

# Pharmacists' Roles in Suicide Care: Influencing Policy through Education and Practice

Presented by: Dr Claire O'Reilly, Dr Sarira El-Den and  
Professor Alan Rosen



# Session Outline

- Speaker 1 – Dr Claire O'Reilly
  - Pharmacists' roles in caring for people at risk of suicide
- Speaker 2 – Dr Sarira El-Den
  - Mental health education and training for pharmacists
- Speaker 3 – Prof Alan Rosen
  - Pharmacists' stigma and attitudes towards suicide

# Background – Pharmacists and Mental Health

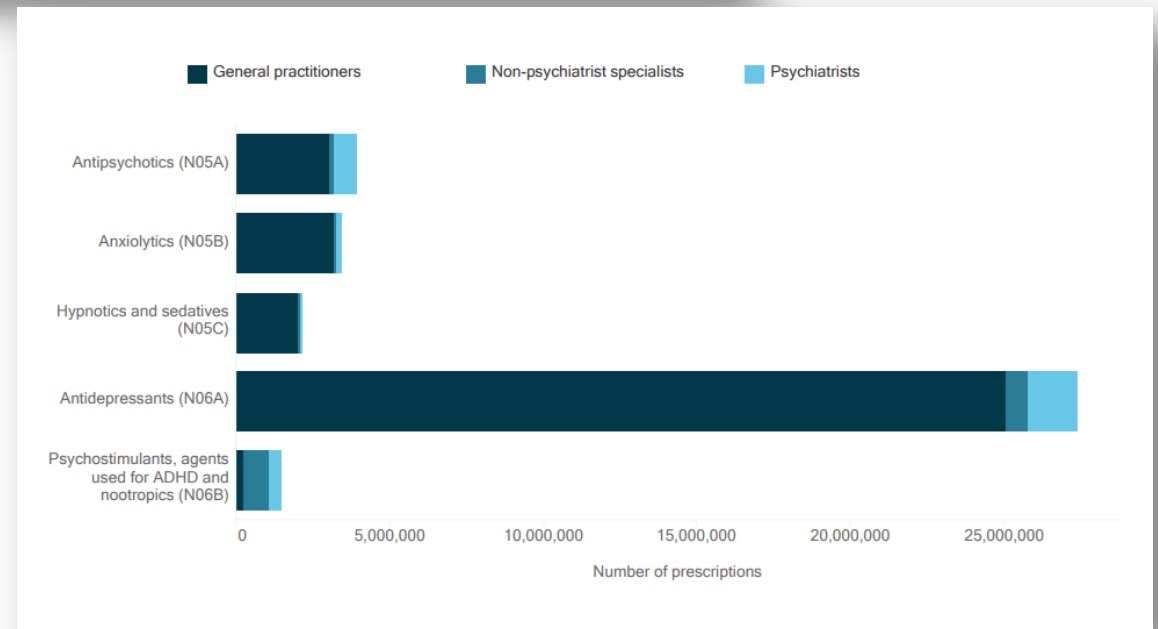
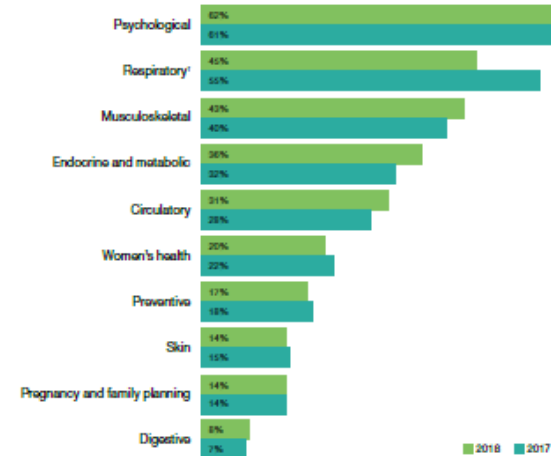
Dr Claire O'Reilly

# Primary health care professionals and mental health

- Most common reason for seeing GP<sup>1</sup>
- 45% of patients who died by suicide contacted a health care professional in the month prior<sup>2</sup>
- Australian pharmacists are involved in dispensing 39 million mental health-related prescriptions, annually<sup>3</sup>
- Australians visit a pharmacy 14 times per year on average<sup>4</sup>
- Evidence that people visit their pharmacy 1.5-10 times more than their primary care physician<sup>5</sup>

FIGURE 1

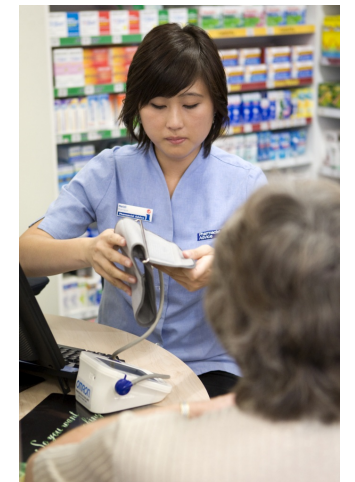
Patients talk to their GP about mental health more than any other health issue\*





