Research Article

Development of a Questionnaire Evaluating the Knowledge, Attitude, and Practice on Geriatric Dermatology among Elderly Caregivers

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Abstract

Information concerning the extent of knowledge, attitude, and practice of elderly caregivers about dermatological care are still limited. This present study aimed to develop a tool with decent validity and reliability to delineate such profiles. A questionnaire was designed by geriatric dermatology experts, followed by content validation and reliability tests using Aiken's V coefficient, Kuder-Richardson Formula 20 (KR-20) or Cronbach's α, and Pearson's correlation. The developed instrument was tested on elderly caregivers, before and after education. Obtained data were analyzed using appropriate inferential statistics. We found that the Aiken's V coefficient for each item was ≥0.70; KR-20 in knowledge section was 0.81; Cronbach's α in attitude and practice section were 0.81 and 0.80, respectively; and Pearson's correlation in all sections was above 0.80. Significant disparities were observed in the initial knowledge (p=0.005) and attitude (p=0.020) based on academic levels. In addition, overall scores generally increased upon education (p<0.001). Therefore, the questionnaire is valid and reliable for assessing elderly caregivers' competencies in geriatric dermatology of which could be improved by education.

Keywords: *attitude, elderly caregivers, geriatric dermatology, knowledge, practice.*

Pengembangan Kuesioner untuk Mengevaluasi Pengetahuan, Sikap, dan Perilaku terkait Dermatologi Geriatri pada Pengasuh Lanjut Usia

Abstrak

Informasi mengenai derajat pengetahuan, sikap, dan perilaku pengasuh terkait perawatan kulit usia lanjut masih terbatas. Penelitian ini bertujuan untuk mengembangkan suatu alat dengan validitas dan reliabilitas yang baik untuk mengetahui profil tersebut. Sebuah kuesioner disusun oleh ahli dermatologi geriatri, dilanjutkan dengan validasi isi dan uji reliabilitas menggunakan koefisien Aiken's V. Kuder-Richardson Formula 20 (KR-20) atau Cronbach's α, dan korelasi Pearson. Instrumen tersebut kemudian diujikan terhadap pengasuh lanjut usia, sebelum dan sesudah edukasi. Data yang diperoleh selanjutnya dianalisis dengan statistika inferensial yang sesuai. Kami mendapatkan koefisien Aiken's V untuk setiap butir kuesioner adalah ≥0.70; KR-20 pada bagian pengetahuan sebesar 0.81; Cronbach's α pada bagian sikap dan perilaku secara berurutan adalah 0.81 dan 0.80; serta korelasi Pearson pada seluruh bagian di atas 0.80. Perbedaan signifikan diamati pada pengetahuan (p=0.005) dan sikap (p=0.020) awal berdasarkan tingkat pendidikan. Selain itu, skor keseluruhan secara umum meningkat setelah edukasi (p<0.001). Dengan demikian, kuesioner ini valid dan reliabel untuk menilai kompetensi pengasuh lanjut usia dalam dermatologi geriatri yang dapat ditingkatkan melalui edukasi.

Kata kunci: *sikap, pengasuh lanjut usia, dermatologi geriatri, pengetahuan, perilaku.*

Introduction

According to the World Health Organization (WHO), elderly population is defined as people with the age of 60 years old or more.[1] This population requires special attention because they experience several aging phenomenon, such as progressive declines in physical and mental capacity as the consequences of molecular and cellular damages,[1,2] resulting in the quality of life decrements, elevated susceptibility to degenerative diseases, and higher mortality rate.[1,3] With the increase of life expectancy, the world is currently facing an accelerated aging trend. Globally, there were 703 million of older adults in 2019 and were estimated to be 1.5 billion by 2050.[1] In Indonesia, there were 23.6 million of senior people in 2017 and were projected to 48.19 million people by 2035.[4] As the population aged, the burden of productive age group (individuals between 18 and 59 years old) will increase physically and financially due to the geriatric syndrome.[5]

The availability of caregivers to look after the older adults may offer the solution to this challenge. In several places, the caregivers are not health workers, so they need adequate knowledge and skills to meet the elderly's physical, psychological, and social needs.[6] Skin aging and geriatric skin disorders are some of the common issues in the senior population. However, research studying the knowledge, attitude, and practice of the elderly caregivers is still limited. A previous study showed a lack of knowledge on dermatology among elderly caregivers, especially regarding pruritus management, prevention of skin diseases, and skin tumors, which additional investigation revealed the main cause was the inadequate communication or education from dermatologists to caregivers concerning geriatric skin problems.[7] Moreover, there were no studies investigating this issue in Indonesia. Herein, we attempted to develop a questionnaire for assessing the extent of knowledge, attitude, and practice of Indonesian caregivers about skin aging, geriatric skin diseases, and their management. Through this study, we aimed to provide an overview of their profiles related to elderly dermatological care, as well as to demonstrate the impact of education upon these matters.

