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1. Introduction

COVID-19, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, was announced by the World Health Organization to be a pandemic on the 11th March 2020.9 The severe acute respiratory infections caused by COVID-19 have had a substantial global impact.9–14 As of the 10th December 2021, there were 267,184,623 confirmed cases including 5,277,327 deaths reported worldwide.10 Its rapid spread increased the need for extensive medical resources causing an increased burden on healthcare systems globally.9,11–13 Healthcare workers were faced with high infection risks, increased workloads and psychological stress.14,15 Despite Australia’s comparatively lower cumulative death toll compared to most of the world, the burden to its healthcare system was substantially increased, which required changes implemented as COVID-19 emergency response plans.16 The Australian government ensured the continued supply of medicines to patients by continuing Pharmaceutical Benefits Scheme (PBS) subsidisation [see Glossary for definitions of all services]. In addition, services introduced included home delivery services (up to once a month) for PBS or Repatriation PBS medicines, digital image prescriptions, telephone medication reviews, and telehealth for MedsCheck and Diabetes MedsCheck.16 The Pharmaceutical Society of Australia (PSA) provided information based on federal government updates on the management of

Keywords:
COVID-19 pandemic
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Legislative/regulatory changes
Pharmacy environment
Pharmacy structure

ABSTRACT

Background: COVID-19 caused Australian government and state legislative/regulatory changes which impacted directly on aspects of professional community pharmacy.

Objectives: To examine the views and experiences of community pharmacists regarding the impact of COVID-19 on professional pharmacy services in Western Australian community pharmacies.

Methods: A Qualtrics questionnaire link was emailed to all 668 community pharmacies in Western Australia in March 2021. Data were collected on the impact of COVID-19 on professional pharmacy services (telehealth, digital image prescriptions, continued dispensing and emergency supply, home delivery services, medicine and medical resource substitutions), the pharmacy environment (work hours) and professional pharmacy structure (staffing and any measures implemented). Questions included 5-point Likert responses as well as yes/no or option responses. Descriptive statistics were used to summarise questionnaire responses. Chi Squared analysis was used to investigate differences between metropolitan and rural community pharmacies.

Results: The response rate was 97/668 (14.5%). Many pharmacies belonged to banner groups (47/95; 40.5%). Use of telehealth was reported (25/96; 26.0%), most commonly for MedsChecks. Many received digital image prescriptions (83/88; 94.3%) and continued dispensing, emergency supply requests, or both (78/84; 92.9%) daily. For home deliveries, most used pharmacy staff (56/78; 71.8%). Shortages were reported for many medicines. Panic buying/stockpiling and the media contributed to increased panic and shortages. Little change occurred in trading hours although many reported increased workloads (67/77; 89.3%).

Conclusions: Covid-19 has fast-tracked digitisation in Western Australian community pharmacies. This change is likely similar in other parts of Australia. This was facilitated through the expedition of regulatory changes to enable digital health. Whilst electronic prescribing has progressed, telehealth in pharmacy remained underutilised. The pandemic has contributed to pronounced medicine and medical resources shortages, which increased the workloads and pressure of community pharmacists. Pharmacists were confronted with a lot of legislative change in a short period of time. There is a need for clear and concise communication from all levels of government in future pandemics.

References:

