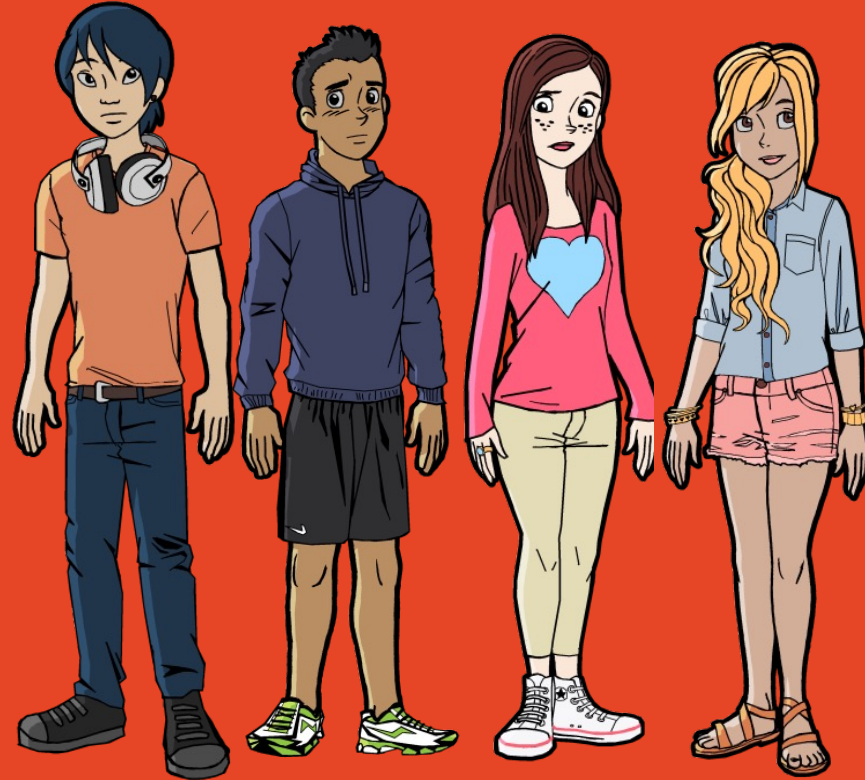


# Digital platforms as agents of change for adolescents at risk

**Distinguished Professor Maree Teesson AC**  
***FAHMS, FASSA, RNSW***

The Matilda Centre

The University of Sydney



I acknowledge the traditional  
Custodians of Country  
throughout Australia and  
recognise their continuing  
connection to land, water and  
culture.

I pay my respects to those who  
have cared and continue to  
care for Country.



# The Matilda Centre



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Mental and substance use disorders cost  
over **\$US 2.4 trillion per year** across  
the globe and this is predicted to more  
than **double by 2030.**

