Wiley
Nursing Forum
Volume 2024, Article ID 3403786, 13 pages
https://doi.org/10.1155/2024/3403786

WILEY

Research Article

Nurses' Attitudes Towards Scholarly Publishing Scale (NAS Scale): A Psychometric Analysis

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Received 21 May 2024; Accepted 10 October 2024

Academic Editor: Sirwan Khalid Ahmed

The existing research studies on tool development are concentrated on determining and assessing the perception of individuals in scientific research. These instruments do not measure the complex construct of nurses' attitudes toward scientific publications, which includes the nurses' perceptions, beliefs, and behaviors regarding the value, accessibility, usability, and impact of scholarly publications. Thus, the aim of this study was to develop and validate a scale specifically measuring Nurses' Attitudes Toward Scholarly Publishing (NAS). This methodological study developed and psychometrically tested the NAS Scale (NAS Scale) through rigorous literature review and interviews with nurses. Content validity and exploratory factor analysis (EFA; $n = 334$) and confirmatory factor analysis (CFA; $n = 305$) were performed. Hypothesis testing was also used to support the scale's construct validity. Internal consistency was computed to support the scale's reliability. The data were collected among nurses in the Philippines from February to March 2024. The EFA revealed a 12-item NAS Scale with three factors: "NAS Challenges" (NAS Challenges), "NAS Benefits and Values" (NAS Benefits and Values), and "NAS Support and Mentorship" (NAS Support and Mentorship). The CFA supported this three-factor solution: $x^2/df = 2.96$, *RMSEA* = 0.08 (90% CI = 0.06–0.09), *SRMR* = 0.057, *NFI* = 0.96, *TLI* = 0.96, and *CFI* = 0.97. The hypothesis testing also supported the construct validity of the scale. The computed Cronbach's alpha for the entire scale was 0.79, with subscale's Cronbach alpha ranging from 0.91 to 0.95. Thus, the NAS Scale has sound psychometric properties in measuring the NAS.

Keywords: attitudes; nurses; nursing; psychometrics; research; scholarly publication

1. Introduction

In modern nursing, providing care at the patient's bedside is accompanied by research, education, and leadership. Nursing is a profession that not only focuses on patient care but also contributes significantly to advancing health sciences. Nurses are not just practitioners, but also potential scholars engaged in research, education, and leadership roles. They can aspire to conduct research, evaluate the content, and utilize it in practice [1]. Academic journal papers serve as a powerful tool and knowledge repository, enabling scholarly communication and tracking emerging ideas in the health science field. Through this, they enhance the professional reputation of nurses by encouraging collaboration across different fields, sharing specialized knowledge, best practices, and experiences, and showcasing

their skills [2, 3]. This empowerment through academic writing can inspire and motivate nurses to contribute to advancing health sciences. While nurses may have differing opinions, most agree that scientific writing is essential. To truly optimize the value of academic writing by nurses, it is crucial to understand their underlying attitudes toward the scholarly publication process thoroughly. Thus, developing a psychometrically tested scale to measure Nurses' Attitudes Toward Scholarly Publishing (NAS) is fundamental to understanding and improving their engagement in academic writing.

The scholarly publication process is complex and multifaceted. Writing a research paper for publication requires careful attention to the mechanics and structure of the text [4]. Similarly, nurses' writing proficiency and inclination to share information impact their view toward healthcare research publication [5]. In addition, a person's positive attitude toward writing and publishing significantly influences the drive to write a paper for publication [6]. This was evident in a previous study that reported that nurses who are involved in research have positive attitudes toward research publications [7].

Some nurses possess positive attitudes towards research, particularly its relevance in nursing practice, education, and professional growth. Nurses recognize that engaging in research enhances their competence in conducting research and providing quality, safe patient care [8]. Regarding scholarly publishing, nurses recognize the critical role of dedicating substantial time to research activities to produce a superior-quality paper [9]. The researchers' credentials and academic degrees are personal attributes that substantially impact the publication of a study [10]. Collaboration and mentorship can assist in attaining success in publishing, facilitating neophyte researchers to develop this skill and knowledge regarding publication [11, 12]. Specifically, mentorship helps new researchers understand research publications and processes by learning from experienced researchers [13, 14]. These training programs on scientific writing and research activities help improve the number of publications nurses produce [15]. This underscores the significant role of mentorship and training activities in motivating, guiding, and supporting nurses, enhancing their attitudes and engagement in scientific publications. However, uncertainty, unease, misconceptions about the publishing process, lack of confidence in their writing abilities, time constraints, the substantial amount of labor required, fear of rejection, a lack of research interest, the peer review process, and the accompanying rules lead to nurses' reluctance to publish their work [16–18]. These identified factors make publishing research in peer-reviewed journals burdensome for some nurses [4].

Despite these studies determining nurses' contributing factors and challenges in a scientific publication, exploring nurses' attitudes specifically on the scholarly publication process is unpopular. A possible explanation for this discrepancy is the absence of an instrument capable of measuring the nurses' attitudes toward scientific publications. Literature shows that the existing research studies on tool development are concentrated on developing and validating tools used to determine and assess utilization and perception of individuals in scientific research, such as "Clifford's Research in Practice Questionnaire," [19] the "Finnish Nurses' Attitudes Towards Nursing Research Questionnaire," [20] the "Attitudes Toward Research Scale," [21] and the "Scale of Attitudes Toward Scientific Research" [22]. Some instruments were developed to measure and evaluate nurses' attitudes toward research utilization, such as "The Attitudes and Factors Affecting the Research Utilization Questionnaire" [23] and "Barriers and Facilitators to Using Research in Practice Instrument" (BARRIERS) [24]. However, these instruments cannot measure the specific construct of "nurses' attitudes toward scholarly publishing." These instruments were developed many years ago, and a new tool that reflects the current literature and practice is needed.