# Why pharmacists & mental health?

- Accessible & trusted primary health care professionals
- Medicines often a mainstay of treatment
- Frequently consulted for advice on psychotropics
- Consumers want information about their medicines
- Multiple physical co-morbidities with mental illness
- Adherence to medicines a major challenge in mental health



# Pharmacists and Mental Health – reports and guidelines

 Pharmaceutical  
Society of Australia



**Australia**

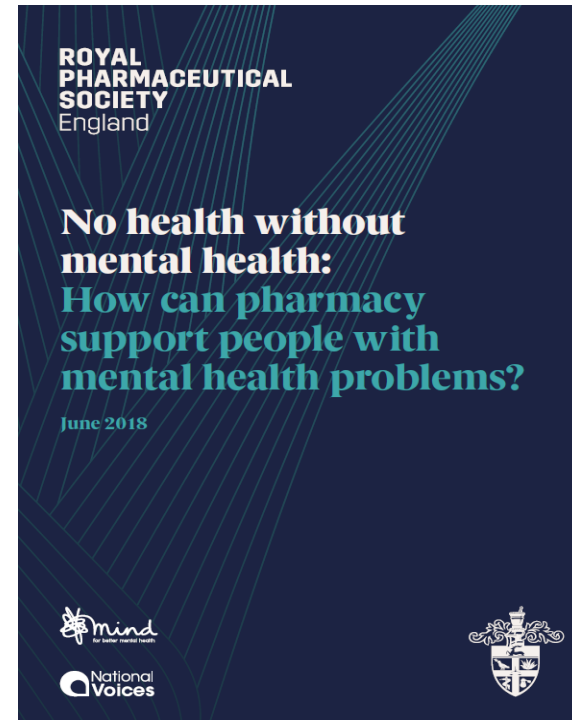
Focus on  
Mental  
Health

The Contribution of  
the Pharmacist

2015



**Worldwide**



**UK**

# Recognition of the pharmacist role

*‘Introduce incentives to include pharmacists as key members of the mental health care team.’*

National Mental Health Commission Report 2015

*‘Pharmacists need to be a part of an integrated approach, working with GPs who are providing continuous follow-up care, and with other members of the multidisciplinary team.’*

*‘Mental health provides considerable scope for pharmacists to exercise their skills in the medication management cycle. It enables a move away from simply dispensing pharmaceuticals to a long-term sustainable role for pharmacists as key multidisciplinary team members.’*

# Suicide Prevention in Australia



# Suicide Prevention in Australia

## The Fifth National Mental Health and Suicide Prevention Plan

1. **Surveillance**—increase the quality and timeliness of data on suicide and suicide attempts.
2. **Means restriction**—reduce the availability, accessibility and attractiveness of the means to suicide.
3. **Media**—promote implementation of media guidelines to support responsible reporting of suicide in print, broadcasting and social media.
4. **Access to services**—promote increased access to comprehensive services for those vulnerable to suicidal behaviours and remove barriers to care.
5. **Training and education**—maintain comprehensive training programs for identified gatekeepers.
6. **Treatment**—improve the quality of clinical care and evidence-based clinical interventions, especially for individuals who present to hospital following a suicide attempt.
7. **Crisis intervention**—ensure that communities have the capacity to respond to crises with appropriate interventions.
8. **Postvention**—improve response to and caring for those affected by suicide and suicide attempts.
9. **Awareness**—establish public information campaigns to support the understanding that suicides are preventable.
10. **Stigma reduction**—promote the use of mental health services.
11. **Oversight and coordination**—utilise institutes or agencies to promote and coordinate research, training and service delivery in response to suicidal behaviours.

# Australian Productivity Commission Review of Mental Health Services

*‘There is an opportunity to better use the skills of pharmacists to improve the use of medicines for mental ill health by integrating pharmacists into multidisciplinary mental healthcare teams, in supporting early detection and intervention, being first responders in mental health crises and supporting people to live well with their mental illness through better and safer use of psychotropic medicines.’*

- 1 Develop and implement **regular review of medicines** for people with mental ill health to reduce the time to respond to medication-related problems and to reduce debilitating side effects from medicines which can be preventable.
- 2 Incorporate **pharmacogenomic testing in primary care** supported by the medicines expertise of pharmacists for people with mental ill health to personalise medicine therapies to improve the safe and quality use of medicines.
- 3 Integrate **pharmacists in suicide prevention strategies**, including supporting pharmacists in their triage role of providing support to people they encounter in mental health crisis situations.
- 4 Support pharmacists, who are often one of the only front-line healthcare providers in rural and remote regions to incorporate **early identification, triage and support** for people with mental ill health.
- 5 Ensure pharmacists, as frontline health professionals in contact with people with mental ill health, have the required expertise such as **mental health first aid**, to support early identification, triage and support for people with mental ill health.

