

Validation of questionnaire on knowledge, attitude, practice of peptic ulcer patients to design pharmacist consultation model

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ABSTRACT

Validated structured questionnaires to assess peptic ulcer patients' Knowledge, Attitudes, and Practices (KAP) are very limited. Therefore, we developed and validated a questionnaire to design a pharmacist counseling model for peptic ulcer patients. By providing appropriate pharmacist counseling. We divided the study into two stages, namely, in the first stage, we designed a questionnaire by developing a framework, compiling question items, measuring the individual item content validity index (I-CVI), and selecting items that are most related to the level of understanding of peptic ulcer patients. In the next stage, we tested the validity of the questionnaire on 101 patients who were indicated to have or were experiencing peptic ulcers using the Statistical Package for the Social Sciences (SPSS). To test its reliability, we used Cronbach's alpha. At the design stage, we determined 46 question items, consisting of 6 sociodemographic question items, 15 question items about patient knowledge, 15 question items about patient attitudes, and 10 question items about patient practices. Furthermore, from the 46 designed question items, we determined the Individual Content Validity Index (I-CVI) score for the Knowledge, Attitude, and Practice (KAP) question items. Our results were worth one, meaning all question items were 100% valid. The Cronbach's alpha coefficients for the KAP items were 0.971, 0.970, and 0.971 ($p < 0.01$), respectively. This study shows that the questionnaire designed and developed is a valid and reliable instrument to assess KAP in gastric ulcer patients.

Keywords: Knowledge, Practice, Attitude counseling, Peptic ulcer

Introduction

Peptic ulcer disease has emerged as a major global health concern, leading to a significant number of hospitalizations and extensive use of healthcare resources worldwide. It typically affects the stomach and the upper duodenum, causing acid-induced damage to the digestive system and potentially resulting in complications like perforation and bleeding [1, 2]. Peptic ulcers are a disease resulting from disorders of the upper gastrointestinal tract caused by the gastric mucosa's excessive secretion of acid and pepsin (Malik *et al.*, 2024, adapted from

Avunduk). Peptic ulcer disease can result from various factors, including smoking, fast food consumption, alcoholic beverages, and the use of NSAIDs (Non-Steroidal Anti-Inflammatory Drugs), and helicobacter pylori [3].

Based on research results, the types of drugs used for peptic ulcer patients were 2.94% omeprazole, 73.53% pantoprazole, 26.47% lansoprazole, 5.89% ranitidine, 58.82% antacids, and 85.29% sucralfate. The results of the rationality evaluation obtained 100% correct indication, 55.88% correct drug, 97.06% correct patient, and 61.76% correct dose. Overall, treatment that meets the four rational treatment criteria is 78.68% [4].

Treating peptic ulcers aims to improve the patient's quality of life, eliminate complaints, heal ulcers, and prevent recurrence and complications [3, 5]. The most appropriate treatment for peptic ulcer disease depends on the cause. Peptic ulcer treatment will be more appropriate if we know the cause. Inaccuracy of indications, drugs, patients, and doses can cause therapy failure. [4, 5]. According to Santika *et al.* (2019), there were 43 inpatients diagnosed with peptic ulcers at Sultan Syarif Mohamad

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Alkadrie Regional Hospital, Pontianak City, in 2017, with an incidence rate of 0.88% of the total inpatients in one year. Meanwhile, cases of peptic ulcers at Kimia Farma pharmacies have not been adequately recorded. However, there are many medicines for peptic ulcers sold, so it is estimated that cases of peptic ulcers are still occurring. Meanwhile, Miftahussurur *et al.* (2021) said few patients suffer from peptic ulcer disease. Still, this disease cannot be taken lightly because, if left unchecked, it can cause recurrence and more severe complications such as stomach cancer, bleeding, and even death [5, 6].