Nurses' attitudes toward scientific publications are complex, encompassing language comprehension, knowledge acquisition, and the reasons for a person's engagement in scholarly publishing [4], necessitating a well-developed and psychometrically sound tool. Also, despite the established benefits of scientific writing, a critical gap exists in understanding nurses' specific attitudes toward the publication process. The development of a tool that will be used to assess and evaluate nurses' attitudes specifically toward scientific publications is necessary and a way to demonstrate the value and respect for the unique perspectives of nurses' attitudes on publication, considering their crucial role in evidence-based practice. A reliable and valid instrument is critical because it ensures accurate measurement of NAS, leading to trustworthy data that can inform effective interventions. Reliable and valid measurements allow healthcare institutions, educational programs, and policymakers to understand and address the barriers and supports needed to enhance nurses' engagement in research publishing, ultimately improving the dissemination of nursing research and evidence-based practice nursing.

1.1. Aim. The study developed and psychometrically tested the NAS Scale (NAS Scale) among nurses.

2. Materials and Methods

2.1. Design. This methodological study developed and psychometrically tested the NAS Scale among nurses.

2.2. Ethical Considerations. The study is part of a study protocol reviewed and approved by the Institutional Research Ethics Committee of BLINDED (635/30102022). We strictly followed the ethical guidelines and standards in conducting research studies on human subjects stipulated in the "Declaration of Helsinki" and the BLINDED throughout the implementation of the entire research process. The participants were provided adequate information about the study to make informed decisions. We provided the respondents with information about the study' aims, processes, benefits, and potential risks, as well as the respondents' rights. The participants were also given the chance to ask questions about the study. The privacy of the

respondents and the confidentiality of the data were protected. Participation was entirely voluntary, and the researchers offered the option to withdraw without repercussions. All participants in any part of the study signed an informed consent after receiving detailed information about the study.

2.3. Scale Development. The development of the items of the scale was performed using a literature review and nurses' interviews. The researchers first defined the tool's construct to guide the item generation. According to the American Association of Colleges of Nursing, nursing scholarship is "the generation, synthesis, translation, application, and dissemination of knowledge that aims to improve health and transform health care" [25]. Scholarly publishing is "the process of scholarly writing being created, peer-reviewed, and disseminated to the scholarly community via reputable sources such as peer-reviewed journals" [26]. "Nurses" in this context are licensed professional nurses practicing nursing in any setting, such as clinical, higher education, and community. The development of this new scale addresses the limitations of existing tools by explicitly focusing on nurses' attitudes in the context of scholarly publishing, which are often overlooked in broader research attitude assessments. It offers a unique perspective by incorporating different aspects of scholarly publishing. It provides a comprehensive measure of nurses' attitudes towards publishing that can be directly linked to practical interventions and policy improvements.

Considering all the definitions provided above, we conducted a literature search in different databases, including Scopus, Medline, EBSCO, and Clarivate Analytics, for studies that used scales to measure the construct of interest. From the retrieved articles, we extracted 57 items related to attitudes toward scholarly publishing. These were the attitudinal items related to the construct of the scale being developed.

We also conducted semistructured interviews among 15 nurses from the Philippines to generate additional items for the scale. Data saturation was achieved in the 15th nurse. To ensure rich data on the nurses' experience of scholarly publishing, we included nurses who had experienced conducting research and who were aware of and had experienced the scholarly publication process. A purposive sampling technique was used to recruit the participants. The participants were recruited by sending a recruitment email to the potential participants. Those who agreed to participate were asked to contact the researchers. The interview date and time were set based on the preferences of the interviewees. An electronic informed consent was signed by the participants. The interviews were performed online using Zoom meetings by two of the researchers. The following were guide questions during the interviews: (1) Can you describe your experience publishing your nursing research? (2) What are the facilitating and hindering factors in publishing nursing research? (3) How do you perceive scholarly publishing? (4) Do your colleagues' perceptions affect your attitudes toward scholarly publishing? Moreover, (5) What are your recommendations to improve scholarly publishing in nursing? The data were analyzed using a thematic approach [27]: "familiarization with the data, coding the data, determining patterns among the codes and beginning the development of the themes, reviewing the themes by going back to the data and comparing the themes against the data, defining and naming the themes, and writing the thematic analysis." To address the researchers' prejudices, ongoing testing of pre-research assumptions was conducted during the data interpretation by performing comparisons of the assumptions and the findings. The researchers and two external evaluators reviewed the transcripts. To ensure credibility, the interpretations of the interviews were presented to the participants for validation. They were asked to evaluate whether the findings reflected their experiences. They were also asked whether the interpreted statements reflected their meaning when they were interviewed. The analysis derived five major themes from the data describing NAS. These themes were: (1) confidence and motivation in publishing, (2) importance and value of publishing, (3) challenges and barriers in publishing, (4) support systems and collaboration in publishing, and (5) attitudes and awareness about the publication and peer review processes. From each identified theme, we developed potential items from the interview data that reflect the nurses' attitudes related to that specific theme. For instance, under the theme "Importance and value of publishing," we developed the item "Scholarly publications play an essential role in developing nursing policy and decision-making" based on the nurses' verbatims. The item "Writing a scholarly manuscript for a peer-reviewed journal is too difficult for me" was created under the theme "Challenges and barriers in publishing." From this process, 85 items that relate to attitudes toward scholarly publishing were extracted.

Hence, a total of 142 items were generated and included in the pool of items. The researchers then critically checked each of the 142 items. In this process, they compared all items for similarity in wording and content, re-examined each item for relevance to the scale's construct, and considered each item's clarity. Where appropriate, similar items or items implying the same meanings were combined into a single, more comprehensive item. Some items were deleted because they were duplicates. After this process, 88 items were removed from the item pool, leaving 54 items for the scale.

