




## Article

# The Effect of Javanese Language Videos with a Community Based Interactive Approach Method as an Educational Instrument for Knowledge, Perception, and Adherence amongst Tuberculosis Patients

Fauna Herawati <sup>1,2,\*</sup> , Yuni Megawati <sup>1</sup>, Aslichah <sup>3</sup>, Retnosari Andrajati <sup>2</sup>  and Rika Yulia <sup>1</sup> 

- <sup>1</sup> Department of Clinical and Community Pharmacy, Faculty of Pharmacy, Universitas Surabaya, Jalan Raya Kalirungkut, Surabaya 60293, Indonesia; yuni.meg@gmail.com (Y.M.); rika\_y@staff.ubaya.ac.id (R.Y.)
- <sup>2</sup> Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Indonesia, Depok 16424, Indonesia; retnosaria@gmail.com
- <sup>3</sup> Rumah Sakit Umum Daerah (RSUD) Bangil, Pasuruan 67153, Indonesia; aslichahdr@gmail.com
- \* Correspondence: fauna@staff.ubaya.ac.id; Tel.: +62-896-5006-7999

**Abstract:** The long period of tuberculosis treatment causes patients to have a high risk of forgetting or stopping the medication altogether, which increases the risk of oral anti-tuberculosis drug resistance. The patient's knowledge and perception of the disease affect the patient's adherence to treatment. This research objective was to determine the impact of educational videos in the local language on the level of knowledge, perception, and adherence of tuberculosis patients in the Regional General Hospital (RSUD) Bangil. This quasi-experimental study design with a one-month follow-up allocated 62 respondents in the intervention group and 60 in the control group. The pre- and post-experiment levels of knowledge and perception were measured with a validated set of questions. Adherence was measured by pill counts. The results showed that the intervention increases the level of knowledge of the intervention group higher than that of the control group ( $p$ -value < 0.05) and remained high after one month of follow-up. The perceptions domains that changed after education using Javanese (Ngoko) language videos with the Community Based Interactive Approach (CBIA) method were the timeline, personal control, illness coherence, and emotional representations ( $p$ -value < 0.05). More than 95% of respondents in the intervention group take 95% of their pill compared to 58% of respondents in the control group ( $p$ -value < 0.05). Utilization of the local languages for design a community-based interactive approach to educate and communicate is important and effective.



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## 1. Introduction

Tuberculosis (TB) is an infectious disease of international concern and is prevalent in Indonesia. In 2050, it is estimated that deaths due to anti-TB drug resistance will be 10 million more than from cancer [1]. The total global losses incurred due to anti-TB drug resistance may reach US\$100 trillion. The World Health Organization (WHO) Global Report 2019 states that the total number of TB cases identified in Indonesia rose from 331,703 in 2015 to 563,879 in 2018 (+70%); a 28% increase happened between 2017 and 2018 [2]. In 2016, 110,000 people, or 42 per 100,000 population, died of TB of which 32,000 (12 per 100,000 population) were caused by Multi-Drug-Resistant Tuberculosis (MDR-TB) [3]. Pasuruan Regency is among the five cities/districts with the highest number of TB cases in East Java. In 2013, the number of TB cases in Pasuruan Regency was 964, which declined to 886 cases in 2014 and rose to 1693 cases in 2015 [4]. In the Regional General Hospital (RSUD) Bangil, there were 100 tuberculosis outpatients at the pulmonary clinic each month from January to June 2018. If the number of tuberculosis patients continues to rise, Indonesia would fail to achieve the TB control targets of the 2020–2024 National Medium-Term

Development Plan (RPJMN), Millennium Development Goals (MDGs), and Sustainable Development Goals (SDGs).

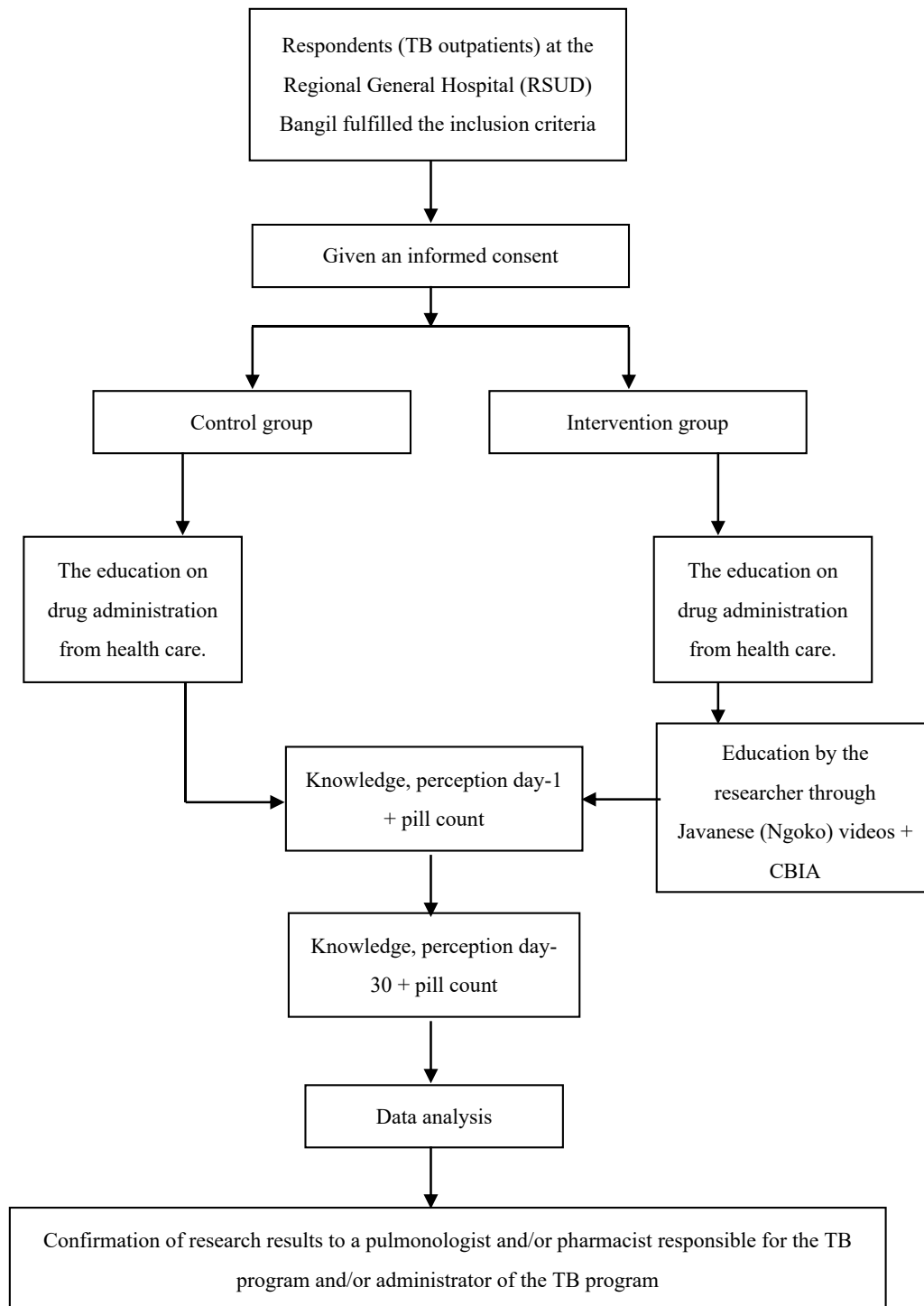
Tuberculosis treatment lasts at least 6 months, depending on the clinical presentation in each patient, which causes patients to be at high risk of forgetting to take medication or dropping out of treatment. Medication non-adherence will prolong therapy duration, and increase the risk of drug resistance, morbidity, and mortality [5,6]. Resistance cannot be eliminated but can be controlled with the appropriate use of anti-TB drugs. Furthauer et al. (2013) argued that factors causing non-adherence include patients' lack of knowledge about their health, the patient's weak relationship with medical personnel, and the drugs' side effects [7].

According to Regulation of the Minister of Health No. 72 of 2016, one of the roles of clinical pharmacists in controlling anti-TB drug resistance is to provide education to patients and the public about tuberculosis and the judicious use of anti-TB drugs, in the hope of increasing patients' knowledge, which in turn shapes correct perceptions about the disease, encourages adherence and controls the number of drug resistance cases [8]. Videos in the Javanese (Ngoko) language were chosen as an instrument because a person can absorb information best and highest through sight and hearing senses; video educational material more effective than text-only [9]. A video educational tool was effective for increasing the level of outpatients' knowledge [10,11] and remained significant after three months [10]. The study was conducted at the Regional General Hospital (RSUD) Bangil because the hospital is a referral hospital in Pasuruan Regency with a high number of TB cases. Secondary data from Patient and Family Education in the pulmonary clinic of the Regional General Hospital (RSUD) Bangil in October 2017 showed educational achievements by the health personnel were not yet optimal. This was confirmed by the pharmacist at the outpatient pharmacy, who reported that many tuberculosis patients who were following treatments at the Regional General Hospital (RSUD) Bangil did not adhere to the scheduled patients' routine visits and no record was written on the pharmacy's education register. This study aimed to assess the impact of a local language educational video on the level of knowledge, perception, and adherence of tuberculosis patients in the Regional General Hospital (RSUD) Bangil.