# Pharmacists' Experiences Caring for People at risk of Suicide

Dr Claire O'Reilly

# Pharmacists' roles in suicide care

- Medicines are common means to suicide<sup>1,2</sup> → role for pharmacists
- BUT, pharmacist's role in suicide prevention limited
  - Pharmacists accessible & trusted health professionals, and medications common in suicide attempts & self-harm
- **Little is known about pharmacists.**

*How common do pharmacists come into contact with people at risk of suicide?*



# Australian & Canadian joint study - 2016

- **Aim:** to explore Australian and Canadian pharmacists' experiences, attitudes and stigma towards people at risk of suicide
- **Specific objectives:**
  - Explore how often pharmacists care for people at risk of suicide
  - Describe the experiences of pharmacists involved in the care of people at risk of suicide
  - Explore the impact of pharmacists' experiences when caring for people at risk of suicide
  - Compare Canadian and Australian pharmacists attitudes, stigma, and experiences regarding people at risk of suicide
  - Explore pharmacists attitudes and stigma towards providing care to people at risk of suicide (Prof Alan Rosen)

# Suicide survey - methods

- **Population:** Australian & Canadian Community Pharmacists
- **Ethics:** University of Sydney and Dalhousie University HREC's
- **Survey:**
  - Demographics
  - Attitudes Towards Suicide Scale<sup>1</sup>
  - Stigma of Suicide Scale<sup>2</sup>
  - Questions regarding pharmacists' experiences with patients at risk of suicide, or who had died by suicide.

# Key results – survey data

- 396 Australian and Canadian pharmacists
  - 161 Australian pharmacists
    - 68% Female
    - 78% urban
    - 92% currently practicing
- 85% of **pharmacists had interacted with someone at risk of suicide at least once**
  - 16% >6 times
- 38% cared for consumer(s) with recent suicide attempt
- 28% lost consumer(s) to suicide

# Pharmacists' experiences of people at risk of suicide

- Pharmacists' most prominent experience:
  - < 50% carried out a suicide assessment
  - 13% directly inquired about suicidal thoughts
- 60% felt uncomfortable about their involvement
- 1 in 4 were dissatisfied with how they handled the situation.
- Training & resources key barriers

## **Survey of Australian and Canadian Community Pharmacists' Experiences With Patients at Risk of Suicide**

Andrea L. Murphy, B.Sc.Pharm., Pharm.D., Claire L. O'Reilly, B.Pharm., Ph.D., Randa Ataya, B.Sc., Steve P. Doucette, M.Sc., Frederick I. Burge, M.D., F.C.F.P., Luis Salvador-Carulla, M.D., Ph.D., Timothy F. Chen, Ph.D., Dani Himmelman, M.Sc., Stanley Kutcher, M.D., F.R.C.P.C., Ruth Martin-Misener, M.N., Ph.D., Alan Rosen, A.O., F.R.A.N.Z.C.P., David M. Gardner, M.Sc., Pharm.D.

# Pharmacists' experiences with people at risk of suicide



- Community pharmacists' descriptions of their most *prominent* experience with a person at risk of suicide
- 4 themes: referrals & triage, accessibility for confiding, emotional toll & stigma

*"I was disappointed in myself as I was afraid to ask her in detail about her plan. I was also hesitant to discuss suicidal ideation with her despite knowing/having done mental health first aid because I didn't want to worsen the situation/felt very under qualified for this discussion."*

ID 335

*"A life changing moment in my career and I was so grateful for my MHFA training, knowing I needed to ask lots of questions to ascertain suicide risk and to act immediately."*

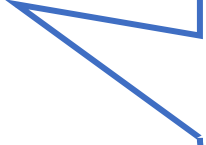
ID 316

# What is the impact of these experiences?


- More Australian than Canadian pharmacists had prior training ( $p < 0.001$ )
  - Australia – 52 (32%) prior training
    - Most commonly Mental Health First Aid (MHFA)
  - How well did this prepare them? n(%)
    - Somewhat 30 (57%)
    - Very well 18 (35%)
- **87%** were encouraged to upskill in mental health care
- **11%** negatively affected on professional and personal level
  - Significantly more negatively affected if:
    - Personal diagnosis of mental illness ( $p = 0.017$ )
    - Previous suicide care experiences ( $p = 0.001$ )
- **8%** not affected at all

# Did pharmacists seek help for themselves?

- 12% of pharmacists access professional support for themselves
  - **51.4% were unsure where to get help**



*"Staying focused on caring for the patients is the biggest obligation and I fear that access[ing] help for myself would put that obligation and duty in jeopardy." ID59*



*"Honestly didn't occur to me to do so." ID519*

# Implications

- Few pharmacists sought professional help
- Pharmacy-specific supports available
- Half were unsure where to seek help
- More postvention research needed
- Further research exploring timing of MHFA training and relationship with experiences in caring for a person experiencing a mental health crisis
- Further mental health education and training needed?

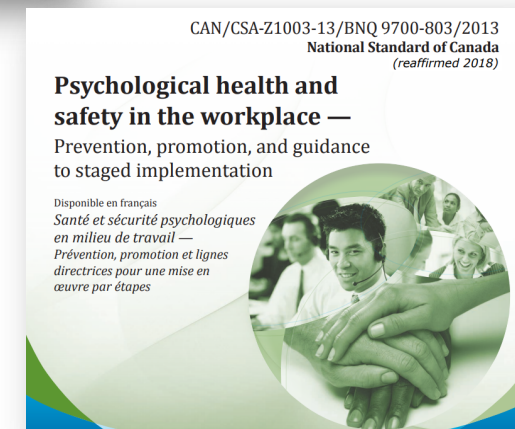
Australia



UK



Canada –  
state-  
based?