2.4. Psychometric Properties Analysis

2.4.1. Content Validity. The 54 items were then presented to seven nurse experts using an online survey to evaluate their content validity. The seven nurse experts were either nurse researchers, at least an Assistant Professor rank, a clinician, or a journal editor. The experts were asked to evaluate the relevance of the 54 items to the construct "NAS." The definitions we used to define our construct were presented to the experts to guide their evaluation. Following the recommendations of Polit, Beck, and Owen, the experts evaluated each item from 1, "not relevant," to 4, "highly relevant"

[28]. The experts' evaluation was analyzed for the "Item-level CVI" (I-CVI) and "scale-level CVI" (S-CVI/Ave) of the scale. We also provided space for any comments and suggestions for each item in the tool. There were suggestions to reword the items to make them attitudinal statements, which we implemented in the items. The calculation of the I-CVI revealed that 24 items had I-CVI ranging from 0.43 to 0.71, which was below the recommended acceptable value of 0.78 for three or more experts. CVI is an inter-rated agreement measurement. According to Polit Polit, Beck, and Owen [28], an I-CVI below 0.78 demonstrates that the item was not a good operationalization of the underlying construct. Hence, these items were deleted from the item pool. The remaining 30 items had I-CVI from 0.86 to 1.00 and an S-CVI/Ave of 0.90, indicating acceptable content validity [28]. After this process, the remaining 30 items were deemed highly relevant to the scale's contract and excellent operationalizations of the scale's underlying construct based on the experts' opinions.

2.4.2. Pilot Testing. The tentative scale was subjected to a pilot test among 40 nurses. Data were collected from January to February 2024 using a paper-and-pen questionnaire containing demographic characteristics questions and the 30-item scale. The following were the inclusion criteria: (1) registered nurse in the Philippines, (2) currently working in nursing-related professions (i.e., clinical nurses, nursing professors, and community health nurses) in the Philippines, and (3) had some level of awareness about scholarly publishing. The nurses were asked to answer the survey based on their attitudes toward scholarly publishing in nursing. A comment section was provided in each item to elicit any suggestions or comments from the nurses. Among the surveyed nurses, the average age was 42.78 (SD = 13.53) years. Ten (25.0%) were males and 30 (75.0%) were females. Twelve nurses had a Bachelor of Science in Nursing (BSN), 20 had a master's degree, and eight had a doctorate. Nineteen respondents worked as nurses in hospitals, 20 worked in higher education, and one in the community. The mean years of work experience was 19.25 (SD = 12.12). The computed Cronbach's alpha of the 30-item scale was 0.91. The respondents reported that the items were straightforward. Hence, no changes were made in the scale.

2.4.3. EFA and CFA. A cross-sectional study design was utilized to execute the EFA and the CFA. A convenience sample of 334 nurses working in Manila, Philippines, was included for the EFA, whereas 305 nurses working in the country's northern region were included in the CFA samples. Convenience sampling is a "nonprobability sampling method where samples who are accessible and available to participate in a study are enrolled by the researchers [29]." Although the literature does not have a consensus on the required sample size for factor analysis, Tabachnick and Fidell recommended that the sample size be at least 300 [30]. Thus, the sample sizes for the EFA and CFA were adequate [31]. The inclusion criteria used in the pilot testing were also implemented, but those included in the pilot test were excluded from EFA samples. Those who were part of the pilot test and EFA sample were excluded from the CFA samples. The EFA data were collected in February 2024, whereas the CFA data were collected in March 2024.

A paper-and-pen survey containing the demographic characteristics questions and the NAS Scale was used to collect data for the EFA. A five-point Likert scale from 1 "strongly disagree" to 5 "strongly agree" was used as the response options for the NAS Scale. The following variables were inquired in the demographic characteristics part of the survey: age, gender, education, nature of work, years of experience as a nurse, years of experience in the current work, managerial/leadership role, inclusion of research in job description, conducted research in the last 12 months, level of awareness about scholarly publication process, attendance to educational activities on nursing research and publication in the previous 12 months, publication of any scholarly work in the last 12 months, and perceived importance of disseminating scholarly findings (i.e., research and quality improvement projects) through peer-reviewed journals in nursing. For the CFA data collection, an online survey using Survey Monkey was used to collect data from the respondents.

During the EFA data collection period, a researcher initially approached colleagues and friends who met the inclusion criteria and recruited them to the study. The researcher then asked them for referrals and invited them to participate in the study. Study information, participants' rights, and expected participation were explained to the respondents before asking them to sign an informed consent. Those who agreed to participate were handed the survey and instructed to return it to the researcher after completing it. The average time to answer the survey was from 10 to 15 min. For the CFA, the survey link was distributed to potential participants through social media and personal communication. The first part of the survey included electronic informed consent, and participants were asked to signify their agreement or disagreement to participate at the end of the consent. Those who clicked "I do not agree" were automatically exited from the survey. Those who clicked "I agree" were brought to the online survey.

The EFA sample data were entered in SPSS version 24.0 for analyses. Descriptive statistics were used to analyze the demographic characteristics. Before conducting the EFA, the item-to-total correlation (ITC), Cronbach's alpha if an item is deleted, and communalities were examined. Items with ITC values below 0.30 and communalities less than 0.50 were dropped from the scale [32]. The "Kaiser–Meyer–Olkin index" (KMO $\geq$ 0.60) and the "Barlett's test of sphericity" were estimated for "sampling adequacy" and the "appropriateness of the factor models," respectively [32]. The maximum likelihood was used for the EFA, and Varimax rotation was used as the rotation method. The researchers used the Eigenvalue and the Scree plot to identify how many factors should be extracted. Factors with an Eigenvalue above one were extracted. This is based on the rationale that a factor should explain more variance than a single observed variable. The Scree plot was also examined to identify the number of factors to be extracted. The researchers identified

the point where the curve starts to flatten (also known as the "elbow"). The number of factors above this point was retained. Factor loading ≥ 0.40 was also considered [32, 33].

