

Factors Associated with the Quality of Life of Hospital Pharmacists during the COVID-19 Pandemic: Survey Validation

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ABSTRACT

Background: The COVID-19 pandemic has impacted the global health system, with different repercussions on the mental health of health professionals. This study introduces the process of developing and validating a survey to assess factors associated with the quality of life of hospital pharmacists during the COVID-19 pandemic. **Materials and Methods:** This is a descriptive study involving the phases of survey development and internal validation, performed by expert pharmacists who rated the proposed items for relevance and clarity. The assessment was conducted in February and March 2022. **Results:** Responses were evaluated by the Item-level Content Validity Index (I-CVI Desirable outcome ≥ 0.78) and the scale-level Content Validity Index (total CVI; Desirable outcome ≥ 0.9). The survey was designed with 23 questions and presented three sections: 1-Socio-demographic profile; 2-Work characteristics; and 3-Perceptions related to COVID-19, with the objective of composing a final instrument in which Section 4-Instrument for assessing Professional Quality of Life will be added. The CVI analyses of all items proved to be acceptable (I-CVI > 0.78 , total CVI-clarity = 0.97, total CVI-relevance = 0.99). Thirty suggestions were received, and 16 questions had some wording and/or options changes. **Conclusion:** The survey showed desirable content validation results and was considered 'valid' for investigating factors associated with the quality of life of pharmacists in the context of the COVID-19 pandemic.

Keywords: Content validation, Coronavirus, Burnout, Compassion Fatigue.

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INTRODUCTION

The COVID-19 pandemic has impacted the global health system, with different repercussions on the mental health of health professionals.¹ The deterioration of quality of life has been considered a crucial threat to the mental health of healthcare providers and the advancement of studies on this health condition can contribute to the development of strategies to promote mental health in this professional category.²

One way to observe professional and emotional involvement in healthcare providers is the Professional Quality of Life assessment, which evaluates the quality that a professional feel in relation to their work.³ This assessment includes compassion

satisfaction, characterized by feelings of satisfaction toward care work, and compassion fatigue, which refers to the negative aspects of care work, a condition of physical and emotional exhaustion as a result of the empathic cost of dealing with another's suffering² and includes the concepts of burnout, defined as physical and psychological exhaustion that arises as a reaction to chronic stress at work⁴ and secondary traumatic stress, characterized by fear and work-related trauma. Professional Quality of Life is established from the balance between compassion satisfaction and compassion fatigue, so that positive feelings prevail over negative ones.³

Prior to the COVID-19 pandemic, burnout rates among healthcare providers were already reported to be higher than in the general working population. Among pharmacists, studies indicated that burnout rates were over 50% and largely driven by exhaustion.⁵⁻⁷ In a study conducted with American hospital clinical pharmacists, Jones, *et al.* found a high burnout rate due to emotional exhaustion, with time spent on non-clinical activities



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and feeling that contributions are undervalued, for example, as predictors.⁷

Another study, conducted with pharmacists during the first weeks of the COVID-19 pandemic, revealed that nearly half of pharmacists in the U.S. healthcare system were experiencing burnout; moreover, pharmacists had a moderate or high chance of secondary traumatic stress, but the level of compassion satisfaction was also high. This research highlights that the development of burnout and secondary traumatic stress can lead to work-related consequences and suggests that further studies are essential to better understand the long-term effects of the COVID-19 pandemic on pharmacists' well-being.⁸

In Brazil, on the other hand, a significant impact was observed during the pandemic period in several aspects. The hospital pharmacist was one of the professional categories affected in facing this tragedy and there were no Brazilian studies focused on the assessment of their professional quality of life and associated factors during the pandemic. Thus, national and international studies have begun to assess issues related to the mental health of healthcare providers in this context.⁸⁻¹² However, although they use validated instruments to assess the investigated conditions, the associated factors to be analyzed are defined by the researchers without prior validation. That way, the purpose of the present work is to introduce the process of development and validation of a survey to assess the factors associated with the professional quality of life of pharmacists working in Brazilian hospitals during the COVID-19 pandemic.

MATERIALS AND METHODS

This is a descriptive study involving the development phases of a specific survey, from its structuring to its validation.

Developing the survey

For the development of the survey in order to assess the factors associated with the professional quality of life of hospital pharmacists during the COVID-19 pandemic in Brazil, a literature review was initially conducted.^{7,8} The survey was designed in three sections: Section 1- Socio-demographic profile; Section 2- Work characteristics; Section 3- Perceptions related to COVID-19, totaling 23 questions, with the objective of composing a final instrument, in which Section 4- Instruments for the evaluation of Professional Quality of Life (ProQOL)². will be added. The survey was prepared in a Word® document and then structured as an electronic form using Google Docs®.

