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Article

Development and Validation of an Instrument to Appraise the Tolerability, Safety of Use, and Pleasantness of a Cosmetic Product

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Abstract: Background: Acceptability tests are designed to demonstrate that there is no chance that cosmetics would irritate or distress users in day-to-day situations. Objectives: to develop and validate a tool or scale that dermatologists, general practitioners, and other healthcare professionals can employ to assess a cosmetic product's tolerability, safety of usage, and pleasantness. Methods: A three-step modified Delphi technique was used in the consensus process. Two rounds of online surveys and a final face-to-face meeting were performed. Fifty experts for the Delphi panel were chosen to reflect a holistic array of expertise and perspectives in pharmacovigilance, dermatology, and cosmetic safety assessments. In round 1, 80 statements and 115 statements related to skin tolerance and cosmetic safety/efficacy, respectively, were distributed to all members of the expert panel. The expert panel was asked to rate the extent to which they agreed with each statement in the questionnaire using a 5-point Likert scale and given a chance to include a remark beside each item. A statement had to receive 80% of the panel's approval to be accepted. Results: A total of 50 professional experts were recruited in the Delphi questionnaire rounds (response rate = 63%). The expert panel reached a consensus on 30 statements to evaluate skin tolerability and 34 statements to evaluate cosmetic safety and efficacy (agreement rate level $\geq$ 80%). The experts also proposed a generic, systematic approach that would allow patients to report both functional and physical symptoms in addition to those discovered during an examination (clinical signs). The confrontation of these symptoms determines whether the investigated cosmetic product is ultimately cutaneously acceptable. Conclusion: The tool that was proposed during this study offered good content validity. Future studies are recommended to test the developed tools in practice to evaluate the good skin compatibility and the safety and quality of cosmetics in the UAE and other nations.

Keywords: skin tolerability; safety; quality and efficacy of cosmetics; cutaneous acceptability; good skin compatibility; cutaneous tolerance; scale validation

Citation: Jairoun, A.A.; Al-Hemyari, S.S.; Shahwan, M.; El-Dahiyat, F.; Zyoud, S.H.; Jairoun, O.; Shayeb, M.A. Development and Validation of an Instrument to Appraise the Tolerability, Safety of Use, and Pleasantness of a Cosmetic Product. *Cosmetics* **2023**, *10*, 15. https://doi.org/10.3390/cosmetics10010015

Academic Editors: Isabel Martins De Almeida and Antonio Vassallo

Received: 28 September 2022
Revised: 10 December 2022
Accepted: 27 December 2022
Published: 12 January 2023

1. Introduction

The skin is the body's exterior protective layer, guarding against physical, chemical, and microbiological harm, as well as preventing excessive water loss [1–3]. The stratum corneum (SC), which is comprised of layers of protein-rich corneocytes and intercellular membrane lipids, such as cholesterol, ceramides, and free fatty acids, acts as the skin's barrier function [1–3]. Corneocytes continually regenerate to keep the skin hydrated, flexible, and structurally sound. They also play a fundamental role in repairing skin damage [1,2].

Skin dryness is caused by a dysfunctional skin barrier, which can be brought on by a genetic predisposition [4,5]; pathological conditions like psoriasis, eczema, or xerosis [6,7]; environmental aggressors, like the sun, wind, or air conditioning [8,9]; repeated contact with chemicals like harsh soaps or detergents [10]; medications like retinoids, statins, or diuretics [11], as well as other factors such as aging [12].

Some people may experience adverse reactions to topical cosmetics. According to studies performed in the United Kingdom, 23% of women and 14% of men reported having an adverse reaction to a cosmetic in the year prior to the study [13], and 57% of women and 31% of men had encountered such a reaction at some point in their lives. Irritation, burning, pruritus, and erythema are the most commonly reported negative aesthetic side effects linked with the use of cosmetics [14].

Most cosmetic users are more concerned with the immediate effects of cosmetics on their appearance than with the long-term effects of such products on the entire body. Cosmetics are assumed to offer a respectable level of safety and acceptability [15]. However, insufficient effort has been invested in testing and monitoring any adverse effects of cosmetics. According to some studies [16,17], exposure to the numerous chemicals found in cosmetics poses a threat to health, with risks ranging from minor hypersensitivity to anaphylaxis or even fatal intoxication. Issues can become evident immediately or after using cosmetics for a prolonged period [16,17]. The most often reported adverse effects linked to prolonged exposure to heavy makeup were headaches, dizziness, fatigue, and nausea [18,19].

The sale of cosmetics is governed in the European Union by EC Regulation No. 1223/2009, which was enacted on 30 November 2009 by the European Parliament and Council. Under this law, all cosmetic products sold on the EU market must be safe for human consumption under normal, foreseeable situations. They must also include clear labeling, presentation, handling and disposal directions, cautions, and other relevant information [20]. Comparably, every product intended for human consumption in the United Arab Emirates (UAE), including cosmetics, must be registered with the municipality of the appropriate emirate and adhere to all applicable laws. Manufacturing, importing, exporting, and selling unlicensed cosmetics and personal care goods are all prohibited throughout the UAE, including Dubai. Regulatory agencies acquire data on the items through the product registration process to evaluate their safety and suitability for consumer use [21].

The Dubai Municipality and the Emirates Authority for Standardization & Metrology (ESMA) both require a GMP certificate for product registration, and current cosmetics legislation in the UAE specifies that GMP certification is mandatory for cosmetics manufacturers [21,22]. These initiatives are designed to prevent potentially unsafe products from being made available on the market while also educating consumers on how to utilize authorized products safely. As a result, all cosmetics sold in Dubai must be registered and follow all applicable laws regarding their production, distribution, and importation.

There have been some instances of fabricated cosmetic items being made available for sale in Dubai. Where these products have been detected, they have been recalled. However, due to the widespread adoption of free trade zones, where counterfeit goods can be repackaged to deceive authorities and customers about their genuine origin, the trade in false goods has increased. The development of fake online cosmetic and health stores and online shopping channels with a global reach have also aided in the mass sale of fake goods. Therefore, it is evident that immediate regulatory action is required to stop the sale of fake or illegal cosmetic items.

Counterfeit cosmetic items containing components or compounds prohibited at concentrations above those allowed can have serious side effects and adverse health consequences. For instance, a study on cosmetics and personal care items conducted in the UAE found that none of the products tested had labels indicating that they contained free formaldehyde or formaldehyde releasers [23]. Pathogens, such as bacteria or mold, can contaminate counterfeit cosmetics that have been produced or stored improperly. According to market research on cosmetics and personal care products in the UAE, 13% of the 100 tested goods contained yeast or mold, and 5% of the 100 samples tested positive for aerobic mesophilic bacteria [24].

Additional difficulties related to counterfeit cosmetics include product labels containing misleading information, not providing the manufacturer's name or address, and failing to mention all the ingredients and their respective quantities. Another investigation into the safety of cosmetics sold in Dubai discovered that 6 of the 102 alcohol-based hand sanitizers tested contained undeclared or unlisted methanol, while other samples contained less than 60% alcohol despite being advertised as having a 70% alcohol content [25–27]. Similar research in Ajman, UAE, resulted in the closure of two producers when they were found to be manufacturing significant amounts of a fake medical sterilizer. Despite being advertised as a medical sterilizer, the product was actually a body perfume spray [28].