Methods

Study Population and Sample Selection

The targeted population were the specialised for the senior group. For such purpose, this study sampled the entire participants of joint educational web-based seminar (webinar) on 13 April 2022 conducted by Indonesian Society of Dermatology and Venereology (INSDV), Ministry of Social Affairs Republic of Indonesia, dr. Cipto Mangunkusumo Hospital, and Faculty of Medicine, Universitas Indonesia. The webinar focused on dermatological care for older population in which the lectures were presented by the speakers from Indonesian Geriatric Dermatology Study Group of INSDV. Expected attendants were professional elderly caregivers working at nursing homes across Indonesia and people who look after older adults at home. Confirmation regarding the background of anticipated entrants upon registration was performed to meet these criteria.

Ethical Approval

Prior to the commencement of study, the proposal was submitted to the Ethical Committee of Faculty of Medicine, Universitas Indonesia on 10 March 2022 for review. The ethical consent for this study was granted on 21 March 2022 with letter number KET-284/UN2.F1/ETIK/PPM.00.02/2022.

Questionnaire Development

The questionnaire was prepared in Indonesian language by three medical staff from Department of Dermatology and Venereology, Faculty of Medicine, Universitas Indonesia-dr. Cipto Mangunkusumo Hospital, who had at least five years of teaching experience in the field. Every staff independently formulated a relatively equal amount of the items. The instrument comprised three sections intended to evaluate the knowledge, attitude, and practice on three different topics: skin aging, geriatric skin problem, and treatment of geriatric skin disorders. The items in the knowledge section were developed in multiple-choice format with only one correct answer, while the attitude and practice section consisted of several statements in which the participants should give the response for each item in Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Content Validation

Upon the completion of questionnaire development, each item in the instrument was validated about their relevance to the topic and language clarity by ten dermatologists with proficiency in geriatric dermatology. The raters were divided into two groups according to their experience duration in related field. The first group

included five senior experts with more than five years of expertise, while five junior evaluators constituted the latter group. Likert scale from 1 (extremely inappropriate) to 5 (extremely appropriate) was used in validation for each question/statement. Active comments from the examiners regarding the content of questionnaire were also collected for further improvements. To determine whether the questions/statements in the questionnaire adequately represented the aim of study, we calculated Aiken's V coefficient along with their 95% and 99% confidence intervals from the pooled expert ratings for content validation.[8] The coefficients were compared to the critical values at 1% and 5% significance levels for the elimination (counted V < $V_{0.05}$), modification ($V_{0.05}$ ≤ counted V ≤ $V_{0.01}$), or acceptance (counted V > $V_{0.01}$) of each item. For the items requiring revision based on calculated V, the amendments were made according to the suggestions issued by the raters.

Internal Consistency and Test-Retest Reliability Evaluation

All modified and accepted items from previous validation were assessed for their internal consistency using Kuder-Richardson Formula 20 (KR-20) for dichotomous variable (knowledge) or Cronbach's-α for ordinal variables (attitude and practice). Pearson's correlation (r) was used to ascertain the test-retest reliability for each section. Items with the minimum value of 0.8 for KR-20 and Pearson's (r) were considered sufficiently reliable, whilst the cut-off value of 0.7 was used for Cronbach's-α.[9] For the internal consistency test, 20 elderly caregivers were randomly selected from the prospective educational webinar participants list and they were assigned to fill the questionnaire one week before the webinar. Once finished, the caregivers were asked to complete the instrument again for test-retest reliability analysis. Their results on the actual evaluation were eventually excluded to reduce the bias of knowing the content of questionnaire in advance. The validated and reliability-checked instrument (available as Supplementary File 1) ultimately served as pretest and posttest on the day of webinar.