## 2. Materials and Methods

Before the Javanese (Ngoko) videos were created, the researcher performed a needs assessment and education plan for respondents so that contents could be suited to the needs of tuberculosis outpatients in the Regional General Hospital (RSUD) Bangil. The Javanese (Ngoko) language was adopted because the majority of patients use the Javanese (Ngoko) language daily. The design of this research was quasi-experimental with a control group and an intervention group. The control group and the intervention group were followed for 30 days. Data collection began by screening the medical records of prospective respondents. Prospective respondents who fulfilled the inclusion and exclusion criteria were visited, and the researcher explained the purpose of the study along with giving an informed consent form to be signed by the respondents as evidence of volunteerism. Respondents who were willing to take part in the study were allocated into a control group and intervention group with a simple random sample using a lottery method. Afterward, on day-1 and 30, respondents were given questionnaires to test their levels of knowledge and perception (Figure 1). Questions on knowledge level were adapted from several studies [12–15], guideline published by Ministry of Health Indonesia [16,17] and WHO [18]. The expected achievements on knowledge level were based on Bloom's Revised Cognitive Domain [19,20], which were knowing, understanding, and applying. Questions on perception were adapted from The Revised Illness Perception Questionnaire [21]. The expected result was a change from negative perception to positive perception. The same questions (Appendix A) were given twice to the control group on day 1 and day 30, and three times to the intervention group on day 1 (before and after being provided with education) and day 30. The researcher performed tests on knowledge and perception

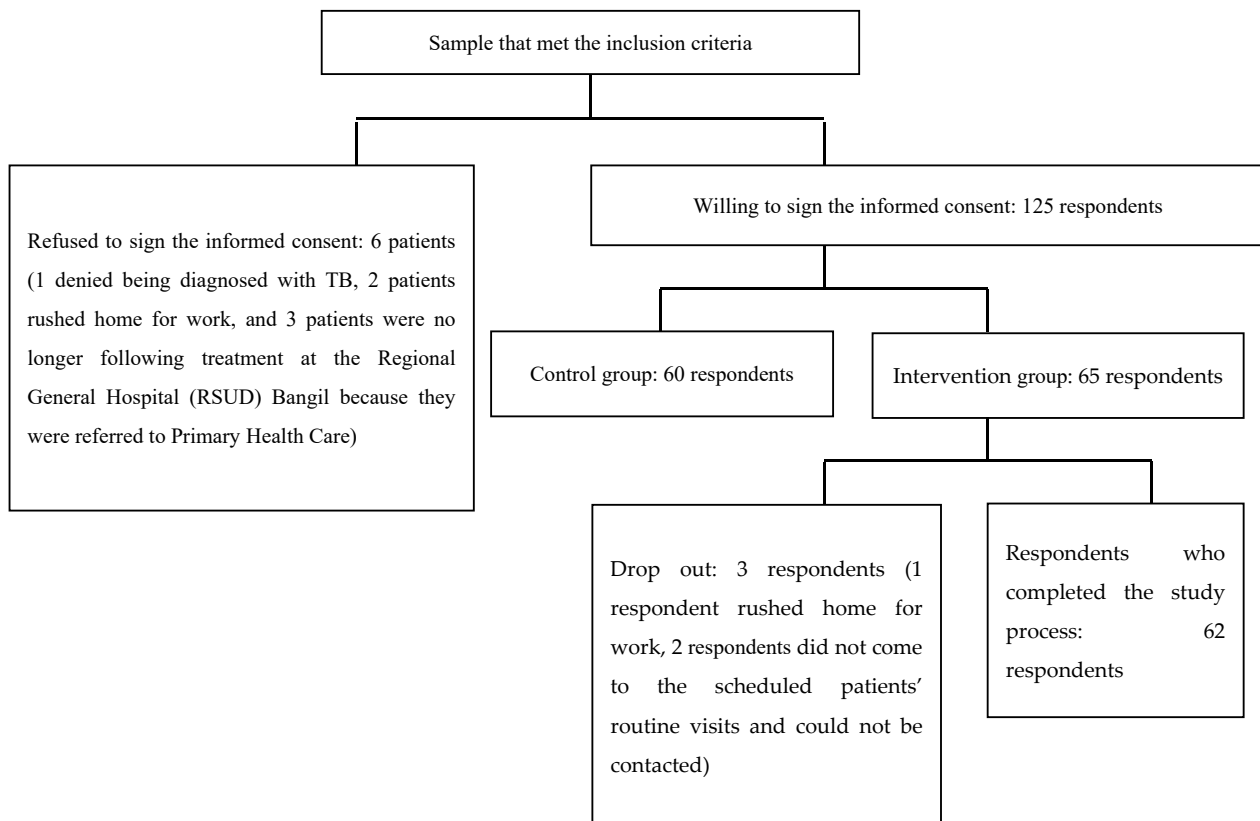
during patients' routine visits at Bangil District Public Hospital. An educational video in the local language about tuberculosis disease, anti-TB drugs administration, and their adverse drug events was given to educate the community (TB outpatients) in a small discussion group, named Community-Based Interactive Approach (CBIA), at the pulmonary clinic of the Regional General Hospital (RSUD) Bangil.



**Figure 1.** The Scheme of Research Work.

### 2.1. Respondents

Data collection for the study sample was performed from October to December 2018 at the pulmonary clinic of the Regional General Hospital (RSUD) Bangil, Pasuruan Regency (Figure 1). The recruitment flow of TB respondents can be seen in Figure 2. Inclusion criteria were tuberculosis patients >14 years who received anti-TB drug category one and two, while exclusion criteria were tuberculosis patients who were currently following the Directly Observed Treatment Short-Course (DOTS) program, patients diagnosed with schizophrenia, blindness, or deafness.



**Figure 2.** The Flow of TB Respondents' Recruitment at the Pulmonary Outpatient Clinic in the Regional General Hospital (RSUD) Bangil.

Education was given by the researcher to the intervention group through videos in Javanese (Ngoko) language with a CBIA approach upon the completion of their clinic visit on day 1. The educational video (CBIA) duration was six minutes. It covered information about tuberculosis disease, tuberculosis treatment (including duration, the risk of drug resistance, and adverse drug events), a reminder system, and non-pharmacology aspects. The control group received standard care, education on drug administration from health care. CBIA was done through small group discussions between 6 and 8 respondents; each group was accompanied by a counselor who facilitated the discussions. Respondents were encouraged to be more active in expressing opinions and asking questions of the informant about the discussion material, and the outcome of these small group discussions was ultimately presented to all groups. During the implementation, every CBIA education session (the control group and the intervention group), was assisted by a group of 3–4 people, comprising of a physician, pharmacist, pharmacy student, and/or medical student who had previously been briefed. To anticipate respondents forgetting the educational material, each respondent was provided with videos on his or her mobile phone. The videos were transferred from the researcher to the respondent's mobile devices (with Bluetooth, Share It, WhatsApp, or LINE platform).

To understand the effect of education on adherence, adherence to treatment in the control group and intervention group was measured by pill counts on day-1 and 30; the number of drugs taken by the patients with counting the remaining units (drugs consumed) divided by the number of drugs prescribed (prescribed drugs). The pill count calculation formula is as follows:

$$\text{Pill count} = \Sigma \text{ Drugs consumed} / \Sigma \text{ Prescribed drugs} \times 100\% \quad (1)$$

Adherence to medications on day-1 was assessed by looking at the number of drugs and medication instructions, attendance at the previously scheduled appointment as specified on the patient's identity card, Hospital Management Information System, and/or medication collection card. On day-1, the patient's medication was examined and recorded. Meanwhile, adherence to medications from day-1 to day-30 was assessed by making records on the number of drugs received by the respondent up to day-30; the remaining medications were counted by the researcher on day-30. A day before the scheduled patients' routine visits on day-30, the researcher reminded respondents via phone calls, as well as chats on WhatsApp or LINE, to bring their medications. If the respondent did not come to the scheduled appointment, the researcher would contact them by phone, as well as chat on WhatsApp or LINE. Nonetheless, if the respondent was still unable to be reached and did not attend the patients' routine visits, he or she was moved to the drop-out category. Respondents were considered to have a high level of adherence to medications if the pill count was  $\geq 95\%$ , and low if it was  $< 95\%$  [22]. The study results were then reported to a pulmonologist and/or pharmacist responsible for the TB program and/or administrator of the TB program, to inform and ask for suggestions relating to the results.

## 2.2. Data Validity Test

A needs assessment and education planning were carried out through a preliminary study in 30 respondents who met the inclusion and exclusion criteria (excluding the research sample). Accordingly, statements or terms that were unclear to the respondents were discussed together. A difficulty index analysis was used for knowledge questions. Questions number 4 (question-related to tuberculosis disease) and 7 (question-related to anti-tuberculosis drugs administration) were considered as 'easy' within the difficulty index (at least 70% of respondents answer it correctly), while questions number 1, 3, 5, 6, 9, 10, 11, and 12 belong to the 'moderate' group (40–60% of respondents answer it correctly). Meanwhile, questions number 2 (question-related to tuberculosis disease) and 8 (question-related to anti-tuberculosis drugs administration) were considered as 'difficult' within the difficulty index (only 30% of respondents answer it correctly). Construct validation was done on perception. A questionnaire regarding perception consisted of 15 questions grouped into 7 domains: timeline, illness coherence, consequences, treatment control, personal control, timeline cyclical, and emotional representations. All perception questions were valid, as the product-moment correlation coefficient was above 0.3, and reliable because the Cronbach's  $\alpha$  test was 0.791. The Javanese (Ngoko) language on the video's script was proofread with experts and validated by tuberculosis patients who were not respondents in the research.

## 2.3. Statistical Analysis

To compare the level of knowledge and the level of perception among the control group and intervention group, the Mann–Whitney test was used. The Wilcoxon Signed-Rank test was used to compare the level of knowledge and the level of perception per domain in each group. The level of adherence to medications in the control group and the intervention group were compared using the chi-square test, as were the relationships between respondents' demographic factors and the level of adherence to medications in the control group and the intervention group.

#### 2.4. Ethics Approval

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of Politeknik Kesehatan Kementerian Kesehatan Surabaya (the Health Research Ethics Commission of the Health Polytechnic of the Ministry of Health Surabaya), Number 025/S/KEPK/V/2017. This study acquired a research permit from Badan Kesatuan Bangsa dan Politik (the National Unity and Politics Agency) Number 072/940/424.104/SUR/RES/2018 and the Regional General Hospital (RSUD) Bangil Number 445.1/2175/424.202/2018.

### 3. Results

The characteristic demographic patients in the intervention group were similar to patients in the control group (Table 1). There was a significant difference between the knowledge level of the control group and that of the intervention group in the knowledge of tuberculosis disease, anti-tuberculosis drug administration, and anti-tuberculosis drug adverse drug events, with a *p*-value of less than 0.05 (Table 2). The consistency of improved knowledge was maintained for one month after the intervention.

**Table 1.** Baseline characteristic.

Variable	Intervention Group ( <i>n</i> = 60)	Control Group ( <i>n</i> = 62)	<i>p</i> -Value
Gender			0.46
Male	25 (42)	30 (48)	
Female	35 (58)	32 (52)	
Age (years old)			0.69
15 to <23	9 (15)	10 (16)	
23 to <31	16 (27)	12 (19)	
31 to <39	12 (20)	7 (11)	
39 to <47	7 (12)	12 (19)	
47 to <55	6 (10)	6 (10)	
55 to <63	7 (12)	9 (15)	
63 to <71	2 (3)	5 (8)	
≥71	1 (2)	1 (2)	
Education			0.77
Primary school	20 (33)	25 (40)	
Secondary school	13 (22)	13 (21)	
High school	20 (33)	20 (32)	
University	5 (8)	2 (3)	
Other <sup>1</sup>	2 (3)	2 (3)	
Knowledge			
Lara TB <sup>2</sup>	1.68	1.65	0.80
Cara ngombe OAT <sup>3</sup>	1.48	1.53	0.89
Efek samping OAT <sup>4</sup>	0.78	0.63	0.24
Perception			
Timeline	3.13	3.27	0.51
Consequence	6.40	6.32	0.64
Personal control	5.94	5.93	0.31
Treatment control	4.11	3.95	0.12
Illness coherence	7.00	6.82	0.30

<sup>1</sup> pondok pesantren similar level with secondary school or high school. <sup>2</sup> Tuberculosis (TB) Disease. <sup>3</sup> Anti-TB Drugs (OAT, Obat Anti Tuberkulosis) administration. <sup>4</sup> Anti-TB Drugs (OAT, Obat Anti Tuberkulosis) adverse drug events.