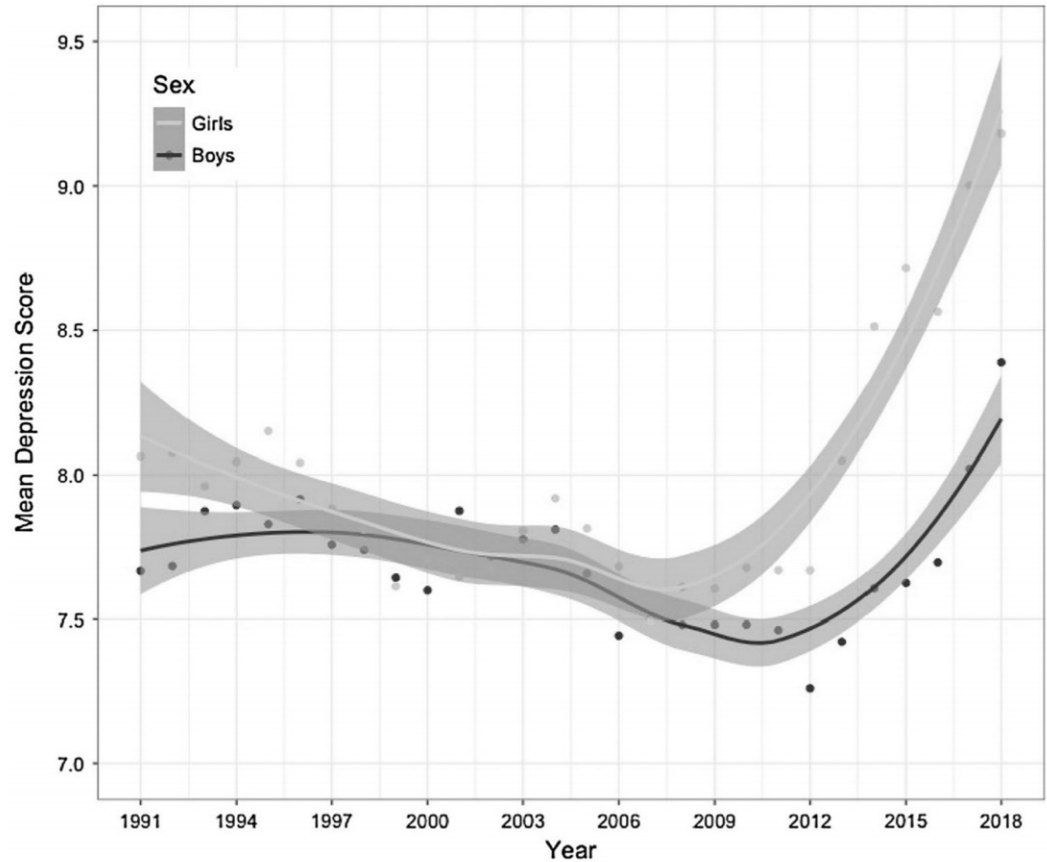
Trautmann S, Rehm J, Wittchen H-U. The economic costs of mental disorders: Do our societies react appropriately to the burden of mental disorders? *EMBO Rep* 2016; **17**(9): 1245-9.

# 1. Young people are facing a mental health crisis



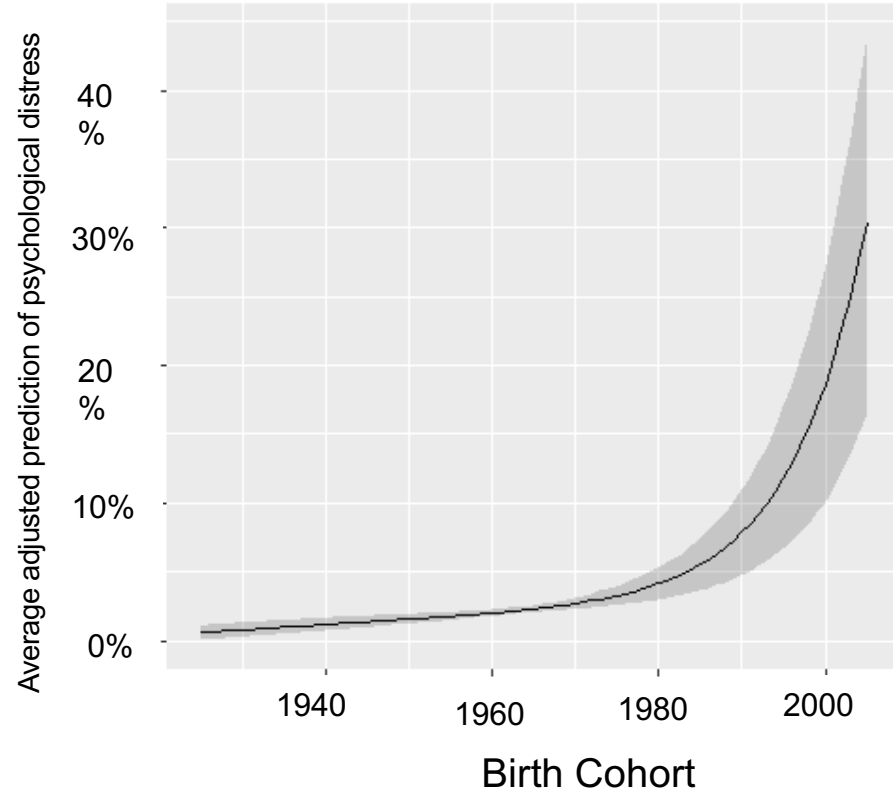
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# Depression among high school students in the US 1991-2018



