wardze lub policzkach? A może miałeś/aś je w przeszłości i usunąłeś/aś?
 - a. Nie
 - b. Nie jestem pewny/a.

- c. Tak, są (lub były) lekko widoczne.
 - d. Tak, są (lub były) bardzo widoczne.
5. Czy ciemne plamy na Twojej twarzy nasilają się, gdy wychodzisz na słońce?
 - a. Nie mam ciemnych plam.
 - b. Nie jestem pewny/a
 - c. Nieco się nasilają (wyglądają nieco gorzej – są bardziej widoczne)
 - d. Bardzo się nasilają (wyglądają o wiele gorzej – są o wiele bardziej widoczne)
 - e. Codziennie nakładam krem przeciwsłoneczny na twarz i nigdy się nie opalam. (Uwaga: jeśli stosujesz ciągłą ochronę przeciwsłoneczną, ponieważ obawiasz się, że możesz dostać ciemnych plam lub piegów, wybierz odpowiedź d.)
 6. Czy rozpoznano u Ciebie melasmę (ostudę), jasne lub ciemnobrązowe lub szare plamy na twarzy?
 - a. Nie
 - b. Tak, ale zniknęły.
 - c. Tak, i nadal je mam.
 - d. Tak, i mam teraz ciężki przypadek.
 - e. Nie jestem pewny/a
 7. Czy masz, lub miałeś/aś kiedyś, małe brązowe plamy (piegi lub plamy słoneczne) na twarzy, klatce piersiowej, plecach lub ramionach?
 - a. Nie
 - b. Tak, mam ich kilka (od 1 do 5)
 - c. Tak, mam ich wiele (od 6 do 15)
 - d. Tak, mam ich mnóstwo (16 lub więcej)
 8. Kiedy po raz pierwszy po kilku miesiącach wychodzisz na słońce, Twoja skóra:
 - a. Tylko ulega poparzeniu słonecznemu
 - b. Ulega poparzeniu, a następnie ciemnieje
 - c. Ciemnieje
 - d. Moja skóra jest już ciemna, więc trudno stwierdzić, czy staje się ciemniejsza (Nie możesz wybrać "Nigdy nie miałem/am kontaktu ze słońcem". Pomyśl o doświadczeniach z dzieciństwa!)
 9. Co się dzieje po wielu dniach z rzędu spędzonych na słońcu?
 - a. Skóra ulega poparzeniu i mam pęcherze, ale nie zmienia koloru.
 - b. Moja skóra staje się nieco ciemniejsza.
 - c. Moja skóra staje się znacznie ciemniejsza.
 - d. Moja skóra jest już ciemna, więc trudno stwierdzić, czy staje się ciemniejsza.
 - e. Nie jestem pewny/a (Znow, nie możesz wybrać "Nigdy nie miałem/am kontaktu ze słońcem". Jeśli musisz wybrać e, najpierw pomyśl o doświadczeniach z dzieciństwa.)
 10. Jaki jest Twój naturalny kolor włosów? (Jeśli masz siwe, podaj kolor przed osiwieniem.)
 - a. Blond
 - b. Brązowy
 - c. Czarny
 - d. Rudy
 11. Jeśli masz ciemne plamy na skórze w obszarach narażonych na słońce, dodaj 5 punktów do swojego wyniku.

Punktacja P vs. N:

Przyznaj sobie 1 punkt za każdą odpowiedź a, 2 punkty za każdą odpowiedź b, 3 punkty za każdą odpowiedź c, 4 punkty za każdą odpowiedź d i 2,5 punktu za każdą odpowiedź e.

Wpisz swój wynik P/N tutaj: _____

Jeśli uzyskałeś/aś wynik między 31 a 45 punktami, Twoja skóra należy do typu P (skóra o wysokiej pigmentacji – z przebarwieniami).

Jeśli uzyskałeś/aś wynik między 10 a 30 punktami, Twoja skóra należy do typu N (skóra o niskiej pigmentacji – bez przebarwień).

CZĘŚĆ CZWARTA

SKÓRA POMARSZCZONA (W) vs. NAPIĘTA (T)

Ta część kwestionariusza ocenia Twoją tendencję do powstawania zmarszczek, a także to jak bardzo jesteś pomarszczony/a teraz. Niektórzy przyznali się, że oszukiwali w tej sekcji, aby zostać typem T (skóra napięta). Nie rób tego! Oszukujesz tylko siebie, odbierając sobie możliwość skorzystania z terapii prewencyjnych, które mogą zapobiec zmarszczkom. Zmiana nawyków teraz może zmienić Twój wynik w przyszłości z W na T. Bądź więc szczery/a i skorzystaj z odpowiednich zabiegów, jeśli ich potrzebujesz.