For the CFA, descriptive statistics were used to analyze the demographic characteristics using the SPSS version 24.0. The CFA was performed using the covariance-based structural equation modeling (CB-SEM) in the online software SmartPLS 4. SmartPLS four is flexible in specifying complex models and handling both reflective and formative constructs, which is crucial for the multifaceted nature of the NAS scale. Its robustness to non-normal data and use of bootstrapping techniques ensures reliable and valid results. The software's user-friendly interface, comprehensive model assessment tools, and strong support for exploratory and confirmatory analyses make it particularly advantageous for developing and validating new scales. These features collectively enhance the accuracy and interpretability of the research findings [34]. The CFA model fit was determined using these parameters: "ratio between the model's chi-square and degrees of freedom (limit of 3)", "root mean square error of approximation" (RMSEA) and "Standardized Root Mean Square Residual" (SRMR) less than 0.08 [35], and "comparative fit index" (CFI), "Tucker Lewis index" (TLI), and "Normed Fit Index" (NFI) above 0.90 [36]. These indices are essential to report to signify a model fit [37].

2.5. Hypothesis Testing. We conducted hypothesis testing to support the construct validity of the NAS Scale [38]. We hypothesized that nurses with higher educational qualifications (i.e., graduate programs) have more positive attitudes toward scholarly publishing. We also hypothesized that nurses with research in their job description, who conducted research in the last 12 months, attended educational activities in nursing research and scholarly publishing in the previous 12 months, and published any scholarly work in a peer-reviewed journal in the last month have more positive attitudes towards scholarly publishing than nurses who do not have the same characteristics or experiences. Another hypothesis that we tested to support the construct validity of the tool was that nurses who had a higher level of awareness about scholarly publishing and higher perceived importance of disseminating scholarly findings (through peer-reviewed journals in nursing) had more positive attitudes towards scholarly publishing.

We used the combined data from the EFA and CFA samples to test these hypotheses. Using the SPSS version 24.0, an Independent samples *t*-test was used to analyze the differences in attitudes toward scholarly publishing between educational qualification (bachelor versus graduate programs), inclusion of research in job description (yes versus no), conduct of research in the last 12 months (yes versus no), attendance of educational activities in nursing research and scholarly publishing in the previous 12 months (yes versus no), and publication of any scholarly work in the last 12 months (yes versus no). Pearson's product-moment correlation was performed to test the association between the nurses' scholarly publishing awareness levels and the perceived importance of disseminating scholarly findings through peer-reviewed journals and their attitudes toward scholarly publishing.

2.6. Reliability of the Scale. The computation of Cronbach's alpha supported the scale's reliability. The Cronbach's alpha of the entire scale and its subscales was computed using the combined EFA and CFA samples. A Cronbach's alpha of 0.70 and above was deemed acceptable [39].

3. Results

3.1. Demographic Characteristics of the Respondents. The respondents' characteristics for the EFA and CFA samples are reflected in Table 1. The mean age in the EFA group was 38.77 (SD = 10.35) years, while the mean age in the CFA group was 37.98 (SD = 8.24) years. In both groups of samples, the majority were females, working in the clinical settings, with no managerial or leadership role, did not conduct research in the last 12 months, did not attend any educational activities in scholarly publishing in the last 12 months, and did not publish any scholarly work in a peer-reviewed journal in the last 12 months. The average level of awareness about the scholarly publication process in the EFA and CFA groups was 5.41 (SD = 2.16) and 4.19 (SD = 3.05), respectively. For the perceived importance of disseminating scholarly findings through peer-reviewed journals in nursing, the mean score in the EFA and CFA groups was 8.74 (SD = 1.73) and 6.17 (SD = 3.94), respectively.

3.2. EFA and CFA Results. The item analysis revealed 10 items with ITC values below 0.30. Additionally, eight (8) items had communalities below 0.50. Hence, these items were deleted from the scale, leaving 12 items for the factor analysis. As reflected in Table 2, the ITC values of the remaining items ranged from 0.36 to 0.70. When deleted, none of the remaining items caused a 10% increase in the scale's Cronbach's alpha. Also, the communalities were from 0.54 to 1.00.

The KMO value was 0.809, and Bartlett's test of sphericity was significant ($x^2 = 2795.96$, $df = 66$, $p < 0.001$). In Table 3, three district factors, with Eigenvalue above 1.00 and factor loading above 0.40, were extracted. The Scree plot of the EFA model is shown in Figure 1. This model explained a cumulative variance of 75.2%. Five items loaded heavily (factor loadings = 0.707–0.880) in factor 1, contributing 41.0% of the overall variance. Four items were loaded in factor 2 (factor loadings = 0.675–0.965), contributing 23.3% of the explained variance. Finally, three items were loaded in factor 3 (factor loadings = 0.763–0.812), explaining 10.9% of the cumulative variance in the model.

Figure 2 reflects the CFA model for the 12-item NAS Scale. The following model fit indices were derived from the analysis: $x^2/df = 2.96$, $RMSEA = 0.08$ (90% CI = 0.06–0.09), $SRMR = 0.057$, $NFI = 0.96$, $TLI = 0.96$, and $CFI = 0.97$. Based on the constructs of the items that loaded in the factors, factor 1 was labeled "NAS Challenges" (NAS Challenges),

Table 1: Demographic characteristics of the samples.