There is not much research focusing on knowledge, attitudes, and practices (KAP) regarding peptic ulcers, one of which is research in Sharjah, United Arab Emirates, on patients with peptic ulcers and gastric cancer caused by *H. pylori*. General awareness of gastric ulcers and cancer caused by *H. pylori* remains poor. The findings of this research can serve as a foundation for developing new educational programs and campaigns to raise awareness of this health issue, which can be effectively prevented through early detection and intervention [3, 5, 7-10].

The KAP instrument for peptic ulcers in Indonesia has not been widely published. Meanwhile, in a series of pharmacist counseling studies, an instrument is needed to measure the level of understanding of peptic ulcer patients regarding their disease. By measuring the patient's knowledge of their peptic ulcer disease, the patient's healing process will be more focused when the pharmacist provides counseling so that peptic ulcer treatment is right on target according to the desired therapy [3, 5-7, 11].

The potential role of pharmacists in the notification and treatment of peptic ulcers is to counsel patients. Evaluation of the use of peptic ulcer drugs is currently more oriented toward the causes of the disease, such as the use of NSAIDs (Non-Steroidal Anti-Inflammatory Drugs), *h. pylori* bacteria and lifestyle. While providing understanding and education to patients about their peptic ulcer disease is still lacking. For this reason, this study requires a questionnaire to determine the level of patient understanding of peptic ulcers. Thus, we can measure the level of patient understanding of peptic ulcers before and after being advised by pharmacists. Pharmacists who provide counseling need to be intervened by providing training and monitoring their activities in the pharmacy. With this questionnaire, we can also set standards for pharmacist counseling for peptic ulcer patients [4, 5, 7].

Materials and Methods

This research was carried out in Jakarta, Indonesia, between February and September 2024. It involved a design and development phase from February to May 2024, followed by a validation phase from June to September 2024. The ethics committee of the Faculty of Pharmacy at Andalas University granted ethical approval for the study. (Number: 55/UN.16.10.D.KEPK-FF/2024). All methods were conducted in accordance with the Declaration of Helsinki, and informed consent was obtained from all participants. This study

was conducted in the design development and validation stages. In the design and development stage, question items were designed in a questionnaire and, in its development, referred to the research objectives so that the items were relevant so that the goals could be achieved. In this first stage, we designed a framework, created question items, selected relevant items, the validity of the question content, and determined the I-CVI by involving experts. The second stage is the validation stage; the question items were measured for validity using Cronbach's alpha analysis and reliability testing.

Participants and sample size

One of the research series objectives is the pharmacist counseling model research, which will be conducted in Jakarta. The patient samples taken are participants known by pharmacists who have practiced in pharmacies in Jakarta, and the participants are peptic ulcer patients. To represent the characteristics of participants in Jakarta, we selected participants with various traits and pharmacy locations that represent the Jakarta area, including gender, age, profession, and education.

In this research stage, we used purposive sampling according to the established criteria. At the design and development stage, we designed a questionnaire referring to secondary data from previous research on peptic ulcer disease. At this stage, we set 15 items for knowledge, 15 for attitudes, and 10 for practice. Furthermore, at the validation stage, we tested it on 101 peptic ulcer patients. These patients are patients from 15 pharmacies spread across the Jakarta area of Indonesia. From a sample size of 101 participants, the margin of error is 10% [3, 5-7]. The pharmacy we chose is the largest pharmacy network in Indonesia and has a standardized education and training system in the company.

Item development

We designed and developed the question items using Indonesian. We did it in four steps: Designing and developing the framework, creating question items, selecting the items that we considered most relevant, and conducting validity tests on them.

Framework development

We designed and developed question items by considering various activities, domains, indicators, and questionnaire designs. The activities we mean are understanding, drug use, and education. The domains we use are socio-demographics and KAP [12]. With the activities and domains, we designed and developed the questionnaire by setting indicators for each construct. In terms of terminology, we can explain that the three main activities in question are: Patient understanding that they have peptic ulcers by feeling the signs and symptoms of peptic ulcers that refer to the prescription or medication purchased by the patient. Gastric ulcer medication is defined as monitoring the doctor's prescription brought by the patient, the type of medication taken by the patient, and the patient's treatment history. Education is described as enhancing patients' knowledge

about peptic ulcers, covering the signs and symptoms of the condition, prevention of transmission, drug side effects, and treatment adherence.