Internal Validation and sampling strategy

The sample of pharmacists targeted by the study was composed of a non-probabilistic strategy, based on literature.¹³ For internal validation, two pharmacists from every Brazilian region were selected (total: 10 evaluators)¹³ with proven experience in the area of hospital pharmacy and selected according to the following

criteria: 1- Active search for names on the website of the Brazilian Society of Hospital Pharmacy (members of the regional boards, lecturers at congresses and/or preparation of technical material);¹⁴ 2- Analysis of their entry on the Brazilian national resumé database,¹⁵ with practice and specialization or residency in the area of hospital pharmacy or related areas as a pre-requisite; 3- Contact with the professional and evaluation of availability to contribute as an evaluator of the research.

The experts were invited to participate in the research via e-mail or phone contact and, during this first contact, the purpose of the research, the role of the evaluator, the time required to answer the survey (estimated in 40 to 50 min), and the deadline date were explained. The survey was sent via e-mail to the experts who agreed to participate in the survey ($n=6$) in two versions: version 1 - "Hospital Pharmacist: How is your professional quality of life two years after the beginning of the COVID-19 pandemic in Brazil?" and version 2 - "Evaluator Validation", along with the instructions for completing the survey.

Initially, the experts were instructed to answer the Free and Informed Consent Form and the four sections of the survey "Hospital Pharmacist: How is your professional quality of life two years after the beginning of the COVID-19 pandemic in Brazil?", simulating the completion of the survey as a participating member of the research and marking the beginning and end times of completion on a stopwatch. Next, the experts were asked to answer the "Evaluator validation" survey, in which they were asked about the clarity and relevance of each question in sections one to three. In each item, there was a space to record the evaluators' suggestions concerning the question at hand, as well as a space at the end of the survey for general suggestions. The evaluators were asked to maintain research confidentiality during the validation process.

In the instructions for completing the survey, it was explained that the relevance criterion considered the importance and adequacy of the question to achieve the proposed objectives (relevance scale: 1-irrelevant, 2-somewhat relevant, 3-relevant, and 4-very relevant), and whether all necessary dimensions of the purpose were included. The clarity criterion assessed the editing of the items, in order to verify if the concept expected to be measured is fully understandable and adequately expressed (clarity scale: 1-not clear, 2-somewhat clear, 3-clear, and 4-very clear).¹³

The evaluation was conducted individually and independently by each expert during the period of one month (February 25, 2022 to March 24, 2022), followed by a moment of interaction between the researcher and the evaluator to clear up any doubts and validate the adjustments, if necessary.

The experts' answers were evaluated via the Content Validity Index of each item (I-CVI), which measures the proportion or percentage of evaluators who agree on certain aspects of the instrument and its items for each question (formula used: I-CVI =

Number of 3 or 4 answers / Total number of answers). According to Polit and Beck, questions with CVI lower than 0.78 must be reviewed and adjusted in an analysis with 6 evaluators.¹⁶ We also evaluated the Scale Content Validity Index (total CVI), calculated as the average of the I-CVI (adding and dividing by the number of items), which must be equal to or greater than 0.9.¹⁷

Data Analysis

The data from the validation process were organized in a computerized Excel® spreadsheet to determine the Content Validity Index for each item as well as for the scale.

Ethical Considerations

The study was approved by the Research Ethics Committee, Federal University of Ceará, on 19 November 2021, with CAAE (Certificate of Presentation for Ethical Consideration) number: 52286121.0.0000.5054. The participants signed the Terms of Free and Informed Consent before entering the study.

RESULTS

The survey was designed with 23 questions, including two open questions (Questions 2 and 9), and 21 multiple choice questions, introducing three sections: Section 1 - Socio-demographic profile, with seven questions related to status, age, gender, marital status, children, practice of physical activity, and sleep; Section 2 - Work characteristics, with eight questions related to the type of institution they work in, salary, functions performed, workload, years of professional experience, additional training, type and amount of employment ties; Section 3 - Perceptions related to COVID-19, with eight questions referring to the period of the COVID-19 pandemic, including the number of hours worked, suspension of the work contract, change of activities performed, salary, remote work, situations experienced, appreciation, desire to work in a hospital.

After the designing of the survey, the internal validation was performed by six experts, with one representative each from the North, Northeast, Midwest, and South regions, and two representatives from the Southeast region of Brazil. The experts

had different lengths of professional experience (4 to 17 years of experience) and reported an average time of 7 min to answer the survey (ranging from 5 to 9 min).