Another study conducted in the UAE examined 125 cosmetic and personal care items. Five (4%) products had cetrimonium chloride levels above those advised for rinse-off hair products, ten (8%) products had cetrimonium chloride levels above those advised for leave-on hair products, and twenty-four (61.5%) products had cetrimonium chloride levels above those advised for use as a preservative in cosmetics [29].

Additional analyses revealed that 12 goods had a total fluoride content below the limits specified on their labels, while 10 of the evaluated 50 cosmetics products had total fluoride levels above the advised concentration of 0.15%. In addition, 22 of the evaluated items had fluoride levels lower than 1000 ppm [30]. To ensure that consumers are adequately informed about the tetrahydrocannabinol levels of the items they purchase, a study conducted in the UAE suggested that the producers of cosmetics products that utilize cannabinoids should create batch quality certificates [31].

Skin sensitive to the environment exhibits subjective cutaneous hyperreactivity [32]. In the absence of obvious irritation-related skin changes, an active immune response, or an allergic reaction, subjects with sensitive skin may experience a non-inflammatory response to products applied topically to the skin, characterized by sensory responses such as stinging, burning, or itching [33–35]. Sensitive skin may be more vulnerable to adverse reactions to cosmetics [35], such as itchiness, burning, redness, pruritus, and erythema where the product is applied [14]. Benzoic acid, cinnamic acid, nonionic emulsifiers, sodium laurel sulfate, bronopol, lactic acid, propylene glycol, urea, and sorbic acid are examples of substances that have been shown to irritate sensitive skin [36,37]. As such, before receiving permission for usage, cosmetic skin products should be clinically tested in realistic use scenarios and on the target demographic.

Some cosmetic items can cause allergic contact dermatitis or discomfort in people with sensitive skin [35–37]. Self-reported sensitive skin is becoming more common: according to data from studies conducted in Europe [38] and the United States, 38 percent and 45 percent of participants, respectively, said they had sensitive or very sensitive skin. Accordingly, it is crucial that topical cosmetic products go through a clinical review to determine whether they are appropriate for this population.

Given the risks described above, topical cosmetic products should undergo a clinical evaluation before receiving clearance for use. Acceptability tests are designed to demonstrate that there is no chance that cosmetics would irritate or distress users in day-to-day situations. The possibility of sensitization at the product application site should be considered in the clinical evaluation. These clinical evaluations can enable the labeling of products as "clinically tested" and "dermatologically tested".

The goal of this study was to create and validate a tool or scale that dermatologists, general practitioners, and other healthcare professionals could employ to assess a cosmetic product under investigation's tolerability, safety of usage, and pleasantness. This scale was developed to assist healthcare professionals in making clinical decisions regarding the safety of a topical product for consumer use by assessing potential adverse effects (such as pruritus, irritation, burning sensation, and erythema) that may develop after using a cosmetic product.

2. Methods and Materials

2.1. Study Design

The aim of this research was to create and validate a cutaneous acceptance and tolerance scale for assessing the tolerability, safety, and pleasantness of a cosmetic product. The modified Delphi approach was used in this investigation. This method involves an iterative process that employs a systematic progression of repeated voting rounds performed by experts with sufficient knowledge and understanding of the subject matter [39]. Between January and August 2022, a three-step modified Delphi technique was used in the consensus process [40,41]. Initially, a thorough list of issues was determined, and a consensus was reached using the input offered by knowledgeable participants from the previous rounds. Two rounds of online surveys and a final face-to-face meeting were performed. The Delphi approach is derived from a modified Ebel technique [42–44] and is also known as the Estimate-Talk-Estimate process [45]. The final in-person meeting was not a part of the original Delphi method created by Dalkey and Helmer in 1963 [44].

The modified Delphi technique was selected for this research because the final round permitted interaction among experts. Members of the panel were able to provide arguments to support their positions and further explain some topics of importance. Research has shown that the modified Delphi approach can be more beneficial than the original Delphi method and is consistently viewed as collaborative and successful [46,47].

The final face-to-face meeting made evaluating the questionnaire's applicability and suitability easier. This would have been challenging using the original Delphi technique, as one of the objectives of this study was to design and validate a cutaneous acceptability and tolerance scale. This technique also ensured that participants' identities were kept private, enabling controlled feedback [48]. This research was performed in full adherence to the CREDES guidelines concerning the conduct and reporting of Delphi studies [45].

2.2. Recruitment of Participants

This study involved two distinct groups of participants.

2.2.1. Scientific Committee

A scientific committee of experts was formed. Four were from the relevant regulatory agencies, four were dermatologists, and the final two were specialists affiliated with Ajman and Al Ain universities. The members of the scientific committee were required to hold a Ph.D. and have an extensive background in dermatology, pharmacovigilance, cosmetic safety assessment, and the cosmetics industry.

Before the questionnaire was forwarded to the expert panel, the scientific committee examined the initial version generated by the research team and suggested changes. It was also accountable for reviewing the selection criteria used to choose the experts who participated in the Delphi consensus. Where applicable, new members were suggested. A letter was sent to professionals inviting them to join the scientific committee. Each committee member received the materials to be reviewed. The experts were initially provided 15 days to study the documents; however, this time frame was extended where required.

2.2.2. Expert Panel

No formal criteria or rules must be followed when choosing experts [49]. Typically, individuals with appropriate knowledge or experience, such as scholars, consultants, or working professionals, might be gathered into an expert group [50].

Participants for the Delphi panel were chosen to reflect a holistic array of expertise and perspectives in pharmacovigilance, dermatology, and cosmetic safety assessment, as reflected by their track record of performing studies and writing papers that were published in peer-reviewed academic journals or policy reports; attendance at dermatology conferences was also taken into consideration as relevant. Participants within the Delphi panel could be national or international. Additionally, the participants were required to be fluent in English to the extent that they could converse in English without needing a translator. The research team identified potential participants by screening the authors of recent papers on relevant topics and other research groups in the study area. The scientific committee examined this list, and the members offered further suggestions for experts who could add value to the study. Without requiring their physical presence, those who met the eligibility requirements received an email invitation to join the study as a member of the expert panel. The project's objectives and procedures were then described, and consent was sought. The panel expert specifically needed to be able to conduct the following:

- Understand safety requirements: Before the cosmetic product is introduced onto the market, it must undergo evaluation
- Encourage and assist patients, customers, and healthcare professionals in reporting adverse reactions
- Contribute to transparency and communication initiatives by disseminating information that was reliable and consistent from a scientific perspective to encourage the safe and efficient use of cosmetics
- Encourage and facilitate reporting of adverse reactions and coordinating initiatives to improve and expand current reporting options
- Where the participants were dermatologists, they were required to possess knowledge about all available dermatological techniques, the ability to diagnose conditions, assess skin health, teach patients preventative skin care, and keep track of how well skin treatments were working.

Table 1 displays the demographic information of the expert panel who took part in the study. A total of 50 skilled professional experts were recruited to the panel. Among the total, 50% (n = 25) held bachelor's degrees, 36% (n = 18) held master's degrees, and 14% (n = 7) held Ph.D. degrees. Of the total, 20 participants (40%) worked at a private organization, 20 (40%) worked at a governmental organization, and 10 participants (20%) worked at both private and public. The work experience of the participant experts was as follows: 6 (12%) had less than 1 year of experience, 21 (42%) had 1 to 5 years, 8 (16%) had 6 to 10 years, 7 (14%) had 11 to 15 years, and 8 (16%) had $\geq$16 years. Pharmacovigilance officers constituted 30% (n = 15) of the panel experts, 40% (n = 20) were dermatologists, and 30% (n = 15) were Cosmetic Safety Assessors. Among the total, 34% (n = 17) were from the EU, 24% (n = 12) from the USA, 22% (n = 11) from the GCC, and 20% (n = 10) from Canada.