We developed the questionnaire items by considering three primary sources of information about KAP and peptic ulcers: (1) practical books on KAP studies that comply with WHO provisions, (2) journals of previous research on peptic ulcers, and (3) consensus of psychological theory to implement evidence-based practice. We also used several questionnaires related to KAP peptic ulcer as references so that in developing the questionnaire that was designed more comprehensively [3, 6, 11, 13].

Item generation

We created question items intending to identify the most appropriate questions for the predetermined domains. We designed questions based on available literature that began with a literature review based on the activities, domains, indicators, and constructions we determined in this study. The questionnaire was in the form of closed questions. In collecting data, the participants filled out the questionnaire in a Google form, or pharmacists at the pharmacy filled out the questionnaire, especially some participants who experienced technical difficulties. The questionnaire was divided into four parts: sociodemographic (S), knowledge (K), attitudes (A), and practices (P). Item creation involved formulating questions, creating response options, and planning assessments.

Item screening

The questionnaire has been designed so that we can consult with experts. The experts evaluate the question items and whether all question items are relevant, represent the content, and have good technical quality [14, 15]. We consulted with four experts: the promoter team consists of a Professor and two Doctors who are lecturers at the Faculty of Pharmacy, Andalas University, and an expert who is a Doctor and lecturer from the Faculty of Pharmacy, Jember University. The experts studied all question items, determined relevant/irrelevant items, provided input for question items that needed to be changed, and directed by giving feedback and suggestions on the questionnaire designed so that a questionnaire that followed the needs was obtained.

Item content validity index (I-CVI)

Content validity index (CVI) is the accuracy of the measurement level to ensure the relevance and representation of the instrument content so that the fulfillment of all items follows the designed construct. To determine this CVI, experts who will study and provide opinions on the design that has been made are needed. We refer to Lynn's theory when calculating the Individual Content Validation Index (I-CVI). Lynn stated that the I-CVI value is 1.0 for 3-5 experts, and the I-CVI value is 0.78 for 6-10 experts. In this study, four experts were asked to assess each item using a four-point Likert scale, with the following provisions: 1 = not relevant, 2 = somewhat relevant, 3 = entirely appropriate, and 4 = very relevant. Experts can reduce,

replace, or add by correcting the question items. From the expert assessment at the initial stage, an I-CVI value of 1.0 was obtained so that the designed questionnaire could be continued to the next stage [14-16].

Validation processes

The questionnaire was validated with 101 participants. To ensure adequate representation, we gathered participant data from 15 pharmacy locations across the DKI Jakarta area, with the assistance of 21 pharmacists practicing at these pharmacies. Participants were pharmacy consumers who visited the 15 pharmacies, either participants who brought a doctor's prescription, a copy of the prescription, or purchased over the counter without a prescription [14-16].

The data from the validation phase were analyzed using various methods, such as participant analysis, Cronbach's alpha, and reliability testing. IBM SPSS® Statistics for Windows, version 25 (IBM Corp., Armonk, NY, USA) was used for this analysis.

Participant analysis

Participant analysis provides a summary of the characteristics of the individuals involved in the study. We determine critical sociodemographic characteristics of participants because these characteristics may influence KAP [14, 15].

Validation test

A validation test is a test to ensure that the measuring instrument used to measure the research object is appropriate and accurate; in this test, the accuracy in measuring becomes very important. In this test, the researcher is expected to get the similarity of the data that will be published with the data obtained directly when researching a research subject. In this study, we conducted the validity test using S.P.S.S. software. This software's measurement results were compared with the validation test table for each question. With this method, it will be known whether the question item is valid or invalid [7, 17, 18].

