A Qualitative Evaluation of the Use of Facial Recognition Technology for Opioid Substitution Treatment in Community Pharmacies

QUALITATIVE STUDY

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ABSTRACT

Introduction: Opioids are used as analgesics and are available as prescription opioids, over-the-counter opioids or illicitly as heroin. Increasingly opioid addiction has become prevalent. Opioid addiction or dependence results in the addicts indulging in harmful or dangerous behaviour including unsafe opioid injecting. To address this issue, approved opioid substitution therapy (OST) has been introduced in Australia. It has been identified informally that community pharmacies have issues in dispensing OST because of less than robust patient verification processes. This has led to input errors, misidentification of patients, and refusal to dispense when the patient is not recognised in the records. Facial Recognition Technology (FRT), a form of artificial intelligence, has been used to recognise patients, dispense, and confirm medication ingestion. Some pharmacies in Victoria have commenced using FRT to address the mis-identification issues and help with better record keeping and auditing.

Methods: A study to evaluate the pharmacy stakeholders' (pharmacists, pharmacy assistants and pharmacy owners) experience of using FRT to dispense OST was conducted over 2019–2020. To evaluate the stakeholder's views, an innovative evaluation approach termed 'integrated model of evaluation (IMoE)' was used. The stakeholders (pharmacies) views about use of FRT for OST and its impact on business practice (medication dispensing process and record keeping) improvement was evaluated. Semi-structured questionnaires were used to conduct interviews with individual stakeholders. To obtain a well-rounded perspective about the experiences with FRT, 11 key participants including three pharmacy owners, six pharmacists and two pharmacy assistants were interviewed. Interviews were transcribed and analysed using thematic analysis. Analysis compared and contrasted experiences and perspectives of OST dispensing prior to and after introduction of FRT.

Results: The data was collated and analysed as per the IMoE framework. The framework focuses on five components including context, intervention, change, outcomes, and emergent program theory. As per the IMoE framework, the data is analysed inductively and used to formulate a theory explaining the changes because

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of the OST. As per this assessment process, the findings indicate a positive perception of the utility of FRT in OST program in specific and the pharmacy context in general. The employment of FRT was seen to be conducive to reducing time to pharmacy dispensing and time saving. Where there were issues, it was because of unfamiliarity with the technology or integration problems. Improvement in integration and scaling up of FRT in more pharmacies will yield efficiencies and economies of scale.

Conclusions: This study presents an important view about the concerns and opportunities pharmacy stakeholders have in the use of FRT. This will help stakeholders better understand the way to implement facial recognition in the pharmacy sector and in what way they should disseminate information to better inform the public of its pros and cons.

INTRODUCTION

In Australia, opioid-related issues including addiction are on the rise [1]. Opioid addiction is exemplified by continued opioid injecting despite occurrences of overdoses or infections. In 2019, it was found nearly one in twenty-five people aged 14 and over in Australia had reported non-medical use of pharmaceuticals in the past 12 months [2]. Opioids are one of the most common pharmaceuticals that are used for non-medical purposes in Australia. Non-medical use of opioids includes taking opioids in a manner other than prescribed or for the feelings that opioids produce. Pharmaceutical opioid misuse is now a major issue in Australia, with overdose deaths now exceeding the number of road mortality in certain parts of Australia [3]. Use of illicit opioids, like heroin, are also on the rise. In 2019, of the 1,865 drug induced deaths, 25 percent were due to heroin [3].

Opioid substitution therapy (OST) is being used in Australia to treat opioid addiction and reduce opioid related morbidity and mortality [3]. The broad goal of OST is to manage opioid addiction and reduce harm [1]. However, OST not only manages the opioid addiction, it also improves physical and social health outcomes by reducing drug crimes, spread of blood-borne diseases, and mortality [3]. In 2015, there were 48,522 people being treated with OST in a single day in Australia [3]. Not all opioid addicts are suitable for opioid substitution therapy, but when selected for treatment, there is substantial evidence OST provides benefits for patients. The drugs used in OST include methadone, naltrexone, and buprenorphine with or without naloxone [1]. Since the mid-1990's, OST is offered in the community instead of clinics in Victoria [3]. As a component of OST, methadone is provided as a syrup to be ingested at the pharmacy (Figure 1). The model is premised on delivery in community settings including general practices and community pharmacies. Community based delivery was considered more appropriate as it would allow integration of treatment of dependence with other ailments, make