2.3. Sampling and Sample Size

In the absence of formal rules delineating the appropriate number of experts for a Delhi panel, it was agreed that the selected panel would consist of at least 20 experts [51,52]. As a result, 50 of the 80 experts invited to participate in the Delphi consensus did so. Purposive sampling was used to choose a variety of experts with an extensive understanding of dermatology, pharmacovigilance, and cosmetic safety evaluation. After that, they were added to the study team's network and sent an email encouraging them to participate. The Delphi round of the online survey was run using the Google Online Survey tool. The selected experts were emailed an introduction letter explaining the study's goal, the advantages and disadvantages of participating, and a link to the online survey. Only those experts who expressed readiness to engage in the survey were requested to complete

it. The experts were first asked to indicate their desire to participate in the survey. Any non-responding experts received two reminders, two weeks apart. The information was gathered from January through August of 2022.

Table 1. Panelists' baseline information (n = 50).

Panelists' Characteristics	Groups	Frequency	Percentage
Educational level	Bachelor's degree or equivalent	25	50%
	Master's degree or equivalent	18	36%
	Ph.D.	7	14%
Type of Organization	Private	20	40%
	Public (government)	20	40%
	Both	10	20%
Work experience	<1 year	6	12%
	1 to 5 years	21	42%
	6 to10 years	8	16%
	11 to 15 years	7	14%
	≥16 years	8	16%
Position	Pharmacovigilance officer	15	30%
	Dermatologist	20	40%
	Cosmetic Safety Assessor	15	30%
Region/country	EU	17	34%
	USA	12	24%
	GCC	11	22%
	Canada	10	20%

Abbreviations: GCC, Gulf Cooperation Council, EU; European Union.

2.4. Development of the Data Collection Instrument (Delphi Questionnaire)

A previous literature review and the experience of the research team and the scientific committee were considered when designing the Delphi questionnaire. First, the research team searched the PubMed, Scopus, and Web of Science databases to assess the most recent research on the topic. The most recent publications were chosen. The study team reviewed all titles and abstracts to eliminate those that were irrelevant based on the findings of the literature review. Articles from the literature search were included if they defined, described, or suggested information related to the evaluation of tolerability, efficacy, safety of use, and pleasantness of a cosmetic product that might occur after using a cosmetic product, including (1) cutaneous acceptability, (2) good skin compatibility, (3) cosmetic qualities and efficacy, (4) effect of the cosmetic product by clinical score, and (5) assessment of skin's physical and functional signs. Oral care product-related articles were not included. Reference lists from the included publications were also checked to identify more studies. The study team then carried out a second screening independently to confirm that the initial list was comprehensive, and full texts of pertinent papers were retrieved and checked for eligibility.

Clinical observations made by a dermatologist to evaluate skin intolerance reactions (evaluation of the functional and clinical indicators) were looked up in full-text publications. We used a relevant questionnaire to assess the product's performance and cosmetic aspects. The information was gathered, and consensus statements were created. A spreadsheet was created in Microsoft Excel 2007 based on the statements. Following a review of the literature,

each claim was given the highest level of evidence that was possible to classify its quality and facilitate decision-making. The research team reviewed the Excel spreadsheet before getting together to address disagreements and create a preliminary consensus that would then be individually evaluated, suggested, and modified by the scientific committee. The research team changed the questionnaire based on the committee's input before receiving final approval.

2.5. Delphi Questionnaire Round

Three rounds of the Delphi study were performed. Email messages were sent to the experts chosen to participate in the exercise. In accordance with Jon Landeta's suggested guidelines, the following items were included in an introduction letter that was sent to the experts [45].

- An overview of the study's goals.
- Methodology.
- Candidate categories and selection criteria.
- How many questions must be answered, and how long the exercise should take.
- Timing of the process.
- Potential applications for the data gathered.
- Advantages of participating.

To expedite the procedure, an electronic link to the questionnaire was added to the cover letter. First, the experts chose to accept or decline their participation by responding to a question before responding to the item in the Delphi questionnaire. Those that agreed to participate subsequently completed the survey.

Round 1

All 50-panel participants were sent an email containing the consensus document. This email included the statements and a detailed explanation of the study's goals and guidelines for panelist involvement. Each expert was asked to rate the extent to which they agreed with each statement on the questionnaire using a 5-point Likert scale: Zero = strongly disagree, 1 = disagree, 2 = neither agree nor disagree, 3 = agree, and four = strongly agree.

Additionally, experts were given a chance to comment and provide extra ideas that might not have been considered while coming up with the initial list of statements. In round 1, it was also intended to make clear any repetitions or problems with each statement's interpretation or syntax. A study team calculated the response frequencies for each item and anonymously entered them into a database.

When creating the final questionnaire/scale, statements had to receive 80% of the panel's approval (i.e., agreement from 40 of the 50 experts) to be accepted. Any statements that received under 80% approval were excluded. In other words, a statement was included in the final scale document if 40 experts agreed; if 40 disagreed, it was excluded from the list of statements. Eighty percent was chosen as an appropriate cutoff based on previous work by Lynn [53], who proposed that when there are at least 10 experts involved in consensus creation, at least 80% of the experts must agree on an item to establish content validity. Any statements that did not receive an 80% agreement were changed before being recirculated to the panelists for Round 2. The first cycle took 9 weeks.

Round 2

The experts who took part in the first round of the Delphi process were given statements in the second round on which there was no agreement. A fresh questionnaire was distributed to experts with the first round's findings (mean values, median, Q1: 25th percentile, Q3: 75th percentile, and rating distribution). The ratings, statistics, and comments for these statements from the experts' panel and the other panelists were also sent to the experts. They were required to rate new items that had been offered during the previous round as well as re-rate/re-assign numbers based on their own and other people's prior responses. With knowledge of the group scores and comments, the experts utilized the identical voting procedure as that used in Round 1. Between one questionnaire and the next, experts were given an overview of the material while maintaining complete anonymity. Fi-

nal responses underwent the same analysis as that performed in round one, and statements that did not receive expert agreement were held back for consideration in round three. The second round took 4 weeks.

Round 3

The third round included a face-to-face meeting. To assess whether a statement was accepted or rejected, an 80% agreement was still required. The third round of voting was a show of hands and did not maintain anonymity. Panel members were encouraged to debate the remaining items until a decision was made on whether to keep, change, or remove a statement from the final questionnaire/scale. Once the responses had been gathered, the results were examined. To thank the members of the scientific committee and the expert panel for their involvement and collaboration in the study, the research team developed a final report of the consensus reached after the three rounds. This report was distributed to the participants.

2.6. Data Collection

The Delphi round of the online survey was performed using the Google Online Survey tool. The selected experts were emailed an introduction note and a link to the online survey. Only those experts willing to engage in the research were requested to complete the questionnaire. The experts were first asked to indicate their desire to participate in the survey. Any non-responding experts received two reminders, two weeks apart. The information was gathered between January and August of 2022.