Cronbach's alpha

We determined and found out the questionnaire score using the Reliability Test. We test the consistency of the score so that it can be used to measure the understanding of peptic ulcer patients about their disease. This questionnaire will later be used in pharmacist counseling for peptic ulcer patients, who will compare their knowledge before and after counseling. The reliability test is conducted using Cronbach's alpha, which verifies the internal consistency of the designed questionnaire. A Cronbach's alpha coefficient is considered reliable if it falls within the range of 0.6 to 0.7 [15, 16, 19].

Results and Discussion

We set 51 question items in the design and development stage. Then, the question items were re-evaluated by pharmacists who will provide counseling to peptic ulcer patients later. After being

modified and evaluated, we re-developed and discussed the relevant items. In the final stage, we selected 46 items for validation. An overview of all these research steps is illustrated in **Figure 1**.

Framework development

The sociodemographic domain encompasses various indicators: age, gender, place of residence, education level, and occupation. The knowledge domain contains indicators related to knowledge about peptic ulcers, namely, understanding of being attacked by the disease, helicobacter pylori bacteria, the relationship between stress and peptic ulcers, symptoms of the disease, foods, and diets that stimulate peptic ulcers. These peptic ulcer drugs can be obtained on pharmacist recommendations, side effects of peptic ulcer drugs, lifestyle factors, the relationship between NSAIDs and peptic ulcers, management if side effects occur, and peptic ulcer consultation with a pharmacist. The attitude domain includes indicators related to the prevention of disease-causing infections, medical advice, avoiding the use of NSAIDs, follow-up treatment, managing stress, consulting with pharmacists, risk of infection if untreated, health campaigns, pharmacist-recommended drugs, adherence to drug regimens, early education, antibiotic resistance, and diet. The practice domain includes indicators related to clean living activities, consultation with pharmacists, avoiding NSAIDs, natural remedies, stress reduction techniques, medication adherence, follow-up

consultation with pharmacists, seeking information about peptic ulcers, and preventing bacterial infections.

Item generation

Initially, 46 items were created, including 6 sociodemographic items, 15 items on knowledge, 15 items on attitude, and 10 items on practice. The Knowledge, Attitude, and Practice (KAP) items were rated using a five-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). The knowledge domain was scored as one as very much disagreement, two as not understanding, three as neutral (uncertain), four as understand, and five as very much understand. The attitude domain was scored as one very unimportant, two not important, three neutral (sometimes), four important, and five very important. The practice domain was scored as one not at all, two ever do, three sometimes do, four often do, and five always do. Higher scores indicated better KAP assessment [3, 15].

Item screening

In the first stage, 51 items were designed, and 46 items were finally used after we evaluated them. The 46 items comprise six sociodemographics, 15 knowledge, 15 attitudes, and ten practices. The items that were removed were five items in the attitude domain, while for the other domains, only minor changes were made to the existing questions [3, 14, 15].