Images:

<https://www.supportforpharmacists.org.au/>

<https://pharmacistsupport.org/>

<https://www.lifemarkworkhealth.ca/services/disability-management/ontario-pharmacy-health-program>



# Mental Health Education for Pharmacists

Dr Sarira El-Den

# Gap in Healthcare Curricula

- Health care professionals receive insufficient training during their university degrees<sup>1</sup>
- Health care professionals' negative attitudes → detrimental outcomes, and delay or prevent help-seeking and recovery<sup>2,3</sup>

# Mental health pharmacy education

## Psychiatry

*Ann Pharmacother* 2006;40:1759-65.

Published Online, 12 Sept 2006, www.theannals.com, DOI 10.1345/aph.1H163

### **A Comparative Study of Consumer Participation in Mental Health Pharmacy Education**

J Simon Bell, Rachelle Johns, Grenville Rose, and Timothy F Chen

2006

*American Journal of Pharmaceutical Education* 2010; 74 (9) Article 167.

## **INSTRUCTIONAL DESIGN AND ASSESSMENT**

### **Consumer-led Mental Health Education for Pharmacy Students**

Claire L. O'Reilly, BPharm (Hons), MPS,<sup>a</sup> J. Simon Bell, PhD, MPS, MRPharmS,<sup>b,c</sup> and Timothy F. Chen, PhD, MPS<sup>a</sup>

2010

### **Impact of mental health first aid training on pharmacy students' knowledge, attitudes and self-reported behaviour: a controlled trial**

*Australian and New Zealand Journal of Psychiatry* 2011; 45:549-557  
DOI: 10.3109/00048674.2011.585454

Claire L. O'Reilly, J. Simon Bell, Patrick J. Kelly, Timothy F. Chen

2011

*American Journal of Pharmaceutical Education* 2018; 82 (2) Article 6222.

## **RESEARCH**

### **Assessing Mental Health First Aid Skills Using Simulated Patients**

Sarira El-Den, PhD, MIPH, BPharm (Hons I), Timothy F. Chen, PhD, DipHPharm, BPharm, Rebekah J. Moles, PhD, DipHPharm, BPharm, Claire O'Reilly, PhD, BPharm (Hons)  
The University of Sydney, New South Wales, Australia  
Submitted December 14, 2016; accepted March 8, 2017; published March 2018.

2018

### **Assessing students' mental health crisis skills via consumers with lived experience: a qualitative evaluation**

Claire L. O'Reilly, Rebekah J. Moles, Evelyn Boukouvalas, Sarira El-Den  
*The Journal of Mental Health Training, Education and Practice*

2019

## **Article in Press**

### **Mental Health First Aid training and assessment among university students: a systematic review**

Dr [Sarira El-Den](#), BPharm (Hons I) GradCertAppPharmPrac MIPH PhD<sup>1</sup>.✉

Lecturer at the School of Pharmacy, Faculty of Medicine and Health, The University of Sydney

AVProf [Rebekah Moles](#), BPharm DipHospPharm PhD GradCertEdStud (Higher Ed)<sup>1</sup>

Associate Professor at the School of Pharmacy, Faculty of Medicine and Health, The University of Sydney

Ms [Huai-Jin Choong](#)

Honours Candidate at the School of Pharmacy, Faculty of Medicine and Health, The University of Sydney

Dr [Claire O'Reilly](#), BPharm (Hons)<sup>1</sup>

2020



# Mental Health First Aid

- *Mental Health First Aid is the help provided to a person who is developing a mental health problem, experiencing a worsening of an existing mental health problem or in a mental health crisis. The first aid is given until appropriate professional help is received or the crisis resolves.<sup>1</sup>*



**A**pproach, assess and assist with any crisis  
**L**isten and communicate non-judgmentally  
**G**ive support and information  
**E**ncourage appropriate professional help  
**E**ncourage other supports

- 12 hours
- Face-to-face
- Open to members of the public
- Integrated into the BPharm and MPharm degrees at USYD
- Offered in ~70% of Pharmacy Schools in Australia

# MHFA evaluation studies

RESEARCH ARTICLE

## Systematic review and meta-analysis of Mental Health First Aid training: Effects on knowledge, stigma, and helping behaviour

Amy J. Morgan\*, Anna Ross, Nicola J. Reavley

Centre for Mental Health, Melbourne School of Population and Global Health, The University of Melbourne, Parkville, Victoria, Australia

\* [ajmorgan@unimelb.edu.au](mailto:ajmorgan@unimelb.edu.au)

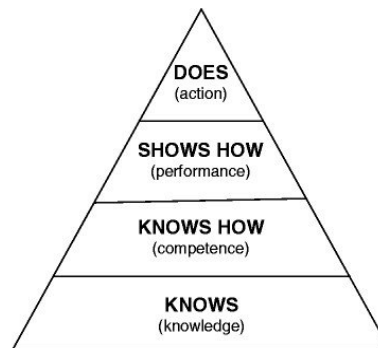
- Improvements in:

- ☐ Knowledge
- ☐ recognition of mental illness
- ☐ beliefs about treatment
- ☐ Stigma
- ☐ Confidence in helping
- ☐ Intentions to provide MHFA
- ☐ Help provided at follow-up

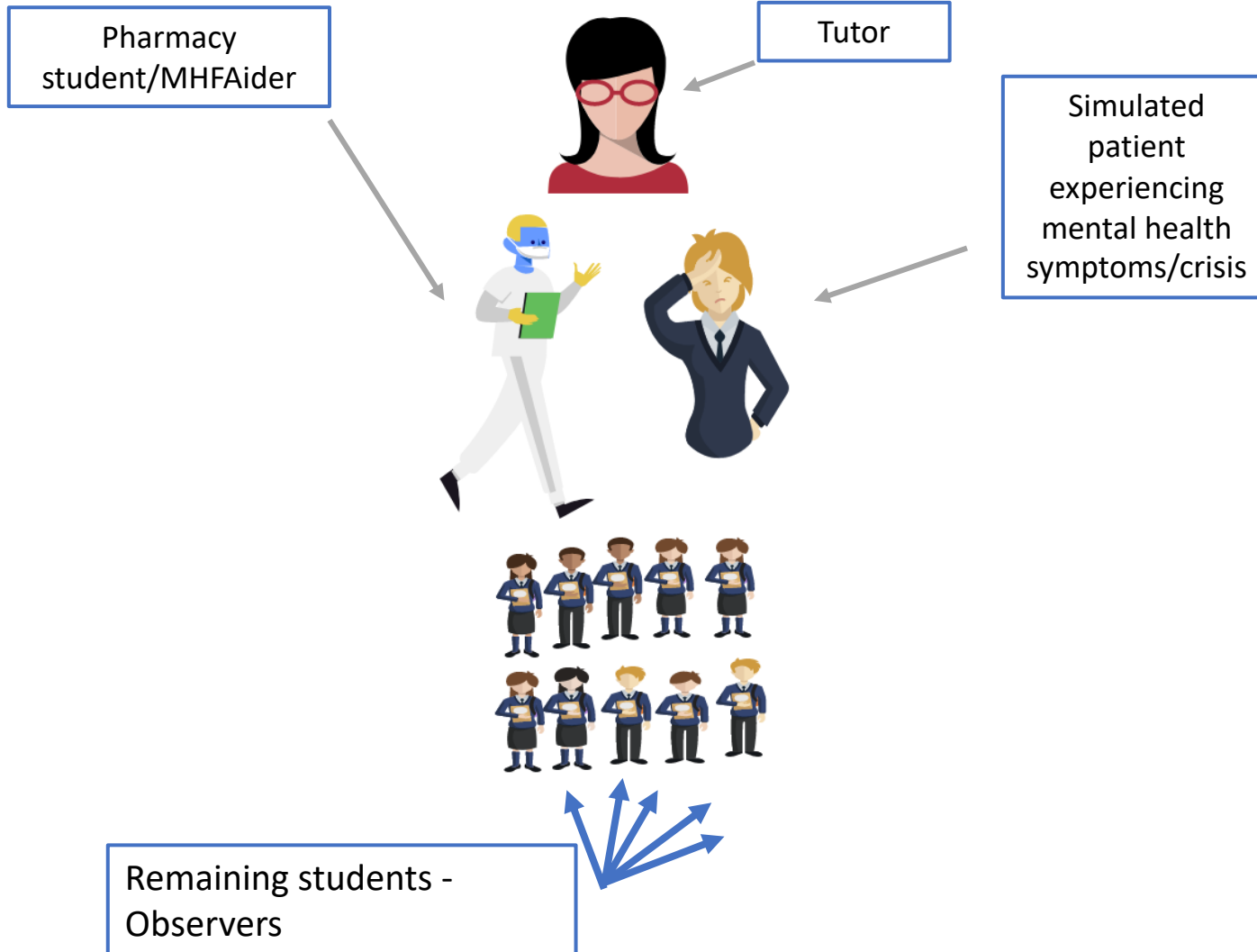
Self-report

# Self-report vs observed behaviours

- Self-reported behaviours do not always correspond to actual, observed behaviours<sup>1,2</sup>
- Incorporating observed behavioural measures ensures that students not only “know” the material and “know how” to apply it, but it allows them to “show how” they apply their newly learned skills.<sup>3</sup>



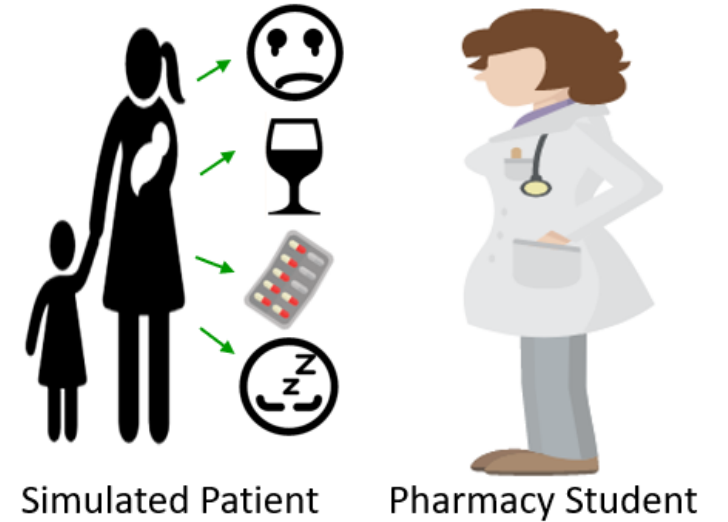
# Simulated patient role-play assessments