Variable	Exploratory factor analysis data ($n = 334$)		Confirmatory factor analysis data ($n = 305$)	
	Mean (SD)	Range	Mean (SD)	Range
Age	38.77 (10.35)	22.00–70.00	37.98 (8.24)	21.00–69.00
Years of experience as a nurse	15.39 (9.56)	1.00–48.00	13.35 (8.60)	0.00–48.00
Years of experience in the current workplace	6.07 (5.51)	1.00–21.00	5.31 (5.50)	0.00–30.25
Level of awareness about the scholarly publication process (0–10 scale)	5.41 (2.16)	1.00–10.00	4.19 (3.05)	1.00–10.00
Perceived importance of disseminating scholarly findings (i.e., research and quality improvement projects) through peer-reviewed journals in nursing (0–10 scale)	8.74 (1.73)	2.00–10.00	6.17 (3.94)	0.00–10.00
Gender	*n*	%	*n*	%
Male	99	29.6	86	28.2
Female	235	70.4	216	71.8
Education				
Bachelor of science in nursing	160	47.9	201	65.9
Master's level (nursing and related field)	131	39.2	86	28.2
Doctorate level (nursing and related field)	43	12.9	18	5.9
Nature of work				
Clinical setting (i.e., hospital and clinic)	221	66.2	175	57.4
Academia (i.e., university and college)	101	30.2	112	36.7
Community setting (i.e., rural health units)	12	3.6	18	5.9
With managerial/leadership role in the workplace				
No	187	56.0	194	63.6
Yes	147	44.0	111	36.4
Job description includes research				
No	175	52.4	172	56.4
Yes	159	47.6	133	43.6
Conducted research in the last 12 months				
No	202	60.5	193	63.3
Yes	132	39.5	112	36.7
Attended any educational activities (i.e., seminars and training) on nursing research in the last 12 months				
No	142	42.5	104	34.1
Yes	192	57.5	201	65.9
Attended any educational activities (i.e., seminars and training) on scholarly publishing in the last 12 months				
No	213	63.8	210	68.9
Yes	121	36.2	95	31.1
Published any scholarly work in a peer-reviewed journal in the last 12 months				
No	284	85.0	266	87.2
Yes	50	15.0	39	12.8

Abbreviation: SD, standard deviation.

Table 2: Item descriptive analysis of the final Nurses' Attitudes Towards Scholarly Publishing Scale (NAS Scale) ($n = 334$).

Item	Mean	SD	Item-total correlation	Cronbach's alpha is item is deleted
Q13	2.54	1.04	0.70	0.83
Q15	2.52	1.10	0.66	0.83
Q8	2.30	1.02	0.53	0.84
Q20	2.49	1.12	0.62	0.83
Q10	3.02	1.03	0.62	0.83
Q3	4.73	0.47	0.44	0.85
Q4	4.73	0.46	0.47	0.85
Q2	4.68	0.49	0.48	0.84
Q7	4.66	0.51	0.36	0.85
Q11	4.63	0.68	0.51	0.84
Q14	4.61	0.60	0.49	0.84
Q16	4.58	0.62	0.54	0.84

Abbreviations: NAS = Nurses' Attitudes Towards Scholarly Publishing, SD = standard deviation.

Table 3: Results of the exploratory factor analysis ($n = 334$).

Item	Communalities	Factor 1 NAS challenges	Factor 2 NAS benefits and values	Factor 3 NAS support and mentorship
13. Preparing all the requirements for scholarly publishing is frustrating	0.79	0.880		
15. The long waiting time for the entire publication process is discouraging	0.65	0.789		
8. Searching for an appropriate journal to publish can be frustrating	0.58	0.754		
20. Writing a scholarly manuscript for a peer-reviewed journal is too difficult for me	0.55	0.722		
10. I do not have the patience to wait for the long process of editing my paper for publication	0.54	0.707		
3. Publishing scholarly materials (i.e., research and quality improvement) contributes to advancing the nursing profession	1.00		0.965	
4. Scholarly publication educational activities (i.e., webinars, seminars, courses, and training) are desirable in improving knowledge and skills in scholarly publication	0.81		0.865	
2. I value scholarly publications as professional achievements	0.55		0.693	
7. Scholarly publications play an essential role in developing nursing policy and decision-making	0.50		0.675	
11. I value the importance of having a mentor with experience in scholarly publishing	0.78			0.812
14. Getting feedback and critique from a research expert before submitting my scholarly work to a journal is essential	0.73			0.808
16. I appreciate the reviewer's comments as they contribute significantly to improving the quality of my work	0.69			0.763
Eigenvalue		4.92	2.80	1.31
Variance explained (%)		41.0	23.3	10.9
Cumulative variance (%)		41.0	64.3	75.2

Abbreviation: NAS = Nurses' Attitudes Towards Scholarly Publishing.

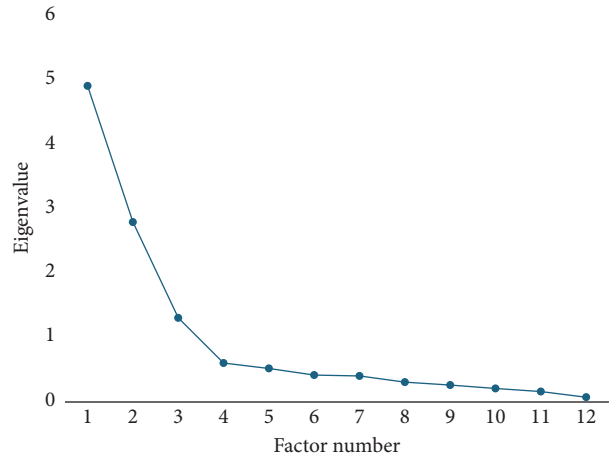

FIGURE 1: Scree plot for the exploratory factor analysis.