When analyzing relevance, only one item was rated "somewhat relevant" (question 4). In the clarity analysis, four items were rated "somewhat clear" by one evaluator each (questions 4, 6, 7, 17) (Figures 1 and 2).

The evaluation of the survey was conducted in only one cycle, because, although some items were evaluated as "somewhat relevant" or "somewhat clear", the CVI analyses of clarity and relevance of all items showed to be acceptable (I-CVI > 0.78, ranging from 0.83 to 1.0), with total CVI = 0.97 for clarity and total CVI = 0.99 for relevance, and is, therefore, above 0.90, as recommended (Tables 1 and 2).

During the validation process, 30 suggestions were received, 36.7% of which (n=11) were for adjustments in the wording of the questions; 30.0% (n=9) were for adjustments in the options (inclusion, exclusion, change in the text, permitting the choice of more than one option); 13.3% (n=4) were for adjustments in the wording and options; 10.0% (n=3) were for inclusion of new questions; 6.7% (n=2) were suggestions for the validation process; 3.3% (n=1) were for change in the order of the questions. From the suggestions received, 16 questions had some changes, with eight changes in the wording of the question; five changes in the statement and options; three changes only in the options.

The final survey (Appendix 1), with 23 questions plus section 4, was sent to Brazilian hospital pharmacists from April 1, 2022 to July 9, 2022 (100 days of data collection), 236 valid responses were obtained from representatives from all states of Brazil.

DISCUSSION

In order for the results obtained in a research study to be reliable, the use of adequate and accurate data collection instruments is necessary. A large number of surveys and scales are currently being applied in healthcare, making it necessary for researchers

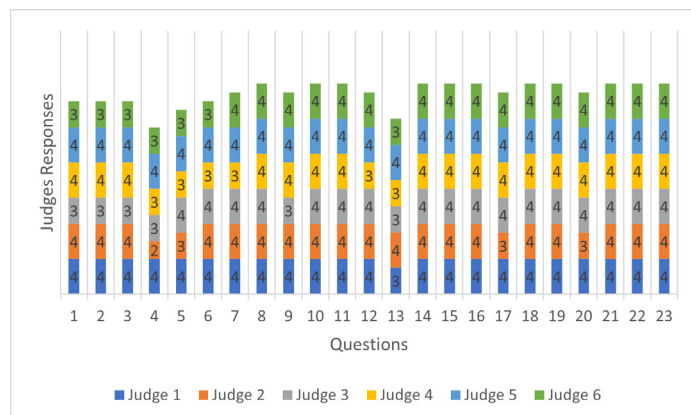


Figure 1: Judges' Responses in The Survey Relevance Analysis.

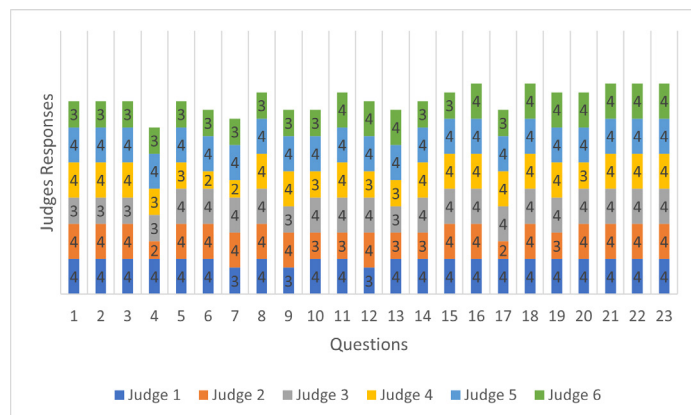


Figure 2: Judges' Responses in The Survey Clarity Analysis.

Table 1: Content Validity Index for the Relevance.

Questions	Judge 1	Judge 2	Judge 3	Judge 4	Judge 5	Judge 6	Agreement Value	I-CVI	Interpretation
1	4	4	3	4	4	3	6	1.00	Acceptable
2	4	4	3	4	4	3	6	1.00	Acceptable
3	4	4	3	4	4	3	6	1.00	Acceptable
4	4	2	3	3	4	3	5	0.83	Acceptable
5	4	3	4	3	4	3	6	1.00	Acceptable
6	4	4	4	3	4	3	6	1.00	Acceptable
7	4	4	4	3	4	4	6	1.00	Acceptable
8	4	4	4	4	4	4	6	1.00	Acceptable
9	4	4	3	4	4	4	6	1.00	Acceptable
10	4	4	4	4	4	4	6	1.00	Acceptable
11	4	4	4	4	4	4	6	1.00	Acceptable
12	4	4	4	3	4	4	6	1.00	Acceptable
13	3	4	3	3	4	3	6	1.00	Acceptable
14	4	4	4	4	4	4	6	1.00	Acceptable
15	4	4	4	4	4	4	6	1.00	Acceptable
16	4	4	4	4	4	4	6	1.00	Acceptable
17	4	3	4	4	4	4	6	1.00	Acceptable
18	4	4	4	4	4	4	6	1.00	Acceptable
19	4	4	4	4	4	4	6	1.00	Acceptable
20	4	3	4	4	4	4	6	1.00	Acceptable
21	4	4	4	4	4	4	6	1.00	Acceptable
22	4	4	4	4	4	4	6	1.00	Acceptable
23	4	4	4	4	4	4	6	1.00	Acceptable
Total CVI								0.99	Acceptable