1. Czy masz zmarszczki na twarzy?
 - a. Nie, nie mam nawet podczas ruchów mimicznych, takich jak uśmiech, marszczenie brwi czy unoszenie brwi.
 - b. Tylko podczas ruchów mimicznych, takich jak uśmiech, marszczenie brwi czy unoszenie brwi.
 - c. Tak mam, gdy poruszam twarzą jak również kilka gdy nie wykonuje żadnej mimiki twarzy.
 - d. Zmarszczki są widoczne nawet, gdy nie uśmiecham się, nie marszczę, ani nie unoszę brwi.

Odpowiadając na pytania 2-7, porównaj siebie i członków swojej rodziny z innymi grupami etnicznymi, nie tylko z własną. W przypadku członków rodziny, których możesz nie znać, zapytaj innych członków rodziny lub, jeśli to możliwe, odnieś się do zdjęć.

2. Na ile lat wygląda/ła skóra twarzy Twojej matki?
 - a. Na 5 do 10 lat młodziej niż jej faktyczny wiek
 - b. Na tyle lat ile faktycznie ma
 - c. Na 5 lat więcej niż jej faktyczny wiek
 - d. Ponad 5 lat więcej niż jej faktyczny wiek
 - e. Nie dotyczy; zostałem/am adoptowany/a lub nie pamiętam.
3. Na ile lat wygląda/ła skóra twarzy Twojego ojca?
 - a. Na 5 do 10 lat młodziej niż jego faktyczny wiek
 - b. Na tyle lat ile faktycznie ma
 - c. Na 5 lat więcej niż jego faktyczny wiek
 - d. Ponad 5 lat więcej niż jego faktyczny wiek
 - e. Nie dotyczy; zostałem/am adoptowany/a lub nie pamiętam.
4. Na ile lat wygląda/ła skóra twarzy Twojej babci ze strony matki?
 - a. Na 5 do 10 lat młodziej niż jej faktyczny wiek
 - b. Na tyle lat ile faktycznie ma
 - c. Na 5 lat więcej niż jej faktyczny wiek
 - d. Ponad 5 lat więcej niż jej faktyczny wiek
 - e. Nie dotyczy; zostałem/am adoptowany/a, nigdy jej nie znałem/am lub nie pamiętam.
5. Na ile lat wygląda/ła skóra twarzy Twojego dziadka ze strony matki?
 - a. Na 5 do 10 lat młodziej niż jego faktyczny wiek
 - b. Na tyle lat ile faktycznie ma