Simulated patient cases are developed and delivered through collaboration with One Door Mental Health Consumer Educators

# Sample case

- To pass the assessment
  - >50% overall mark
  - Need to assess for suicide
    - If patient is suicidal → need to keep them safe and provide immediate professional help
- After the role-play
  - Immediate feedback discussion with mental health consumer educator, tutor and peers





# Evaluation of Simulated Patient Role-play assessments

*American Journal of Pharmaceutical Education* 2018; 82 (2) Article 6222.

## RESEARCH

### Assessing Mental Health First Aid Skills Using Simulated Patients

Sarira El-Den, PhD, MIPH, BPharm (Hons I), Timothy F. Chen, PhD, DipHPharm, BPharm,  
Rebekah J. Moles, PhD, DipHPharm, BPharm, Claire O'Reilly, PhD, BPharm (Hons)

The University of Sydney, New South Wales, Australia

Submitted December 14, 2016; accepted March 8, 2017; published March 2018.

- Students under- and overestimate their self-reported confidence in enquiring about suicide, when compared to performance in simulated patient role-play assessments
- Students performed better in the cases where the simulated patient did not experience suicidal thoughts
  - Ambiguous language often used around suicide
  - Difficulty of knowing how to respond to suicidal thoughts

# Evaluation of Simulated Patient Role-play assessments

Social Psychiatry and Psychiatric Epidemiology (2018) 53:1185–1195  
<https://doi.org/10.1007/s00127-018-1582-2>

ORIGINAL PAPER



**Confidence and attitudes of pharmacy students towards suicidal crises: patient simulation using people with a lived experience**

Evelyn A. Boukouvalas<sup>1</sup> · Sarira El-Den<sup>1</sup> · Timothy F. Chen<sup>1</sup> · Rebekah Moles<sup>1</sup> · Bandana Saini<sup>1</sup> · Alison Bell<sup>2</sup> · Claire L. O'Reilly<sup>1</sup>

- Comparative study: students who participated in/observed the role-plays were more likely to maintain significant improvements in confidence at follow-up than those who completed MHFA only.

**Assessing students' mental health crisis skills via consumers with lived experience: a qualitative evaluation**

Claire L. O'Reilly, Rebekah J. Moles, Evelyn Boukouvalas and Sarira El-Den

- Qualitative analyses: role-plays beneficial to and valued by consumers and students

Article

**Simulated Patient Role-Plays with Consumers with Lived Experience of Mental Illness Post-Mental Health First Aid Training: Interrater and Test Re-Test Reliability of an Observed Behavioral Assessment Rubric**

Sarira El-Den \*, Rebekah J. Moles , Randi Zhang and Claire L. O'Reilly

- Interrater and test re-test reliability of rubric: modifications to improve clarity and ensure consistency among markers. Development of rubric versions to differentiate between appropriate MHFA provision in crisis and non-crisis case.

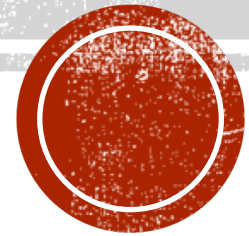
# International perspective

- Some healthcare curricula globally have started to integrated MHFA in curricula<sup>1</sup>
- There have been funding initiatives to support tertiary health students students<sup>2</sup>, including medical students<sup>3</sup> to receive MHFA training
- US pharmacists in Washington need to complete mandatory Suicide Prevention Training prior to registration<sup>4</sup>
- BUT – no minimum standard of mental health and suicide prevention education for pharmacists nationally or internationally

# Pharmacists' stigma of suicide

Prof Alan Rosen

# **CANADIAN-AUSTRALIAN JOINT SUICIDE STIGMA IN PHARMACISTS STUDY DALHOUSIE UNIVERSITY- UNIVERSITY OF SYDNEY 2016-2019**



**Claire O'Reilly, Sarira El-den, Alan Rosen TheMHS Conference, February 2021**

**Murphy A, O'Reilly C et al, J Social Psychiatry & Epidemiology, 2018.**

**Murphy A O'Reilly C et al, Sage Open Medicine, 2019.**

# RESULTS — PREVIOUS MENTAL HEALTH CRISIS TRAINING

- More Australian than Canadian pharmacists had prior training ( $p < 0.001$ )
- Australian Pharmacists — 28.6% had prior MH crisis training (Canadians 11.5%)
  - Most commonly Mental Health First Aid (MHFA)
- How well did this prepare them? n(%)
  - Somewhat 30 (57%)
  - Very well 18 (35%)

A new initiative of  
SANE Australia's Anne  
Deveson Research  
Centre, the National  
Stigma Report Card