2.7. Statistical Analysis

To analyze the data, SPSS version 26 was used. Frequencies and percentages were used to summarise the baseline attributes and demographics of the sample. The quantitative variables were summarised using Mean and Standard Deviation (SD) (scale items).

2.8. Ethics Approval and Consent to Participate

The Institutional Ethical Review Committee at Al Ain University approved this research. Every technique was used in compliance with the applicable rules and regulations at that time. The purpose of the study was made explicit on the questionnaire's cover page, and all respondents were made aware that taking part was fully optional. The participants were deemed to have given their written informed consent if they continued to the second page of the questionnaire. The confidentiality of the participants' data was ensured, and their identities were not recorded.

3. Results

3.1. Development of the Data Collection Instrument (Delphi Questionnaire)

This step commenced with a thorough review of the pertinent literature to comprehend the theoretical underpinnings of the study challenges and objectives, identify the important variables, select the content domains, and highlight any areas of concern with the questionnaire.

The literature search aimed to find examples of best practices for evaluating a cosmetic product's quality, effectiveness, and skin tolerance. In total, 754 relevant publications were identified during the literature search. Of these, 88 were chosen based on their titles and abstracts, and 25 more articles were found in reference lists. A total of 113 publications were included that discussed methods of evaluating a cosmetic product's tolerability, safety, and pleasantness.

In this study, two different forms of statements and items were created. An experimental cosmetic product's cutaneous acceptability was assessed in the first item/statement. The second item/statement assessed the effectiveness, characteristics, and potential uses of a cosmetic product following application in the typical usage circumstances intended by the producer.

For the cutaneous acceptability or skin tolerance items, information was gathered from studies that discussed the main skin irritation and pertinent factors, such as functional and physical signs, as well as those noted during examination (clinical signs), after a single and repeated application under normal conditions of use, in the adult subject, to develop statements pertaining to cutaneous acceptability or skin tolerance of a cosmetic product. Accordingly, information from the included publications produced 80 statements divided into functional and physical symptoms that assessed how well the cosmetic product worked on the skin (such as tightness, stinging, itching, and a warm or burning sensation).

Based on the feedback from the scientific committee, each functional and physical sign was rated on a five-point Likert scale, ranging from 0 (no functional and physical signs) to 4 (severe functional and physical signs). Each question asked the respondent to assess a specific statement on a 5-point Likert-type scale according to the severity of several specific complaints they had experienced.

For the items related to the efficacy and quality of a cosmetic product, information from studies that covered the self-evaluation and/or self-perception of the cosmetic attributes, performance, and overall satisfaction of a cosmetic product was collated to generate statements relevant to the efficacy and quality of a cosmetic product. As a result, 115 assertions were produced using the evidence from the listed publications. Each claim was evaluated on a Likert scale consisting of 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree). For round 1 voting, the produced statements for both scales were distributed to all members of the expert panel.

3.2. Delphi Questionnaire Round

Round one

Following the conclusion of round 1 voting and the compilation of comments, repetitive statements and statements with comparable structures were combined and reduced to provide the statements relating to the cutaneous acceptability or skin tolerance of a cosmetic product. In particular, 10 statements that were produced after the combination and reduction of 45 of the original 80 statements were agreed upon and used in the final document. In order to reduce redundancy, functional indications (such as stinging, tightness, itching, or a warm/burning sensation) that had comparable synonyms, similar diagnoses, and/or similar appearances were integrated into a single statement that was then approved for the final guideline document.

Eight of the first 80 statements were included in the final version of the text without change since they were not regarded as redundant and attained consensus (40 of the panel members voted “agree”). The final set of guidelines included 18 statements from Round 1. After Round 1, 27 of the initial 80 statements were not agreed upon. The outcomes of the modified Delphi approach are shown in Figure 1.

After Round 1 voting was finished and the comments were summarized, repetitive statements and statements with similar structures were combined and reduced to provide the statements relating to the efficacy and quality of a cosmetic product. In particular, 63 of the 115 initial assertions were consolidated and condensed to create 10 statements that were approved for the final draft and attained consensus. Out of the 115 initial statements, 15 were included in the final document without change, were not deemed redundant, and obtained consensus (40 of the panel members voted “agree” on a statement). Twenty-five statements from Round 1 were included in the final set of guidelines. After round 1, 37 of the 115 initial statements were not agreed upon. The outcomes of the modified Delphi approach are shown in Figure 1.

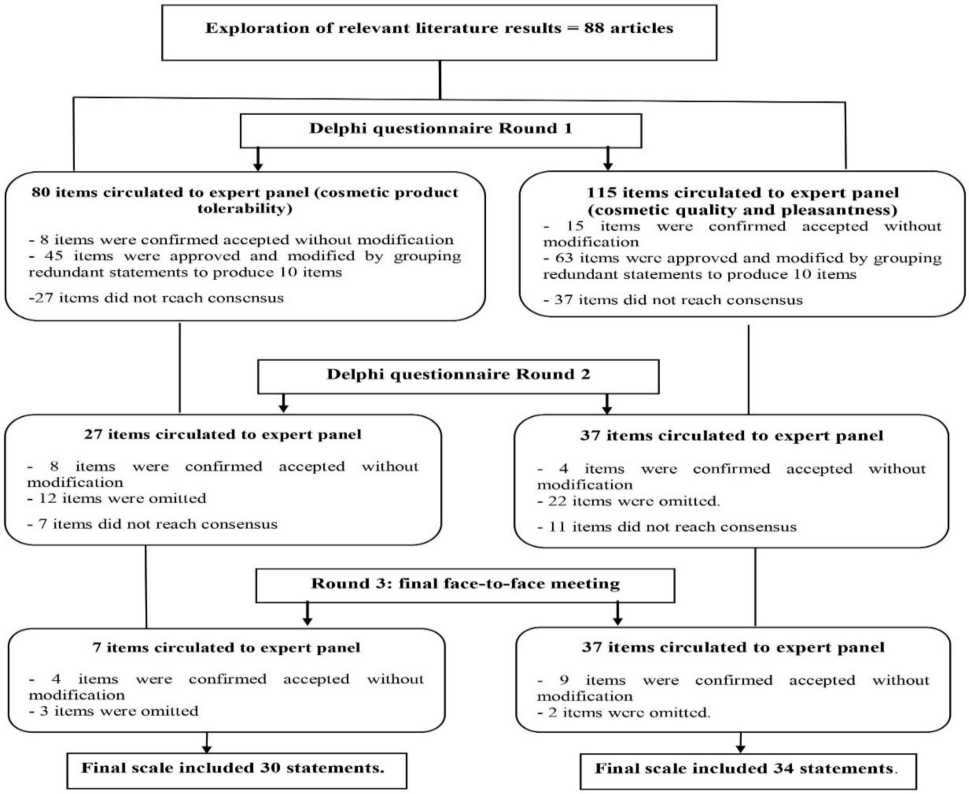

Figure 1. Modified Delphi method and results.

Round two

In Round 2, 27 of the statements pertaining to cutaneous acceptability or skin tolerance of a cosmetic product did not receive consensus. These were reissued to the participants, along with accompanying comments. After Round 2 voting, panel members reached a consensus on eight of the 27 statements that initially had not received consensus in Round 1 ($\geq$40 panel members voted "agree" on a statement). These eight statements were accepted into the final guideline document. The panel also reached a consensus to omit twelve items from the final document ($\geq$40 panel members voted "disagree" on a statement). Consensus was not reached on seven of the 27 statements after Round 2.