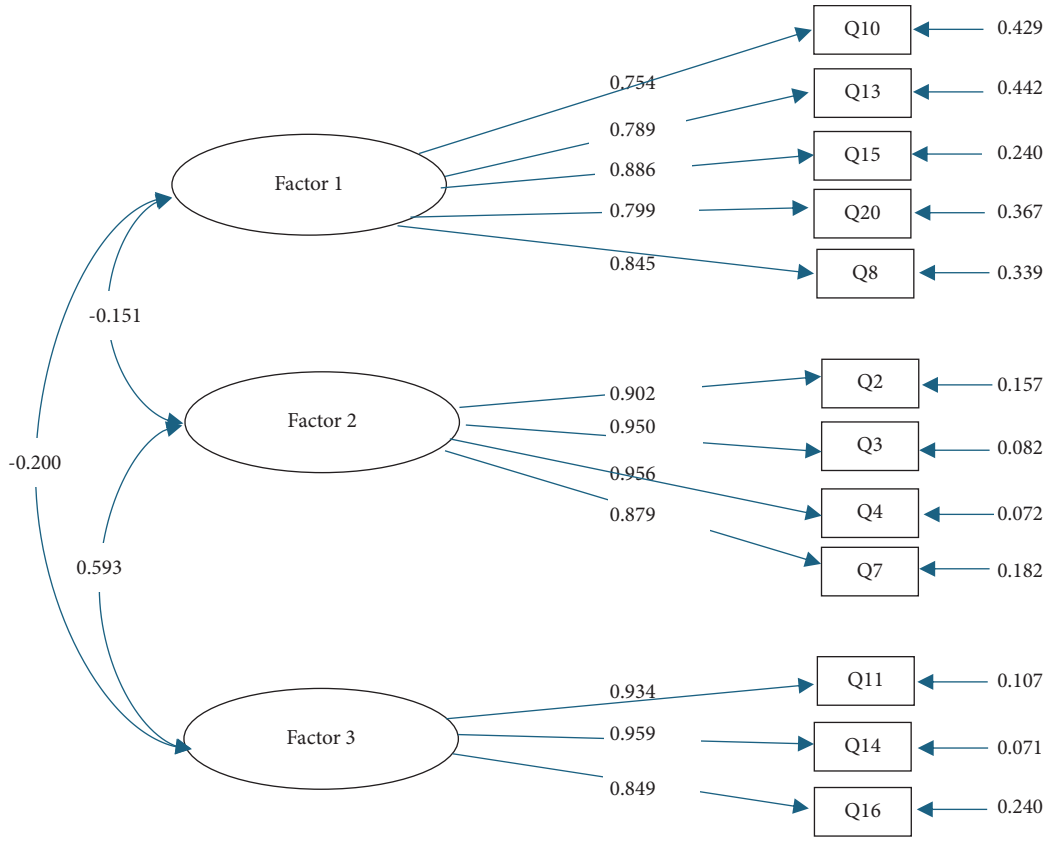

FIGURE 2: Confirmatory factor analysis.

factor 2 was named "NAS Benefits and Values" (NAS Benefits and Values), and factor 3 was labeled "NAS Support and Mentorship" (NAS Support and Mentorship).

3.3. Hypothesis Testing Results. As indicated in Table 4, the analysis revealed that nurses with a graduate program degree ($M = 3.85$, SD = 3.77) had more positive attitudes than nurses with a BSN degree ($M = 3.77$, SD = 0.52, $t = -2.16$, $p = 0.031$). Nurses who had research a part of their job description ($M = 3.85$, SD = 0.50) possessed more positive attitudes than those without research in their job description ($M = 3.77$, SD = 0.53, $t = -1.98$, $p = 0.048$). Nurses who attended education activities on nursing research ($t = -2.68$, $p = 0.008$) and scholarly publishing ($t = -2.58$, $p = 0.010$) were more positive about scholarly publishing than those without similar experiences. The nurses who published any scholarly work in a peer-reviewed journal in the last 12 months ($M = 3.92$, SD = 0.51) had more positive attitudes toward scholarly publishing than those who did not have a publication experience ($M = 3.79$, SD = 0.51, $t = -2.28$, $p = 0.023$).

Table 4: Hypothesis testing results ($n = 639$).

Variable	Mean	SD	Statistical test	p
Education				
Bachelor of science in nursing ($n = 361$)	3.77	0.52	$t = -2.16$	0.031*
Graduate (master's and doctorate) ($n = 278$)	3.85	0.51		
Job description includes research				
No ($n = 347$)	3.77	0.53	$t = -1.98$	0.048*
Yes ($n = 292$)	3.85	0.50		
Conducted research in the last 12 months				
No ($n = 395$)	3.75	0.53	$t = -3.18$	0.002**
Yes ($n = 244$)	3.89	0.49		
Attended any educational activities (i.e., seminars and training) on nursing research in the last 12 months				
No ($n = 246$)	3.74	0.54	$t = -2.68$	0.008**
Yes ($n = 393$)	3.85	0.49		
Attended any educational activities (i.e., seminars and training) on scholarly publishing in the last 12 months				
No ($n = 423$)	3.77	0.52	$t = -2.58$	0.010*
Yes ($n = 216$)	3.88	0.49		
Published any scholarly work in a peer-reviewed journal in the last 12 months				
No ($n = 550$)	3.79	0.51	$t = -2.28$	0.023*
Yes ($n = 89$)	3.92	0.51		
Level of awareness about the scholarly publication process (0–10 scale)			$r = 0.37$	< 0.001***
Perceived importance of disseminating scholarly findings (i.e., research and quality improvement projects) through peer-reviewed journals in nursing (0–10 scale)			$r = 0.31$	< 0.001***

Abbreviation: SD, standard deviation.
*Significant at 0.05 level, **Significant at 0.01 level, ***Significant at 0.001 level.

There was a moderate and positive correlation between the NAS and their level of awareness about the scholarly publication process ($r = 0.37$, $p < 0.001$). There was also a moderate and positive correlation between the nurses' attitudes and the perceived importance of disseminating scholarly findings through peer-reviewed journals in nursing ($r = 0.31$, $p < 0.001$).