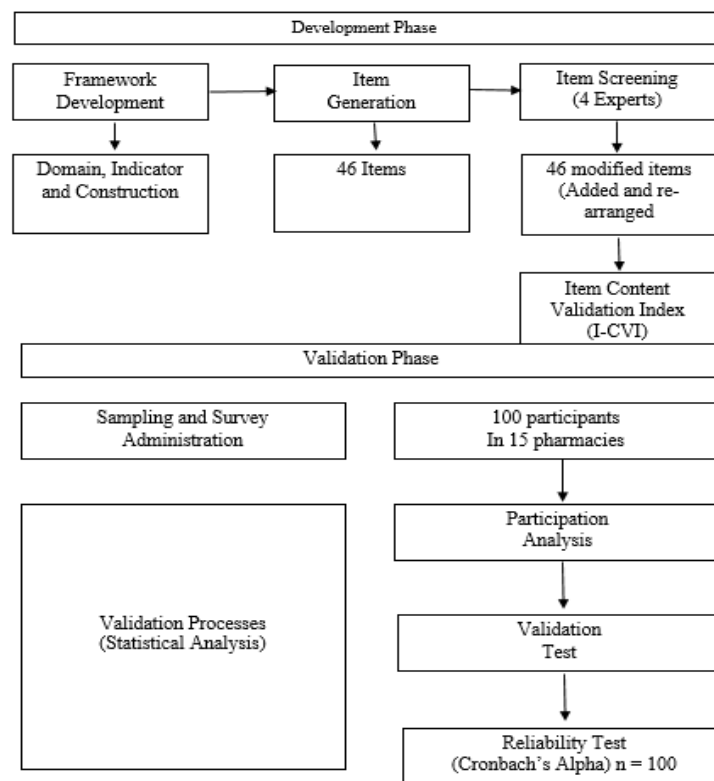


Figure 1. Steps of research

The changes made to the test items are biased, especially in the practice domain. Furthermore, modifications are made to make the questions more accessible for patients. Experts recommend

using standard terms for test items and improving sentence structures to make them easier to understand. For example, when asking about peptic ulcer symptoms, experts recommend

using words that are easy to understand, namely, feeling a burning sensation in the stomach. After all the test items have been revised, the revision will go through another stage of expert approval.

I-CVI

The I-CVI measurement for the Knowledge, Attitude, and Practice items was 1.0 each. Before the I-CVI value was determined, the level of change was trimmed for all domains except the attitude domain because 5 question items were removed due to overlapping questions and because the questions were too specific for the general public. Experts recommended reorganizing the sentences in the Knowledge and Attitude domains to improve clarity and align them with the study's concept. The results of the I-CVI are shown in **Table 1**.

Table 1. The I-CVI results

Domain	Professional Pharmacist I	Professional Pharmacist II	Professional Pharmacist III	Professional Pharmacist IV	Mean I-CVI	S-CVI/UA
Knowledge	1	1	1	1	1	1
Attitude	1	1	1	1	1	1
Practice	1	1	1	1	1	1

Validation process

Participant analysis

From the study we conducted to determine the validity of the test, 20-30 participants were needed. However, in this study, we tested the questionnaire on 101 peptic ulcer patients who were pharmacy customers and would be the location of the pharmacist counseling research later. All participants were adults, and we did not find elderly participants in the questionnaire distribution. Most participants were female (78.2%), and the rest were male. The city where the participants lived was Jakarta, where 66.3% of the participants lived. The education level of the participants was only high school graduates to university graduates, while we did not find elementary school and junior high school graduates. Most participants were employees. **Table 2** displays the characteristics of the participants.

Table 2. The characteristics of the participants

Characteristic	N (101)
Age	
Adult	101 (100%)
Geriatric	0
Sex	
Male	22 (21,8%)
Female	79 (78,2%)
City of Residence	
Jakarta	67 (66,3%)

Bekasi	5 (4,95%)
Bogor	2 (1,98%)
Surabaya	2 (1,98%)
Bengkulu	10 (9,9%)
Boyolali	2 (1,98%)
Sukabumi	2 (1,98%)
Others	11 (10,89%)
Education	
Primary School	0
Middle School	0
High School	34 (33,7%)
University	67 (66,33%)
Education	
Student	23 (22,8%)
Freelance	5 (4,95%)
Employee	47 (46,5%)
Entrepreneur	8 (7,9%)
Others	18 (17,8%)

Cronbach's alpha

The Cronbach's alpha coefficient obtained for the third domain in KAP was all > 0.70. Cronbach's alpha coefficient value of 0.971 shows that our questionnaire has very good internal consistency. The Cronbach's alpha results can be seen in **Tables 3 and 4**.

Table 3. The findings from Cronbach's alpha

Case Processing Summary			
		N	%
Cases	Valid	101	100.0
	Excluded	0	0.0
	Total	101	100.0

a. Listwise deletion based on all variables in the procedure.

Table 4. The findings from Cronbach's alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.971	40

We developed and validated a KAP instrument that pharmacists can use to determine the level of patient understanding before and after being counseled about peptic ulcer drugs. This instrument consists of 46 items containing basic KAP for gastric ulcer patients, drug use, and learning. We divided the question items into four categories: sociodemographic (6 items), knowledge (15 items), attitudes (15 items), and practices (10 items). At the design and development stage, the questionnaire initially had 51 items.