For statements about the efficacy and quality of a cosmetic product, 37 statements that did not receive consensus, along with accompanying comments made during Round 1, were recirculated to the panelists. After Round 2 voting, panel members reached a consensus on four of 37 statements that initially had not received consensus in Round 1 ($\geq$40 panel members voted "agree" on a statement). These four statements were accepted into the final guideline document. The panel also reached a consensus to omit twenty-two items from the final document ($\geq$40 panel members voted "disagree" on a statement). Consensus was not reached on 11 of the 37 statements after Round 2.

Round three

During the face-to-face meeting held in Round 3, the experts discussed the remaining claims regarding cutaneous acceptability or skin tolerance, as well as claims regarding the effectiveness and quality of a cosmetic product. Statements that did not receive unanimous support in earlier rounds were the subject of clarification requests in Round 3.

After discussion, 40 of the panel members voted "agree" to include four of the seven remaining phrases about cutaneous acceptability or skin tolerance in the final guideline text. The panel also conceded to removing three items from the final draft. Consequently, 30 statements were included in the final guideline text (Table 2).

Table 2. Final cutaneous tolerance and good skin compatibility items.

Main End Points Evaluation of Good Skin Compatibility of the Cosmetic Product (Cutaneous Tolerance)		
Erythema: Evaluation	Score	Agreement Rate *n* (%)
No Erythema	0	41 (82%)
Very slightly Erythema (hardly visible) in at least ¾ of the application area	1	44 (88%)
Clearly visible Erythema, uniformly allocated on at least ¾ of the application area	2	43 (86%)
Important Erythema (dark red)	3	50 (100%)
Purpuric Erythema	4	48 (96%)
Edema: Evaluation		
No Edema	0	47 (94%)
Very slightly Edema and palpable on at least ¾ of the application area, or smaller edema on a smaller surface	1	44 (88%)
Slight Edema (Edges well defined) on at least ¾ of the application area.	2	45 (90%)
Severe Edema (1 mm thick at less) on the surface greater than the application area	3	48 (96%)
Severe Edema (1 mm thick at least) on the surface greater than the application area	4	49 (98)
Papule/vesicles/bullae/pustules: Evaluation		
No Papule, vesicles, bullae, or pustules	0	50 (100%)
Papules or very small vesicles (less than about 1 mm in diameter)	1	50 (100%)
Vesicles of 1 to 2 mm in diameter	2	50 (100%)
Pustules	3	47 (94%)
Bullae with clear liquid	4	42 (84%)
Dryness/Desquamation: Evaluation		
No Dryness and Desquamation	0	44 (88%)
Slight Dryness = mat, unpolished aspect, on at least ¾ of the application area or pulverulent (whitish) aspect on a surface smaller than ¾ of the application area	1	46 (88%)
Clear dryness = pulverulent aspect on at least ¾ of the application area or desquamatory aspect on a surface smaller than ¾ of the application area	2	46 (92%)
Moderate desquamation = desquamatory aspect on at least ¾ of the application area, or presence of thick squamae on a surface smaller than ¾ of the application area	3	48 (96%)
Severe desquamation = presence of thick squamae or at least ¾ of the application area, with possibility of tegument fissuration	4	49 (98%)
Detergent effect: Evaluation		
No rugosity	0	49 (98%)
Slight rugosity = slightly worn aspect on at least ¾ of the application area or clearly worn aspect on a surface smaller than ¾ of the application area	1	50 (100%)
Clear rugosity = clearly worn aspect on at least ¾ of the application area or very worn aspect (presence of wrinkles with well-pronounced crests)	2	50 (100%)
Moderate rugosity = very worn aspect on at least ¾ of the application area or presence of deep wrinkles on a surface smaller than ¾ of the application area	3	46 (92%)
Severe rugosity = presence of deep wrinkles on at least ¾ of the application area	4	42 (84%)
Reflectivity: Evaluation		
No Reflectivity	0	46 (92%)
Slight Reflectivity = slightly shiny aspect on at least ¾ of the application area or clearly shiny aspect on a surface smaller than ¾ of the application area	1	47 (94%)
Clear Reflectivity = shiny aspect on at least ¾ of the application area or varnished aspect on a surface smaller than ¾ of the application area	2	49 (98%)
Moderate Reflectivity = glossy aspect on at least ¾ of the application area or glazed aspect on a surface smaller than ¾ of the application area	3	48 (96%)
Severe Reflectivity = glazed aspect, deeply shimmering, on at least ¾ of the application area	4	45 (90%)

≥80% of experts denoting “agree” or “strongly agree.

On the other hand, after discussion, nine of the 11 remaining statements about the efficacy and quality of a cosmetic product were incorporated into the final guideline document (40 panel members voted "agree"). Additionally, the panel decided to eliminate two items from the final document. Consequently, these 34 statements were included in the final guideline text (Table 3).

Table 3. Final cosmetic qualities and efficacy items.

	Cosmetic Product' Efficacy	Agreement Rate *n* (%)
1.	The skin is moisturized	44 (88%)
2.	The product prevents the new spots' appearance	45 (96%)
3.	Pigmentary spots are reduced	48 (96%)
4.	Spots intensity is reduced	49 (98%)
5.	The skin regains its clarity	49 (98%)
6.	The skin is smoothed	50 (100%)
7.	Skin brightness is revived	50 (100%)
8.	The complexion is more luminous	50 (100%)
9.	The complexion is more uniform	49 (98%)
10.	The skin looks visibly younger	40 (40%)
11.	The skin seems better protected against aging	44 (88%)
12.	The micro-relief seems smoothed	43 (86%)
13.	The fine lines seem smoothed	43 (68%)
14.	The skin is brighter	42 (84%)
15.	The complexion homogeneity is improved	45 (90%)
16.	The skin seems restructured	46 (92%)
17.	The skin quality is improved	50 (100%)
18.	The product is suitable for sensitive skin.	46 (92%)
19.	The product is suitable for combination with oily skin	44 (88%)
20.	The coverage of the product is high	41 (82%)
21.	The product perfectly covers my hyperpigmentation marks	43 (86%)
22.	The skin is mattified throughout the day	47 (94%)
23.	The product unifies the complexion without leaving a mask-like effect	48 (96%)
24.	The product resists throughout the day.	49 (98%)

Table 3. *Cont.*

	Cosmetic Product' Efficacy	Agreement Rate *n* (%)
25.	The product resists strong heat.	45 (90%)
26.	The product is resistant to transpiration	44 (88%)
27.	The product is water-resistant	41 (82%)
	Cosmetic product' quality	
28.	The fragrance suits you	41 (82%)
29.	The product is easy to apply	43 (86%)
30.	The product foams easily	45 (90%)
31.	The texture is unctuous and silky	49 (98%)
32.	The product does not sting skin	43 (86%)
33.	The product is easily rinsed off	45 (90%)
34.	The product does not leave an oily film	45 (90%)

≥ 80% of experts denoting "agree" or "strongly agree.

The last in-person meeting was also utilized to build and create a generic, systematic approach that would allow patients to report both functional and physical symptoms in addition to those discovered during an examination (clinical signs). The confrontation of these symptoms determines whether the investigated cosmetic product is ultimately cutaneously acceptable (Figure 2).