Keyes et al

## Predicted prevalence of high psychological distress



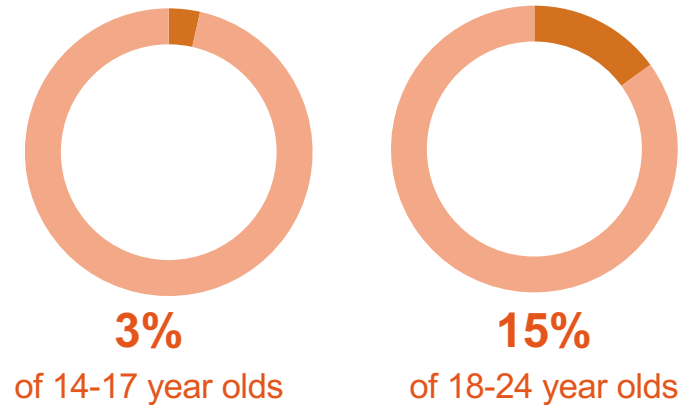
Spikes in high psychological distress seem to be driven by increases among “Millennial” and “Gen-Z”

# Rates of risky drinking are significant

- Rates of very high risk binge drinking are significant and are highest among young people
- Younger people remain more likely to be victims of alcohol related crime



## 11+ Drinks at least monthly



Source: National Drug Strategy Household Survey



## 2. Can we use digital platforms for universal prevention ?



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# Advantages and disadvantages of universal digital prevention

## Advantages:

- Everyone gets the intervention
  - Stigma is low
- Conducted in specific settings like schools so they can reach large numbers
- Allows multiple targets in keeping with contemporary dimensional views of psychopathology

## Disadvantages:

- Need large sample sizes so trials have to be big
- Small effects: do they work and do the effects persist ?





# OUR *Futures*

**Combined universal digital prevention of anxiety, depression and substance use.**



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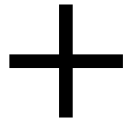
Matilda Centre

# Combined prevention for anxiety, depression and substance use

Aim: To develop and evaluate the first combined approach to 'universal' substance use and mental health prevention in adolescence, delivered through school.



Substance Use  
course



Mental Health  
course

The first trial to test an integrated model of prevention.

# OurFutures 'alcohol & cannabis' course

- **Universal eHealth** prevention program
- **12 lessons** on alcohol & cannabis
- **Effective principles** of drug prevention
- Embedded within **school health curriculum**
- **Overcomes barriers** to implementation
  - **Digital** to increase fidelity
  - **Engaging** for students & teachers



# Evidence base: *OurFutures* alcohol & cannabis course

- 3 RCTs & pilot in the UK
- Findings:
  - ✓ Increase alcohol & cannabis knowledge
  - ✓ Reduce average alcohol consumption
  - ✓ Reduce binge drinking
  - ✓ Reduce frequency of cannabis use
  - ✓ Reduce truancy