**Table 2.** Average Score of Respondent's Knowledge and Perception after intervention, day-30.

Variable	Intervention Group (n = 60)	Control Group (n = 62)	p-Value
Knowledge			
Lara TB <sup>1</sup>	3.95	1.75	<0.001
Cara ngombe OAT <sup>2</sup>	3.47	1.52	<0.001
Efek samping OAT <sup>3</sup>	3.21	0.80	<0.001
Perception			
Timeline	2.56	3.30	<0.001
Consequence	6.26	6.38	0.70
Personal control	6.00	5.85	0.01
Treatment control	4.10	3.97	0.17
Illness coherence	3.00	6.70	<0.001

<sup>1</sup> Tuberculosis (TB) Disease. <sup>2</sup> Anti-TB Drugs (OAT, Obat Anti Tuberkulosis) administration. <sup>3</sup> Anti-TB Drugs (OAT, Obat Anti Tuberkulosis) adverse drug events.

Perception domains that were changed due to education through Javanese (Ngoko) videos with the CBIA method were a timeline, personal control, illness coherence, and emotional representations ( $p$ -value < 0.05) (Table 2). Perception domains that did not change after education was given were the consequence, treatment control, and timeline cyclical ( $p$ -value > 0.05).

With regards to adherence, additional education from the researcher increased the number of respondents who take 95% of their pill in the intervention group (37% increases) three times higher than in the number of the respondent in the control group (12% increases) (Table 3). There was no relationship found between respondents' demographic factors (gender, age, level of education, and occupation) and the level of adherence to medications in the control group and the intervention group ( $p$ -value > 0.05) but this may be because the group size was modest.

**Table 3.** Percentage of respondents' adherence after a 30-days follow-up.

Time	Intervention Group (n = 60)	Control Group (n = 62)	p-Value
Pill count, day-1	58.06%	51.67%	0.48
Pill count, day-30	95.16%	63.33%	<0.001

#### 4. Discussion

Many factors influenced the successful delivery of this education. First, respondents had a strong desire to recover, and this heightened their need to obtain correct information about the disease. Second, placing the video on each respondent's mobile phone enabled patients to watch the videos again if they had forgotten. Other factors that may have affected knowledge include education level, information source, economic level, age, and occupation. An education increases adherence [23]. There is a positive relationship between knowledge level and adherence to taking anti-TB drugs [24–27]. Patients with a high level of knowledge had a greater chance of being adherent to medications compared to those having a low level of knowledge. A survey by Wandwalo and Morkve (2000) with regards to patients' knowledge about tuberculosis revealed that only 43.9% of patients knew the cause of tuberculosis, 54.9% of patients knew how *Mycobacterium tuberculosis* bacteria are transmitted, 82% of patients assumed that tuberculosis disease could be cured, 44.3% thought that tuberculosis disease could be prevented, 50.7% of patients knew the duration of tuberculosis treatment, and 29% of patients knew the side effects of anti-TB drugs [28].

Knowledge influences perception [29–32]. Perception about illness is the patient's experience with the disease suffered and that experience will be applied to his or her condition [33–35]. There is a positive correlation between perception and adherence to taking anti-TB drugs [36–40], and Pasek et al. (2013) found that 94% of patients with

positive perception adhere to their treatment, whereas only 13% of patients with negative perception adhere to their treatment. There are 33 out of 40 tuberculosis patients (82.5%) who had a positive perception and 27 out of 40 tuberculosis patients (67.5%) had good knowledge [41].

A greater increase of respondent's knowledge and perception in this study not only because of using a video but also because of using the local language. Language concordance will improve patient understanding, trust in the healthcare, and adherence to their treatment [42]. The implementation limitation of this study was not every healthcare had local language proficiency.

## 5. Conclusions

The use of videos with the local language, Javanese (Ngoko), as an educational tool effective increasing knowledge of tuberculosis disease, anti-TB drug administration, and anti-TB drug adverse drug events; understanding, and implicating as described in Bloom's taxonomy; turning negative perceptions of timeline, personal control, illness coherence, and emotional representations into positives perceptions; and increasing the adherence to tuberculosis medications.

**Author Contributions:** Conceptualization, F.H. and R.Y.; methodology, F.H. and A.; software, Y.M.; validation, F.H., Y.M., and A.; formal analysis, Y.M., F.H., and R.A.; investigation, Y.M.; resources, A.; data curation, Y.M.; writing—original draft preparation, F.H.; writing—review and editing, F.H. and R.A.; supervision, R.A. and R.Y.; project administration, R.Y.; funding acquisition, R.Y. All authors have read and agreed to the published version of the manuscript.

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**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the patient(s) to publish this paper.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions (privacy).

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## Appendix A

Knowledge questionnaire.

### SOAL PENGETAHUAN TUBERKULOSIS (TBC)

Penyakit TBC (total poin = 100)

1. TBC itu mlebu penyakit nular opo gak?
  - Lara sing nular (poin = 1)
  - Dudu lara sing nular (poin = 0)
  - Gak ngerti utawa bingung (poin = 0)
2. Lara TBC iki sebabe opo?
  - Bakteri *Mycobacterium tuberculosis* (poin = 1)
  - Jamur (poin = 0)
  - Virus (poin = 0)
  - Parasit (poin = 0)
  - Gak ngerti utawa bingung (poin = 0)
3. Tondo-tondo TBC iku opo? Tau ngalami dewe? ..... Sak piro suwene? ..... (lek jawaban bener  $\geq 3$  = poin 1; jawaban bener  $< 3$  = 0)



- Metu kringet adem lek bengi
  - Lemah, lemes, lepok
  - Ambekan sesek lan dodo lara koyok disuduk
  - Panas sak wulan luwih
  - Bobote mudhun
  - Nafsu mangan mudun
  - Watuk riak'en rong minggu luwih lan onok getih e
4. Coro TBC nular yo opo? (lek jawaban bener  $\geq 2 =$  poin 1; jawaban bener  $< 2 = 0$ )
- Watuk  Anginlek  Wahing  Ngidu  Nafas

#### Coro Ngombe OAT (total poin = 100)

1. Biasane sampeyan cara ngombe obate yo opo? (lek jawaban bener  $\geq 1 =$  poin 1)
- Sak-elinge
  - Diombe lek wayahe watuk tok, utawa panas tok
  - Isuk utawa bengi, sak jam sadurunge mangan (bener)
  - Isuk utawa bengi, rong jam sak wise mangan (bener)
  - Pas waktune utawa tetep waktune utawa pancet waktune ben dino e (bener)
  - Gak ngerti utawa lali utawa bingung
2. Sampeyan tau lali ngombe obat TBC? (lek jawaban bener  $\geq 1 =$  poin 1)
- Tau →Langsung ngombe dobel obat e saka biasae
  - Tau →Langsung ngombe pas eling (bener)
  - Tau →Kandha dokter (bener)
  - Tau →Gak ngombe obat sampe wayahe kontrol maneh
  - Gak tau lali (bener)
  - Bingung
- Lek tau lali, opo sing sampeyan lakukno ben gak gampang lali? (data deskriptif)
3. Jare dokter, sak piro suwene sampeyan kudu ngombe obat TBC iki? (jawaban bener poin = 1)
- Rong minggu luwih (poin = 0)
  - 1 wulan (poin = 0)
  - 2 wulan (poin = 0)
  - 3 wulan (poin = 0)
  - 6 wulan utawa luwih tergantung penyakite (poin = 1)
4. Opo ae macem e obat TBC sing sampeyan ombe? ngerti jeneng e? (lek jawaban bener  $\geq 2 =$  poin 1; jawaban bener  $< 2 = 0$ )
- Isoniazid (INH)  Pirazinamid
  - Rifampisin  Streptomisin injeksi
  - Etambutol

#### Efek Samping (total poin = 100)

1. Tondo-tondo opo ae sing perlu diwaspadai marine ngombe obat TBC? (lek jawaban bener  $\geq 2 =$  poin 1; jawaban bener  $< 2 = 0$ )
- Uyuh e abang  lara weteng  gringgingen
  - muneg-muneg lan muntah  ora nafsu mangan  nyeri sendi
  - budeg  gatel-gatel lan abang-abang nde kulit
  - kuning  mripat e bureng
2. Opo sing sampeyan lakukno lek onok keluhan koyok muneg-muneg lan muntah, lara weteng, gak nafsu mangan marine ngombe obat? (jawaban bener 2 = poin 1; jawaban bener  $< 2 = 0$ )
- Mandeg ngombe obat, wes gak gelem ngombe obat maneh sateruse
  - Ganti ngombe obat herbal
  - Ganti obat liyane ora kandha dokter

- Diombe isuk utawa bengi sakwise mangan (bener)
  - Kandha dokter (bener)
3. Lek uyuh e abang sakwise ngombe obat, sampeyan ngerti penyebab obat opo?
- Rifampisin (poin = 1)
  - Isoniazid (poin = 0)
  - Etambutol (poin = 0)
  - Pirazinamid (poin = 0)
  - Streptomisin (poin = 0)
4. Opo akibat e lek ngombe obat TBC gak teratur? (lek jawaban benar  $\geq 2$  = poin 1; jawaban benar  $< 2$  = 0)
- Ngulang pengobatane utawa tambah suwe waras e (bener)
  - Obat e gak mempan maneh (bener)
  - Penyakit e tambah akeh (bener)
  - Gak ngerti utawa bingung

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*Editor-in-Chief*

College of Pharmacy, University of Minnesota, 308 Harvard Street, SE, Minneapolis, MN 55455, USA

**Interests:** information processing and decision making related to the provision, use, and evaluation of drug products and pharmacist services. the work is grounded in health behavior theories; decision-making theories; behavioral economics; cognitive, social, and behavioral psychology; and marketing models of organizational and consumer behavior

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**Prof. Dr. David Wright** [Website](#)