- c. Na 5 lat więcej niż jego faktyczny wiek
 - d. Ponad 5 lat więcej niż jego faktyczny wiek
 - e. Nie dotyczy; zostałem/am adoptowany/a, nigdy go nie znałem/am lub nie pamiętam.
6. Na ile lat wygląda/ła skóra twarzy Twojej babci ze strony ojca?
- a. Na 5 do 10 lat młodziej niż jej faktyczny wiek
 - b. Na tyle lat ile faktycznie ma
 - c. Na 5 lat więcej niż jej faktyczny wiek
 - d. Ponad 5 lat więcej niż jej faktyczny wiek
 - e. Nie dotyczy; zostałem/am adoptowany/a, nigdy jej nie znałem/am lub nie pamiętam.
7. Na ile lat wygląda/ła skóra twarzy Twojego dziadka ze strony ojca?
- a. Na 5 do 10 lat młodziej niż jego faktyczny wiek
 - b. Na tyle lat ile faktycznie ma
 - c. Na 5 lat więcej niż jego faktyczny wiek
 - d. Ponad 5 lat więcej niż jego faktyczny wiek
 - e. Nie dotyczy; zostałem/am adoptowany/a, nigdy go nie znałem/am lub nie pamiętam.
8. Czy kiedykolwiek w życiu opalałeś/aś się regularnie przez więcej niż dwa tygodnie w roku? Jeśli tak, przez ile lat to robiłeś/aś? Proszę uwzględnić opalanie podczas gry w tenisa, wędkowania, gry w golfa, narciarstwa lub innych zajęć na świeżym powietrzu. Plaża nie jest jedynym miejscem, gdzie można się opalić.
- a. Nigdy
 - b. Od 1 roku do 5 lat
 - c. Od 5 do 10 lat
 - d. Ponad 10 lat
9. Czy kiedykolwiek w życiu opalałeś/aś się sezonowo przez dwa tygodnie w roku lub mniej? (Tak, wakacje letnie też się liczą!) Jeśli tak, jak często?
- a. Nigdy
 - b. Od 1 roku do 5 lat
 - c. Od 5 do 10 lat
 - d. Ponad 10 lat
10. Biorąc pod uwagę miejsca, w których mieszkałeś/aś, ile codziennej ekspozycji na słońce miałeś/aś w swoim życiu?
- a. Mało; mieszkałem/am głównie w miejscach, gdzie jest szaro i pochmurno.
 - b. Trochę; czasami mieszkałem/am w mniej nasłonecznionych miejscach, ale także w miejscach z bardziej regularnym nasłonecznieniem.
 - c. Umiarkowanie; mieszkałem/am w miejscach z dość dużym nasłonecznieniem.
 - d. Dużo; mieszkałem/am w tropikach, na południu lub w bardzo nasłonecznionych miejscach.
11. Jak myślisz, na ile lat wyglądasz?
- a. Na 1 rok do 5 lat młodziej niż mój faktyczny wiek
 - b. Na tyle lat ile faktycznie mam
 - c. Na 5 lat więcej niż mój faktyczny wiek
 - d. Na ponad 5 lat więcej niż mój faktyczny wiek
12. W ciągu ostatnich pięciu lat, jak często opalałeś/aś się (celowo lub przypadkowo) podczas uprawiania sportów na świeżym powietrzu lub innych zajęć?
- a. Nigdy
 - b. Raz w miesiącu
 - c. Raz w tygodniu
 - d. Codziennie

13. Jak często, jeśli w ogóle, korzystałeś/aś z solarium?
- a. Nigdy
 - b. Od 1 do 5 razy
 - c. Od 5 do 10 razy
 - d. Wielokrotnie
14. Ile papierosów wypaliłeś/aś w swoim życiu (lub byłeś/aś na nie narażony/a)?
- a. Żadnego
 - b. Kilka paczek
 - c. Wiele paczek
 - d. Palę codziennie
 - e. Nigdy nie paliłem/am, ale mieszkalem/am, wychowywałem/am się lub pracowałem/am z osobami, które regularnie paliły w mojej obecności.
15. Opisz zanieczyszczenie powietrza w miejscu, gdzie mieszkasz:
- a. Powietrze jest świeże i czyste.
 - b. Przez część roku, ale nie przez cały rok, mieszkam w miejscu, gdzie powietrze jest czyste.
 - c. Powietrze jest lekko zanieczyszczone.
 - d. Powietrze jest bardzo zanieczyszczone.
16. Opisz, jak długo używałeś/aś kremów do twarzy z retinoidami, takich jak retinol, Renova, Retin-A, Tazorac, Differin lub Avage:
- a. Wiele lat
 - b. Okazjonalnie (sporadycznie)
 - c. Kiedyś, z powodu trądziku, gdy byłem/am młodszy/a
 - d. Nigdy
17. Jak często obecnie spożywasz owoce i warzywa?
- a. Do każdego posiłku
 - b. Raz dziennie
 - c. Okazjonalnie (sporadycznie)
 - d. Nigdy
18. W ciągu całego swojego życia, jaki procent Twojej codziennej diety stanowiły owoce i warzywa? (Uwaga: nie wliczaj soków, chyba że są świeżo wyciskane.)
- a. 75-100 %
 - b. 25-75 %
 - c. 10-25 %
 - d. 0-10 %
19. Jaki jest Twój naturalny kolor skóry (bez opalania lub samoopalaczy)?
- a. Ciemny
 - b. Średnio opalony
 - c. Jasny
 - d. Bardzo jasny
20. Opisz swoje pochodzenie etniczne? (Proszę wybrać najlepszą odpowiedź.)
- a. Afroamerykanin/Karaib/Czarnoskóry
 - b. Azjata/Hindus/basen Morza Śródziemnego/Inny
 - c. Latynos/Hiszpan
 - d. Biały
21. Jeśli masz sześćdziesiąt pięć lat lub więcej, dodaj 5 punktów do swojego wyniku.

Punktacja W vs. T:

Przysnaj sobie 1 punkt za każdą odpowiedź a, 2 punkty za każdą odpowiedź b, 3 punkty za każdą odpowiedź c, 4 punkty za każdą odpowiedź d i 2,5 punktu za każdą odpowiedź e.