Newton, N. et al. (2020). *Psych Med.*

Newton, N., et al. (2010). *Addiction.*

Newton, N. et al. (2009). *Preventive Medicine.*

Champion, K. et al. (2016). *ANZJP.*

Teeson, M. et al, (2017). *Psych Med.*

Teeson, M. et al (2020). *Lancet Digital Health*



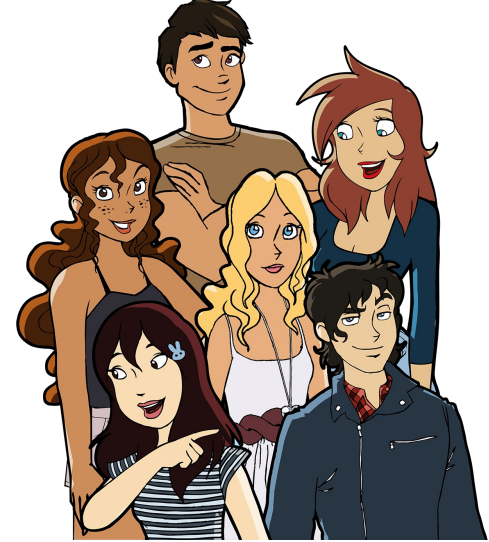
# OurFutures combined prevention

## Substance Use module

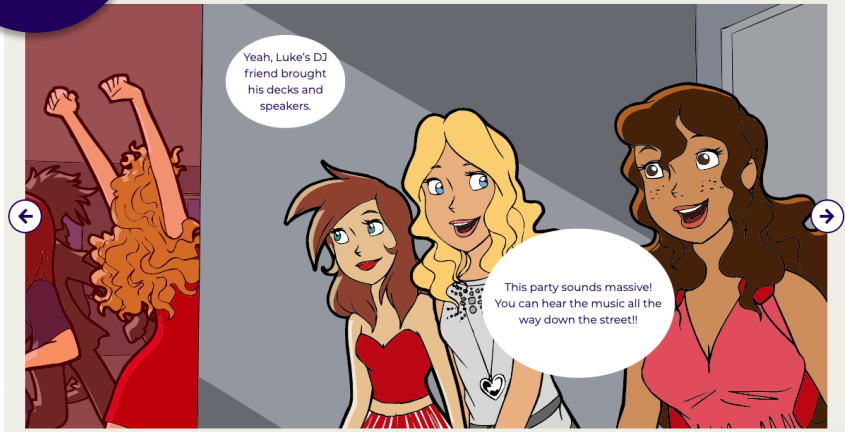
- 6 x 40-minute lessons focusing on **alcohol** +
- 6 x 40-minute lessons focusing on **alcohol and cannabis**

## Mental Health module

- 6 x 40-minute lessons aimed at reducing **anxiety and mental health symptoms**
- 
- Delivered via a web-based cartoon model (*Newton et al., 2009; 2010* )
  - Social influence, skills & CBT, co-designed, peer led, curriculum aligned.

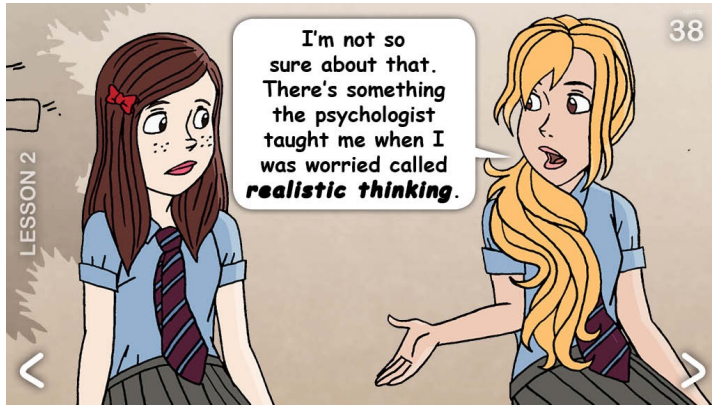


# Voiceovers





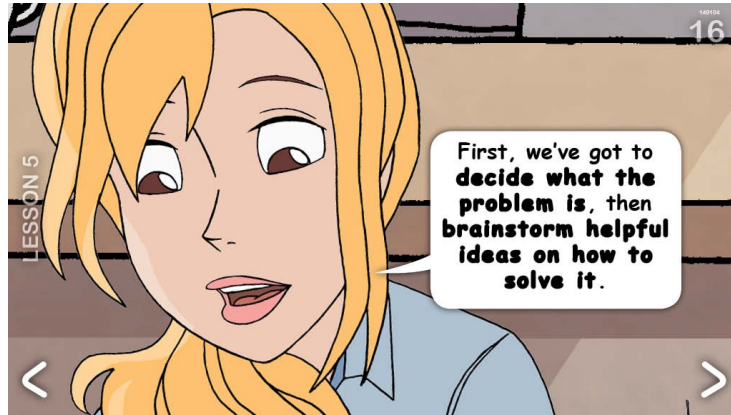
# Realistic Thinking



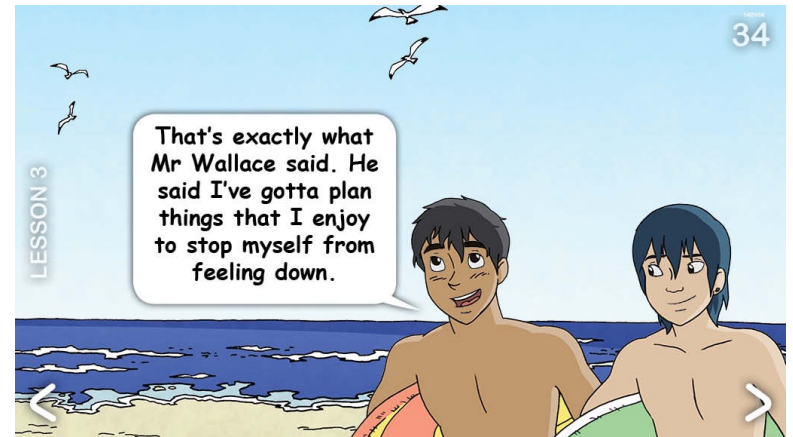
# Assertiveness



# Structured Problem Solving



# Activity Planning



# Study aim & design

- Aim: examine **long term effects** of combined substance use & mental health prevention
- Four arm cluster RCT run over 6 years (13–19 years of age)
  1. **Control:** education as usual
  2. **Substance use** universal prevention
  3. **Mental Health** universal prevention
  4. **Combined** substance use + mental health prevention