9 World Health Organization. Pandemic declaration by the World Health Assembly on 11 March 2020. https://www.who.int/zh/events/pandemics/coronavirus-disease-2019-covid-19
10 World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report 441. 10 December 2021. https://www.who.int/docs/default-source/coronaviruse/situation-reports/2021-scale-up/2021-scale-up_10dec2021.pdf
11 Frontline Health Workers Coalition. Healthcare Workers are in the Line of Fire: The Pandemic has Caused a Crisis for Healthcare Workers. May 2020. https://www.frontlinehealthworkers.org/wp-content/uploads/2020/05/Live-Fire-Report.pdf
12 World Health Organization. Global Pandemic Preparedness: Addressing the Social Determinants of Health. April 2020. https://www.who.int/news-room/articles-detail/global-pandemic-preparedness-addressing-the-social-determinants-of-health
13 World Health Organization. COVID-19 and the Anaemic Blood Supply Chain. 2020. https://www.who.int/publications/m/item/2020-08-30-anemic-blood-supply-chain
14 Cárdenas, A. et al. Psychological impact of the COVID-19 pandemic on healthcare workers: a meta-analysis. Rev Panam Salud Publica 2020. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7271961/
15 World Health Organization. General Council: 64th Session: Global Report on the COVID-19 Pandemic. May 2020. https://www.who.int/dg/situation-reports/coronavirus-disease-2019-covid-19/
16 Pharmaceutical Society of Australia. COVID-19: Current position 10 September 2021. https://www.pharmacy.org.au/about-us/press-releases/2021/8/covid-19-current-position-10-september-2021
| Date               | Event                                                                 | Details                                                                                                                                 |
|--------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 24th March 2020    | Federal Legislation                                                   | Poison Standard Amendment (Hydroxychloroquine and Salbutamol) Instrument 2020. Limit the supply of salbutamol and hydroxychloroquine. Administered by: Health |
| 26th March 2020    | Federal Legislation                                                   | National Health (COVID-19 Supply of Pharmaceutical Benefits) Special Arrangement 2020. Supply certain medicines if provided with a digital image prescription created during the telehealth attendance. Administered by: Health |
| 26th March         | Queensland Health                                                    | Permission of image-based prescriptions with paper version of prescription for certain medicines (e.g. Schedule 8 medicines) being sent to the pharmacy within 7 days of post-dispensing period |
| 27th March 2020    | Victorian Government Gazette                                         | Drugs, Poisons and Controlled Substances Act 1981 Public Health Emergency Order under Section 22D Supply Schedule 4 medicines without a prescription |
| 31st March 2020    | Victorian Government Gazette                                         | Regulations remain silent regarding to substitution of Schedule 4 medicines, but pharmacists are required to comply with professional practice standards- limit the supply of certain over-the-counter medicines |
| 8th April 2020     | Federal Legislation                                                   | National Health (COVID-19 Supply of Pharmaceutical Benefits) Special Arrangement 2020. Improve convenience of telehealth. Allow the supply of medicines based on a digital image of the paper version of prescription. Administered by: Health |
| 8th April 2020     | Victoria Government Gazette                                          | Allow supply of Schedule 4 medicines based on the digital image of a paper version of prescription. The record of such prescription should be classified under public health emergency order (PHEO#4) and it should be kept for two years |
| 8th April 2020     | South Australia Office of the Chief Pharmacist Communique             | Supply of medicine (certain Schedule 8 or Schedule 4 drugs are excluded) based on the digital image of a paper version of prescription |
| 9th April 2020     | Public Health Act 2016 (Western Australia)                           | Supply of Schedule 4 and Schedule 8 medicines based on the digital image of the original prescription. The prescription of Schedule 8 medicines should be sent to pharmacy within five working days after dispensing. The digital image of Schedule 4 medicines should be kept for at least two years |
| 15th April 2020    | Tasmania Department of Health                                        | Supply of Schedule 4 medicines based on a digital image of a prescription. The original prescription should be retained for two years |
| 17th April 2020    | New South Wales                                                      | Poisons and Therapeutic Goods Amendment (Prescriptions) Regulation 2020 under the Poisons and Therapeutic Goods Act 1966. Supply of restricted medicines if provided with a digital image of prescription with the exception of medication chart prescription |
| 17th April 2020    | Federal Legislation                                                   | Veterans’ Affairs Pharmaceutical Benefits Schemes Amendment (Special Arrangement—COVID-19 Supply of Pharmaceutical Benefits) Determination 2020. Supply of Pharmaceutical Benefits Schemes and Repatriation Pharmaceutical Benefits Schemes based on a digital image of the paper version of prescription. Administered by: Veterans’ Affairs |
| 24th April 2020    | Therapeutic Goods Administration notice                              | Permit substitution of medicines that are in short supply |
| 1st May 2020       | Australian Capital Territory instrument                               | Medicines, Poisons and Therapeutic Goods (Temporary Authority - Supply of a substitute medicine by pharmacists) CHO Standing Order 2020 (No.3). Medicine substitution due to medicine shortage |
| 11th May 2020      | Victoria Government Gazette                                          | The handwritten signature of prescriber should be included in the original prescription. The copy of digital image should be retained for two years |
| 13th May 2020      | Therapeutic Goods Administration notice                              | Substitution of Metformin modified-release tablets-500mg due to low level of stock |
| 15th May 2020      | Western Australia Department of Health                               | Permission on substitution of the same medicine with different strength and dose form, or medicine with different onset of action |
| 18th May 2020      | Queensland Legislation                                               | Health (Drugs and Poisons) Amendment Regulation 2020 Authorising act: Health Act 1937 Validation of “Digital Images of prescription” measure during special arrangement for COVID-19 |
| 28th May 2020      | South Australia Department of Health                                 | Substitution of medicines under special condition |