*Associate Editor*

School of Pharmacy, University of East Anglia, Norwich NR4 7TJ, UK

**Interests:** provision of pharmaceutical care for older people; development and evaluation of complex interventions

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**Prof. Dr. Jeffrey Atkinson** [Website](#) [SciProfiles](#)

*Section Editor-in-Chief*

Pharmacolor Consultants Nancy, 12 rue de Versigny, Villers 54600, France

**Interests:** pharmacy education and training; bibliometrics

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**Prof. Dr. Keith A. Wilson** [Website](#)

*Founding Editor-in-Chief*

Aston Pharmacy School, School of Life and Health Sciences, Aston University, Aston Triangle, Birmingham, B4 7ET, UK

**Interests:** medicines management and prescribing controls in antibiotic use; pharmacy education; policy and health professional practice

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The Danish National Committee on Health Research Ethics

**Interests:** drug safety; pharmacovigilance; health law; regulatory science



**Dr. Bjarke Abrahamsen** [Website](#) [SciProfiles](#)

Department of Research and Development, Danish College of Pharmacy Practice, Milnersvej 42, Hillerød 3400, Denmark

**Interests:** medication review; deprescribing; adherence; pharmaceutical care; community pharmacy services



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**Prof. Dr. Majdi N. Al-Hasan** [Website](#) [SciProfiles](#)

School of Medicine, University of South Carolina, Columbia, SC 29208, USA

**Interests:** antimicrobial stewardship; antimicrobial resistance; bloodstream infections; sepsis; gram-negative bacteria; antibiotics; antibacterial agents; urinary tract infections

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**Dr. Chris Alderman** [Website](#)

School of Pharmacy and Medical Sciences, University of South Australia, Australia

**Interests:** clinical pharmacy; psychopharmacology; geriatrics; medicolegal pharmacy practice

---



**Dr. Minyon Avent** [Website](#)

1. Queensland Statewide Antimicrobial Stewardship Program, Brisbane, Australia

2. Infection and Immunity Theme, UQCCR, The University of Queensland, Australia

**Interests:** antimicrobial stewardship; dose optimisation

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**Prof. Dr. Amy E. Barton** [Website](#)

MHI / Science Lead, Nanomedicine Flughofstrasse 61 / CH-8152 Glattbrugg, Switzerland

**Interests:** dialysis; intravenous iron; anemia; innovative practice models; health policy; acute kidney injury

---



**Prof. Dr. Pierrick Bedouch** [Website](#)

Department of Clinical Pharmacy, Faculty of Pharmacy, Université Grenoble Alpes & Pharmacy Department, Grenoble Alpes University Hospital, France

**Interests:** clinical pharmacy; pharmacy practice education; adverse drug events prevention; health information technology; pharmacoepidemiology/Big data

---



**Prof. Dr. Sandra Benavides** [Website](#)

Department of Administrative and Clinical Sciences, College of Pharmacy, Larkin Health Sciences Institute, 18301 North Miami Avenue, Suite 1, Miami, FL 33169, USA

**Interests:** obesity; diabetes; ambulatory care services

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School of Human & Health Sciences, University of Huddersfield, UK

**Interests:** narratives around medicines; medication usage; social sciences and pharmacy; pharmacy practice; adherence, compliance and concordance

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**Dr. Barry E. Bleske** [Website](#) [SciProfiles](#)

Department of Pharmacy Practice and Administrative Sciences, University of New Mexico, College of Pharmacy, Albuquerque, NM, USA

**Interests:** cardiovascular; heart failure; atrial fibrillation; complementary alternative medicine; HMG-CoA reductase inhibitors; team based learning; clinical community pharmacy; environmental toxicology

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**Dr. Sinthia Boanic-Anticevich** [Website](#)

Woolcock Institute of Medical Research, University of Sydney, Sydney Local Health District, Sydney, NSW, Australia

**Interests:** allergic rhinitis; primary health care; asthma

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**Prof. Dr. Borut Bozic** [Website](#)

Faculty of Pharmacy, University of Ljubljana, Askerceva cesta 7, Ljubljana 1000, Slovenia

**Interests:** pharmacy practice and education; autoantibodies; autoimmunity; rheumatic diseases

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**Dr. Luigi Brunetti** [Website](#) [SciProfiles](#)

Department of Pharmacy Practice, Ernest Mario School of Pharmacy, Piscataway, NJ 08854, USA

**Interests:** cardiovascular disease and drug use in special populations

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**Dr. Suzanne M. Cadarette** [Website](#) [SciProfiles](#)

Leslie Dan Faculty of Pharmacy, University of Toronto, Toronto, ON M5S 3M2, Canada

**Interests:** epidemiology; health policy; health services; pharmacoepidemiology; pharmacy practice; osteoporosis; fracture prevention

---



**Dr. Afonso M. Cavaco** [Website](#)

Department of Social Pharmacy, Faculty of Pharmacy University of Lisbon, Lisbon, 1649-003, Portugal

**Interests:** pharmacy practice; health communication; social pharmacy

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**Prof. Dr. Christian Cavé**

Faculty of Pharmacy, university Paris Sud, 5 Rue Jean Baptiste Clément, Châtenay - Malabry, F 92290, France

**Interests:** pharmacy education (postgraduate studies); medicinal chemistry; chemistry; parasitology

---

**Dr. Jongwha Chang** [Website](#)

School of Pharmacy, Department of Pharmacy Practice, University of Texas at El Paso, 500 W. University Ave, El Paso, TX 79968, USA

**Interests:** health outcomes; pharmacoeconomics; health services research; healthcare management

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**Dr. Lita Chew** [Website](#)

1. Head, Associate Professor, Department of Pharmacy, National University of Singapore, Singapore 117543, Singapore

2. Chief Pharmacist, Ministry of Health, Singapore 169854, Singapore

**Interests:** medication management; medication adherence; pharmacy practice; workforce development

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**Dr. Richard Cooper** [Website](#) [SciProfiles](#)

School of Health and Related Research, The University of Sheffield, Western Bank, Sheffield S10 2TN, UK

**Interests:** misuse, abuse and addiction to medicines; over-the-counter and prescription medicine supply and prescribing; medical sociology; pharmacy; medical ethics

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**Prof. Dr. Hans De Loof** [Website](#)

Departement Farmaceutische Wetenschappen, University of Antwerp - Campus Drie Eiken, Universiteitsplein 1, B-2610 Antwerpen, Belgium

**Interests:** community pharmacy; pharmacology; bioinformatics/health informatics; critical thinking

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**Prof. Dr. Kristien De Paepe** [Website](#)

VUB, Brussels, Belgium

**Interests:** experimental in vitro toxicology and dermato-cosmetology; skin function and permeability; pharmaceutical and pharmacological sciences

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**Prof. Dr. Lealey Diack** [Website](#)

School of Pharmacy and Life Sciences, Robert Gordon University, Aberdeen, AB22 8LF, UK

**Interests:** technology-enhanced learning; improving the student experience; lifelong learning

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**Prof. Dr. Parasitou Donyal** [Website](#) [SciProfiles](#)

Department of Pharmacy, University of Reading, Reading, RG6 6AP, UK

**Interests:** pharmacy practice; the social psychology of medication taking and medicine reuse

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**Dr. Rohan Elliott** [Website](#)

Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, 381 Royal Pde, Parkville, VIC 3052, Australia

Pharmacy Department, Austin Health, Heidelberg, VIC 3084, Australia

**Interests:** geriatric medicine; clinical pharmacy; medication safety; medication adherence

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**Dr. Jasmina Fejzic** [Website](#)

School of Pharmacy, University of Queensland, Woolloongabba QLD 4102, Australia

**Interests:** social pharmacy; culture; translatability of research; pharmacy education

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**Dr. Helen Gallagher** [Website](#)

Head of Clinical Pharmacology, School of Medicine, Conway Institute, University College Dublin, Belfield, Dublin 4, IRELAND

**Interests:** pharmaceutical care; practice of pharmacy; neuropharmacology; oncanaesthesia

---

**Prof. Dr. Paul J. Gallagher** [Website](#)

School of Pharmacy, Royal College of Surgeons in Ireland, 123 St. Stephens Green, Dublin 2, Ireland

**Interests:** pharmacy management; medication use in pregnancy; pharmacy education; policy and health professional practice

---

**Dr. Giselle Gallego** [Website](#) [SciProfiles](#)

School of Medicine, Sydney, The University of Notre Dame Australia, Sydney, Australia

**Interests:** health care education; interprofessional learning; health services research; knowledge translation; vulnerable populations; disability

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**Prof. Dr. Beverley D. Glass** [Website](#) [SciProfiles](#)

Pharmacy, College of Medicine and Dentistry, James Cook University, Angus Smith Drive, Townsville, Queensland 4811, Australia

**Interests:** photo-stability; in-use drug stability; drug regulation and quality; counterfeit medicines

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**Prof. Dr. Ferraz Gonçalves** [Website](#) [SciProfiles](#)

Instituto Português de Oncologia de Francisco Gentil Porto, Porto, Portugal

**Interests:** palliative care; pain and other symptom control; opioid pharmacology; ethics on end-of-life issues

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**Dr. Muhammad Hadi** [Website](#) [SciProfiles](#)

Senior Lecturer in Pharmacy Practice and Policy, Institute of Clinical Sciences, University of Birmingham, Birmingham, B15 2TT, UK

**Interests:** mixed-methods; health services research; medication safety; adherence; systematic reviews

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**Dr. Karl Hanford** [Website](#) [SciProfiles](#)

Institute for Molecular Bioscience, University of Queensland, Brisbane, QLD 4072, Australia

**Interests:** antibiotics; antimicrobial resistance; polymyxins; peptide chemistry; peptide mimicry; drug discovery; organic synthesis

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**Dr. Laetitia Hattingh** [Website](#)

School of Pharmacy and Pharmacology, Griffith University, Gold Coast campus, 4215, Queensland, Australia

**Interests:** law and ethics; professional pharmacy services; mental health; drug misuse/abuse

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**Prof. Dr. Kurt E. Herberger** [Website](#)

Pharmaceutical Care Research Group, University of Basel, Basel, Switzerland

**Interests:** pharmaceutical care; pharmacy practice; medication management; adherence

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**Prof. Dr. Jouni Hirvonen** [Website](#)

Pharmacy Faculty, University of Helsinki, Yliopistonkatu 4, P.O. Box 33-4, Helsinki 00014, Finland

**Interests:** pharmacy; pharmaceutical technology; drug delivery nanoparticles; drug dissolution and absorption

---



**Dr. Samantha Hollingworth** [Website](#)

School of Pharmacy, University of Queensland, Woolloongabba QLD 4102, Australia

**Interests:** pharmacoepidemiology; health technology assessment; health outcomes and medicines use in the real world; health services research