Wpisz swój wynik W/T tutaj: _____

Jeśli uzyskałeś/aś wynik między 41 a 85 punktów, Twoja skóra należy do typu W (skóra pomarszona/z zmarszczkami).

Jeśli uzyskałeś/aś wynik między 20 a 40 punkty, Twoja skóra należy do typu T (skóra napięta).

Aby określić swoje ostateczne wyniki typów skóry, wpisz poniżej wszystkie wyniki poszczególnych sekcji w kolejności odpowiedzi na test:

Mój wynik O/D to _____, co odpowiada _____

Mój wynik S/R to _____, co odpowiada _____

Mój wynik P/N to _____, co odpowiada _____

Mój wynik W/T to _____, co odpowiada _____

Połącz je wszystkie i teraz znasz swój typ skóry!

Oświadczenia współautorów

Warszawa, 28/02/2025r.

.....
(miejscowość, data)

Joanna Gotlib-Małkowska

.....
(imię i nazwisko)

OŚWIADCZENIE

Jako współautor pracy pt. „*The importance of remote counseling in cosmetology and cosmetic dermatology*” oświadczam, iż mój własny wkład merytoryczny w przygotowanie, przeprowadzenie i opracowanie badań oraz przedstawienie pracy w formie publikacji stanowi: krytyczna recenzja, ostateczna akceptacja.

Mój udział procentowy w przygotowaniu publikacji określam jako 17%.

Wkład Justyny Brzozowskiej w powstawanie publikacji określam jako 83%,

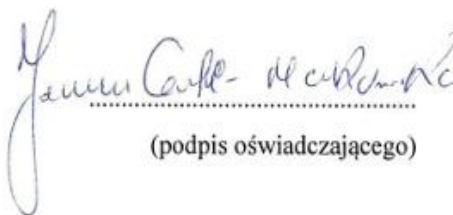
(imię i nazwisko kandydata do stopnia)

obejmował on: koncepcję i projekt pracy, zbieranie i analizę danych, odpowiedzialność za analizę statystyczną, pisanie artykułu, krytyczną recenzję, ostateczną akceptację.

(merytoryczny opis wkładu kandydata do stopnia w powstanie publikacji)*

Jednocześnie wyrażam zgodę na wykorzystanie w/w pracy jako część rozprawy doktorskiej mgr Justyny Brzozowskiej.

(imię i nazwisko kandydata do stopnia)


.....
(podpis oświadczającego)

*w szczególności udziału w przygotowaniu koncepcji, metodyki, wykonaniu badań, interpretacji wyników

Warszawa, 28/02/2025 r.

(miejscowość, data)

Joanna Gotlib-Małkowska

(imię i nazwisko)

OŚWIADCZENIE

Jako współautor pracy pt. „*Social Media Potential and Impact on Changing Behaviors and Actions in Skin Health Promotion: Systematic Review*” oświadczam, iż mój własny wkład merytoryczny w przygotowanie, przeprowadzenie i opracowanie badań oraz przedstawienie pracy w formie publikacji stanowi: zbieranie i analiza danych, krytyczna recenzja.

Mój udział procentowy w przygotowaniu publikacji określam jako 14%.

Wkład Justyny Brzozowskiej w powstawanie publikacji określam jako 86%,

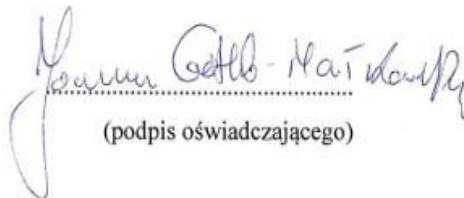
(imię i nazwisko kandydata do stopnia)

obejmował on: koncepcję i projekt pracy, zbieranie i analizę danych, wizualizację, napisanie oryginalnego projektu, przejrzanie i edycję manuskryptu, krytyczną recenzję i ostateczną akceptację.

(merytoryczny opis wkładu kandydata do stopnia w powstanie publikacji)*

Jednocześnie wyrażam zgodę na wykorzystanie w/w pracy jako część rozprawy doktorskiej mgr Justyny Brzozowskiej.

(imię i nazwisko kandydata do stopnia)


(podpis oświadczającego)

*w szczególności udziału w przygotowaniu koncepcji, metodyki, wykonaniu badań, interpretacji wyników