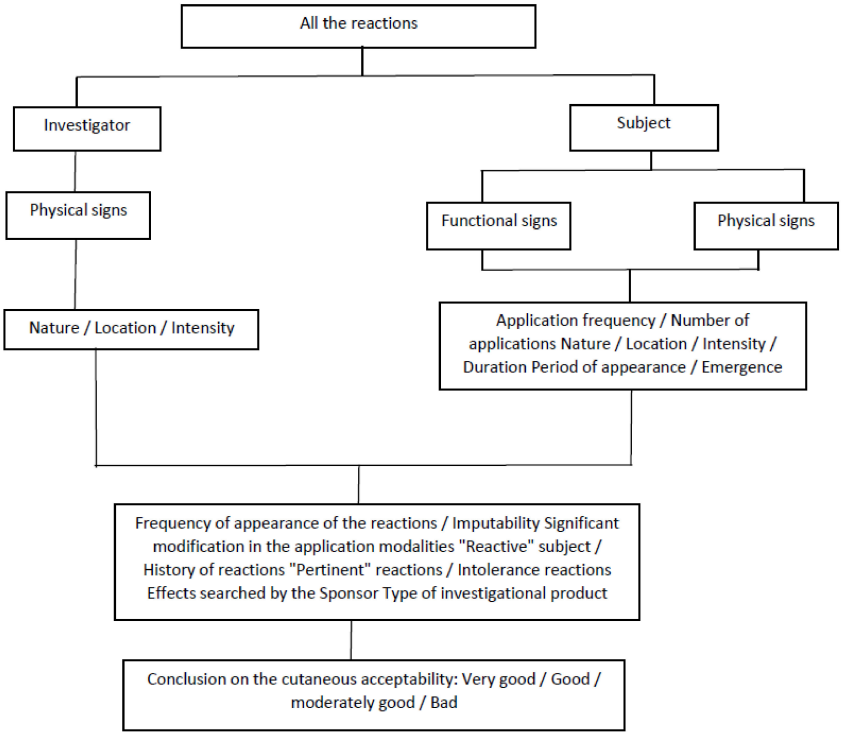

Figure 2. Generic and systematic approach to report Cutaneous acceptability.

4. Discussion

To the best of the authors' knowledge, this study represents one of the earliest studies to develop and validate a technique (an instrument/scale) to aid dermatologists and primary care physicians in evaluating the skin tolerance, safe usability, and pleasantness of an experimental cosmetic product. This is significant given the increased rate of unfavorable aesthetic adverse reactions described in other research studies [54–58]. Furthermore, research has revealed that cosmetics with a hypoallergenic claim also contain known allergens or irritants [59–61].

Fortunately, the findings of our study indicated that the content validity of the tools developed was good because the cutaneous acceptability was evaluated, on the one hand, based on clinical skin examinations allowing for the observation of the physical signs (erythema, edema, dryness, desquamation) linked to the use of the investigational product and, on the other hand, of a line of inquiry that facilitated an evaluation of functional symptoms (prickling, tightness). These details, which included the frequency and number of applications as well as the type, location, intensity, duration, period of appearance, and emergence after application of any reactions, were explored via a questionnaire that the subject filled out and returned to the dermatologist or primary care physician (Figure 2).

It is important to note that our study developed a new, reliable scale for assessing the effectiveness and quality of experimental cosmetic products. As all the experts who participated in the Delphi rounds were knowledgeable and skilled, they could highlight the most crucial aspects of cosmetic safety and quality, leading to the perception that this measurement scale was reliable in identifying significant areas.

Furthermore, the Delphi round's expert panel was relatively sizable (n = 50). The expert panel's diversity was guaranteed by including individuals from relevant organizations, the university, and the cosmeceutical sector. The Delphi questionnaire received an outstanding response rate of 63%. A high response rate and outstanding levels of respondent accuracy were achieved due to the length of the instruments and the time required to complete the questionnaire.

Overall, we are confident that we have developed reliable and accurate techniques to facilitate an assessment of a cosmetic product's cutaneous tolerance, effectiveness, and quality. This is due to the multiple stages that were used in their creation. As a result, we intend to choose the instruments in upcoming studies to evaluate the degree of good skin compatibility and the safety and quality of cosmetics in the UAE and other nations. The research could help dermatologists, general practitioners, and pharmacists treat patients with sensitive skin more effectively while also having a better understanding of the safety criteria and more faith in the cosmetics they recommend. This will be beneficial in terms of both future patient safety and revenue. In light of the results of our study, we will now collaborate with governments and health authorities in the UAE and elsewhere to explore how we might help with future assessments of the cosmetic acceptability and efficacy of cosmetics. Among the limitations of the current study is that we have yet to test the tool. We suggest more comprehensive validation of the instrument, including the validation tests (like test/retest, content validity, factor, and confirmatory factor analysis). However, we are confident that the use of a reliable technique in this study ensures that the tool will prove to be practical in a variety of contexts.

5. Conclusions

The tool that was proposed during this study offered good content validity. It is anticipated that the proposed tool will facilitate a thorough and reliable evaluation of a product's safety, tolerance, and irritant potential. It will also enable the collection of data pertaining to the functional signs, aid observation of physical signs, and facilitate analysis of the investigational product's imputability. A group of subjects using a cosmetic product under normal conditions can be medically observed by a dermatologist using these tools. Therefore, it can benefit both the patient and their doctor and patients at risk of contact dermatitis and bad skin reactions [62]. Public engagements with pharmacists

are well documented [63]. Pharmacists can play a significant role in bolstering a nation's cosmetovigilance system because they are the public's first and easiest point of contact.

Author Contributions: Conceptualization, A.A.J. and S.S.A.-H.; methodology, A.A.J., F.E.-D. and M.S.; software, M.A.S. and A.A.J.; validation, S.H.Z., A.A.J. and M.S.; formal analysis, A.A.J. and F.E.-D.; investigation, S.S.A.-H. and O.J.; resources, S.H.Z. and M.A.S.; data curation, A.A.J. and O.J.; writing—original draft preparation, S.S.A.-H. and A.A.J.; writing—review and editing, M.S. and O.J.; visualization, M.S., A.A.J. and S.H.Z.; supervision, S.H.Z. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The Institutional Ethical Review Committee at Al Ain University approved this research (reference number: AAURE/COP/2021/56).