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**Dr. Stéphane G. Honoré** [Website](#)

Department of Clinical Pharmacy, Faculty of Pharmacy, Aix-Marseille University & Pharmacy Department, La Timone University Hospital, Assistance Publique-Hôpitaux de Marseille, France

**Interests:** clinical pharmacy; pharmacy practice and education; pharmacoepidemiology and clinical trials; adverse drug reaction prevention

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**Prof. Dr. Christine A. Hughes** [Website](#) [SciProfiles](#)

Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta, Edmonton, Alberta, T6G 1C9, Canada

**Interests:** HIV; sexually transmitted and blood-borne infections; point of care testing; pharmacy practice research; professional development of pharmacists

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**Prof. Dr. Renata Jachowicz**

Department of Pharmaceutical Technology and Biopharmacy, Faculty of Pharmacy in Collegium Medicum, Jagiellonian University, Krakow, Poland

**Interests:** technological aspects of improving the pharmaceutical availability; optimization of modern drug forms; drug form design; innovative solutions in drug form design

---

**Dr. Meghan N. Jeffres** [Website](#) [SciProfiles](#)

University of Colorado Anschutz Medical Campus, Skaggs School of Pharmacy and Pharmaceutical Sciences, Department of Clinical Pharmacy, CO 80045, USA

**Interests:** antibiotic allergy/hypersensitivity; infectious diseases education; gamification

---



**Prof. Dr. Sue Jordan** [Website](#) [SciProfiles](#)

Faculty of Health and Life Sciences, Swansea University, Swansea SA2 8PP, UK

**Interests:** medicines management; adverse drug reactions / nurse-led monitoring; pharmaco-epidemiology and breastfeeding

---

**Dr. Susanne Kaae** [Website](#) [SciProfiles](#)

Department of Pharmacy, University of Copenhagen, Universitetsparken 2, 2100 København Ø, Denmark

**Interests:** communication between patients and health care professionals; patient-centered care; cognitive services; patient perspectives on medicine use

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**Dr. Nina Katajavuori** [Website](#) [SciProfiles](#)

Centre for University Teaching and Learning, University of Helsinki, Helsinki 00014, Finland

**Interests:** pharmacy education; curriculum development; teaching and learning pharmacy; development of pharmaceutical expertise; faculty development; scholarship of teaching

---



**Prof. Dr. Reem Kayyali** [Website](#) [SciProfiles](#)

School of Pharmacy and Chemistry, Kingston University

**Interests:** public health; medicines optimisation; patient care; mobile health; pharmacy services; patient education; telehealth; patient experience; healthcare education

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**Dr. Richard Keers** [Website](#)

Division of Pharmacy and Optometry, School of Health Sciences, The University of Manchester, Manchester M13 9PL, UK

**Interests:** medication safety; pharmacoepidemiology; pharmacy education; mental health therapeutics; mental health pharmacy; clinical pharmacy practice; process evaluation

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---

**Dr. Nadir Khair** [Website](#)

School of Pharmacy, The University of Auckland, Private Bag 92019, Auckland 1142, New Zealand

**Interests:** social and administrative pharmacy; health outcome research; patient-reported outcomes

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**Dr. Sam Kosari** [Website](#) [SciProfiles](#)

Discipline of Pharmacy, Faculty of Health, University of Canberra, Canberra, ACT, Australia

**Interests:** quality use of medicines; aged care; medication safety; pharmacists in aged care; pharmacists in General Practice; medication adherence; Pharmacoeconomics; pharmacy education; health service optimisation

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**Dr. Andries S. Koster** [Website](#)

Department Pharmaceutical Sciences, Utrecht University, Utrecht, the Netherlands

**Interests:** the development of undergraduate programs for pharmacy, pharmaceutical and biomedical sciences; the role of motivational and other noncognitive factors in the study success of undergraduate students and pharmacists who participate in continuous professional development programs

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**Dr. Cherie Lucas** [Website](#) [SciProfiles](#)

Graduate School of Health (Pharmacy), University of Technology Sydney, Sydney, Australia

**Interests:** curriculum instruction and design; reflective practice; pharmacy; interprofessional education and collaboration; AI reflective writing tools

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**Prof. Dr. Ulf Madsen** [Website](#)

School of Pharmaceutical Sciences, Faculty of Health and Medical Sciences, University of Copenhagen, Universitetsparken 2, 2100 Copenhagen, Denmark

**Interests:** AMPA receptors; NMDA receptor; neurotransmission

---

**Prof. Dr. Ulf Madsen** [Website](#)

School of Pharmaceutical Sciences, Faculty of Health and Medical Sciences, University of Copenhagen, Universitetsparken 2, 2100 Copenhagen, Denmark

**Interests:** AMPA receptors; NMDA receptor; neurotransmission

---

**Dr. Ian Maidment** [Website](#) [SciProfiles](#)

Reader in Clinical Pharmacy, Lead Course Tutor, Postgraduate Psychiatric Pharmacy Programme, Medicines and Devices in Ageing Cluster Lead, School of Life and Health Sciences, Aston University, Birmingham, B4 7ET, UK

**Interests:** medication optimisation in older people; mental health; use of mixed methods and realist research

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**Prof. Dr. Marketa Marvanova** [Website](#) [SciProfiles](#)

Chair of the Department of Pharmacy Practice and Associate Professor, College of Health Professions, School of Pharmacy, North Dakota State University, Fargo, ND 58057, USA

**Interests:** clinical pharmacology and therapeutics; geriatric medicine; management of outpatients and inpatients with Parkinson's disease and Lewy body dementia; comprehensive pharmacologic management of epilepsy; dementia; and management of neuropsychiatric issues associated with epilepsy and neurodegenerative disorders; continuous professional development in pharmacy; and pharmacy education and training in the area of geriatric and neuropsychiatry

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**Prof. Dr. Conxita Mestres** [Website](#) [SciProfiles](#)

Department of Pharmacy and Nutrition, School of Health Sciences Blanquerna, University Ramon Llull, Barcelona 08025, Spain

**Interests:** pharmacy practice; pharmaceutical care; health sciences education; pharmacology

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**Prof. Dr. Constantin Miricliu** [Website](#)

Pharmacy Faculty, University of Medicine and Pharmacy "Carol Davila" Bucharest, Dionisie Lupu 37, Bucharest 020021, Romania

**Interests:** pharmacokinetics; pharmacy practice and education

---

**Dr. Darko Modun** [Website](#)

Department of Pharmacy, School of Medicine, University of Split, Split, Croatia

**Interests:** clinical pharmacy; education; attitudes; knowledge; antibiotics

---



**Prof. Dr. Ana Isabel Morales Martin** [Website](#) [SciProfiles](#)

Universidad de Salamanca, 37008 Salamanca, Spain

**Interests:** nephrotoxicity; nephrology; pharmacology

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**Prof. Dr. Mark Naunton** [Website](#) [SciProfiles](#)

Discipline of Pharmacy, Faculty of Health, University of Canberra, Canberra, ACT, Australia

**Interests:** medication safety; aged care; pharmacists in aged care; pharmacists in General Practice; medication adherence; infectious disease; quality use of medicines; travel medicine; Men's Health; Pharmacoeconomics; pharmacy education

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**Dr. George Mihai Nitulescu** [Website](#) [SciProfiles](#)

Faculty of Pharmacy, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

**Interests:** developing and using computational methods in medicinal chemistry; quantitative structure-activity/in silico/ target identification; the prediction of biopharmaceutical properties; predictive toxicology evaluation

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**Prof. Dr. Aleš Obreza** [Website](#)

Faculty of pharmacy, University of Ljubljana, Aškerčeva cesta 7, Ljubljana 1000, Slovenia

**Interests:** pharmaceutical chemistry

---



**Dr. Karl L. Olson** [Website](#)

Kaiser Permanente Colorado and University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Boulder, CO, USA

**Interests:** cardiovascular; cardiovascular risk reduction; health services research; medication adherence; HMG-CoA reductase inhibitors

---



**Dr. Richard H. Parrish II** [Website](#)

1. Director and Chief Pharmacist and Director, St. Christopher's Hospital for Children, 160 East Erie Avenue, Philadelphia, PA 19134, USA  
2. Clinical Associate Professor (affiliate), School of Pharmacy, Virginia Commonwealth University, Richmond, VA 23298, USA

**Interests:** pharmacy pediatrics; perioperative care; medication management; health informatics; clinical administration

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**Dr. Nilesh Patel** [Website](#) [SciProfiles](#)

Reading School of Pharmacy, University of Reading, Reading RG6 6AP, UK

**Interests:** clinical pharmaceuticals; pharmacy practice; drug delivery; qualitative research; pharmacy

---



**Dr. Joseph V. Pergolizzi** [Website](#)

Johns Hopkins University School of Medicine in Baltimore, Maryland Naples Anesthesia and Pain Associates in Naples, Florida

**Interests:** Analgesics Pk/PD

---



**Prof. Dr. Gregory Peterson** [Website](#)

School of Pharmacy and Pharmacology, University of Tasmania, Bag 26, Hobart, TAS 7001, Australia

**Interests:** clinical pharmacy; medication safety; health informatics; health services research

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**Dr. Brian J. Piper** [Website](#) [SciProfiles](#)

Department of Medical Education, Geisinger Commonwealth School of Medicine, Scranton, PA 18509, USA

**Interests:** opioids; cannabinoids; stimulants; controlled substances; medical education

---



**Prof. Dr. Lisa Pont** [Website](#) [SciProfiles](#)

Discipline of Pharmacy, Graduate School of Health, University of Technology Sydney, PO Box 123, Broadway NSW 2007, Australia

**Interests:** pharmacoepidemiology; drug utilisation research; health services research; clinical pharmacy research; medication use among older populations

---



**Dr. Melany P. Pugliese** [Website](#)

Department of Pharmaceutical Sciences, Chicago State University, 9501 S. King Drive, Chicago, IL 60623, USA

**Interests:** pharmacy education; pharmaceutical sciences; biochemistry; curriculum development; drug discovery

---

**Dr. Dimitrios M. Rekkas** [Website](#) [SciProfiles](#)

Department of Pharmacy, National and Kapodistrian University of Athens, Athens 15784, Greece

**Interests:** pharmaceutical technology; industrial pharmacy; dosage form design; experimental design; statistical process control; quality control; quality assurance; total quality management; quality by design (QbD)

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**Prof. Dr. Paul Rutter** [Website](#)

University of Portsmouth, Portsmouth, United Kingdom

**Interests:** self-care; community pharmacy; clinical decision making and clinical reasoning; service development

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**Prof. Dr. Cristin Ryan** [Website](#) [SciProfiles](#)