Figure 1 Patient participating in Opioid Substitution Therapy (OST) (Source: Talking Drugs, licensed by CC BY-SA, Available at https://www.talkingdrugs.org/sites/default/files/styles/main/public/images/methadone-clinic.jpg?itok=REQbmYPm, consent provided for use).

attendance more convenient and improve accessibility. In Victoria, methadone and buprenorphine are mainly used in OST and in July 2015 , 14,122 people had received OST in Victoria [3].

Despite the benefits of OST, there are some risks with the treatment program, especially with methadone dispensing [1, 3]. Methadone is potentially a toxic drug, that can cross react with other sedating substances [1]. Therefore, safety is paramount in OST. Due to the emphasis on safety, in Victoria state, OST is coordinated through a permit system, whereby permits are limited to prescribers and pharmacists who are appropriately trained by health authorities [3]. The permission for ongoing provision of OST is dependent on practices and pharmacies adhering to relevant policy. This policy requires appropriate identification of patients before administering a dose and assessing the patient for signs of possible intoxication amongst other requirements. Most practices and pharmacies adhere to the policy. Yet, it has been identified informally that some community pharmacies have issues in dispensing OST because of less than robust patient verification processes [4]. Current record keeping and identification process is cumbersome and complex. This has led to input errors, misidentification of patients, and refusal to dispense when the patient is not recognised in the records. Misidentification or denial of service due to errors can be costly to the pharmacy both financially and legally [3].

Despite a negative perception in other sectors, facial recognition technology (FRT) is now increasingly being incorporated into healthcare systems and processes including check-ins, patient matching, and even in medical diagnosis [5–7]. FRT is a subfield in the larger domain of pattern recognition technology. In most cases, FRT creates a template of the recipient's facial image and then compares it to pre-existing facial images. FRT use artificial intelligence (AI) algorithms to identify distinct details of the person's face (Figure 2). These details can be distance between eyes or shape of the chin. The process commences with detection of the recipient's face followed by extraction of patterns from the image. These details are then converted into a mathematical representation and compared to the image database. In instances, where relevant facial images of the target are not available in the database, a probability match score between the unknown person and existing templates or a message conveying inability to recognise the target is presented.

FRT's use for patient verification has shown promise and validated in certain instances like patient safety monitoring and biometric identification [5, 6]. By incorrect identification, significant risks can be imposed on patients including incorrect medication, incorrect site procedure, and admission of incorrect patients. While technologies other than FRT, like fingerprint and identification scanners, have been trialled to address these issues, there are several limitations and drawbacks with these technologies. FRT is used currently not just for identification but also increasingly in screening and surveillance [6]. FRT has become common in ports of entry (air and sea) and by police authorities for surveilling populations for anti-social activity [8]. While these measures are valuable for the authorities and security, there is growing concern about privacy and rights that may be compromised because of the use of FRT [9, 10]. This has in turn led to resistance from citizens and in certain instances banning of the use of FRT for surveillance [10]. This aspect coupled with general concerns about use of AI, like impact on autonomy and privacy concerns [11], means there is uncertainty amongst some about