Protocol

## Evaluating the Long-Term Effectiveness of School-Based Depression, Anxiety, and Substance Use Prevention Into Young Adulthood: Protocol for the Climate School Combined Study

Louise Birrell<sup>1\*</sup>, BSocSc, BPsych (Hons), PhD; Nicola C Newton<sup>1\*</sup>, BPsych (Hons), PhD; Tim Slade<sup>1</sup>, BPsych (Hons), PhD; Catherine Chapman<sup>1</sup>, BA (Hons), PhD; Louise Mewton<sup>1</sup>, BAPsych (Hons), PhD; Nyanda McBride<sup>2</sup>, DTeach, BEd, PGDHealth Prom, MPH, PhD; Leanne Hides<sup>3</sup>, BBehSc (Hons), PhD; Mary Lou Chatterton<sup>4</sup>, BScPharm, PharmD; Steve Allsop<sup>2</sup>, PhD; Annalise Healy<sup>1</sup>, BPsych (Hons); Marius Mather<sup>1</sup>, BAPsych (Hons), MBiostat; Catherine Quim<sup>3</sup>, BA (Hons), MCLinPsych, PhD; Cathrine Mihalopoulos<sup>4</sup>, BBSec (Hons), GDEcSt, PGDHthEc, PhD; Maree Teesson<sup>1</sup>, BPsych (Hons), PhD

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\*these authors contributed equally

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22-32 King Street

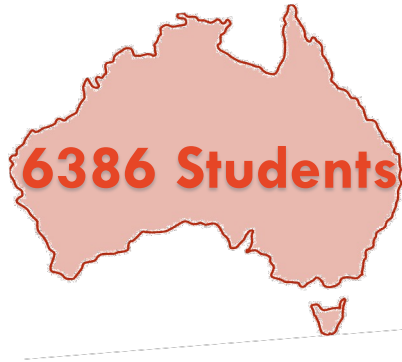
Sydney, 2052

Australia

Phone: 61 2 8936 1039

Email: [annalise.healy@unsw.edu.au](mailto:annalise.healy@unsw.edu.au)

# Cluster Randomised Controlled trial



## KEY OUTCOMES:

- Use of alcohol
- Levels of anxiety (GAD) & depression symptoms (PHQ)

	School follow-up							7yr follow-up	
<b>Year</b>	2014	2014	2015	2015	2015	2016	2016	2018 / 19	2020/21
<b>Age</b>	13.5	14	14.5	15	15.3	15.5	16	18.5	20
<b>Grade</b>	8	8	9	9	9	10	10		
<b>Follow up (years)</b>	Baseline + intervention	.5	1	1.5	1.75	2	2.5	5	6
<b>n</b>	6,386	5,639	5,337	5,134	5,079	4,757	4,359	1877	

# Combined universal digital prevention of anxiety, depression and substance use is promising at 3 years.

Articles



Increasing knowledge



Reducing alcohol consumption and binge drinking



Improving attitudes towards alcohol



Slowing the progression of anxiety symptoms

## Combined prevention for substance use, depression, and anxiety in adolescence: a cluster-randomised controlled trial of a digital online intervention



Maree Teesson\*, Nicola C Newton\*, Tim Slade, Cath Chapman, Louise Birrell, Louise Mewton, Marius Mather, Leanne Hides, Nyanda McBride, Steve Allsop, Gavin Andrews



### Summary

**Background** Substance use, depression, and anxiety in adolescence are major public health problems requiring new scalable prevention strategies. We aimed to assess the effectiveness of a combined online universal (ie, delivered to all pupils) school-based preventive intervention targeting substance use, depression, and anxiety in adolescence.