Fig. 1. – Timeline of the main legislative changes issued by the federal and jurisdictional governments in Australia from 1st March 2020 to 31st March 2020.
COVID-19. The Pharmacy Guild of Australia (Guild) developed a guideline to aid in the management of ‘cold-and-flu’ symptoms by advertising social distancing, hygiene maintenance, and the triaging of patients. The Society of Hospital Pharmacists of Australia enabled pharmacists to undergo free hospital training and upskilling packages, and the National Pharmaceutical Services Association provided updates concerning the availability of medicine stock. With its first case recognised on the 25th January 2020, COVID-19’s impact in Australia was marked from March 2020 onwards, where an AUD$2.4 billion dollar health package was established to provide essential care in terms of: personal protective equipment, aged care, and primary care for non-hospital treatments. Specific to community pharmacies, legislative and regulatory changes were introduced by both the Australian and state governments, which changed aspects of professional pharmacy, especially professional pharmacy services, the pharmacy environment, and structure (Fig. 1). These included adjustments to: patient-healthcare worker interactions and sharing health-information through electronic media (telehealth); prescription options moving from paper-based to include digital (digital image prescriptions), dispensing without current prescriptions (continued dispensing), and medicines substitution and personal protective equipment (PPE) due to shortages. In contrast to other Australian states, Western Australia (WA) has been less affected by COVID-19. This was mainly due to the extended closure of the WA border to other states/territories of Australia, which was not possible for other states owing to large population areas close to their borders. This resulted in less exposure of the WA populations to especially the delta strain of COVID-19 compared to other states and internationally. WA is the largest state in Australia, with widespread pockets of rural and regional communities distributed across the state. In many of these WA communities, access to other healthcare is limited. We have previously reported on services provided in community pharmacies in WA. However, the impact of COVID-19 on WA community pharmacies has not thus far been reported. It is unknown whether changes to professional-workplace services, environment and structure had desirable outcomes, and what the study involved. The questionnaire was anonymous. Only respondents who provided informed consent and indicated they had worked in WA community pharmacy during the 1st March 2020 to the 31st May 2020 gained access to the online questionnaire. The questionnaire is provided as Supplementary data.

2.2. Questionnaire distribution

The link to the questionnaire was dispatched to the Pharmacy Registration Board of Western Australia (PRBWA), and distributed via email to a census sample of 668 WA community pharmacies (484 metropolitan, 184 rural) on the 18th March 2021. To maximise responses, follow-up reminder emails were sent on the 14th April 2021 and 20th April 2021. The questionnaire officially concluded on the 27th April 2021. A response rate of 20–30% (134–201) was desired to obtain data enabling a full statistical analysis.

2.3. Data analysis

All data was collected by Qualtrics® into an Excel spreadsheet. The extracted Excel spreadsheet was converted into SPSS version 27, IBM, Armonk, USA software program for data analysis. Simple descriptive statistics included frequencies and percentages for categorical variables, and means and medians for parametric data. Chi square analysis was used to assess statistically significant differences between metropolitan and rural pharmacies. A priori level of significance for all statistical tests was set at $P \leq 0.05$. Where missing data occurred for any question the total number of respondents to that question was used as the baseline.

3. Results

3.1. Demographic data

Of the 668 questionnaires distributed by the PRBWA, 104 (15.6%) were returned. Seven respondents returned incomplete questionnaires, yielding a total of 97/668 (14.5%) usable responses. The response rates for metropolitan and rural community pharmacies were 53/484 (11.0%) and 35/184 (19.0%) respectively ($p = 0.006$) (nine respondents did not provide a postcode). Many pharmacies belonged to a banner (franchise) group (47/95; 49.5%). The distribution of male and female respondents was approximately equal (46.9% vs 52.1%) and more respondents were aged 31–40 years (35/96; 36.5%) (Table 1).

3.2. Professional pharmacy services

3.2.1. Use of telehealth

The use of telehealth services was reported by 25 respondents (26.0%), mainly for MedsChecks (14/25; 56.0%) or Diabetes MedsChecks (6/25; 24.0%). Other services included Home Medicines Reviews (HMRs) and Residential Medication Management Reviews (RMMRs).

3.2.2. Digital image prescriptions

Most respondents (83/88; 94.3%) said they received digital image prescriptions and most pharmacies (69/80; 86.3%) utilised them every day (Table 1). Most pharmacies either checked for receipt of the original prescription (legal) daily (31/80; 38.8%) or once a week (29/80; 34.9%). Only 3/80 (3.7%) never checked. On average, most pharmacies spent...
<30 min (34/80; 42.5%) or between 30 and 45 min (22/80; 27.5%)
checking that the paper-based prescriptions were subsequently provided.