School of Pharmacy and Pharmaceutical Sciences, Trinity College Dublin, Dublin 2, Ireland

**Interests:** intervention development; appropriate prescribing; polypharmacy; adherence; medicines optimisation

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**Dr. Cheryl A. Sadowaki** [Website](#) [SciProfiles](#)

Faculty of Pharmacy & Pharmaceutical Sciences, University of Alberta, 3-229 Edmonton Clinic Health Academy, Edmonton, AB T6G 1C9, Canada

**Interests:** geriatrics; geriatric syndromes; falls; attitudes toward older adults; deprescribing; medication appropriateness

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**Dr. Bandana Saini** [Website](#)

School of Pharmacy, Faculty of Medicine and Health, University of Sydney

**Interests:** pharmacy health care services; patient preferences, patient experience and clinical respiratory and sleep health

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**Prof. Dr. Antonio Sánchez Pozo** [Website](#)

Faculty of Pharmacy, University of Granada, 18071 Granada, Spain

**Interests:** pharmacy education; curriculum development

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**Prof. Dr. Ellen Schattheutle** [Website](#)

Division of Pharmacy and Optometry, School of Health Sciences, Centre for Pharmacy Workforce Studies, The University of Manchester, Manchester, UK

**Interests:** pharmacy policy; pharmacy education; workforce; community pharmacy; primary care

---



**Dr. Theresa J. Schindel** [Website](#) [SciProfiles](#)

Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta, Canada

**Interests:** pharmacy practice; qualitative research methods; professional identity; practice change; social pharmacy; pharmacy education

---



**Dr. Jennifer Schneider** [Website](#) [SciProfiles](#)

Discipline of Clinical Pharmacology, School of Medicine and Public Health University of Newcastle, University Drive, Callaghan NSW 2308, Australia

**Interests:** palliative care; therapeutic drug monitoring and use of dried blood spot testing in oncology and transplant patients; cannabinoids; clinical pharmacokinetics and pharmaceuticals; drug stability; teaching and learning

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Special Issue in *Pharmacy*: Pharmaceuticals and Clinical Pharmacokinetics

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**Prof. Dr. Nick Shaw** [Website](#)

The School of Pharmacy, The University of Queensland, Pharmacy Australia Centre of Excellence, Level 4, 20 Cornwall Street, Woolloongabba, QLD 4102, Australia

**Interests:** application of a range of analytical methodologies to solve clinical and health-related problems; metabolite profiling methodology applied to nutrient profiles of tropical and other plants and secondary metabolite identification and quantitation from bacteria; drug metabolism; biopharmaceutics; drug delivery and pharmacokinetic studies; education, curriculum development and workforce issues in pharmacy

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**Dr. Maree Donna Simpson** [Website](#)

School of Biomedical Sciences, Charles Sturt University, Orange, New South Wales 2800, Australia

**Interests:** workplace learning; professional education; interprofessional assessment; pharmacy practice

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**Prof. Dr. Agnieszka Skowron** [Website](#)

Jagiellonian University, Gołębia 24, 31-007 Kraków, Poland

**Interests:** pharmacy; drug information; clinical pharmacy; patient safety; pharmacy education; clinical trials of pharmaceuticals; healthcare quality; quality management; evidence based medicine; medical education

---

**Dr. Douglas Steinke** [Website](#) [SciProfiles](#)

Senior Lecturer in Pharmacoepidemiology and Division Senior PGR Tutor, Division of Pharmacy & Optometry, School of Health Sciences, The University of Manchester, Manchester, M13 9PT, UK

**Interests:** pharmacoepidemiology; drug utilisation research; health services research; clinical pharmacy research; medication use in chronic diseases

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**Prof. Dr. Ieva Stupana** [Website](#)

School of Health and Biomedical Sciences, RMIT University, Victoria 3000, Australia

**Interests:** pharmacy education; interprofessional education; teaching and learning; staff development

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**Prof. Dr. Jeff Taylor** [Website](#)

College of Pharmacy and Nutrition, University of Saskatchewan, Saskatoon, SK S7N 5C9, Canada

**Interests:** self-care; OTC medicines; pharmacist prescribing

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---

**Dr. Janine M. Trauleen** [Website](#)

Department of Pharmacy (Social and Clinical Pharmacy), Faculty of Health and Medical Sciences, University of Copenhagen, Universitetsparken 2, 2100 Copenhagen Ø, Denmark

**Interests:** medical sociology; pharmaceutical policy; the pharmacy profession; medical technology assessment; medication usage; social sciences and pharmacy; theory and methods in social pharmacy research; patient/lay perspectives on medicines

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**Prof. Dr. Paul M. Tulkens** [Website](#) [SciProfiles](#)

Cellular and Molecular Pharmacology, Louvain Drug Research Institute, Université catholique de Louvain (UCLouvain), Brussels, Belgium

**Interests:** pathophysiology of lysosomes; endocytosis and of the interactions of drugs and chemicals with membranes and subcellular organelles; antibiotic toxicity (molecular, cellular and clinical aspects); chemotherapy of intracellular infection; antibiotic efflux pumps and transporters; pharmacodynamics and pharmacokinetics of anti-infective drugs (in vitro models and clinical trials); discovery and development of new antibiotics; promotion of proper antibiotic usage (through guidelines and public actions); implementation of clinical pharmacy in Belgium

---

**Dr. Michael James Twigg** [Website](#)

University of East Anglia

**Interests:** realist research; mixed methods; community pharmacy; primary care pharmacy; medication management; chronic disease



---

**Prof. Dr. Mojtaba Valemoradi** [Website](#) [SciProfiles](#)

Faculty of Nursing and Health Sciences, Nord University, Bodo, Norway

**Interests:** medicines management; patient safety; nursing care

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Special Issue in *Pharmacy*: PRN Medicines Management



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**Prof. Dr. Daley Volmer** [Website](#) [SciProfiles](#)

University of Tartu, Ülikooli 18, 50090 Tartu, Estonia

**Interests:** pharmaceutical development; pharmacy; drug information; pharmacy education; clinical pharmacy; drug safety; hospital pharmacy; therapeutic drug monitoring; herbal medicine; patient safety

---

**Prof. Dr. Shigeo Yamamura**

Faculty of Pharmaceutical Science, Josai International University, Gumyo 1, Togane, Chiba 283-8555, Japan

**Interests:** pharmacy education; pharmacy practice research; education and training for healthcare professionals; model statistics



---

**Dr. Wai Ping Yau** [Website](#) [SciProfiles](#)

Department of Pharmacy, National University of Singapore, 18 Science Drive 4, Singapore 117543, Singapore

**Interests:** clinical pharmacokinetics; pharmacogenetics; pharmacoepidemiology; public health; pharmaceutical analysis; pharmacy education



---

**Prof. Dr. Lillya Eugenevna Ziganshina** [Website](#)

1. Cochrane Russia, St Albans House, 57-59 Haymarket, London SW1Y 4QX, UK

2. Centre for Knowledge Translation, Institute for Methodology of Professional Development, Federal State Budgetary Educational Institution of Continuing Professional Education "Russian Medical Academy of Continuing Professional Education" of the Ministry of Health of the Russian Federation (RMANPO): 2/1, Barikadnaya Street, 123995 Moscow, Russia

3. Department of Pharmacology, Kazan State Medical University of the Ministry of Health of the Russian Federation (KSMU), 49 Butlerov Street, 420012 Kazan, Russia

4. Department of Basic and Clinical Pharmacology, Kazan Federal University of the Ministry of Science and Higher Education of the Russian Federation (KFU), 18 Kremlevskaya Street, 420008 Kazan, Russia

**Interests:** evidence-based medicine; clinical epidemiology; pharmacoepidemiology; pharmacology; clinical pharmacology & therapeutics

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### Disposal Practices of Unused and Leftover Medicines in the Households of Dhaka Metropolis

by Mst. Marium Begum, Sanzana Fareen Rivu, Md. Mahmud Al Hasan, Tasnova Tasnim Nova, Md. Motiar Rahman, Md. Abdul Alim, Md. Sahab Uddin, Azharul Islam, Nurnahar, Nuzhat Tabassum, Md. Marufur Rahman Moni, Rehnuma Roselin, Munny Das, Rayhana Begum and Md. Sohanur Rahman

*Pharmacy* 2021, 9(2), 103; <https://doi.org/10.3390/pharmacy9020103> - 20 May 2021

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**Abstract Background:** This fact-finding study aimed to attain an overall idea and knowledge about medicine disposal practices in Dhaka Metropolitan households. **Methods:** This mixed study (both quantitative and qualitative) was orchestrated to inspect the household leftover medicine disposal pattern's governing status. A cross-sectional survey [...] [Read more.](#)

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### Community Pharmacy Minor Ailment Service (PMAS): An Untapped Resource for Children and Their Carers

by Tami Benzaken, Godwin Oligbu, Michael Levitan, Subrina Ramdarshan and Mitch Blair

*Pharmacy* 2021, 9(2), 102; <https://doi.org/10.3390/pharmacy9020102> - 17 May 2021

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**Abstract Background:** The Pharmacy Minor Ailment Service (PMAS) was introduced in the UK over 15 years ago for use in treating minor ailments and has been shown to be effective and acceptable by the public in reducing the burden on high-cost healthcare settings (such [...]) [Read more.](#)

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Open Access Review



### Opioid-Induced In-Hospital Deaths: A 10-Year Review of Australian Coroners' Cases Exploring Similarities and Lessons Learnt

by Nicholas Smoker, Ben Kirsopp and Jacinta Lee Johnson

*Pharmacy* 2021, 9(2), 101; <https://doi.org/10.3390/pharmacy9020101> - 07 May 2021

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**Abstract** Although opioids are the cornerstone of moderate-to-severe acute pain management they are appropriately recognised as high-risk medicines. Patient and health service delivery factors can contribute to an increased risk of death associated with excessive sedation and respiratory impairment. Despite increasing awareness of opioid-induced [...] [Read more.](#)

(This article belongs to the Special Issue [Responsible Use of Opioids](#))

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## A 15-Year Ecological Comparison for the Hiring Dynamics of Minnesota Pharmacies between 2006 and 2020

by Jon C. Schommer, Anthony W. Olson, SuHak Lee, Caroline A. Gaither and Stephen W. Schondelmeyer

*Pharmacy* 2021, 9(2), 100; <https://doi.org/10.3390/pharmacy9020100> - 06 May 2021

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**Abstract** Labor market forces in pharmacy are affected by frictional unemployment (job turnover), structural employment forces that require new skill sets for employees, and hiring practices that integrate technology or less costly labor such as pharmacy technicians. The objectives of this study were to [...] [Read more.](#)