Question items in the knowledge and attitude domain were only refined to make them easier to understand for the general public, in this case, gastric ulcer patients. Meanwhile, the practice domain from 15 items became ten items because after being discussed with the promoter team, there were question items that were thought to be difficult for patients to understand, items

that were similar to other items, and items that could measure the practices carried out.

We have designed and developed this new instrument to assess the KAP of peptic ulcer patients and measure their understanding of medication use. In preparing the questionnaire, we discussed it with pharmacists who are actively providing counseling to patients and several senior pharmacists from PT. Kimia Farma Apotek. Content validity testing ensures that all question items are relevant and measured by the domain. We consulted and discussed with four experts: a professor from the Faculty of Pharmacy at Andalas University, two doctors from the Faculty of Pharmacy at Andalas University, and a doctor from the Faculty of Pharmacy at Jember University. We validate the content by determining the I-CVI value. These four experts are lecturers, researchers, and practitioners in pharmacies. One expert is experienced in providing counseling in hospitals, has worked in a national pharmaceutical company, and has experience working at BPOM RI. One other expert is also experienced as a practicing pharmacist in an international pharmacy network and is continuing his doctoral program in the Netherlands. One Professor is experienced in pharmaceutical practice in pharmacies, has been a lecturer and researcher, and has done community service for more than 30 years.

In the development stage, according to previous research, we must create a framework containing domains, activities, indicators, and questionnaire construction to identify domain coverage and facilitate the creation of items [16, 19, 20]. Experts then evaluate this framework to verify content validity. Boateng *et al.* recommended that expert assessors should be separate from those who created the item pool. According to Boateng *et al.* experts should not be chosen arbitrarily to review the questionnaire. It's important to understand the backgrounds of the experts to ensure that the most qualified individuals evaluate the questionnaire. Systematic expert assessment is necessary to prevent bias in evaluating items [15, 19]. Their evaluations are quantified using a defined scale and statistical methods, such as the content validity ratio to assess consensus and the content validity index to gauge proportional conformity. We selected the Lynn criterion to measure proportional conformity and to provide clarity on the content validity index [5]. To calculate the content validity index, experts employ a variety of techniques. I-CVI (item-level content validity index), S-CVI (scale-level content validity index), S-CVI/UA (scale-level content validity index using the universal agreement calculation method), and S-CVI/Ave (scale-level content validity index using the average calculation method) are all included in the content validity index, according to Polit and Beck (2006) [14-16]. The I-CVI is determined by dividing the number of experts who rate something a 3 or a 4 (thereby classifying the ordinal scale as relevant or irrelevant) by the total number of experts [15, 16]. We use I-CVI information to guide us in revising, deleting, or replacing items [14]. The I-CVI value for four experts is one. We found that I-CVI meets Lynn's criteria; a valid item must have an I-CVI of 1.0 for 3–5 experts [14, 15].

The validation process, conducted with 101 participants of varying characteristics, demonstrated that the instrument was

both valid and reliable for evaluating the KAP of peptic ulcer patients, particularly regarding their understanding of their condition and medication use. A study in the United Arab Emirates revealed poor general knowledge about *H. pylori*, with only 24.6% of participants familiar with the bacteria. Additionally, 61% were unaware of the connection between *H. pylori* and gastric cancer, and only 3% linked psychological stress to the development of gastric ulcers. Females had higher knowledge scores ($p = 0.008^*$), and participants with a medical background generally scored higher than those in other professions ($p < 0.0001^*$). Attitudes towards *H. pylori* were suboptimal, with only 33% of participants willing to seek medical help if symptoms arose. Despite this, about 84% of participants demonstrated excellent practice regarding *H. pylori*. This study highlights a lack of general awareness about gastric ulcers and *H. pylori*-related cancer. The findings suggest a need for new educational programs and awareness campaigns focused on prevention, early detection, and intervention. Therefore, sociodemographic characteristics were considered when recruiting participants for the validation process to ensure the development of a comprehensive KAP assessment tool [1, 3, 4, 17, 18, 21].