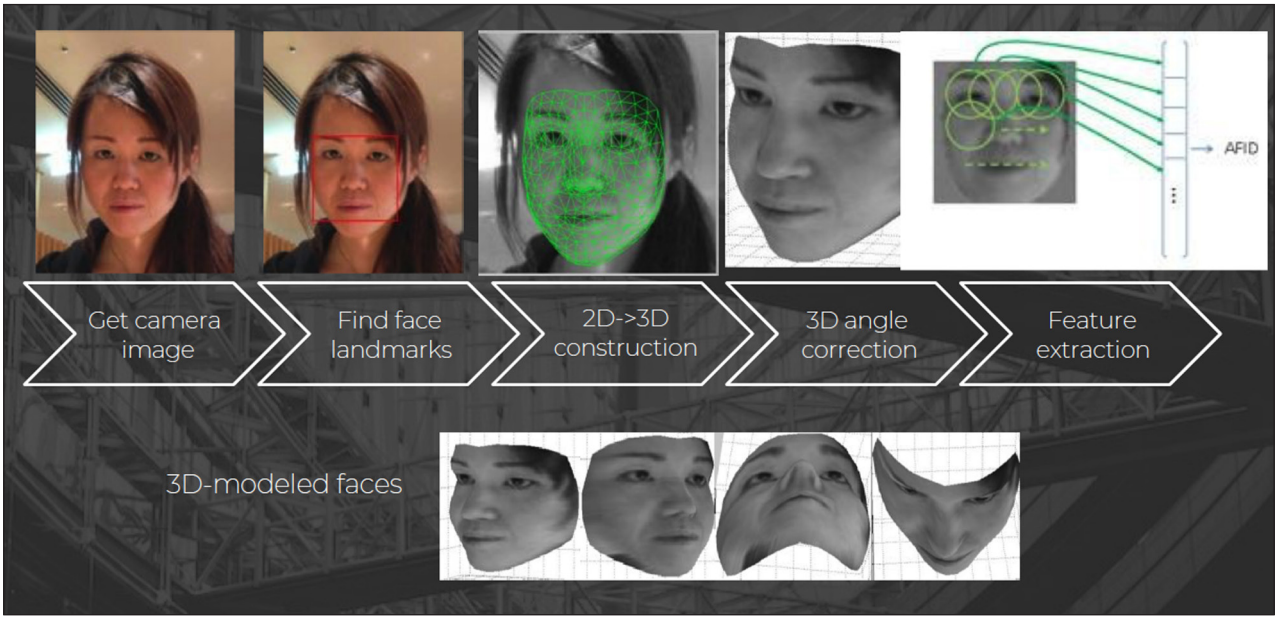

Figure 2 Facial Recognition Technology Process (Source: Strong Room, model consent provided for use).

the value of FRT in healthcare. In the past, there have been studies about the perceptions of AI amongst healthcare staff [11, 12] but there hasn't been a study about the perceptions of the use of FRT in healthcare and specifically relating to OST. Understanding the views of healthcare staff about FRT and in turn exploring the benefits or limitations of the technology is important. Especially considering the negative perception of FRT in other sectors.

MATERIALS AND METHODS

Some of the community pharmacies involved in OST have employed a methadone dispensing software developed by Strong Room technologies [4]. This software comprises of FRT that helps with automated patient verification. It also consists of features that enable patient alerts and stock management system. The use of the software and FRT reduces the time required of pharmacists to dispense medications and speeds up the OST process. The technology also reduces the possibility of misidentification and thus medication errors. With the software deployed in multiple community pharmacies and the need to understand user's perspectives of FRT, the situation permitted for a qualitative evaluation. To provide a strong theoretical basis to the evaluation, a novel form of evaluation termed 'Integrated Model of Evaluation (IMoE)' was employed. This evaluation framework is especially suited for evaluation in healthcare settings and is grounded in translational research [13]. The framework has been used to assess multiple health programs including clinical quality improvement programs. IMoE combines traditional evaluation approaches with theory driven practices providing a sound framework to realise results. The main components of the IMoE framework include a program theory, context, intervention, change and outcomes as outlined in Figure 3. Each component is assessed separately, and the components together contribute to a thorough assessment of the target program or intervention.

A critical feature of IMoE is to set a program theory in the onset and test it via the remaining components of the framework [13]. The program theory posits 'why and how an intervention or program works or doesn't?'. In this instance, whether FRT is useful for the delivery of OST as stated by pharmacy staff. For this evaluation, the initial program theory was outlined as in Figure 4.

Underpinning the above program theory and IMoE is translational research (TR). The primary goal of TR is to work with the interpretation of logical discoveries into certifiable practices. Utilising the approach, the IMoE draws upon information and abilities from different sources to yield a persistent bidirectional range of reasonable exploration. Accordingly, the IMoE process requires the program theory to be tested via data collection and analysis. For this study, semi structured interviews (see appendix for questionnaire) were considered for data collection. For recruitment of participants, we utilised a purposive sampling and following necessary human research ethics approval (**HEAG-H 122_2019**), 11 key participants including three pharmacy owners, seven pharmacists and two pharmacy assistants from the pharmacies, where the software was used, were recruited to be interviewed. To avoid conflict of interest and bias, only the lead author (SR) was involved in the interviews, data collation and analysis. The interviews were conducted in person and over the phone during the late half of 2019 and early 2020. Further recruitment was

Figure 3 Integrated Model of Evaluation Approach and Components.