**Murphy A et al, J Social Psychiatry & Epidemiology, 2018**



# **CANADA VS AUSTRALIA PHARMACISTS**

## **ATTITUDES & BEHAVIOURAL INTENTION**

### **RE SUICIDAL CLIENTELE**

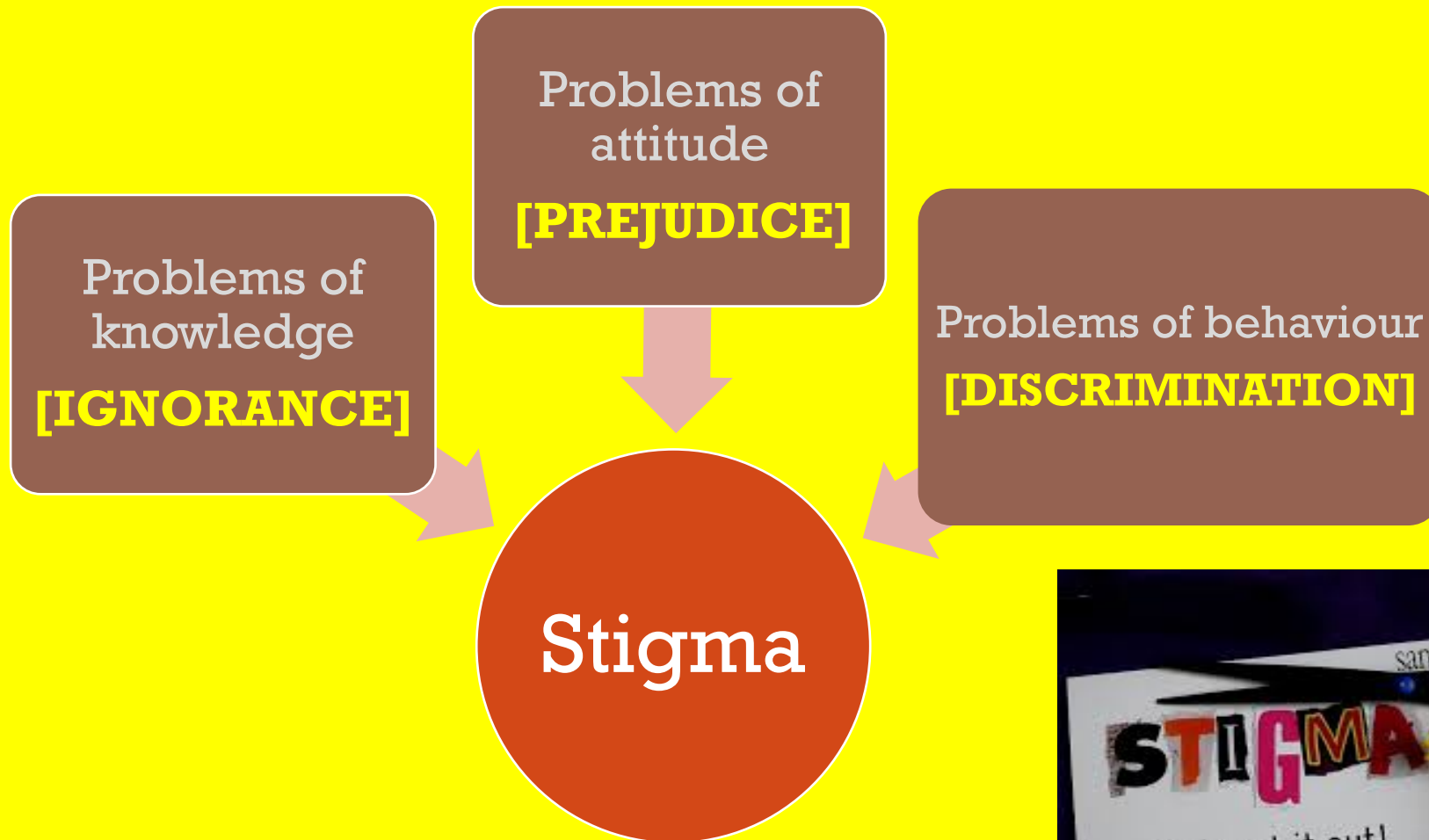
**-CANADIAN PHARMACISTS WERE LESS DISMISSIVE OF SUICIDAL CLIENTELE AS PATHETIC, IMMORAL, WEAK OR IRRESPONSIBLE---SO LESS STIGMATISING, ----BUT MORE OF THEM FELT HELPLESS & DID NOT KNOW WHAT TO DO.**

**-AUSTRALIAN PHARMACISTS WERE MORE STIGMATISING, (CLOSER TO GENERAL CANADIAN POPULATION RESULTS) ----BUT FELT LESS HELPLESS & KNEW TO APPROACH THEM & OFFER TO ASSIST THEM FINDING SUITABLE CARE----MORE INSTRUMENTAL, MORE POSITIVE DISCRIMINATION**





# MODEL OF STIGMA



Thornicroft, G. Shunned 2007





# DISCRIMINATION

**Discrimination:** enacted stigma through behavioural actions

experienced

- **Unfair treatment due to a mental illness**
- **Example: *unreasonably rejected for a job***

anticipated

- **Fear of encountering discrimination**
- **Example: *individual does not apply for a job***

positive

- **Beneficial treatment**
- **Example: *preferentially hired due to mental health diagnosis***