*Lancet Digital Health* 2020; 2: e74-84

Published Online  
January 3, 2020  
[https://doi.org/10.1016/S2589-7500\(19\)30213-4](https://doi.org/10.1016/S2589-7500(19)30213-4)  
See [Comment](#) page e52

\*Contributed equally

**Methods** We did a multicentre, cluster-randomised controlled trial in secondary schools in Australia, with pupils in year 8 or 9 (aged 13–14 years). Participating schools were randomly assigned (1:1:1:1) to one of four intervention conditions: (1) Climate Schools–Substance Use, focusing on substance use only; (2) Climate Schools–Mental Health, focusing on depression and anxiety only; (3) Climate Schools–Combined focusing on the prevention of substance

But they were still in school

# Universal prevention of depression at schools: dead end or challenging crossroad?

Pim Cuijpers  <sup>1,2</sup>

<sup>1</sup>Department of Clinical, Neuro and Developmental Psychology, Amsterdam Public Health research institute, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands  
<sup>2</sup>Babeş-Bolyai University, International Institute for Psychotherapy, Cluj-Napoca, Romania

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Received 15 March 2022

Accepted 14 April 2022

## ABSTRACT

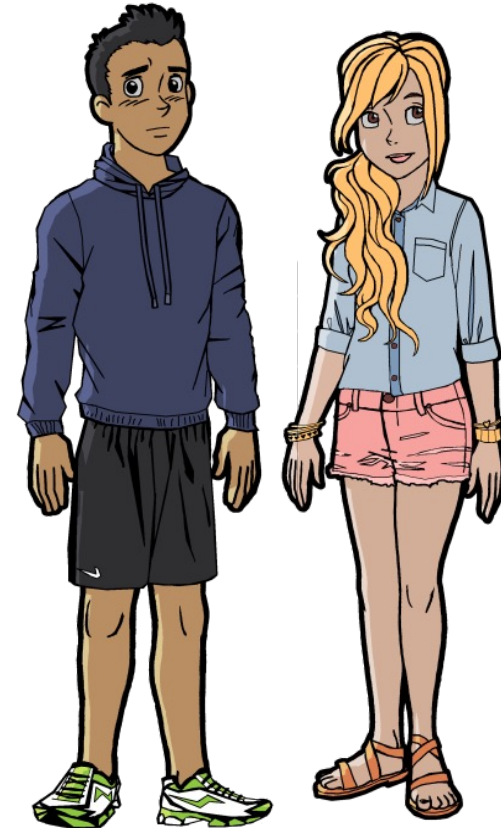
Universal school programmes aimed at the prevention of depression and other common mental health problems in adolescents are attractive because they are less stigmatising than targeted interventions, have a high uptake and may shift the ‘normal distribution’ of mental health problems in the positive direction. Research up to now shows small effects of these interventions, but even small effects may have a large impact because of the large number of people receiving these interventions. However, such small effects may also be related to the modest quality of the trials in this area. This means that current research has no clear indication whether universal prevention has a large public health impact or no impact at all. The MYRIAD trial is a large, fully powered, high-quality study showing that universal prevention probably is not effective, although it is

Another reason why universal prevention is attractive is that it may move the ‘normal distribution’ of mental health problems a little to the positive side. This argument goes back to the work of Geoffrey Rose,<sup>4</sup> who said that determinants of ill health are typically normally distributed in the general population. In this view, the most efficient way to prevent ill health is to shift the normal curve, just a little, into the positive direction. That can be done with universal interventions, such as school programmes aimed at all adolescents. Just a small change of the normal curve will have a huge impact on the number of people at the extreme side of the curve, and more efficiently than a ‘high-risk’ or targeted strategy.

So in principle, universal interventions are very attractive and promising. However, universal prevention is only interesting when it is indeed

# Conclusions

1. Some evidence that universal combined digital platforms have long-term lasting effects for drinking and binge drinking
2. Less evidence for their effect for depression and anxiety prevention.
3. What about novel targets and selective?