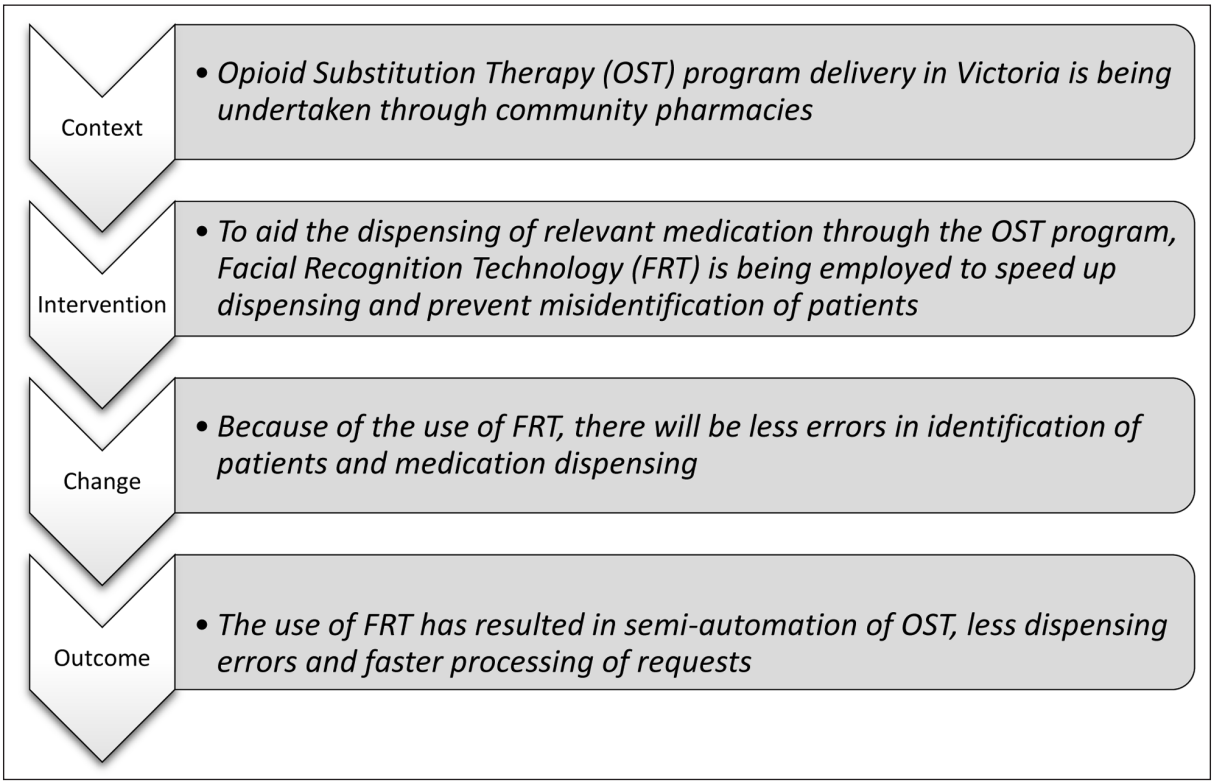

Figure 4 Preliminary Program Theory.

ceased because of the onset of the COVID-19 pandemic and subsequent restrictions imposed by authorities.

RESULTS

Collated data was analysed as per the IMoE model components: Organisational Context, Intervention, Change, Outcomes and Emergent Program Theory. The data was analysed as per inductive logic principles with a theory built from the analysis. The interview analysis involved a paragraph-by-paragraph analysis of the transcripts for themes and a constant comparison approach to help in building the theory. The findings are then utilised to revise the preliminary program theory. The key qualitative findings are outlined below as they relate to different IMoE components.