Data Collection and Statistical Analysis

At the beginning of educational webinar, entire participants were instructed to answer a pretest prepared in google® form. Following the lectures, they completed a posttest provided in the same platform. Afterwards, obtained pretest and posttest data were matched with their consecutive names. Duplicate entries and those who did not submit either pretest or posttest were ruled out for further evaluation. Statistical Package for the Social Sciences (SPSS) version 20.0 software for Microsoft Windows was used for data recording and analysis. Baseline comparison from pretest scores were made according to prior training history in geriatric dermatology, last educational degree, and work experience duration as professional caregiver. Overall scores between pretest and posttest were also compared for determining the impact of education to the knowledge, attitude, and practice on elderly dermatological care among the attendants. Appropriate statistical tests were utilized for each comparison with significance level of 0.05.

Results

Content Validation

A sum of 32 items (15 multiple choice questions in knowledge section, 9 statements in attitude section, and 8 statements in practice section) were evaluated for their content validity relating to relevance and clarity through the calculation of Aiken's V coefficient and confidence intervals. Based on the number of raters (N=10), the amount of assessed items (n=32), and the range of Likert scale used (c=5), the critical value of V at 5% and 1% significance levels are 0.70 and 0.78, respectively.[10] In terms of both relevance and clarity, the calculated coefficients of all items were above the cutoff at 5% significance level (counted V ≥0.70), hence confirming their content validity. Nevertheless, ten items in the instrument were modified due to their calculated V were between 0.70 and 0.78, which the amendments included paraphrasing into publicly known terms (K6, K8, K9, K13), changing the structure of sentences (A2, P7), emphasizing the negative articles with underline (K11), and revising into affirmative statements (A4, P1, P8). Moreover, several experts commented upon K3 and K4 had comparable contents. Therefore, succeeding thorough deliberation, we decided to omit K4 for having lower Aiken's V coefficient.

Internal Consistency and Test-Retest Reliability Evaluation

Out of 179 prospective participants of the educational webinar, 20 were randomly sampled and subjected to reliability tests for the remaining 31 valid items from the questionnaire. When all

the topics in respective section were cumulatively calculated, they displayed KR-20 value of 0.81 for knowledge section. As for attitude and practice section, the overall Cronbach's values were 0.81 and 0.80. The Pearson's correlation (r) values for knowledge, attitude, and practice section were 0.98, 0.88, and 0.94.

Responses

After removing submissions from the ones participated in the reliability tests, duplicates and those who did not complete both pretest and posttest on the educational webinar, the final 106 participants were included in this study and mapped for their characteristics (Table 1). Professional caregivers (76.4%) and those with last educational degree of bachelor (40.6%) and secondary school (30.2%) constituted most of the eligible attendants. A third of total study population had prior training history in geriatric dermatology provided by various health science faculties and social foundations.

The distribution of responses before and after intervention (educational webinar) are shown in Table 2. Preceding the webinar, amongst all questions asked in the knowledge section, items about the etiology of dry skin (K7), suitable material for undergarments (K14), and management of pressure ulcer (K12) had the greatest number of respondents answered correctly (95.3%, 84.1%, and 84.0%, respectively). In contrast, question regarding viral skin diseases (K9) was considered the hardest as only 37.7% managed to give accurate response. The majority of respondents were strongly agreed with almost every statement in attitude section, except for the one concerning importance of knowing internal medicine relative to dermatology (A4) received mixed responses. Similar pattern was also noticed in the practice section, although the answers were more widely distributed for each statement. Furthermore, there were improvements of true answer percentages in the knowledge section after the webinar (posttest), with the items related to dry skin treatment (K11), prevention of skin aging (K5), and comparison between older and younger populations (K2) had

Table 1. Demographic Characteristics of the Respondents (n = 106)

Characteristics	Have Taken Geriatric Skin Training		Have not Taken Geriatric Skin Training	
	n	%	n	%
Gender				
Male	8	7.5	21	19.8
Female	27	25.5	50	47.2
Age Group				
18-29	6	5.7	14	13.2
30-49	18	17.0	33	31.1
50-64	10	9.4	21	19.8
≥65	1	0.9	3	2.8
Last Educational Degree				
Secondary school	10	9.4	22	20.8
Associate	6	5.7	8	7.5
Bachelor	13	12.3	30	28.3
Postgraduate	6	5.7	11	10.4
Work experience (as professional caregiver)				
No experience	7	6.6	18	17.0
Novice (<1 year)	2	1.9	14	13.2
Intermediate (1-5 years)	15	14.2	25	23.6
Advanced (>5 years)	11	10.4	14	13.2