Table 5: Internal consistency reliability of the scale ($n = 639$).

Variable	Cronbach's alpha
Factor 1: NAS Challenges	0.91
Factor 2: NAS Benefits and Values	0.95
Factor 3: NAS Support and Mentorship	0.92
NAS Scale	0.79

Abbreviation: NAS = Nurses' Attitudes Towards Scholarly Publishing.

3.4. Reliability Results. The computed Cronbach's alpha for the entire scale was 0.79. For its subscales, the computed Cronbach's alpha for "NAS Challenges" was 0.91, while for "NAS Benefits and Values" and "NAS Support and Mentorship" was 0.95 and 0.92, respectively (see Table 5).

4. Discussion

This study developed the NAS Scale, which can be used to assess NAS. Specifically, it assessed the NAS Scale's reliability and validity in the context of Filipino nurses. Several noteworthy findings were reported in this study.

The results of the EFA shed light on the structure of the NAS Scale. The item analyses conducted before EFA revealed 10 items exhibiting weak ITC values below 0.30 and eight having communalities below 0.50, indicating poor contribution towards the scale [32, 40]. These items were removed, aligning with standard practices in psychometric evaluation, ensuring the scale's structural validity [32, 40]. Deleting items with low ITC values and communalities improves the scale's internal consistency and construct validity. By removing items that do not correlate well with the overall scale or share variance with the common factors, the remaining items better represent the intended construct, leading to a more reliable and valid measure [33]. The KMO value was 0.809, which was suitable for factor analysis. The EFA resulted in three distinct factors, each exceeding an eigenvalue above 1.00 and factor loadings above 0.40, which abide by the recognized guidelines in factor analysis [32]. This implies three distinct areas of scholarly publication where nurses' attitudes could be measured to provide general attitudes toward scholarly publication. These factors were identified based on the patterns of loadings, with each item strongly loading onto one of these three factors, indicating a clear structure within the scale. The first factor, "NAS Challenges (NAS Challenges)," covers the nurses' attitudes toward the perceived challenges and barriers they may face while engaging in scholarly publication activities. The items clustered in this factor were related to the difficulties and hindrances faced during various stages of publication, such as manuscript preparation, submission, peer review, and editing. This dimension is consistent with previous studies. For instance, Hakami reported that nurses experience different barriers in conducting and publishing scientific research, including lack of training, language-related challenges, and work pressures [41]. Another study reported

a lack of time, writing experience, and getting started as significant barriers to scholarly productivity among nurses [42]. The next factor, "NAS Benefits and Values (NAS Benefits and Values)," presents nurses' attitudes toward the significance and advantages of scholarly publications. This factor focuses on understanding scholarly publications' positive outcomes and contributions to the nursing profession, professional development, knowledge enhancement, policy development, and decision-making processes. A previous study supports this dimension. According to an earlier study, nurses value the benefits of scholarly publications as they are helpful in learning and applying what they have learned and in elaborating clinical protocols and guidelines. The same study elaborated that there will be no improvement in knowledge, nursing competencies, and care without scientific research publications [4]. The third factor, "NAS Support and Mentorship (NAS Support and Mentorship)," represents nurses' attitudes toward the support and guidance available while preparing for scholarly publication. This factor underscores the nurses' attitudes toward the importance of having experienced mentors in scholarly publishing, seeking feedback from research experts, and valuing reviewers' comments to improve the quality of scholarly work. The literature supports the significance of support and mentorship for nurses to be successful in scholarly publishing. According to a previous study, creating a culture of publication in clinical settings can be achieved through "mentoring, role modeling, education, securing appropriate resources, and celebration/recognition," which is consistent with this dimension [43].

The CFA results further support the NAS Scale's structural validity. The CFA model had a 2.96 $\chi 2$/df ratio, which was less than 3, suggesting a good fit [38]. Likewise, the RMSEA results yielded a 0.08 value, suggesting a reasonable fit, with values below 0.08 indicating a good fit [35, 44]. The SRMR value of 0.057 was less than the cut-off value of 0.08, supporting a good model fit [35]. Hu and Bentler state that an SRMR below 0.08 indicates a good fit [44]. The NFI, TLI, and CFI values were above 0.95 (above the minimum value of 0.90), exhibiting a good fit [36]. Hu and Bentler reported that values closer to one indicate a better fit [44]. Thus, the overall CFA results on the NAS Scale demonstrate an acceptable model fit, suggesting that the scale effectively captures nurses' attitudes toward scholarly publishing in three dimensions [45].

The hypotheses testing also supports the tool's construct validity. The findings revealed significant associations between the nurses' demographic characteristics and scholarly publishing attitudes, which the study hypothesized. Specifically, the findings revealed that nurses with a better understanding of the scholarly publication process tended to have more positive attitudes toward scholarly publishing. These results reflect those of Johann [46] and Berezko et al. [47], who have highlighted the importance of knowledge and understanding of the publication process in fostering positive attitudes toward scholarly activities. Wang, Ai, and Kostogriz noted that collaborative efforts provide a better understanding of the scholarly publication process; thus, collaboration between healthcare professionals should be acknowledged in writing for publications [48]. Another finding noted a significant association between nurses' attitudes and the perceived importance of disseminating scholarly findings through peer-reviewed journals. This means that nurses who think that sharing research findings through peer-reviewed journals have a more favorable attitude towards scholarly publication. This finding is consistent with previous studies emphasizing the importance of publishing research studies in academic journals [46]. These findings underscore the critical role of understanding scholarly publications and disseminating scholarly findings among nurses, thereby recognizing the value of scholarly research dissemination in nursing practice [49]. The findings also showed that nurses who finished a graduate program and those with research included in their job description had more positive attitudes than bachelor's degree graduates and those without research in their job description, respectively. These findings corroborate previous findings. For instance, a study in Kenya revealed that nurses with higher education (i.e., master's and PhD) reported higher research publications than those with bachelor's degrees [49], indicating that nurses with a graduate degree have more positive attitudes toward scholarly publishing due of their experience in research and publishing. Integrating research into the job description of nurses is one way of institutionalizing research and ensuring a positive nursing research culture. Having research as part of nurses' official roles and responsibilities will drive more nurses to be involved in research and publication, improving the attitudes toward scholarly publishing [50]. Hence, nursing education and professional development programs are imperative in enhancing nurses' engagement in scholarly activities [43, 49].