CONTEXT

Context in the IMoE process relates to the situation in which the OST program is operating like the political, public health and economic scenarios. The interview questionnaire (see appendix) elicited participants' understanding of the OST program they were participating in and the background to the introduction of the program. The participants had a varying degree of involvement and experience with the OST program. Their duration of experience with the OST program ranged from a couple of months to many years with the pharmacists more closely involved in the delivery and the pharmacy assistants assisting patients with information and not involved in dispensing. Considering this, the pharmacists had a better understanding of the history of the OST program and the mechanics of the delivery of the program. However, all participants were aware of the existence of the OST program in their pharmacies and how and when the patients could access the program.

INTERVENTION

This IMoE component assesses the participant's understanding and experience of the intervention, in this case the use of FRT to support or deliver the OST. The component is a link between the context and change components. The participants were specifically asked of their knowledge of FRT both within and outside their pharmacies. They were also asked as how the FRT was utilised (see appendix). The knowledge and experience of FRT amongst the participants varied. Some participants expressed a good understanding of how FRT was used generally like security and surveillance and the reason for its use in the OST. Others encountered FRT only through their pharmacies.

> *"My only awareness experience of the Facial Recognition Technology has been through the Pharmacy"*
> -Pharmacist Participant One

> *"Yes, I am aware of Facial Recognition Technology being used for security purposes oversea and for access to mobile phones as such"*
> -Pharmacist Participant Two

However, all participants were aware of the reasons for the use of the FRT in their pharmacies. For the OST program, one pharmacy had stopped using the FRT because of the small numbers of OST patients. Other reasons for not using FRT was because of it initially slowing down the dispensing process and later the onset of COVID-19 pandemic and installation of protection screens preventing facial recognition. In only one pharmacy, OST patients objected to the use of FRT as screening.

CHANGE

Assessing change is one of the unique components of the IMoE. The component evaluates variations in participant's business or clinical practices because of the result of the intervention i.e., FRT. The changes can be positive or adversarial. Both are important to be considered in the evaluation. Nearly all the pharmacist participants attested to the FRT improving the practice of dispensing in the OST program. This feedback was more so with the ones that continued to use the FRT for a longer period. As per the participants, the use of FRT streamlined the OST program, improved accuracy of identification of patients, supported adherence to the program, reduced medication errors and amount of deceptiveness of patients in order of importance.

> *"I guess it (FRT) has made the dispensing more efficient and automatic as well"*
> -Pharmacist Participant One

> *"It (FRT) becomes quite useful when the locum pharmacist is at the pharmacy and is not familiar with the clients"*
> -Pharmacist Participant Five

However, as outlined in the earlier section some pharmacies stopped using the FRT as it slowed down the process and was found redundant in instances where there were very small OST clients and all of them were familiar to the pharmacist.

> *"The main reason I disabled it (FRT) was because we have a program of 30, and we know everyone by name."*
> -Pharmacy Owner One

OUTCOME

For this component, the evaluation assesses whether the intended objectives of the program were achieved because of the intervention. The main reasons for consideration of FRT in the OST program as identified through initial discussions with stakeholders and literature review were to reduce misidentification and potential medication errors. The pharmacies that continued to use the FRT for a longer period attested to the achievement of these objectives in addition to faster dispensing.

> *"Everything is done in one step; it is quicker and simpler"*
> -Pharmacist Participant Four

> *"There is no need to ask for signatures and recognise clients through their photos"*
> -Pharmacist Participant One

However, one pharmacy owner (who is a pharmacist) also relayed they were no longer using the FRT as when installed it slowed down the process and they did not seek rectification and replacement of the software. In these instances, and where the number of OST patients were small, FRT was not contributing to the objectives of their OST programs and in certain instances unhelpful.

> *"It (FRT) was slow and making the other programs lag behind"*
> -Pharmacy Owner Two

Based on the above thematic analysis, participant information and literature review, the preliminary program theory was finalised as outlined in Figure 5. The changes to the program theory are outlined in **bold** font.