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## COVID the Catalyst for Evolving Professional Role Identity? A Scoping Review of Global Pharmacists' Roles and Services as a Response to the COVID-19 Pandemic

by Kaitlyn E. Watson, Theresa J. Schindel, Marina E. Barsoum and Janice Y. Kung

*Pharmacy* 2021, 9(2), 99; <https://doi.org/10.3390/pharmacy9020099> - 04 May 2021

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**Abstract** The COVID-19 pandemic requires a range of healthcare services to meet the needs of society. The objective was to explore what is known about the roles and services performed by frontline pharmacists during the first year of the COVID-19 pandemic. A scoping review [...] [Read more.](#)

(This article belongs to the Special Issue [Pharmacist Services II](#))

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## Cross-Sectional Survey among General Population Regarding Knowledge and Attitude toward Antibiotic Usage in Western Saudi Arabia

by Syed Faisal Zaidi, Muhannad Wael Baroom, Adil Ibrahim Hanbashi, Abdulrahman Abdulaziz Alkhaibari, Ahmed Omar Yahya, Muath Alsalmi, Rakan Alotaibi, Abdulaziz Nagro, Muhammad Anwar Khan and Asim Muhammed Alshanberi

*Pharmacy* 2021, 9(2), 98; <https://doi.org/10.3390/pharmacy9020098> - 01 May 2021

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**Abstract** Background: Antibiotic resistance is a threatening issue to human wellbeing and an obstacle in the treatment process of many life-threatening illnesses. This study aims to assess the knowledge and attitudes toward antibiotic usage among the general population in Jeddah, Saudi Arabia. Methods: A [...] [Read more.](#)

(This article belongs to the Section [Pharmacy Education and Student / Practitioner Training](#))

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## A Methodological Assessment of Pharmacist Therapeutic Intervention Documentation (TID) in a Single Tertiary Care Hospital in Jeddah, Kingdom of Saudi Arabia

by Ali F. Alwadie, Anjum Naeem, Meaad Almazmomi, Meshail A. Baswaid, Yahya A. Alzahrani and Abdullah M. Alzahrani

*Pharmacy* 2021, 9(2), 97; <https://doi.org/10.3390/pharmacy9020097> - 28 Apr 2021

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**Abstract** Pharmacist intervention has valuable input to the healthcare system by reducing medication errors, costs of treatment and improving therapeutic outcomes. This study aimed to analyze pharmacists' interventions during the verification of computerized physician order entry and to determine the association between prescribers' level [...] [Read more.](#)

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## Pharmacist Prescribing for Minor Ailments Service Development: The Experience in Ontario

by Nardine Nakhla and Anastasia Shiamptanis

*Pharmacy* 2021, 9(2), 96; <https://doi.org/10.3390/pharmacy9020096> - 27 Apr 2021

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**Abstract** To date, eight of ten Canadian provinces have authorized pharmacists to prescribe for minor ailments. Prompted by a request by the Ontario Minister of Health, draft regulations were submitted to enable this pharmacy service in Ontario. Differences exist in how jurisdictions have approached [...] [Read more](#).

(This article belongs to the Special Issue *Community Pharmacy Minor Ailment Services*)

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## Australian Community Pharmacy Harm-Minimisation Services: Scope for Service Expansion to Improve Healthcare Access

by Sara S. McMillan, Hidy Chan and Laetitia H. Hattingh

*Pharmacy* 2021, 9(2), 95; <https://doi.org/10.3390/pharmacy9020095> - 26 Apr 2021

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**Abstract** Community pharmacies are well positioned to participate in harm-minimisation services to reduce harms caused by both licit and illicit substances. Considering developments in pharmacist practices and the introduction of new professional pharmacy services, we identified a need to explore the contemporary role of [...] [Read more](#).

(This article belongs to the Special Issue *Addiction and Mental Health in Pharmacy*)

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## Distributing Publicly-Funded Influenza Vaccine—Community Pharmacies' Perspectives on Acquiring Vaccines from Public Health and from Private Distributors in Ontario, Canada

by Joseph Fonseca, Richard Violette, Sherilyn K. D. Houle and Nancy M. Waite

*Pharmacy* 2021, 9(2), 94; <https://doi.org/10.3390/pharmacy9020094> - 24 Apr 2021

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**Abstract** Objectives: To explore community pharmacies' experience with two models of distribution for publicly-funded influenza vaccines in Ontario, Canada—one being publicly-managed (2015–2016 influenza season) and one involving private pharmaceutical distributors (2016–2017 season). Methods: Online surveys were distributed to community pharmacies across Ontario during the [...] [Read more](#).

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## Use of Visual Dashboards to Enhance Pharmacy Teaching

by Andrew Bartlett, Carl R. Schneider, Jonathan Penm and Ardalan Mirzaei

*Pharmacy* 2021, 9(2), 93; <https://doi.org/10.3390/pharmacy9020093> - 23 Apr 2021

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**Abstract** Teaching large cohorts of pharmacy students with a team of multiple tutors in a feedback intensive course poses challenges in relation the amount of data generated, data integrity, interpretation of the data and importantly application of the insights gained from the data. The [...] [Read more](#).

(This article belongs to the Special Issue *Technology-Enhanced Pharmacy Teaching and Learning Strategies*)

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## Perceptions of Independent Pharmacist Prescribing among Health Authority- and Community-Based Pharmacists in Northern British Columbia

by Jordan Lewis, Arden R. Barry, Katie Bellefeuille and Robert T. Pammett

*Pharmacy* 2021, 9(2), 92; <https://doi.org/10.3390/pharmacy9020092> - 23 Apr 2021

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**Abstract** Pharmacists across Canada have varying degrees of ability to prescribe medications depending on their jurisdiction of licensure. The purpose of this study was to evaluate attitudes, beliefs, and perceptions of independent pharmacist prescribing among health authority- and community-based pharmacists. This prospective, cross-sectional [...] [Read more.](#)

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## Feedback for Learning in Pharmacy Education: A Scoping Review

by Nicholas R. Nelson, Rebecca B. Carlson, Amanda H. Corbett, Dennis M. Williams and Denise H. Rhoney

*Pharmacy* 2021, 9(2), 91; <https://doi.org/10.3390/pharmacy9020091> - 23 Apr 2021

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**Abstract** Feedback is an effective pedagogy aimed to create cognitive dissonance and reinforce learning as a key component of clinical training programs. Pharmacy learners receive constant feedback. However, there is limited understanding of how feedback is utilized in pharmacy education. This scoping review sought [...] [Read more.](#)

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## Factors Associated with Medication Non-Adherence among Patients with Lifestyle-Related Non-Communicable Diseases

by Rie Nakajima, Fumiyuki Watanabe and Miwako Kamei

*Pharmacy* 2021, 9(2), 90; <https://doi.org/10.3390/pharmacy9020090> - 22 Apr 2021

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**Abstract** This cross-sectional study explored the association between medication non-adherence and its factors in patients with non-communicable diseases (NCDs) using an online structured questionnaire emailed to 30,000 people (aged over 20 years who lived in Japan at the time of the survey). The questions [...] [Read more.](#)

(This article belongs to the Special Issue Patient Adherence)

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## Adapting a National Framework to Inform Curricular Redesign Focused on Enhancing Student Clinical Competency

by Andrew Bzowycyk, Bridget Bradley, Pauline Cawley, Brandon Nuziale and Sarah White

*Pharmacy* 2021, 9(2), 89; <https://doi.org/10.3390/pharmacy9020089> - 22 Apr 2021

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**Abstract** Doctor of Pharmacy (PharmD) programs continually engage in curricular redesign to ensure practice readiness of graduates. With ever-increasing demands on clinical competency and curricular time, it is important to be intentional when determining curricular priorities and prioritize contemporary pharmacist practice. This paper describes [...] [Read more.](#)

(This article belongs to the Special Issue An International Professional Mandate: Pharmacy Clinical Competency)

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## Medicines as Common Commodities or Powerful Potions? What Makes Medicines Reusable in People's Eyes

by Monica Chauhan, Hamza Alhamad, Rachel McCrindle, Terence K. L. Hui, R. Simon Sherratt and Parastou Donyai

*Pharmacy* 2021, 9(2), 88; <https://doi.org/10.3390/pharmacy9020088> - 20 Apr 2021

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**Abstract** Background: Medicines reuse involves dispensing quality-checked, unused medication returned by one patient for another, instead of disposal as waste. This is prohibited in UK community pharmacy because storage conditions in a patient's home could potentially impact on the quality, safety and efficacy of [...] [Read more](#).

(This article belongs to the Special Issue Medicines Reuse)

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## Enhancing Student Knowledge of Diabetes through Virtual Choose Your Own Adventure Patient Case Format

by Tyler Marie Kiles, Elizabeth A. Hall, Devin Scott and Alina Cernasev

*Pharmacy* 2021, 9(2), 87; <https://doi.org/10.3390/pharmacy9020087> - 20 Apr 2021

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**Abstract** Educational strategies to teach pharmacy students about diabetes are necessary to prepare future pharmacists to manage complex patients. The Choose Your Own Adventure (CYOA) patient case format is an innovative activity that presents a patient case in an engaging way. The objectives of [...] [Read more](#).

(This article belongs to the Special Issue Pharmacy Education Development)

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## The Effect of Javanese Language Videos with a Community Based Interactive Approach Method as an Educational Instrument for Knowledge, Perception, and Adherence amongst Tuberculosis Patients

by Fauna Herawati, Yuni Megawati, Aslichah, Retnosari Andrajati and Rika Yulia

*Pharmacy* 2021, 9(2), 86; <https://doi.org/10.3390/pharmacy9020086> - 18 Apr 2021

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**Abstract** The long period of tuberculosis treatment causes patients to have a high risk of forgetting or stopping the medication altogether, which increases the risk of oral anti-tuberculosis drug resistance. The patient's knowledge and perception of the disease affect the patient's adherence to treatment. [...] [Read more](#).

(This article belongs to the Special Issue Pharmacist-Led Antimicrobial Stewardship)

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## Stakeholder Views on the Idea of Medicines Reuse in the UK

by Parastou Donyai, Rachel McCrindle, Terence K. L. Hui and R. Simon Sherratt

*Pharmacy* 2021, 9(2), 85; <https://doi.org/10.3390/pharmacy9020085> - 16 Apr 2021

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**Abstract** People's views about medicines reuse are being examined in a handful of qualitative studies and this commentary adds to that work by drawing on our own discussions with groups of stakeholders in the UK in the past two years. The reuse of medicines [...] [Read more](#).