3.2.3. Continued dispensing and emergency supply

A majority of respondents (78/84; 92.9%) reported using either conin-
ued dispensing or emergency supply with most (56/84; 66.7%) providing
both services (Table 1). Most (48/69; 69.6%) reported that emergency sup-
ply dispensing increased workload, whereas 34/63 (54.0%) reported that
continued dispensing did not increase workload (Fig. 2). Moreover, most
respondents felt comfortable explaining the rules of continued dispensing
if it was required more than once annually.

3.2.4. Home delivery services

Where pharmacies provided home delivery services, most used pharmacy
staff for deliveries (56/78; 71.8%) and some utilised both Australia
Post and pharmacy staff (16/78; 16.5%). Only one pharmacy used Kings
Group for deliveries. Most community pharmacies stated that less than 10
deliveries were remunerated by the government (35/78; 44.9%), while
68/75 (90.7%) community pharmacies disclosed that less than 10 deliver-
ies were paid by the patient (Table 2).

3.2.5. Medicine substitutions due to shortage of medicines and Personal
Protection Equipment (PPE)

Shortages were reported for almost all medicines (Fig. 3 shows 15
medicines/ medicine groups associated with greater shortages), as well as
hand sanitisers (59/73; 80.8%), face masks (55/73; 75.3%), and gloves
(53/73; 72.6%). Most respondents ‘strongly agreed’ to experiencing greater
medicine shortages during the period 1st March 2020 to the 31st May 2020
(54/75; 72.0%), Panic buying/stock-piling behaviours (54/73; 73.9%)
with the influence of mainstream media/social-media platforms (51/73;
69.9%) contributed to increased shortages (Fig. 2). Metropolitan
community pharmacies had significantly greater levels of medicines short-
ages than rural community pharmacies in relation to medicines for hyper-
tension, gastro-oesophageal reflux disease and benign prostatic hyperplasia (p = 0.030; p = 0.012; p = 0.024, respectively).

More respondents agreed that medicine shortages added 41–60 min/
day to their workload (26/74; 35.1%), however notable proportions re-
ported increases of 20–40 min/day (23/74; 31.1%) or greater than 1 h/
day (20/74; 27.0%).

Pharmacists were vigilant regarding accessing important practice and
legal information which was mainly obtained from ‘Pharmacy Guild Mem-
ber Updates’ (22/73; 30.1%), ‘Local WA Department of Health Updates’
(18/71; 25.4%) and colleagues (16/70; 22.9%).

3.3. Professional pharmacy environment

More than one-quarter of WA community pharmacists reported working
six days per week (28/72; 38.9%) and 49/72 (68.1%) respondents
worked over 40 h per average week (Table 3). A majority of pharmacies
had no changes in pharmacy trading hours (48/72; 66.7%) and few ex-
tended pharmacy hours (7/72; 9.7%), although some shortened their trad-
ing hours slightly (14/72; 19.4%).

3.4. Professional pharmacy environment

All pharmacies (69/69; 100%) displayed social distancing guides and
most initiated increased frequency of store-cleaning (68/69; 98.6%),
hand-washing (67/69; 97.1%) and set up signs of entry conditions (67/
69; 97.1%). However, some pharmacy staff started wearing masks (29/
69; 42.0%), using gloves (17/69; 24.6%), promoting outside seating (24/
69; 34.8%), checked body temperature (22/69; 31.9%) or used ‘drive
through pharmacy’ (10/69; 14.5%) (Fig. 4).

### Table 1

| Demographic Parameter | Frequency | Percentage |
|-----------------------|-----------|------------|
| Gender (n = 96)        |           |            |
| Male                  | 45        | 46.9%      |
| Female                | 50        | 52.1%      |
| Prefer not to say     | 1         | 1.0%       |
| Missing               | 1         | 1.0%       |
| Age (n = 96)          |           |            |
| 21–30                 | 13        | 13.5%      |
| 31–40                 | 35        | 36.5%      |
| 41–50                 | 21        | 21.9%      |
| 51–60                 | 19        | 19.8%      |
| >60                   | 8         | 8.3%       |
| Qualification (n = 96) |           |            |
| Bachelor of Pharmacy/ (Honours) | 81 | 84.4% |
| Master of Pharmacy (GEM) | 5   | 5.2%   |
| Graduate Diploma in Pharmacy | 3   | 3.1%   |
| Master of Pharmacy     | 5         | 5.2%       |
| Doctor of Philosophy (PhD) | 1   | 1.0%   |
| Other                 | 1         | 1.0%       |
| Post Code (n = 88)    |           |            |
| Metropolitan          | 53        | 60.2%      |
| Rural                 | 35        | 39.8%      |
| Missing               | 9         | 10.0%      |
| Banner Group (n = 95) |           |            |
| Yes                   | 47        | 49.5%      |
| No                    | 48        | 50.5%      |
| Missing               | 2         | 2.1%       |
| Usage of Telehealth (n = 96) |       |          |
| Yes                   | 25        | 26.0%      |
| No                    | 71        | 74.0%      |
| Usage of Continued Dispensing/ Emergency Supply (n = 84) | | |
| Yes                   | 56        | 66.7%      |
| No                    | 6         | 7.1%       |
| Frequency of dispensing medicines under the Emergency Supply arrangement per average week (n = 69) | | |
| Yes                   | 68        | 98.6%      |
| No                    | 1         | 1.4%       |
| Pharmacists actions (multiple responses possible) | | |
| Yes                   | 61        | 84.7%      |
| No                    | 20        | 28.3%      |
| Frequency of checking the arrival of the original prescription (n = 80) | | |
| Yes                   | 69        | 86.3%      |
| No                    | 11        | 13.7%      |
| Frequency of Digital Image Prescriptions/week (n = 80) | | |
| Yes                   | 49        | 61.3%      |
| No                    | 31        | 38.7%      |