# **CONCLUSION: 1.**

**(POSSIBLE EXPLANATION-HYPOTHESIS LEVEL):**

**STIGMA MAY COMPRISE OFTEN RELATED BUT SOMETIMES DIVERGENT ATTITUDINAL & BEHAVIOURAL VARIABLES OR COMPONENTS:**

- **Must Attitudes & Behaviours always be congruent or can they be contradictory?**
- **It appears that Cognitive Dissonance may not be a barrier to ethical, responsible & responsive behaviours?**
- **Consistency or Purity of Thought & Action may be an unrealistic expectation or aspiration, sometimes or even often?**
- **Is MHFA more effective with behaviour change than with attitudinal change with primary healthcare professionals? Are they just pragmatic & less reflective about applying required behaviours?**

- **Caveats/Limitations:**

-no matching was possible between particular Australians or Canadians who had completed Mental Health courses, and those who were more or less stigmatizing or enabling.

-measure was of behavioural intention, not of behaviours themselves.

-we can't conclude too much from the national differences in pharmacist stigma of suicide, as it was a cross-sectional measure at one time point, without analysing the influence of training over more points in time.



## **CONCLUSION: 2.**

**(POSSIBLE NEXT STEPS TOWARDS SOLUTIONS-HYPOTHESIS LEVEL):  
STIGMA MAY COMPRISE OFTEN RELATED BUT SOMETIMES  
DIVERGENT ATTITUDINAL & BEHAVIOURAL VARIABLES OR  
COMPONENTS:**

- **Should we prioritize, focus initially & strive directly for helpful behaviours? Maybe they will reshape attitudes on the rebound?**
- **Over-reliance on self-rating attitude studies. Does this suggest the need for more simulated behavioural or more truly behavioural studies? (Thornicroft).**
- **Are such studies ethical? Eg. with Service Users with consistent support, in recovery as roleplay or simulation enablers & as discussants, or with actors?**
- **Do we need both Mental Health First Aid & Experiential Suicidality Attitudinal, Awareness & Responsiveness Training for co-laterally involved professionals & community members? Eg Hairdressers? Real-estate agents?**
- **Should we tackle Trauma & Stigma together—pulling out the stops on overcoming both together synergistically? Optimizing both Neuroplasticity & Empowerment?**



# CONCLUSIONS 3.

## Results of parallel Univ Sydney Comm Pharm Research O'Reilly C et al, Internat J of Social Psychiatry, 2019

- **Discrimination** from primary & secondary health professionals is **prevalent**.
- Low discrimination scores from **assertive mental health** team staff:
  - Do they shield service-users from -ve discrimination?
  - Do they provide Positive Discrimination? Is it therapeutic?
- As both +ve attitudes and +ve behaviours may be **synergistic** in a) destigmatising, b) getting practical help, c) positive discrimination\*, and d) healing & recovery, can they be learned with training? Does this require **MHFA (theoretical + face-to-face components) + experiential training** with service-users & families in highly valued & legitimized expert roles?

\* eg human rights facilitation, doing special things, undoing unneeded treatments & orders



**WE CAN ALL BE MORE EFFECTIVE  
IF WE ARE ALL ON THE SAME PAGE**



# STIGMA AS A SOURCE OF TRAUMA

- **Prominent Sources of Trauma in Mental Health Services (can be co-occurring)**
  1. **Frightening acute psychotic & suicidal experiences**
  2. **Involuntary Hospital Admission & Treatment, being secluded, held down & injected**
  3. **Early & persistent experiences of Stigma**
- **Service-users report that the experience of the stigma of having a mental illness is often worse than living with the illness.**
- **Acute &/or cumulative experiences of being stigmatized, shunned and discriminated against may be erosive & contribute substantially to the genesis of PTSD.**
- **Self-stigma can set in early & become an indelible “traumatic shadow or stain” -so difficult to remove.**
- **Recent evidence suggests that hyper-reactivity to stress may often be epigenetically transmitted to future generations, with investment in preventive interventions likely to be worthwhile.**



# Acknowledgements

## **FUNDING**

- Dalhousie Pharmacy Endowment Fund (DPEF)
- Pharmacy Council of New South Wales
- Drug Evaluation Alliance of Nova Scotia
- International Program Development Fund

## **COLLABORATORS**

- Dr Andrea Murphy
- Prof David Martin Gardner
- Dr Fred Burge
- Prof Timothy F Chen
- Prof Stanley Kutcher
- Dr Luis Salvador-Carulla
- Ms. Dani Himmelman,
- Ms. Stephanie Webster
- Ms Randa Ataya
- Mr Steve P Doucette
- Dr Ruth Martin-Misener
- A/Prof Rebekah Moles
- Ms Sarah Choong
- Ms Randi Zhang

## **COLLABORATING ORGANISATION**

- One Door Mental Health

We would like to thank MHFA Australia, as well as the mental health consumers, students and pharmacists who have contributed to this research.

# Thank you

Questions?