(This article belongs to the Special Issue Medicines Reuse)

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## Addressing Barriers to HIV Point-of-Care Testing in Community Pharmacies

by Kimberly McKeirman, Sorosh Kherghehpoush, Angie Gladchuk and Shannon Patterson  
*Pharmacy* 2021, 9(2), 84; <https://doi.org/10.3390/pharmacy9020084> - 16 Apr 2021

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**Abstract** Significant numbers of human immunodeficiency virus (HIV) infections are transmitted unknowingly, making efforts to increase HIV testing accessibility crucial. As trusted healthcare providers, pharmacists can increase accessibility of HIV screening and referral services. However, challenges with lack of private counseling and testing space, [...] [Read more.](#)  
(This article belongs to the Special Issue [The Role of Community Pharmacists in Public Health II](#))

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## The Knowledge and Perceptions of Florida Pharmacists in Administering Inactivated Influenza Vaccines to Pregnant Women

by Oluyemisi Falope, Cheryl Vamos, Ricardo Izurieta, Ellen Daley and Russell S. Kirby  
*Pharmacy* 2021, 9(2), 83; <https://doi.org/10.3390/pharmacy9020083> - 16 Apr 2021

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**Abstract** Background: Influenza vaccine rates in pregnant women remain suboptimal despite the recommendations from healthcare organizations. Though pharmacists can provide immunization services as a result of the standing order, few studies have examined the role of the pharmacist in providing immunization to pregnant women [...] [Read more.](#)

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## Knowledge and Attitude of Pharmacy Students toward People with Mental Illnesses and Help-Seeking: A Cross-Sectional Study from Saudi Arabia

by Saud Alsahali  
*Pharmacy* 2021, 9(2), 82; <https://doi.org/10.3390/pharmacy9020082> - 16 Apr 2021

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**Abstract** People with mental illnesses (MIs) face several challenges in addition to their disease. People's negative views of those with MIs impact patients' decisions to seek professional help. The aims of this study were to assess pharmacy students' attitudes toward people with MIs and [...] [Read more.](#)

(This article belongs to the Special Issue [Addiction and Mental Health in Pharmacy](#))

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## Experiential Learning in a Gamified Pharmacy Simulation: A Qualitative Exploration Guided by Semantic Analysis

by Denise L. Hope, Gary D. Rogers, Gary D. Grant and Michelle A. King  
*Pharmacy* 2021, 9(2), 81; <https://doi.org/10.3390/pharmacy9020081> - 15 Apr 2021

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**Abstract** Experiential learning is an important component of pharmacist education and is primarily achieved through supervised placement or simulation. This study explored senior pharmacy students' experiential learning in an extended, immersive, gamified simulation, conducted as a capstone learning activity toward the end of their [...] [Read more.](#)

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## Creating Standardized Tools for the Pharmacist-Led Assessment and Pharmacologic Management of Adult Canadians Wishing to Quit Smoking: A Consensus-Based Approach

by Kristi Butt and Nardine Nakhla

*Pharmacy* 2021, 9(2), 80; <https://doi.org/10.3390/pharmacy9020080> - 14 Apr 2021

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**Abstract** Tobacco use continues to be recognized as the single most preventable cause of death worldwide. As the gatekeepers of and experts on pharmacotherapy, pharmacists play a vital role in facilitating smoking cessation. While existing frameworks have enabled pharmacists to provide smoking cessation services [...] [Read more](#).

(This article belongs to the Special Issue [Over-the-Counter \(OTC\) Medicines Use](#))

Open Access Editorial



## Medication Experiences

by Jon C. Schommer

*Pharmacy* 2021, 9(2), 79; <https://doi.org/10.3390/pharmacy9020079> - 13 Apr 2021

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**Abstract** Welcome to the "Medication Experiences" Special Issue in the journal—*Pharmacy*—an open access journal focused on pharmacy education and practice [...] [Full article](#)

(This article belongs to the Special Issue [Medication Experiences](#))

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## Development and Content Validation of an Instrument to Measure Medication Self-Management in Older Adults

by Tejal Patel, Aidan McDougall, Jessica Ivo, Jillian Carducci, Sarah Pritchard, Feng Chang, Sadaf Faisal and Catherine Lee

*Pharmacy* 2021, 9(2), 78; <https://doi.org/10.3390/pharmacy9020078> - 11 Apr 2021

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**Abstract** Background: For older adults, the capacity to self-manage medications may be limited by several factors. However, currently available tools do not permit a comprehensive assessment of such limitations. The Domain Specific Limitation in Medication Management Capacity (DSL-MMC) was developed to address this need. [...] [Read more](#).

(This article belongs to the Section [Clinical Pharmacy](#))

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## Public Attitudes towards Medicinal Waste and Medicines Reuse in a 'Free Prescription' Healthcare System

by David McRae, Abigail Gould, Rebecca Price-Davies, Jonathan Tagoe, Andrew Evans and Delyth H. James

*Pharmacy* 2021, 9(2), 77; <https://doi.org/10.3390/pharmacy9020077> - 08 Apr 2021

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**Abstract** This study investigates public attitudes towards medicinal waste and medicines reuse within a 'free prescription' healthcare system. A quantitative online survey was employed in a sample drawn from the population of Wales, where prescription medicines have been 'free' since 2007. Qualitative interviews informed [...] [Read more](#).

(This article belongs to the Special Issue [Medicines Reuse](#))

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## A Questionnaire-Based Survey to Assess the Level of Knowledge and Awareness about Drug–Food Interactions among General Public in Western Saudi Arabia

by Syed Faisal Zaidi, Rayan Mgarry, Abdullah Alsanea, Sakar Khalid Almutairi, Yaser Alsinnari, Saad Alsobaiei and Kanwal Ahmed

*Pharmacy* 2021, 9(2), 76; <https://doi.org/10.3390/pharmacy9020076> - 08 Apr 2021

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**Abstract Introduction:** Various drug–food interactions exist that may hinder treatment and can sometimes be lethal. Our aim was to assess the level of public knowledge and awareness in Jeddah city, Western Saudi Arabia, about drug–food interactions, along with the effects of demographics on their [...] [Read more.](#)

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## A Novel Approach to Pharmacy Practice Law Instruction

by Matthew Deneff, Lisa M. Holle, Jill M. Fitzgerald and Kathryn Wheeler

*Pharmacy* 2021, 9(2), 75; <https://doi.org/10.3390/pharmacy9020075> - 03 Apr 2021

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**Abstract** Pharmacy law instruction is often taught as a didactic course; however practical application of pharmacy law is a main component of pharmacy practice. Technology-based simulations are becoming more frequently used to enhance didactic pharmacy education. The goal of this study was to evaluate [...] [Read more.](#)

(This article belongs to the Special Issue Technology-Enhanced Pharmacy Teaching and Learning Strategies)

Open Access Commentary



## Pharmacy Practice in High-Volume Community Settings: Barriers and Ethical Responsibilities

by Christopher T. Owens and Ralph Baergen

*Pharmacy* 2021, 9(2), 74; <https://doi.org/10.3390/pharmacy9020074> - 03 Apr 2021

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**Abstract** Pharmaceutical care describes a philosophy and practice paradigm that calls upon pharmacists to work with other healthcare professionals and patients to achieve optimal health outcomes. Among the most accessible health professionals, pharmacists have responsibilities to individual patients and to public health, and this [...] [Read more.](#)

(This article belongs to the Special Issue Pharmacists' Job Satisfaction)

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## A Message from the Editor-in-Chief for *Pharmacy*—A Journal of Pharmacy Education and Practice

by Jon C. Schommer

*Pharmacy* 2021, 9(2), 73; <https://doi.org/10.3390/pharmacy9020073> - 31 Mar 2021

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**Abstract** Dear Reader of *Pharmacy*, [...] [Full article](#)

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## Predisposing, Enabling, and Need Factors Associated with the Choice of Pharmacy Type in the US: Findings from the 2015/2016 National Consumer Survey on the Medication Experience and Pharmacists' Roles

by Mohamed Rashrash, Suhila Sawesi, Jon C. Schommer and Lawrence M. Brown

*Pharmacy* 2021, 9(2), 72; <https://doi.org/10.3390/pharmacy9020072> - 28 Mar 2021

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**Abstract** Background: Knowing the type of pharmacy used by the patient is meaningful to the pharmacist. Previous studies have assessed different factors predicting the kind of pharmacy selection and reached inconsistent findings. Objectives: To identify patient and health-related factors associated with pharmacy type selection. [...] [Read more](#).  
(This article belongs to the Special Issue *Medication Experiences II*)

Open Access Systematic Review



## Systematic Review of L-Arginine for the Treatment of Hypoactive Sexual Desire Disorder and Related Conditions in Women

by Nicole E. Cieri-Hutcherson, Andrea Jaenecke, Ajeet Bahia, Debra Lucas, Ann Oluloro, Lora Stimmel and Timothy C. Hutcherson

*Pharmacy* 2021, 9(2), 71; <https://doi.org/10.3390/pharmacy9020071> - 27 Mar 2021

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**Abstract** This systematic review evaluates the efficacy and safety of L-arginine alone or in combination for the treatment of women with hypoactive sexual desire disorder (HSDD) or related conditions, such as female sexual interest/arousal disorder and female sexual arousal disorder. Medline, Embase, International [...] [Read more](#).

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Open Access Review



## Strategies to Inspire Students' Engagement in Pharmacology Courses

by Hussein N. Rubaiy

*Pharmacy* 2021, 9(2), 70; <https://doi.org/10.3390/pharmacy9020070> - 28 Mar 2021

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**Abstract** Pharmacology is a distinct discipline and offers core knowledge to broaden student programs in the provision of health care (medicine, nursing, pharmacy, and others) as well as research-oriented programs (biosciences and biomedical). Therefore, knowledge and information on topics such as prescribing medication, drug [...] [Read more](#).  
(This article belongs to the Section *Pharmacy Education and Student / Practitioner Training*)

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## Current Knowledge about Providing Drug–Drug Interaction Services for Patients—A Scoping Review

by Tora Hammar, Sara Hamqvist, My Zetterholm, Päivi Jokela and Mexhid Ferati

*Pharmacy* 2021, 9(2), 69; <https://doi.org/10.3390/pharmacy9020069> - 24 Mar 2021

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**Abstract** Drug–drug interactions (DDIs) pose a major problem to patient safety. eHealth solutions have the potential to address this problem and generally improve medication management by providing digital services for health care professionals and patients. Clinical decision support systems (CDSS) to alert physicians or [...] [Read more](#).  
(This article belongs to the Special Issue *Digital Solutions to Improve Medication Management*)

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