Table 2. Distribution of Responses Before and After Intervention Presented in Percentage (n=106)

Topic	Item	Knowledge			
		Before		After	
		True	False	True	False
Skin aging	K1	67.9	32.1	82.1	17.9
	K2	69.8	30.2	87.7	12.3
	K3	80.2	19.8	96.2	3.8
	K5	54.7	45.3	84.9	15.1
Geriatric skin problem	K6	71.7	28.3	80.2	19.8
	K7	95.3	4.7	99.1	0.9
	K8	66.0	34.0	85.8	14.2
	K9	37.7	62.3	67.0	33.0
	K10	81.1	18.9	91.5	8.5
Geriatric skin treatment	K11	51.9	48.1	84.0	16.0
	K12	84.0	16.0	96.2	3.8
	K13	56.6	43.4	81.1	18.9
	K14	84.9	15.1	96.2	3.8
	K15	58.5	41.5	87.7	12.3

Topic	Item	Attitude									
		Before					After				
		ED	D	N	A	EA	ED	D	N	A	EA
Skin aging	A1	-	-	0.9	11.3	87.7	-	-	1.9	7.5	90.6
	A2	16.0	3.8	-	11.3	68.9	0.9	4.7	1.9	16.0	76.4
	A3	0.9	-	4.7	19.8	74.5	-	0.9	7.5	12.3	79.2
Geriatric skin problem	A4	17.9	9.4	33.0	19.8	19.8	-	5.7	28.3	20.8	45.3
	A5	-	-	3.8	19.8	76.4	-	-	3.8	17.0	79.2
	A6	-	0.9	3.8	15.1	80.2	-	0.9	4.7	16.0	78.3
Geriatric skin treatment	A7	-	-	1.9	12.3	85.8	-	0.9	5.7	8.5	84.9
	A8	0.9	0.9	11.3	25.5	61.3	-	1.9	7.5	23.6	67.0
	A9	-	-	1.9	13.2	84.9	-	-	1.9	12.3	85.8

Topic	Item	Practice									
		Before					After				
		ED	D	N	A	EA	ED	D	N	A	EA
Skin aging	P1	10.4	2.8	1.9	20.8	64.2	-	5.7	4.7	17.9	71.7
	P2	4.7	7.5	21.7	18.9	47.2	-	1.9	6.6	19.8	71.7
	P3	3.8	4.7	8.5	24.5	58.5	1.9	12.3	15.1	15.1	55.7
Geriatric skin problem	P4	5.7	2.8	12.3	21.7	57.5	-	2.8	9.4	18.9	68.9
	P5	-	-	1.9	16.0	82.1	0.9	-	5.7	10.4	83.0
	P6	10.4	8.5	17.9	35.8	27.4	-	2.8	11.3	31.1	54.7
Geriatric skin treatment	P7	6.6	5.7	8.5	34.0	45.3	4.7	1.9	11.3	21.7	60.4
	P8	5.7	2.8	11.3	38.7	41.5	-	-	12.3	27.4	60.4

A=agree; A*i* = attitude, followed by item number *i*; D=disagree; EA=extremely agree; ED=extremely disagree; K*i*=knowledge, followed by item number *i*; N=neutral; P*i*=practice, followed by item number *i*.

the highest increments (32.1%, 30.2% and 29.3%).

We attempted to compare the respondents' pretest scores based on whether they had geriatric dermatology training in advance, experience as professional caregiver, and their latest academic degree. As nearly all the data within groups did not

have normal distribution (p<0.05 on Kolgomorov-Smirnov test if the number of samples (n) ≥50, or Shapiro-Wilk test if n <50, whichever applicable), Mann-Whitney U test and Kruskal-Wallis H test were used for mean rank comparisons. The exception went for overall scores in attitude section according to the last educational degree, which they were statistically tested with analysis of variance (ANOVA) due to the data were normally distributed. Prior training history and work experience had no impact upon baseline overall scores in knowledge, attitude, and practice section. Conversely, according to Dunn's post-hoc test, those with the latest academic degree of secondary school marked significantly lower in total knowledge section compared to the alumni of associate (p=0.031) and bachelor (p=0.009). Bonferroni post-hoc test also showed significant differences between (p=0.014) secondary school and bachelor graduates in overall attitude scores (Table 3).