Finally, the NAS Scale exhibited an acceptable Cronbach's alpha (> 0.70) for the entire scale and its three sub-scales, indicating good internal consistency reliability. This finding means that items within the scale correlate, demonstrating consistency in measuring distinct attitudes toward scholarly publishing. Likewise, DeVellis and Thorpe reported that Cronbach's alpha of more than 0.70 indicates good reliability [33]. Thus, the NAS is reliable for measuring NAS.

4.1. Implications. The tool can be used in clinical, academic, and community settings to assess the NAS. Healthcare institutions and educational programs can use the NAS Scale to identify barriers and provide targeted interventions to enhance nurses' skills in research and publishing. The data collected using this tool can inform the creation of policies and interventions to ensure nurses' positive attitudes toward scholarly publishing, contributing to nursing research dissemination and utilization. Specifically, this can guide curriculum design, professional development, and policy-making to foster a positive research culture and improve research dissemination. NAS Scale can be used as a measure of the outcome of interventions to improve the NAS. Regularly using the scale can help track progress and adjust strategies to support nurses in scholarly activities better. This tool can also contribute to a holistic assessment of the culture of nursing research since the tool can assess an individual factor (i.e., attitudes toward scholarly publishing) contributing to a positive culture of nursing research in hospitals and academia.

4.2. Limitations. The study is limited in several ways. First, the scale's items require some degree of awareness about the scholarly publication process, making the scale inappropriate for assessing the attitudes of nurses unaware of scholarly publishing. Second, a non-probability sampling technique was used, which may have led to self-selection bias and limitation in the findings' generalizability. Nurses who decided to participate may had characteristics or attitudes that were not representative of the entire population of nurses. Also, because sampling selection was not randomly conducted, the findings may not represent the scholarly publishing of the whole population of nurses. Hence, caution should be taken when using the study findings. Third, construct validity was only supported by the hypothesis testing method. Other construct validity methods should be conducted to support the findings. Fourth, Cronbach's alpha assumes unidimensionality and equal factor loadings, which can be problematic for multidimensional constructs, leading to an underestimation of reliability. It is also sensitive to the number of items and inter-item correlations, potentially misrepresenting the actual reliability of complex scales. To address these limitations, it is recommended to use complementary measures like composite reliability and report additional indices such as McDonald's omega. Fifth, although English is commonly used in the Philippines, English not being the first language may have influenced the study results. However, the pilot test revealed that the items were easily understandable. Focusing the study on a specific demographic (i.e., Filipino nurses) may have some cultural inclusions that influence attitudes toward scholarly publishing, such as cultural norms, values, and professional practices in the Philippines that may differ from those in other countries. Additionally, the work environment and culture, available resources, and institutional support for scholarly activities in the country may vary from those in other countries. These differences may affect the applicability of the findings to nurses in different cultural contexts. Therefore, future research should test the scale's psychometric properties in other languages, contexts, and countries to strengthen and support the validity and reliability of the scale. Fifth, the scale's validity was established using content, structural, and construct (i.e., hypothesis testing method) validity. Although these provide solid evidence of the scale's validity, other methods of construct validity, such as convergent and divergent validity, discriminant validity, and known-groups validity, are recommended to further demonstrate the tool's validity. Sixth, the scale's reliability was only supported by internal consistency reliability; other reliability measures (i.e., test and re-test reliability) are recommended in future studies.

5. Conclusions

The study tested the psychometric properties of the NAS Scale among nurses in the Philippines. The tool's validity and reliability supported the tool's ability to assess NAS in the Philippines. The tool was found to be accurate in what it measures and consistent in its results, making it a reliable way to understand nurses' attitudes toward publishing research. Moreover, the study supported the three subscales of the instrument, namely, "NAS Challenges," "NAS Benefits and Values," and "NAS Support and Mentorship." The newly developed tool provides a valid and reliable measurement of NAS. This tool can assess NAS with some degree of awareness about publishing.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

Jonas Preposi Cruz serves as an academic editor of the journal. However, he is not involved in any way in the review process of the paper. The other authors declare no conflicts of interest.

Author Contributions

Study conception and design: Jonas Preposi Cruz, Joseph U. Almazan, Paolo C. Colet. Data collection: Jovencio M. Milan Jr., Fritz Gerald V. Jabonete, Ejercito Mangawa Balay-Odao. Data analysis and interpretation: Jonas Preposi Cruz, Joseph U. Almazan, Ejercito Mangawa Balay-Odao. Drafting of the article: Jonas Preposi Cruz, Joseph U. Almazan, Paolo C. Colet, Jovencio M. Milan Jr., Ejercito Mangawa Balay-Odao. Critical revision of the article: All Authors. Final approval of the version to be published: All Authors. Agreement to be accountable for all aspects of the work: All Authors.

Funding

The research was supported by Nazarbayev University (10.13039/501100012632). This work is part of a project supported through the Social Policy Research Grant (PI: JPC) provided by the School of Medicine, Nazarbayev University, Astana, Kazakhstan.

Acknowledgments

The researchers acknowledge all the nurses who participated in this study. The research was supported by Nazarbayev University (10.13039/501100012632). This work is part of a project supported through the Social Policy Research Grant (PI: JPC) provided by the School of Medicine, Nazarbayev University, Astana, Kazakhstan.

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