DISCUSSION

The cost of illicit drug use to the Australian society is huge [3]. For example, the cost was estimated to be AUD 6.9 billion in 2004–05 and related crime to be AUD 3.6 billion. Opioid addiction is a prominent contributor this problem [1, 3]. The government and community have an interest in addressing this issue in an evidenced-based approach. OST programs, through its pharmacotherapy, have shown efficacy in tackling opioid dependence. OST programs are not simply maintaining addiction in opioid users but significantly reducing harm. However, methadone, the preferred drug in OST programs, can be toxic in certain doses when given incorrectly or to the wrong person leading to an overdose [14]. Considering the manual process of dispensing methadone or opiates in the OST program has shown business process inefficiencies like delay in dispensation and in certain instances errors, FRT has been proposed to rectify these issues. However, the use of FRT in such situations is novel and hasn't been evaluated for efficacy and safety. This issue must be cogitated in relation to the wider context of some communities resisting the use of FRT and general apprehension about AI. Therefore, this evaluation can be considered important in that it is first to assess the use of FRT in ORT programs and user perception of FRT. The findings, as outlined in Table 1,

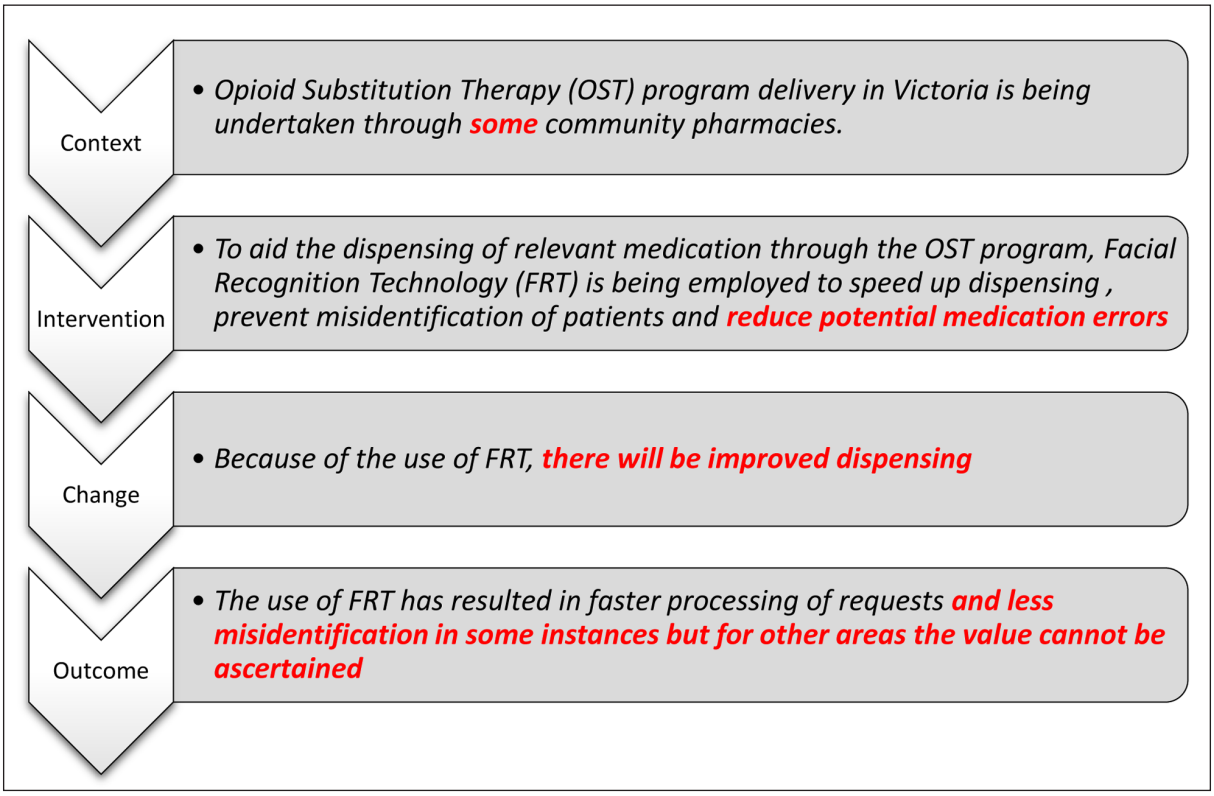

Figure 5 Revised and Final Program Theory.