Table 3. Overall Scores in Knowledge, Attitude, and Practice According to Educational Degree

Section	Last educational degree								p value*
	Secondary school (n = 32)		Associate (n = 14)		Bachelor (n = 43)		Postgraduate (n = 17)		
	M ± SD	Med (IQR)	M ± SD	Med (IQR)	M ± SD	Med (IQR)	M ± SD	Med (IQR)	
Knowledge Skin aging (max = 4)	2.50 ± 1.08	2.50 (1.00)	2.71 ± 1.07	3.00 (0.00)	2.95 ± 1.05	3.00 (2.00)	2.59 ± 1.28	3.00 (2.00)	0.297
Geriatric skin problem (max = 5)	2.88 ± 1.26	3.00 (2.00)[d]	3.86 ± 1.03	4.00 (1.50)	3.84 ± 1.17	4.00 (2.00)[d]	3.65 ± 1.22	4.00 (2.00)	0.009[a]
Geriatric skin treatment (max = 5)	2.81 ± 1.03	3.00 (1.00)[e]	3.93 ± 0.73	4.00 (0.75)[e]	3.35 ± 1.31	3.00 (2.00)	3.12 ± 0.99	3.00 (1.00)	0.011[a]
Overall score (max = 14)	8.19 ± 2.25	7.50 (3.00) [f,g]	10.50 ± 2.28	11.00 (1.75)[f]	10.14 ± 2.76	10.00 (5.00)[g]	9.35 ± 2.67	10.00 (4.00)	0.005[a]
Attitude Skin aging (max = 15)	11.69 ± 1.80	11.00 (1.00)	11.21 ± 2.01	11.00 (0.00)	11.23 ± 1.63	11.00 (0.00)	11.47 ± 1.37	11.00 (0.00)	0.526
Geriatric skin problem (max = 15)	13.16 ± 1.48	13.00 (3.00) [h,i]	12.43 ± 1.79	12.50 (2.00)	11.88 ± 1.56	12.00 (2.00)[h]	11.82 ± 1.42	12.00 (1.00)[i]	0.004[a]
Geriatric skin treatment (max = 15)	14.44 ± 0.95	15.00 (1.00)	14.57 ± 0.85	15.00 (0.00)	13.77 ± 1.41	14.00 (2.00)	14.06 ± 1.20	15.00 (2.00)	0.049[b]
Overall score (max = 45)	39.28 ± 3.08[j]	39.00 (3.25)	38.21 ± 3.49	37.00 (4.75)	36.88 ± 3.52[j]	37.00 (3.50)	37.35 ± 2.91	37.00 (2.00)	0.020[c]
Practice Skin aging (max = 15)	10.34 ± 2.27	10.00 (2.00)	10.14 ± 2.96	10.00 (1.75)	10.00 ± 2.27	10.00 (2.00)	9.24 ± 1.82	10.00 (3.00)	0.447
Geriatric skin problem (max = 10)	6.53 ± 1.34	6.00 (0.00)	6.00 ± 0.39	6.00 (0.00)	6.70 ± 1.21	6.00 (1.00)	6.82 ± 0.95	7.00 (1.00)	0.046[b]
Geriatric skin treatment (max = 15)	9.34 ± 2.38	9.00 (3.00)	8.00 ± 3.01	8.50 (5.75)	7.98 ± 2.26	8.00 (2.00)	7.82 ± 2.38	8.00 (2.00)	0.051
Overall score (max = 40)	26.22 ± 5.13	24.00 (5.25)	24.14 ± 4.93	25.00 (5.75)	24.67 ± 4.41	24.00 (2.00)	23.88 ± 4.14	25.00 (4.00)	0.433

IQR=interquartile range; M=mean; max=possible maximum score for the section; Med=median; SD=standard deviation; *Kruskal-Wallis test, except for overall score in attitude section was calculated ANOVA; [a]significant value (p<0.05), Kruskal-Wallis test; [b]significant value (p<0.05), Kruskal-Wallis test, but Dunn's post-hoc test failed to show significant differences among groups; [c]significant value (p<0.05) according to ANOVA; [d-i]=significant difference between the groups (p<0.05) according to Dunn's post-hoc test; [j]=significant difference (p<0.05), Bonferroni post-hoc test (equal variances assumed).

As shown in Table 4, the outcomes indicated statistically significant improvements in total marks of each section before and after the webinar based on Wilcoxon signed rank test (p<0.001). Apart from the attitude regarding geriatric skin treatment (p=0.577), the results elucidated the pivotal role of education in general increment of the scores.