I-CVI: Content Validity Index of the item. Relevance Scale: 1-irrelevant, 2-somewhat relevant, 3-relevant, 4-very relevant.

to watch out for the quality of the data collection instruments used.¹³

In order to achieve a good quality in our instrument, the development of the survey had an initial stage in which a literature search was conducted to establish the questions and items of interest.¹⁸ After, the validation stage was performed by experts.¹⁹ The experts selected for the validation of our survey were chosen so as to obtain representativeness from all regions of Brazil and from different periods of professional practice; thus, we considered obtaining different views on the suggested questions, which contributed to the development of a final instrument capable of assessing different factors associated with the professional quality of life of pharmacists in the context of the pandemic of COVID-19.

When analyzing relevance and clarity, it was possible to obtain the desired result in the very first cycle, which suggests that the survey was sufficiently 'clear' and 'relevant' to be used in research, with no need to conduct a second cycle.²⁰

Despite this result, some questions underwent changes as suggested by the experts. These changes were passed on to the evaluators, however, there was no need to perform a second cycle of analysis because the changes did not generate substantial changes in the items. Thus, as observed in other studies,^{20,21} the suggestions received were crucial for the improvement of the survey, since they increased the clarity of the questions, contributing for the instrument to assess, effectively, what was intended.

Our study had some limitations, such as the use only of the content validity index as a psychometric measure and the possibility of not having all the variables that could be related to the professional quality of life of hospital pharmacists identified, thus exhausting the theme. Yet, the validated survey was used in a national survey and allowed the identification of factors associated with the professional quality of life of hospital pharmacists, suggesting the groups that need more attention (data not shown).

The designing process of this instrument with the experts brought more reliability for the analysis of socio-demographic and work

Table 2: Content Validity Index for the Clarity.

Questions	Judge 1	Judge 2	Judge 3	Judge 4	Judge 5	Judge 6	Agreement Value	I-CVI	Interpretation
1	4	4	3	4	4	3	6	1.00	Acceptable
2	4	4	3	4	4	3	6	1.00	Acceptable
3	4	4	3	4	4	3	6	1.00	Acceptable
4	4	2	3	3	4	3	5	0.83	Acceptable
5	4	4	4	3	4	3	6	1.00	Acceptable
6	4	4	4	2	4	3	5	0.83	Acceptable
7	3	4	4	2	4	3	5	0.83	Acceptable
8	4	4	4	4	4	3	6	1.00	Acceptable
9	3	4	3	4	4	3	6	1.00	Acceptable
10	4	3	4	3	4	3	6	1.00	Acceptable
11	4	3	4	4	4	4	6	1.00	Acceptable
12	3	4	4	3	4	4	6	1.00	Acceptable
13	4	3	3	3	4	4	6	1.00	Acceptable
14	4	3	4	4	4	3	6	1.00	Acceptable
15	4	4	4	4	4	3	6	1.00	Acceptable
16	4	4	4	4	4	4	6	1.00	Acceptable
17	4	2	4	4	4	3	5	0.83	Acceptable
18	4	4	4	4	4	4	6	1.00	Acceptable
19	4	3	4	4	4	4	6	1.00	Acceptable
20	4	4	4	3	4	4	6	1.00	Acceptable
21	4	4	4	4	4	4	6	1.00	Acceptable
22	4	4	4	4	4	4	6	1.00	Acceptable
23	4	4	4	4	4	4	6	1.00	Acceptable
Total CVI								0.97	Acceptable

I-CVI: Content Validity Index of the item. Clarity scale: 1-not clear, 2-somewhat clear, 3-clear, 4-very clear.

variables that may be associated with the professional quality of life of hospital pharmacists. The final instrument, divided into three sections (Sociodemographic profile, Work characteristics, and Perceptions related to COVID-19), can be used as a reference in future studies with hospital pharmacists, and can be used in its entirety for studies in the context of the COVID-19 pandemic or only the socio-demographic profile and work characteristics sections for professional quality of life studies in other scenarios.