BENEFITS	CHALLENGES	OPPORTUNITIES
Faster dispensation of OST	Integration with existing IT systems	Extension to other areas of pharmacies including general dispensation
Reduction of potential medication errors	Limited value when there are low number of OST patients	
Less misidentification of patients	Privacy Issues	

Table 1 Benefits, challenges, and opportunities of the use of FRT in OST programs as identified by this study.

will prove useful to stakeholders like the government, policy makers, healthcare providers, pharmacies, and software vendors. The outcomes of this research will lead to better understanding of concerns/objectives pharmacists have for the use of facial recognition in the pharmacy. This will help stakeholders better understand the way to implement facial recognition in the pharmacy and in what way they should disseminate information to better inform the public of its pros versus cons. This study reveals initial biases and challenges to integrating facial recognition in the pharmacy workflow and by doing so have better understanding for rolling out bigger programs.

While the evaluation involved only a small number of participants and pharmacies, the evaluation utilised a qualitative approach where the emphasis is on seeking information rich participants rather than many number of participants [15, 16]. Also, the onset of the COVID-19 pandemic and subsequent restrictions affected further recruitment of pharmacies and participants. Yet, the findings indicate a favourable attitude towards the use of FRT in healthcare contexts such as OST programs. It also identifies how FRT can enhance business processes and minimise human errors. The latter aspect is an important element in clinical governance and safety and quality processes. If FRT can reduce medication errors, it may lead to wider employment of the technology in healthcare delivery. Indeed, some of the research participants attest to the wider use of FRT in medication dispensing and related healthcare contexts. Where the FRT did not seem to work in pharmacies in this study, they can be attributed to technical issues such as integration with legacy IT systems and business matters such as low number of enrolled patients.

Future studies can include more participants and even patients to assess their perception and experience of FRT. Specific aspects like patients' expectations towards facial recognition technology can be probed in-depth. If its revealed patients seem to prefer convenience of faster dispensing roll-out further to the potential risks of FRT, it may indicate where stakeholders like governments and healthcare providers prioritise their strategies. Also, if significant differences between dispensing

times are revealed, there would be justification towards developing a more integrated facial recognition system for different dispensing methods and drugs such as staged supply.

CONCLUSION

In spite of a negative perception of FRT and resistance to its use in surveillance [8, 10], this evaluation showcases the potential benefits of using FRT in healthcare. While being a small study focusing on a specific use case, the study yet provides indicators of where FRT can be used effectively. Such as improving business processes and reducing medication errors. Larger evaluations and studies can confirm or challenge the findings of this evaluation and provide a more definitive perspective of the value of FRT in healthcare.

APPENDIX

INTERVIEW QUESTIONNAIRE

Participant Code:
Pharmacy:
Role:
Professional Experience (in years and months):

CONTEXT

1. What is your role in the Pharmacy?
2. How long have you been working in the Pharmacy?
3. Are your familiar with the Opioid Replacement Therapy program?
4. Does your Pharmacy provide Opioid Replacement Therapy?
5. Do you have a role in the provision of Opioid Replacement Therapy?
6. If yes, describe?

INTERVENTION

1. Are you aware of Facial Recognition Technology?
2. If yes, can you describe what is your understanding?
3. Do you use Facial Recognition Technology in Opioid Replacement Therapy?
4. If yes, can you describe how it is used?
5. If no, what other health technology do you use?

CHANGE

1. Has the use of Facial Recognition Technology changed the way you deliver Opioid Replacement Therapy program in your Pharmacy?
2. If yes, can you describe how so?
3. If no, what are the reasons?

OUTCOME

1. As a result of the use of Facial Recognition Technology in Opioid Replacement Therapy have you noticed any improvement in patient identification?
2. If yes, can you describe how so?
3. If no, what are the reasons?
4. As a result of the use of Facial Recognition Technology in Opioid Replacement Therapy have you noticed any improvement in record keeping?
5. If yes, can you describe how so?
6. If no, what are the reasons?

OTHER

1. How would you describe your overall experience with the use of Facial Recognition Technology in your Pharmacy?
2. What barriers do you perceive in the use of Facial Recognition Technology in your Pharmacy?
3. What opportunities do you perceive in the use of Facial Recognition Technology in your Pharmacy?

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COMPETING INTERESTS

Sandeep Reddy, the lead author declares no competing interests.