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Elias, P.M. Stratum corneum defensive functions: An integrated view. *J. Investig. Dermatol.* **2005**, *125*, 183–200. [CrossRef]
2. Haftek, M.; Roy, D.C.; Liao, I.-C. Evolution of skin barrier science for healthy and compromised skin. *J. Drugs. Dermatol.* **2021**, *20*, s3–s9. [CrossRef] [PubMed]
3. Roure, R.; Lanctin, M.; Nollent, V.; Bertin, C. Methods to assess the protective efficacy of emollients against climatic and chemical aggressors. *Dermatol. Res. Pract.* **2012**, *2012*, 864734. [CrossRef]
4. Kim, Y.; Lim, K.M. Skin barrier dysfunction and filaggrin. *Arch. Pharm. Res.* **2021**, *44*, 36–48. [CrossRef] [PubMed]
5. Chandan, N.; Rajkumar, J.R.; Shi, V.Y.; Lio, P.A. A new era of moisturizers. *J. Cosmet. Dermatol.* **2021**, *20*, 2425–2430. [CrossRef] [PubMed]
6. Kim, J.; Kim, B.E.; Leung, D.Y.M. Pathophysiology of atopic dermatitis: Clinical implications. *Allergy Asthma Proc.* **2019**, *40*, 84–92. [CrossRef] [PubMed]
7. Harrison, I.P.; Spada, F. Breaking the itch-scratch cycle: Topical options for the management of chronic cutaneous itch in atopic dermatitis. *Medicines* **2019**, *6*, 76. [CrossRef]
8. Kahremany, S.; Hofmann, L.; Harari, M.; Gruzman, A.; Cohen, G. Pruritus in psoriasis and atopic dermatitis: Current treatments and new perspectives. *Pharmacol. Rep.* **2021**, *73*, 443–453. [CrossRef]
9. Morris-Jones, R.; Robertson, S.J.; Ross, J.S. Dermatitis caused by physical irritants. *Br. J. Dermatol.* **2002**, *147*, 270–275. [CrossRef]
10. Cork, M.J. The role of *Staphylococcus aureus* in atopic eczema: Treatment strategies. *J. Eur. Acad. Dermatol. Venereol.* **1996**, *7*, 31–37. [CrossRef]
11. Greive, K. Cleansers and moisturisers: The basics. *Wound. Pract. Res.* **2015**, *23*, 76–81.
12. Wang, Z.; Man, M.-Q.; Li, T.; Elias, P.M.; Mauro, T.M. Aging-associated alterations in epidermal function and their clinical significance. *Aging* **2020**, *12*, 5551–5565. [CrossRef] [PubMed]
13. Willis, C.M.; Shaw, S.; De Lacharriere, O.; Baverel, M.; Reiche, L.; Jourdain, R.; Bastien, P.; Wilkinson, J.D. Sensitive skin: An epidemiological study. *Br. J. Dermatol.* **2001**, *145*, 258–263. [CrossRef] [PubMed]
14. Lumelsky, V.J.; Shur, M.S.; Wagner, S. Sensitive skin. *IEEE Sensors J.* **2001**, *1*, 41–51. [CrossRef]
15. Kwa, M.; Welty, L.J.; Xu, S. Adverse Events Reported to the US Food and Drug Administration for Cosmetics and Personal Care Products. *JAMA Int. Med.* **2017**, *177*, 1202–1204. [CrossRef]
16. Alani, J.I.; Davis, M.D.P.; Yiannias, J.A. Allergy to cosmetics: A literature review. *Dermatitis* **2013**, *24*, 283–290. [CrossRef]
17. Draelos, Z.D. Cosmetics: The Medicine of Beauty. *J. Cosmet. Derm.* **2015**, *14*, 91. [CrossRef]
18. Husain, K. A survey on usage of personal care products especially cosmetics among university students in Saudi Arabia. *J Cosmet Dermatol.* **2019**, *18*, 271–277. [CrossRef]
19. Orton, D.I.; Wilkinson, J.D. Cosmetic Allergy. *Am. J. Clin. Dermatol.* **2004**, *5*, 327–337. [CrossRef]
20. Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 on Cosmetic Products. Available online: https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=celex%3A32009R1223 (accessed on 28 May 2021).
21. Health and Safety Department, Dubai Municipality. Apply for Consumer Products Registration (MONTAJI). Available online: https://hub.dm.gov.ae/link/servicedetails?servicecode=3560 (accessed on 21 May 2021).
22. UAE. Scheme for Cosmetic and Personal Care, & Emirates Authority for Standardization and Metrology. UAE Scheme for Cosmetic and Personal Care. Available online: http://dubai-ecs.com/en/wp-content/uploads/2017/03/CPC-Regulations-UAE.pdf (accessed on 15 June 2021).