CONCLUSION

The instrument developed aims to be applied to groups of hospital pharmacists in order to assess factors associated with the professional quality of life of these healthcare providers when faced with the pandemic of COVID-19. The survey presented results for content validation in desirable standards, and, therefore, the content is considered "valid" for investigation of associated factors and their interfaces in this context.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

CVI: Content Validity Index; **I-CVI:** Item-level Content Validity Index; **Total- CVI:** Scale-level Content Validity Index..

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APPENDIX 1

Survey

Section 1 - Sociodemographic profile

1. Which state do you work in?

2. How old are you (in years)? _____

3. Regarding your gender, how do you identify?

Female

Male

Undeclared

Other

4. What is your marital status?

Single

Married

Common-law marriage

Divorced

Widow

5. Do you have school-aged children?

Yes

No

6. Are you physically active* (*planned, structured, repetitive and purposeful physical activity)?

1-2 days per week

3-4 days per week

>4 days per week

Not physically active

7. How many days a week can you sleep more than 7 hr?

1-2 days per week

3-4 days per week

>4 days per week

None

Section 2 – Work characteristics*

8. What type(s) of hospital institution(s) do you work for?

	Yes	No
Public		
Private		
Philanthropic		
Other		

9. What is your total monthly net salary* (in Brazilian Reais, without punctuation - e.g., 3200)?

*Final remunerated amount, after the deduction of all mandatory official taxes: _____

10. Which of these roles did you play as a pharmacist during the pandemic?

	Yes	No
Managing pharmacist (Manager, coordinator or other management position)		
Pharmacist at Pharmaceutical Supply Center		
Pharmacist at Satellite Pharmacies		
Dispensing Pharmacist		
Pharmacist in Prescription Analysis		
Pharmacist in Emergency Department		
Pharmacist in Intensive Care Unit		
Pharmacists in Infirmaries		
Pharmacist in COVID-19 Intensive Care Unit		
Pharmacist in COVID-19 Infirmary		
Pharmacist in Hospital Infection Control		
Pharmacist in Home Care		
Resident Pharmacist		
Other		

11. What is your weekly workload as a pharmacist*? (*Sum of the weekly workload of all jobs as a pharmacist, if you have more than one).

- Up to 36 hr per week
- 37 to 44 hr per week
- > 44 hr per week

12. How many years of professional experience as a pharmacist do you have?

- 0-5 years
- 6-10 years
- 11-20 years
- >20 years

13. What complementary training(s) do you have?

	Yes	No

Postgraduate degree		
Residency		
Master's degree		
Doctorate's degree		

14. What is(are) your employment relationship(s) with the institution(s) you work?

	Sim	Não
Civil servant		
CLT employed		
Temporary contract		
Resident		
Other		

15. Do you have more than one employment relationship?

- Yes, I have two jobs
- Yes, I have three or more jobs
- No

Section 3 – Perceptions related to COVID-19

16. In the pandemic period, your number of hours worked in the institution:

- Increased
- Decreased
- Remained unchanged

17. During the pandemic period, did you have your work contract temporarily suspended at any time?

- Yes
- No

18. During the pandemic period, was there any change in the activities to be developed in at least one of your jobs?

- Yes
- No

19. In the pandemic period, your salary:

- Increased
- Decreased
- Remained unchanged

20. During the pandemic period, did you do remote work*? (*outside the institution)

- Yes

No

21. Which of the situations below did you experience in your work environment during the pandemic?

	Yes	No
Medication shortage		
Shortage of Personal Protection Equipment		
Restrictions in the use of Personal Protection Equipment		
Absence of clear processes and protocols regarding COVID-19		
Direct patient contact with COVID-19		
Difficulty keeping up with the available literature on COVID-19		
Changes in the medication distribution process		
Difficulty in the gowning/disgowning process		

22. Did you feel more valued as a professional in the institution(s) where you work?

Yes

No

23. Did the pandemic change your desire to work in a hospital?

Increased

Decreased

Remained unchanged

Specialist Analysis for each issue – Question #	RELEVANCE <input type="checkbox"/> 1- Irrelevant <input type="checkbox"/> 2- Somewhat relevant <input type="checkbox"/> 3- Relevant <input type="checkbox"/> 4- Very relevant	CLARITY <input type="checkbox"/> 1- Not clear <input type="checkbox"/> 2- Somewhat clear <input type="checkbox"/> 3- Clear <input type="checkbox"/> 4- Very clear
Suggestion:		