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<30 min (34/80; 42.5%) or between 30 and 45 min (22/80; 27.5%)
3.5. Professional pharmacy structure

With respect to pharmacist views, one-quarter to one-half of respondents agreed with most of the following statements: my workload increased considerably (67/75; 89.3%); pharmacies were cleaned thoroughly (62/75; 82.7%) and I felt confident when asking about the symptoms of COVID-19 and giving advice (62/68; 91.2%).

Fig. 2. Views of community pharmacies with respect to the provision of medicines and essential care within different aspects of professional pharmacy, namely professional pharmacy services, environment and structure.
3.6. Feedback

When asked if a similar pandemic/emergency situation arose in future, a majority of respondents stated that they were ‘very confident’ or ‘confident’ (55/67; 82.1%) in coping with a similar situation in the future.

4. Discussion

This is the first study investigating the impact of COVID-19 in Australia and on both metropolitan and rural WA community pharmacies. The findings indicated that COVID-19 required changes that moved community pharmacy practice away from paper-based methods of ensuring continuity of patient care towards digital/online-based methods. COVID-19 expedited regulatory changes and increased the use of many professional pharmacy services investigated, including digital image prescriptions, continued dispensing and emergency supply, but not telehealth. Although WA was less affected by COVID-19 due to extended border closures to other states/territories of Australia and international travellers, resulting in less exposure of the Western Australian population to pre-omicron strains of COVID-19, most of the COVID-19 pharmacy practice changes were Australia wide. WA being at the end of supply chains was affected in this way more than some other states. COVID-19’s impact caused an increased pharmacist workload, a perceived lack of support from government regulatory bodies, and pronounced medicine and medical resource shortages requiring medicine substitutions. COVID-19 did not seem to induce alterations in staffing structure, or trading hours and team rostering, however it yielded conflicting reports concerning rostering schedules. Despite a level of fragmentation due to a general lack of clear guidance from government regulatory bodies, WA community pharmacies were generally able to adapt to COVID-19-related changes. Amidst COVID-19, pharmacists showed generally high levels of resilience and confidence in dealing with pandemic/emergency situations.

Although continued patient care was already being piloted in some pharmacies it caused rapid movement towards more digital/online-based methods. The current investigation indicates that COVID-19 impacted on WA community pharmacy by accelerating the uptake of digital image

| Statements | Less than 10 deliveries | 10–20 deliveries | 21–30 deliveries | 31–40 deliveries | Over 40 deliveries | Missing (excluded) |
|------------|------------------------|-----------------|-----------------|-----------------|------------------|-------------------|
| n %        | n %                    | n %             | n %             | n %             | n %              | n %               |
| Total number of deliveries that your pharmacy provided per month (n = 78) | 25 32.1 | 15 19.2 | 3 3.8 | 3 3.8 | 32 41.0 | 19 |
| Rural (n = 32) | 15 46.8 | 5 15.6 | 2 6.3 | 2 6.3 | 8 25.0 | 3 |
| Metropolitan (n = 43) | 8 18.6 | 10 23.3 | 1 2.3 | 1 2.3 | 23 53.5 | 10 |
| The number of deliveries that were paid/renumerated by the government as part of the Home Medicines Service (n = 78) | 35 44.9 | 17 21.8 | 4 5.1 | 4 5.1 | 18 23.1 | 19 |
| The number of deliveries that were paid by the patients (n = 75) | 68 90.7 | 3 4.0 | 2 2.7 | 0 0 | 2 2.7 | 22 |
| The number of deliveries that were unrenumerated (n = 76) | 41 53.9 | 12 15.8 | 8 10.5 | 5 6.6 | 10 13.2 | 21 |