# 3. Can we use digital platforms for novel targets and selective prevention ?







Health4Life

Physical and mental wellbeing  
in adolescence and beyond

# Health4life: A digital platform to prevent depression and anxiety through indirect targets



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# The Big 6 risk factors as indirect targets

- **Traditional risk factors:** Alcohol use, smoking, physical inactivity & poor diet.
- **Emerging risk factors:** Screen time & sleep

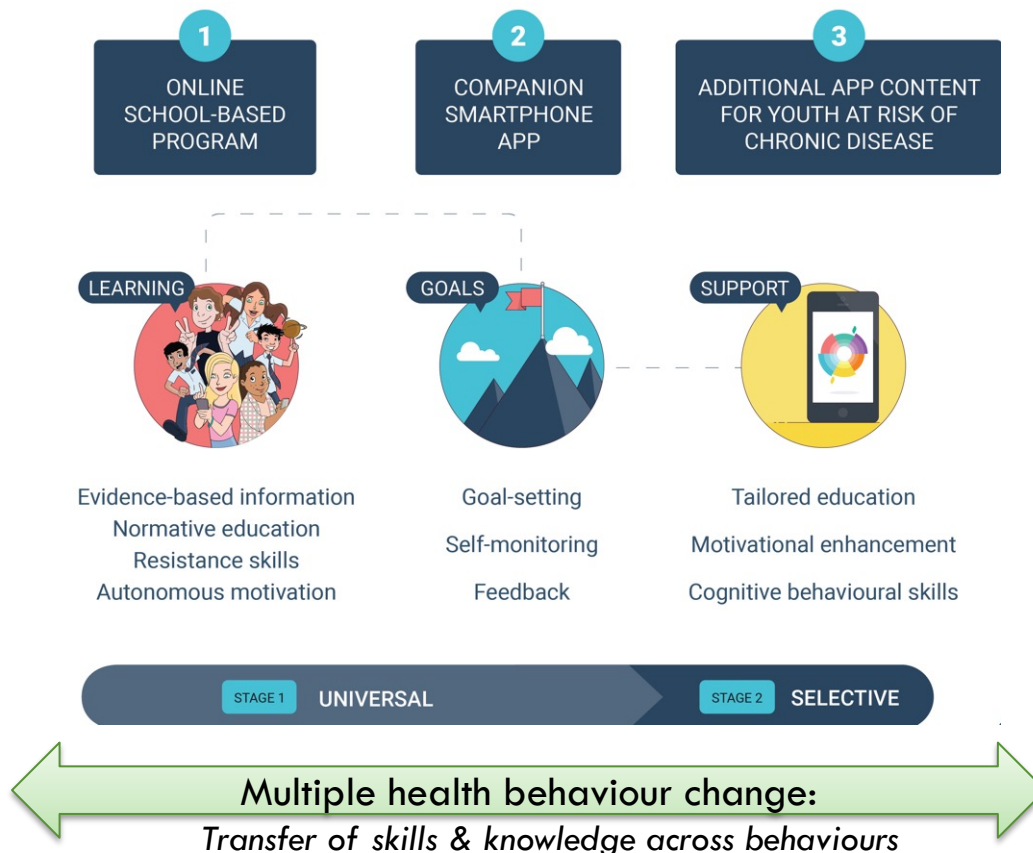


Alcohol, passive screen time, poor sleep, physical inactivity, poor diet, smoking/vaping



Dose-dependent associations between Big 6 and mental health: Smout et al. ANZJPH 2023

# Health4Life: novel targets, universal – selective



Health4Life  
protocol:  
Teesson, Champion,  
Newton, et al. BMJ  
Open 2020

# The Health4Life digital program

- 6 x 20-minute online modules, delivered in school
- Delivered via web-based cartoons
- Co-designed with youth, teachers and experts in 2018-2019
- Aims to:
  - Provide evidence-based info about Big 6
  - Improve drug resistance skills
  - Modify existing norms
  - Increase autonomous motivation.



**JMIR Publications**  
Advancing Digital Health & Open Science

Articles ▾ Search articles

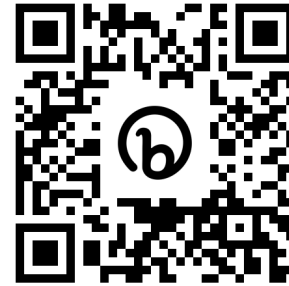
JMIR Formative Research ↓ Journal Information ▾ Browse Journal ▾

 **A Web-Based Intervention to Prevent Multiple Chronic Disease Risk Factors Among Adolescents: Co-Design and User Testing of the Health4Life School-Based Program**