Table 4. Overall Scores in Knowledge, Attitude, and Practice Regarding Geriatric Skin among The Respondents (n = 106)

Section	Before (pre-test)		After (post-test)		p value*
	M ± SD	Med (IQR)	M ± SD	Med (IQR)	
Knowledge					
Skin aging (max = 4)	2.73 ± 1.10	3.00 (2.00)	3.51 ± 0.80	4.00 (1.00)	<0.001[a]
Geriatric skin problem (max = 5)	3.52 ± 1.25	4.00 (2.00)	4.24 ± 0.94	5.00 (1.00)	<0.001[a]
Geriatric skin treatment (max = 5)	3.23 ± 1.16	3.00 (2.00)	4.45 ± 0.91	5.00 (1.00)	<0.001[a]
Overall score (max = 14)	9.47 ± 2.66	9.50 (5.00)	12.20 ± 2.17	13.00 (3.00)	<0.001[a]
Attitude					
Skin aging (max = 15)	11.41 ± 1.69	11.00 (1.00)	14.21 ± 1.41	15.00 (1.00)	<0.001[a]
Geriatric skin problem (max = 15)	12.33 ± 1.63	12.00 (2.00)	13.53 ± 1.57	14.00 (2.25)	<0.001[a]
Geriatric skin treatment (max = 15)	14.12 ± 1.21	15.00 (2.00)	14.17 ± 1.39	15.00 (1.00)	0.577
Overall score (max = 45)	37.86 ± 3.41	38.00 (4.25)	41.91 ± 3.65	43.00 (4.00)	<0.001[a]
Practice					
Skin aging (max = 15)	10.00 ± 2.30	10.00 (2.00)	13.27 ± 2.02	14.00 (3.00)	<0.001[a]
Geriatric skin problem (max = 10)	6.58 ± 1.15	6.00 (1.00)	9.28 ± 1.10	10.00 (2.00)	<0.001[a]
Geriatric skin treatment (max = 15)	8.37 ± 2.47	8.00 (3.00)	13.17 ± 1.79	13.00 (3.00)	<0.001[a]
Overall score (max = 40)	24.94 ± 4.68	24.00 (4.00)	35.73 ± 3.91	36.00 (7.00)	<0.001[a]

IQR= interquartile range; M=mean; max=possible maximum score for the section; Med=median;
SD=standard deviation; *Wilcoxon signed rank test; [a]significant value (p <0.05).

Discussion

As the global population is continuously expanding and the life expectancy is generally improving, the World Health Organization (WHO) has estimated the doubling of elderly cohort by 2050, from nearly one billion in 2020.[1] Similar phenomenon was also observed in Indonesia as the fourth most populous country worldwide in which the proportion of senior group was projected to escalate at dramatic rate from 7.6% in 2010 to 15.8% in 2035.[11] Indonesia is currently encountering demographic bonus period where the productive age group outnumbers the dependents (children and older adults), the future generation will bear a massive responsibility to assure the quality of life and health of increasing aging population.[12] The elderly population requires specialized assistance due to the comorbidities which often present as a result of senescence, such as cardiovascular diseases, neuro-degenerative disorders, metabolic derangements, and malignancy.[13] They are also posed with psychosocial challenges owing to depression and isolation related to their diminished physical health.[14] These conditions will negatively impact their quality of life, ultimately leading to frailty, disability, and long-term dependency, which

collectively known as geriatric syndrome.[15] Not to mention the high cost to fulfill their additional necessities, thus completing the physical and economic burden of working-age group in taking care the older adults.[16]

Elderly caregivers, both professionally (for example, those working at nursing homes) and informally (for instance, family members looking after the senior at their own houses), may offer substantial benefits in improving the quality of life, as well as reducing financial expenditures for long-term period. Aside from assisting daily activities, family caregivers also responsible in providing spiritual and emotional supports for the chronically ill older adults, as well as addressing their concerns regarding the patients' wellbeing and adverse outcomes.[17,18] On the other hand, professional caregivers, even though costs a fortune to hire at first, their presence was associated with reduced risk of preventable hospitalization and formal health care expenses in the elderly.[19] Nevertheless, they need to be physically, emotionally, and intellectually competent to ensure their quality of care, especially for those with no prior experience in caregiving.[18]