23. Jairoun, A.A.; Al-Hemyari, S.S.; Shahwan, M.; Zyoud, S.e.H.; Ashames, A. Hidden formaldehyde content in cosmeceuticals containing preservatives that release formaldehyde and their compliance behaviors: Bridging the gap between compliance and local regulation. *Cosmetics* **2020**, *7*, 93. [CrossRef]
24. Jairoun, A.A.; Al-Hemyari, S.S.; Shahwan, M.; Zyoud, S.H. An investigation into incidences of microbial contamination in cosmeceuticals in the UAE: Imbalances between preservation and microbial contamination. *Cosmetics* **2020**, *7*, 92. [CrossRef]
25. Dubai Municipality Withdraws 6 Sterilizers for Hands that Do Not Meet Specifications from the Local Market. Localities—Health—Emirates Today. Available online: https://www.emaratalyoum.com/local-section/health/2020-04-01-1.1328166a.(1) (accessed on 12 April 2020).
26. Jairoun, A.A.; Al-Hemyari, S.S.; Shahwan, M.; El-Dahiyat, F.; Jamshed, S. Scale validation for the identification of falsified hand sanitizer: Public and regulatory authorities perspectives from United Arab Emirates. *BMC Public Health* **2020**, *20*, 1595. [CrossRef] [PubMed]
27. Jairoun, A.A.; Al-Hemyari, S.S.; Shahwan, M. The pandemic of COVID-19 and its implications for the purity and authenticity of alcohol-based hand sanitizers: The health risks associated with falsified sanitizers and recommendations for regulatory and public health bodies. *Res. Soc. Adm. Pharm.* **2021**, *17*, 2050–2051. [CrossRef] [PubMed]
28. Ajman Economy Seized and Confiscated Adulterated Sterilizers. Available online: http://www.alkhaleej.ae/alkhaleej/page/8ab6eebb-42ac-4a05-a8dd-378a41896b57 (accessed on 5 May 2020).
29. Jairoun, A.A.; Al-Hemyari, S.S.; Shahwan, M.; Zyoud, S.H. Analysis and Quantification of Alkyl (C12-22) Trimethyl Ammonium Chloride Content in Cosmetics: Regulatory Compliance Gap Analysis. *Cosmetics* **2021**, *8*, 103. [CrossRef]
30. Jairoun, A.A.; Al-Hemyari, S.S.; Shahwan, M.; Jairoun, O.; Zyoud, S.H. Analysis of Fluoride Concentration in Toothpastes in the United Arab Emirates: Closing the Gap between Local Regulation and Practice. *Cosmetics* **2021**, *8*, 113. [CrossRef]
31. Jairoun, A.A.; Al-Hemyari, S.S.; Shahwan, M.; Ibrahim, B.; Hassali, M.A.; Zyoud, S.H. Risk Assessment of Over-the-Counter Cannabinoid-Based Cosmetics: Legal and Regulatory Issues Governing the Safety of Cannabinoid-Based Cosmetics in the UAE. *Cosmetics* **2021**, *8*, 57. [CrossRef]
32. Berardesca, E.; Farage, M.; Maibach, H. Sensitive skin: An overview. *Int. J. Cosmet. Sci.* **2013**, *35*, 2–8. [CrossRef]
33. Coverly, J.; Peters, L.; Whittle, E.; Basketter, D.A. Susceptibility to skin stinging, non-immunologic contact urticaria and acute skin irritation; is there a relationship? *Contact Dermat.* **1998**, *38*, 90–95. [CrossRef]
34. Pons-Guiraud, A. Sensitive skin: A complex and multifactorial syndrome. *J. Cosmet. Dermatol.* **2004**, *3*, 145–148. [CrossRef]
35. Farage, M.A.; Katsarou, A.; Maibach, H.I. Sensory, clinical and physiological factors in sensitive skin. *Contact Dermat.* **2006**, *55*, 1–14. [CrossRef]
36. de Groot, A.C.; White, I.R.; Flyvholm, M.A.; Lensen, G.; Coenraads, P.J. Formaldehyde-releasers in cosmetics: Relationship to formaldehyde contact allergy. Part 1. Characterization, frequency and relevance of sensitization, and frequency of use in cosmetics. *Contact Dermat.* **2010**, *62*, 2–17. [CrossRef]
37. Lundov, M.D.; Johansen, J.D.; Carlsen, B.C.; Engkilde, K.; Menné, T.; Thyssen, J.P. Formaldehyde exposure and patterns of concomitant contact allergy to formaldehyde and formaldehyde-releasers. *Contact Dermat.* **2010**, *63*, 31–36. [CrossRef] [PubMed]
38. Misery, L.; Boussetta, S.; Nocera, T.; Perez-Cullell, N.; Taieb, C. Sensitive skin in Europe. *J. Eur. Acad. Dermatol. Venereol.* **2009**, *23*, 376–381. [CrossRef] [PubMed]
39. Meshkat, B.; Cowman, S.; Gethin, G.; Ryan, K.; Wiley, M.; Brick, A.; Clarke, E.; Mulligan, E. Using an e-Delphi technique in achieving consensus across disciplines for developing best practice in day surgery in Ireland. *J. Hosp. Adm.* **2014**, *3*, 1–8. [CrossRef]
40. Dalkey, N.; Helmer, O. An experimental application of the Delphi method to the use of experts. *Manag Sci.* **1963**, *9*, 458–467. [CrossRef]
41. Dalkey, N.C. *The Delphi Method: An Experimental Study of Group Opinion*; Rand Corp.: Santa Monica, CA, USA, 1969; Available online: https://www.rand.org/pubs/research_memoranda/RM5888.html (accessed on 14 June 2021).
42. Butterwick, D.J.; Paskevich, D.M.; Lagumen, N.G.; Vallevand, A.L.C.; Lafave, M.R. Development of a content-valid technical skill assessment instrument for athletic taping skills. *JAH* **2007**, *35*, 147–155.
43. Lafave, M.; Katz, L.; Butterwick, D. Development of a content-valid standardized orthopedic assessment tool (SOAT). *Adv. Health Sci. Educ. Theory Pract.* **2008**, *13*, 397–406. [CrossRef]
44. Lafave, M.R.; Butterwick, D.J.; Murray, R.P.; Freeman, T.; Lau, B.H. Content validity of the Rodeo-SCAT. *Int. J. Sports Med.* **2013**, *34*, 170–175. [CrossRef]
45. Jünger, S.; Payne, S.A.; Brine, J.; Radbruch, L.; Brearley, S.G. Guidance on Conducting and REporting DElphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. *Palliat. Med.* **2017**, *31*, 684–706. [CrossRef]
46. Gustafson, D.H.; Shukla, R.K.; Delbecq, A.; Walster, G.W. A comparative study of differences in subjective likelihood estimates made by individuals, interacting groups, delphi groups, and nominal groups. *Organ Behav. Hum. Perf.* **1973**, *9*, 280–291. [CrossRef]
47. Graefe, A.; Armstrong, J.S. Comparing face-to-face meetings, nominal groups, delphi and prediction markets on an estimation task. *Int. J. Forecasting* **2016**, *27*, 183–195. [CrossRef]
48. El Metodo Delphi: Landeta, Jon: Libros. Available online: https://www.amazon.es/El-metodo-delphi-Jon-Landeta/dp/8434428369 (accessed on 12 February 2022).
49. Jones, J.; Hunter, D. Consensus methods for medical and healthservices research. *Br. Med. J.* **1995**, *311*, 376–380. [CrossRef] [PubMed]

50. Campbell, S.M.; Cantrill, J.A. Consensus methods in prescribing research. *J. Clin. Pharm. Ther.* **2001**, *26*, 5–14. [CrossRef] [PubMed]
51. Rowe, G.; Wright, G. The Delphi technique as a forecasting tool: Issues and analysis. *Int. J.* **1999**, *15*, 353–375. [CrossRef]
52. Okoli, C.; Pawlowski, S.D. The Delphi method as a research tool: An example, design considerations and applications. *Inf. Manag.* **2004**, *42*, 15–29. [CrossRef]
53. Lynn, M.R. Determination and quantification of content validity. *Nurs. Res.* **1986**, *35*, 382–385. [CrossRef]
54. Getachew, M.; Tewelde, T. Cosmetic Use and Its Adverse Events among Female Employees of Jimma University, Southwest Ethiopia. *Ethiop. J. Health Sci.* **2018**, *28*, 717–724. [CrossRef]
55. Huf, G.; Rito, P.d.N.; Presgrave, R.d.F.; Boas, M.H.S.V. Adverse reactions to cosmetic products and the Notification System in Health Surveillance: A survey. *Braz. J. Epidemiol.* **2013**, *16*, 1017–1020. [CrossRef]
56. Bilal, A.I.; Tilahun, Z.; Osman, E.D.; Mulugeta, A.; Shekabdulahi, M.; Berhe, D.F. Cosmetics use-related adverse events and determinants among Jigjiga town residents, Eastern Ethiopia. *Dermatol. Ther.* **2017**, *7*, 143–153. [CrossRef]
57. Di Giovanni, C.; Arcoraci, V.; Gambardella, L.; Sautebin, L. Cosmetovigilance survey: Are cosmetics considered safe by consumers? *Pharmacol. Res.* **2006**, *53*, 16–21. [CrossRef]
58. Korichi, R.; Pelle-De-Queral, D.; Gazano, G.; Aubert, A. Why women use makeup: Implication of psychological traits in makeup functions. *J. Cosmet. Sci.* **2008**, *59*, 127–137. [PubMed]
59. FDA. "Hypoallergenic" Cosmetics. 2020. Available online: https://www.fda.gov/cosmetics/cosmetics-labeling-claims/hypoallergeniccosmetics#Hypoallergenic_Cosmetics (accessed on 5 June 2022).
60. Hamann, C.R.; Bernard, S.; Hamann, D.; Hansen, R.; Thyssen, J.P. Is there a risk using hypoallergenic cosmetic pediatric products in the United States? *J. Allergy Clin. Immunol.* **2015**, *135*, 1070–1071. [CrossRef] [PubMed]
61. Lazzarini, R.; Hafner, M.d.F.S.; Rangel, M.G. Evaluation of the presence of allergens in children's products available for sale in a big city. *An. Bras Dermatol.* **2018**, *93*, 457–459. [CrossRef] [PubMed]
62. Ashique, K.T.; Chandrasekhar, D. Role of clinical pharmacist in cosmetovigilance of misuse and abuse of topical corticosteroids. *Indian J. Dermatol.* **2017**, *62*, 213–214. [CrossRef] [PubMed]
63. Allison, D.G.; Higginson, P.; Martin, S. Antibiotic resistance awareness: A public engagement approach for all pharmacists. *Int. J. Pharm. Pr.* **2017**, *25*, 93–96. [CrossRef] [PubMed]