Levels of satisfaction to each Home Delivery Service (0 = least satisfied; 10 = most satisfied) | Median | Minimum | Maximum |
|---------------------------------------------------------------|--------|---------|---------|
| Australian Post (n = 20)                                      | 6.5    | 1       | 10      |
| Kings Group (n = 2)                                           | 5      | 4       | 6       |
| Pharmacy staff (n = 69)                                       | 9      | 3       | 10      |
| Satisfaction of government fee (n = 77)                       | 5      | 0       | 10      |

Fig. 3. Medicine shortages from the 1st March 2020 to 31st May 2020 (left hand side) and from the 1st June 2020 to 31st December 2020 (right hand side). ‘Yes’ (red) indicates that there were medicine shortages, ‘sometimes’ (yellow) indicates that there were sometimes medicine shortages, and ‘no’ (green) indicates that there were no medicine shortages.
As opposed to face-to-face consults, which was at variance with these a study in China reported increased usage of telepharmacy during COVID-

an increased demand for medicines leading to medicine (antivirals) and medical devices, including PPE shortages. The requirement of having to check that original paper-

to digital/online methods of practice. This impacted on professional pharmacy services, environment, and structure and caused some level of fragmentation in work pattern but little or no change in staffing or rostering schedules. In addition to the remuneration for services by the Australian Government, a significant number of community pharmacies did not receive payment for most home delivery services. Medicine and medical resource shortages were a major factor increasing workload and almost half had their workload increased by more than 40 min per day.

In response to ‘coping with a similar pandemic/emergency situation in the future’, a majority of respondents were confident of their abilities. However, respondents emphasised that there were increases in workload; there was a general ‘silence’ from the government surrounding changes; there was conflicting information between federal and state Ministers. Additionally, most argued that better exemption and compensation systems were needed, that pharmacy owners and other professions were more supported than pharmacy staff who were overworked and received no benefits therefore needing to overwork for little remuneration. These findings may contribute to increasing awareness within the pharmacy profession by providing feedback to government authority-bodies about regulatory changes and their impact on community pharmacy..

There were several limitations associated with this study. Although COVID-19 expedited regulatory changes and increased the use of several pharmacy services, some digital services were still in the pilot phase in some pharmacies prior to COVID-19. However, COVID-19 caused them to be immediately implemented in all pharmacies. Further, other services such as emergency supply, digital image prescriptions and continued dispensing had temporary legislation implemented specifically due to COVID-19 of which some legislation has subsequently been retained. A low response rate was this investigation’s greatest limitation; this was likely due to completing the questionnaire on the dispensing computer, which was also used for other purposes; the length of questionnaire, its large scope, competing demands of pharmacists leading to time constraints. This limits the generalisability of its findings within the broader Australian context. In addition, the respondents may not represent the collective thought of all pharmacists. Another limitation is the lapse in time before the data were collected, considering that COVID-19 is a rapidly changing space (i.e., the situation is different now to when the pandemic first started). However, we ensured that a requirement of respondents was that they had worked during the COVID-19 period. The pandemic has been a very memorable event for pharmacists, especially as it is an ongoing issue. Further, the lessons learned are still relevant as the profession needs to be agile to respond to emergencies like this when future pandemics, bushfires or other emergencies arise.

Table 3
Professional pharmacy environment, professional pharmacy structure, and associated parameters (* due to personal health issues, some staff were asked not to work and replaced by new staff).

| Parameter | Frequency |
|-----------|-----------|
| 1 day a week | 0.0 0.0 |
| 2 days a week | 0.0 0.0 |
| 3 days a week | 4.2 3.1 |
| 4 days a week | 18.1 20.8 |
| 5 days a week | 27.8 28.6 |
| 6 days a week | 38.9 40.3 |
| 7 days a week | 11.1 11.1 |
| Missing | 25 25 |

| Hours that pharmacists worked per average day (n = 72) | Frequency |
|-----------|-----------|
| 0–2 | 3 4.2 |
| 3 to 4 | 1 1.4 |
| 5 to 6 | 0 0.0 |
| 7 to 8 | 20 27.8 |
| 9 to 10 | 33 45.8 |
| >10 | 15 20.8 |
| Missing | 25 25 |

| Changes in the rostering schedule (n = 72) | Frequency |
|-----------|-----------|
| Shorter hours | 13.9 13.9 |
| Longer hours | 34.7 34.7 |
| No change | 51.4 51.4 |
| Missing | 25 25 |

| Usage of team-rostering approach (n = 72) | Frequency |
|-----------|-----------|
| Yes | 37.5 37.5 |
| No | 62.5 62.5 |
| Missing | 25 25 |