Boateng *et al.*'s recommended development sequence was followed in the creation of the questionnaire. The results of this study were acceptable according to psychometric, content, and concept analysis, and the test-retest reliability was also satisfactory [15, 16]. We observed that Cronbach's alpha coefficient was more significant than 0.70 for all parameters in the reliability test, suggesting that the questionnaire exhibits internal solid consistency [15, 16]. The results of the validation phase were consistent with the overall psychometric testing, which showed positive values for the parameters [16]. The findings of our study can therefore be used as a tool to evaluate the degree of patient comprehension of peptic ulcer illness [3, 4]. Considering that Jakarta is a barometer of the quality of patient understanding of peptic ulcers, this questionnaire can be used to assess the current situation of KAP peptic ulcer patients in three domains, namely patient knowledge of peptic ulcers, patient attitudes in treating peptic ulcers and practices carried out by patients so that they can recover from peptic ulcer disease, this questionnaire can help assess the level of patient understanding of peptic ulcer disease.

KAP assessment of patient understanding of peptic ulcer disease is critical in healing. This questionnaire can measure the role of pharmacists in providing drug counseling to patients so that the positive impact of pharmacist counseling can be measured. One of the measuring tools used in this questionnaire is comparing patients' Knowledge, Attitude, and Practice toward peptic ulcers before and after being counseled by the pharmacist. This questionnaire can help pharmacists who practice pharmacy in pharmacies.

A 2021 study in Indonesia found that peptic ulcers were the 10th leading cause of death, accounting for 0.9% of deaths. This was based on a mortality rate of 8.41 per 100,000 people [9]. Peptic ulcer formation occurs when there is an imbalance between protective factors and aggressive factors in the gastroduodenal

mucosa. The high mortality rate is often attributed to excessive use of non-steroidal anti-inflammatory drugs (NSAIDs). Turmeric contains curcuminoids and essential oils, with curcuminoids capable of inhibiting prostaglandin formation and suppressing the activity of the cyclooxygenase enzyme. Literature reviews indicate that turmeric extract can safeguard the gastric mucosa by enhancing mucus secretion and providing a vasodilator effect, thereby boosting the mucosal defense against NSAID-induced gastric ulcers [1, 3, 22-25].

Regarding treatment support, community pharmacists can educate patients, as demonstrated by Karuniawati *et al.* in 2019 with tuberculosis patients. This approach can enhance patient adherence to their treatment plans. Additionally, in monitoring roles, community pharmacists, particularly those in pharmacy practice, can detect issues related to drug therapy, such as compliance and adverse drug reactions. They can also assist in identifying potential problems with drug therapy when initiating complex treatment regimens [23, 26-28]. We estimate that counseling by pharmacists can also be helpful for peptic ulcer patients.

The study's limitations should be acknowledged. Firstly, this questionnaire does not apply to the global pharmacy population, as it was specifically developed and validated for the Indonesian pharmacy population, particularly in Jakarta. Second, the knowledge, attitudes, and practices related to peptic ulcer treatment are general patient understanding because this questionnaire is designed as a measuring tool to improve patient understanding with pharmacist counseling. Third, because this guideline is a tool to measure patient understanding with pharmacist counseling, then if it is for other purposes, it needs to be further adjusted with the updated guidelines, especially for the three domains of knowledge, attitudes, and practices. Nevertheless, we believe that incorporating diverse participant characteristics during the validation process and performing a thorough and systematic analysis will enhance the validity and reliability of the questionnaire [29-32].

Conclusion

This study demonstrates that the developed questionnaire is a valid and reliable tool for evaluating the KAP of patients with peptic ulcers. It effectively measures patient understanding following counseling from pharmacists in Indonesia, particularly in major cities. Future research should focus on translating and validating the questionnaire for use across the global pharmacy population.

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