Max Mito and Mark Feldschuh are the co-founders of Strong Room.

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REFERENCES

1. **McDonough M.** Opioid treatment of opioid addiction. *Australian Prescriber*. 2013; 36. DOI: https://doi.org/10.18773/austprescr.2013.033

2. **National Opioid Pharmacotherapy Statistics Annual Data (NOPSAD) collection [Internet].** Australian Institute of Health and Welfare. 2019 [cited 2nd February 2022]. Available from: https://www.aihw.gov.au/about-our-data/our-data-collections/nopsad-collection.
3. **Government of Victoria.** Policy for maintenance pharmacotherapy for opioid dependence. Melbourne; 2016. Available at: https://www.health.vic.gov.au/publications/policy-for-maintenance-pharmacotherapy-for-opioid-dependence.
4. **Palmer-Derrien S.** Facial recognition in the pharmacy: Meet Strong Room, the startup bringing tech into opioid-addiction treatment: Smart Company; 2019. Available from: https://www.smartcompany.com.au/startupsmart/news/facial-recognition-pharmacy-strong-room/.
5. **Jeon B, Jeong B, Jee S, Huang Y, Kim Y, Park GH,** et al. A Facial Recognition Mobile App for Patient Safety and Biometric Identification: Design, Development, and Validation. *JMIR Mhealth Uhealth*. 2019; 7(4): e11472. DOI: https://doi.org/10.2196/11472
6. **Introna L, Nissenbaum H.** Facial Recognition Technology-A Survey of Policy and Implementation Issues. New York University: The Centre for Catastrophe Preparedness and Response; 2010.
7. **Katsanis SH, Claes P, Doerr M, Cook-Deegan R, Tenenbaum JD, Evans BJ,** et al. A survey of U.S. public perspectives on facial recognition technology and facial imaging data practices in health and research contexts. *PLoS One*. 2021; 16(10): e0257923. DOI: https://doi.org/10.1371/journal.pone.0257923
8. **Roussi A.** Resisting the rise of facial recognition. *Nature*. 2020: 350–3. DOI: https://doi.org/10.1038/d41586-020-03188-2
9. **Lamy JB, Sekar B, Guezennec G, Bouaud J, Seroussi B.** Explainable artificial intelligence for breast cancer: A visual case-based reasoning approach. *Artif Intell Med*. 2019; 94: 42–53. DOI: https://doi.org/10.1016/j.artmed.2019.01.001
10. **Conger K, Fausset R, Kovaleski SF.** San Francisco Bans Facial Recognition Technology. *The New York Times*; 2019. Available from: https://www.nytimes.com/2019/05/14/us/facial-recognition-ban-san-francisco.html.
11. **Esmaeilzadeh P.** Use of AI-based tools for healthcare purposes: a survey study from consumers' perspectives. *BMC Med Inform Decis Mak*. 2020; 20(1): 170. DOI: https://doi.org/10.1186/s12911-020-01191-1
12. **Castagno S, Khalifa M.** Perceptions of Artificial Intelligence Among Healthcare Staff: A Qualitative Survey Study. *Front Artif Intell*. 2020; 3: 578983. DOI: https://doi.org/10.3389/frai.2020.578983
13. **Reddy S, Namara KM, Malakellis M, Denton T, McDonald C, Opie J,** et al. Evaluation of clinical quality improvement interventions: feasibility of an integrated approach. *Pilot Feasibility Stud*. 2019; 5(4). DOI: https://doi.org/10.1186/s40814-018-0386-1
14. **Wu L-T, John WS, Morse ED, Adkins S, Pippin J,** et al. Opioid treatment program and community pharmacy collaboration for methadone maintenance treatment: results from a feasibility clinical trial. *Addiction*. 2022; 117: 444–456. DOI: https://doi.org/10.1111/add.15641
15. **Etz KE, Arroyo JA.** Small Sample Research: Considerations Beyond Statistical Power. *Prev Sci*. 2015; 16(7): 1033–6. DOI: https://doi.org/10.1007/s11121-015-0585-4
16. **Vasileiou K, Barnett J, Thorpe S, Young T.** Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC Med Res Methodol*. 2018; 18(1): 148. DOI: https://doi.org/10.1186/s12874-018-0594-7

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