| Professional Pharmacy Services | Changes in staffing as a consequence of COVID-19 (n = 67) | Frequency |
|-----------|-----------|-----------|
| Employed | 10 14.9 |
| Health issues* | 1 1.5 |
| Health issues*, Employed | 4 6.0 |
| Health issues*, Resigned | 6 9.0 |
| Health issues*, Resigned, Employed | 9 13.4 |
| No change | 17 25.4 |
| No change, Health issues* | 4 6.0 |
| No change, Health issues*, Resigned | 1 1.5 |
| No change, Resigned | 7 10.4 |
| Resigned | 4 6.0 |
| Resigned, Employed | 4 6.0 |
| Missing | 30 30 |

prescriptions, continued dispensing and emergency supply, and home delivery services. These findings are also supported by research from the Netherlands, France, China, Egypt and the United States that established a preference for electronic-prescriptions over paper-based prescriptions, increased authorisation and reliance on new services, and increasing the provision of essential services by increasing the supply of medicines in order to limit face-to-face contacts and decrease the risk of transmission. It was notable that most respondents used their own pharmacy staff to conduct home delivery services and rated themselves highest (median score 9/10) in terms of satisfaction of completing said delivery services. Interestingly, a study in China reported increased usage of telepharmacy during COVID-19 as opposed to face-to-face consults, which was at variance with these findings which indicated a very limited uptake of telehealth. This could be due to different healthcare systems but it could also be due to the fact that community pharmacies in WA were deemed as essential and remained open during the pandemic, so the need for increased telehealth appeared to be less than for other health professional services such as doctors who were usually only available via telehealth.

COVID-19 increased pharmacist workloads, and medicine and medical resource shortages and therefore medicine substitutions, especially during the period from the 1st March 2020 to the 31st May 2020 rather than from the 1st June 2020 to the 31st December 2020. Metropolitan community pharmacies had significantly greater levels of medicine shortages than rural community pharmacies. The shortage of medicines and medical devices was expected and may be partially explained by panic buying/stock-piling behaviours, and the influence of mainstream/social-media platforms. Supporting the current findings, a cross-sectional study in Egypt also reported an increased demand for medicines leading to medicine (antivirals) and medical devices, including PPE shortages. The requirement of having to check that original paper-based prescriptions were subsequently provided to the pharmacy, and that changes to professional pharmacy practice in terms of the utilisation of new services also contributed to increased workloads. Regarding actions taken in the pharmacy, most metropolitan community pharmacies reported availability of customer shields, and selected yes to wearing masks and asking for a consumers travel history, however rural community pharmacies had mixed responses.

COVID-19 resulted in regulatory and legislative changes which led to digital/online methods of practice. This impacted on professional pharmacy services, environment, and structure and caused some level of fragmentation in work pattern but little or no change in staffing or rostering schedules. In addition to the remuneration for services by the Australian Government, a significant number of community pharmacies did not receive payment for most home delivery services. Medicine and medical resource shortages were a major factor increasing workload and almost half had their workload increased by more than 40 min per day.

In response to ‘coping with a similar pandemic/emergency situation in the future’, a majority of respondents were confident of their abilities. However, respondents emphasised that there were increases in workload; there was a general ‘silence’ from the government surrounding changes; there was conflicting information between federal and state Ministers. Additionally, most argued that better exemption and compensation systems were needed, that pharmacy owners and other professions were more supported than pharmacy staff who were overworked and received no benefits therefore needing to overwork for little remuneration. These findings may contribute to increasing awareness within the pharmacy profession by providing feedback to government authority-bodies about regulatory changes and their impact on community pharmacy..

There were several limitations associated with this study. Although COVID-19 expedited regulatory changes and increased the use of several pharmacy services, some digital services were in the pilot phase in some pharmacies prior to COVID-19. However, COVID-19 caused them to be immediately implemented in all pharmacies. Further, other services such as emergency supply, digital image prescriptions and continued dispensing had temporary legislation implemented specifically due to COVID-19 of which some legislation has subsequently been retained. A low response rate was this investigation’s greatest limitation; this was likely due to completing the questionnaire on the dispensing computer, which was also used for other purposes; the length of questionnaire, its large scope, competing demands of pharmacists leading to time constraints. This limits the generalisability of its findings within the broader Australian context. In addition, the respondents may not represent the collective thought of all pharmacists. Another limitation is the lapse in time before the data were collected, considering that COVID-19 is a rapidly changing space (i.e., the situation is different now to when the pandemic first started). However, we ensured that a requirement of respondents was that they had worked during the COVID-19 period. The pandemic has been a very memorable event for pharmacists, especially as it is an ongoing issue. Further, the lessons learned are still relevant as the profession needs to be agile to respond to emergencies like this when future pandemics, bushfires or other emergencies arise.
5. Conclusion