Caregivers are usually focused on older patients with advanced or terminal chronic diseases while the subject of dermatological care is relatively neglected. This notion is supported by a study demonstrated that some caregivers had to improve their knowledge regarding identification, prevention, communication, and treatment of skin diseases in elderly. Pruritus management (41.4%), prevention of skin disease (50.0%), and skin tumors (77.2%) were the specific topics the caregivers were interested in furtherance.[7] These findings were surprising, considering the fact that dermatological health has an important role in the quality of life. Another study reported that dermatoses had moderate to huge negative impact upon quality of life among 16% of geriatric patients.[20] The underlying reason of this phenomenon was the minimal communication between healthcare providers and the caregivers, or simply put, the lack of education and training.[7]

In this present study, we developed a questionnaire intended to evaluate the comprehension of elderly caregivers in geriatric dermatology (in terms of knowledge, attitude, and practice), followed by content validation and reliability tests to ensure the adequacy and reproducibility of the instrument for such purposes.[21] We put emphasizes in skin aging, as well as geriatric skin problem and treatment to be covered in the questionnaire, which several subjects were suggested by the previous study.[7] Detailed topics included the physical characteristics in aged skin (wrinkle, thinning, and reduction in collagen numbers), intrinsic and extrinsic determinants for skin aging along with their prevention, numerous common geriatric dermatological problems (pruritic dry skin, pressure ulcer, and contact dermatitis), as well as their management (application of sunscreen and moisturizer, choosing the appropriate cleanser for bath and the suitable material for undergarments, and decubitus ulcer control).

A total of 32 items in the designed questionnaire were subjected for content validation by ten examiners, which met the required number of 5-15 experts.[22] We asked each rater to give quantitative evaluation using Likert scale from 1 to 5 in terms of relevance and clarity, as well as qualitative evaluation by providing active comments for further improvements of the items.[8] Aiken's *V* coefficients were then calculated from the cumulative ratings and all the items had sufficient *V* to be considered valid. However, several modifications were made based on the experts' opinions for the items with moderate calculated *V*. In addition, we also opted to omit the question number 4 due to the similarity with the previous question and for the sake of effectiveness. After the amendments, we presented the revised items to the validators until a mutual consensus was achieved. The further tests using KR-20, Cronbach's α, and Pearson's correlation manifested the decent internal consistency and test-retest reliability, which means our questionnaire is expected to show comparable results when tested in different populations.

Our study population included both professional and family caregivers attending the educational webinar. They displayed disparate initial scores of knowledge and attitude according to their academic backgrounds. Secondary school graduates marked lower in knowledge section compared to the alumni of associate and bachelor, presumably due to the extra vocational (associate) and theoretical (bachelor) experiences during their formal studies. Interestingly, those with latest educational degree of bachelor scored lower in attitude section compared to secondary school graduates, possibly due to the former group being highly educated inversely affected the "positive perspectives" and "willingness" to take care the elderly. Analogous pattern was found in another study using questionnaire to evaluate the knowledge and attitude of different academic levels, even though it covered an unrelated topic (coronavirus disease 2019).[23] Moreover, we found no association between history of training in geriatric

dermatology and duration of work experience to the pretest scores. These findings may be explained by the long period since last training (the average was approximately five years ago, data not shown) and inapplicability of prior training materials or caregiving experiences to answer the questions. However, given our research was amongst the first to assess such issue, additional studies are necessary to confirm or reject these hypotheses.

We also observed the significant increment of overall knowledge, attitude, and practice scores in posttest, indicating that webinar was an effective method for education, as shown in a study that also utilized audiovisual facilities.[24] Although the attitude and practice scores improved upon educational webinar, the distribution of responses were similar with the initial ones, implying that it may require time to embed an attitude, and probably more time to develop a particular habit in practice.[25]

This is a study utilizing questionnaire designed to assess the extent of knowledge, attitude and practice among Indonesian caregivers concerning geriatric dermatology. While the instrument successfully delineated their profiles, due to the limited number of respondents, caution should be undertaken when inferring the results to general population. The original version for our evaluation was authored in Indonesian language. However, validation and performing reliability tests are highly recommended before its adoption.

Conclusion

The developed questionnaire is a valid and reliable instrument for evaluating the knowledge, attitude, and practice on geriatric dermatology among Indonesian elderly caregivers. While their knowledge was at moderate level and the attitude and practice section had mixed responses in the initial assessment, education had a positive impact in the universal increment of the scores. Education of dermatological care in older adults among caregivers should be encouraged to improve their competence, thereby achieving an optimal quality of life in the senior population.

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