The current investigation has established that community pharmacies have adopted additional mechanisms to reduce paper-based methods of ensuring continued patient access to medicines and care in a timely manner, with increased use of digital/online-based methods. This is particularly relevant especially in cases when a person needed to be in isolation and had accessed telehealth and digital image prescriptions. This holds true for all professional pharmacy services excluding telehealth. Additionally, COVID-19 contributed to pronounced medicine and medical resource shortages, which increased the workloads of community pharmacists. Pharmacists accepted and adapted to new rules/regulatory changes, making policy changes overall not difficult to enforce. During the main COVID-19 crisis a general lack of consistent guidance from government regulatory bodies occurred. However, community pharmacies typically showed high levels of resilience in responding to pandemic/emergency situations.

Fig. 4. Pharmacy protocols, procedures and actions surrounding the identification of individuals with COVID-19. ‘Yes’ (red) indicates that the option was conducted, ‘sometimes’ (yellow) indicates that the option was sometimes conducted, and ‘no’ (green) indicates that the option was not conducted.
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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.rcsop.2022.100145.

References

1. Pharmaceutical Society of Australia. Summary of COVID-19 regulatory changes Australia: Pharmaceutical Society of Australia Ltd; 2021. [cited 2021 9 December]. Available from: https://www.psa.org.au/coronavirus/regulatory-changes/.

2. Pharmaceutical Society of Australia. Electronic Prescriptions Australia: Pharmaceutical Society of Australia Ltd. [cited 2021 9 December]. Available from: https://www.psa.org.au/e prescriptions/.

3. Pharmacy Guild of Australia. Home Delivery 2021. [cited 2021 9 December]. Available from: https://www.guild.org.au/guild-branches/oa/australia-covid-19-information/covid-19-home-delivery.

4. Australian Government Department of Health. Pharmacy programs administrator: home medicines review. Department of Health. 2018.

5. Australian Government Department of Health. Pharmacy programs administrator: program rules MedsCheck and Diabetes MedsCheck. Department of Health. 2021.

6. Australian Government Department of Health. The Pharmaceutical Benefits Scheme 2021. [10 December 2021]. Available from: https://www.pbs.gov.au/info/about-the-pbs/.

7. Australian Government Department of Health. Pharmacy programs administrator: Residential Medication Management Review and quality use of medicines. 2018.

8. Pharmacy Guild of Australia. Telehealth services from community pharmacies 2021 [10 December 2021]. Available from: https://www.guild.org.au/news-events/news/forefront/v09n16/telehealth-services-from-community-pharmacies.

9. Amawi H, Gal Abu Deib, Aljabali A, et al. COVID-19 pandemic: an overview of epidemiology, pathogenesis, diagnostics and potential vaccines and therapeutics. Ther Deliv. 2020;11(4):245–268.

10. World Health Organisation. WHO Coronavirus (COVID-19) dashboard 2021 [10 December 2021]. Available from: https://covid19.who.int/.

11. Chakraborty R, Parvez S. COVID-19: an overview of the current pharmacological interventions, vaccines, and clinical trials. Biochem Pharmacol 2020;114184.

12. Wiersinga WJ, Rhodes A, Cheng AC, et al. Pathophysiology, transmission, diagnosis, and treatment of coronavirus disease 2019 (COVID-19): a review. JAMA 2020;324(8):762–770.

13. Remuzzi A, Remuzzi G. COVID-19 and Italy: what next? Lancet 2020;395(10231):1225–1228.
MedsCheck provides a similar service, however focuses on providing a review of a patient's type 2 diabetes medicines, monitoring devices and overall management. The MedsCheck/Diabetes MedsCheck Programs are funded by the seventh Community Pharmacy Agreement, a community pharmacy contractual agreement between the Australian government and the Pharmacy Guild of Australia. The program provides for in-pharmacy reviews of consumers who are taking multiple medications and/or have newly diagnosed or poorly controlled Type 2 diabetes.

Pharmaceutical Benefits Scheme (PBS): An Australian Government scheme which provides a wide range of medicines for Australian citizens and permanent residents at a subsidised price.

Repatriation Pharmaceutical Benefits Scheme (RPBS): Provides eligible veterans of Australia's defence force with a range of medicines and wound care items at a concessional rate.

Residential Medication Management Review (RMMR): Accredited pharmacist review of the medication management needs of a patient in a residential aged care facility.

Telehealth: A telephone or video consultation with a healthcare provider.