Katrina Elizabeth Champion <sup>1,2</sup> , Lauren Anne Gardner <sup>1</sup> , Cyanna McGowan <sup>2</sup> ,  
Cath Chapman <sup>1</sup> , Louise Thornton <sup>1</sup> , Belinda Parmenter <sup>1</sup> , Nyanda McBride <sup>4</sup> ,  
David R Lubans <sup>3</sup> , Karrah McCann <sup>1</sup> , Bonnie Spring <sup>2</sup> , Maree Teesson <sup>1</sup> ,  
The Health4Life Team <sup>5</sup>; Nicola Clare Newton <sup>1</sup> 



# The Health4Life school-based program



Health4Life  
Development: Champion  
et al. JMIR 2020

**Web-based tailored feedback, based on self-report assessments.**

*You're a little more than halfway there! You need to cut out a little more screen time to meet the national recommendations!*

**Action needed** **Needs some work** **Going strong**

You said that you are currently engaging in an average of 2 hours and 35 minutes of recreational screen time per day.

**i** According to the Australian Guidelines for Physical Activity and Sedentary Behaviour, people your age should limit the use of electronic media for entertainment to no more than 2 hours a day.

**i** Remember, there are many strategies to limit your screen time each day, such as meeting up with friends face-to-face, setting reminders to turn off your phone, or making your bedroom a screen free zone.

**Where you are now**  
16/09/2019

**Colour-coded feedback about adherence to national**

**Strategies & tips to improve/maintain behaviour**

# The Health4Life Smartphone App

- Companion tool to accompany school-based program
- Self-monitoring and goal setting.

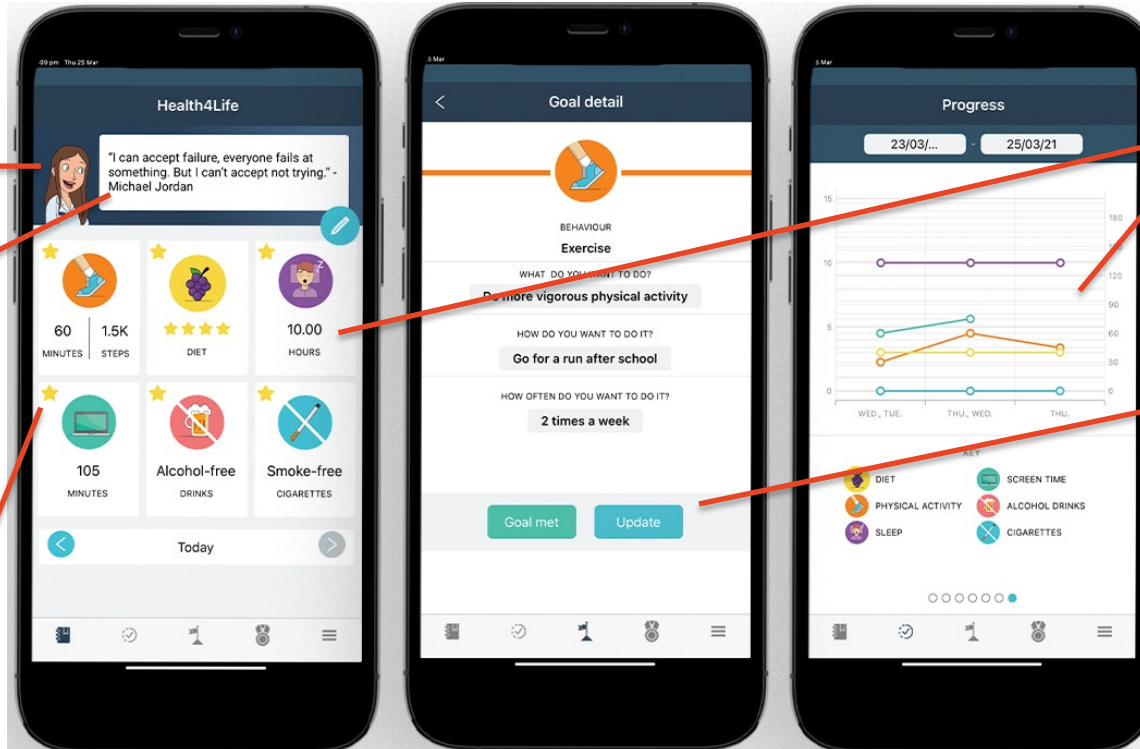
Choose their  
"Health4Life  
Buddy"

Motivational  
Quotes

'Rewards' &  
encouragement  
for meeting  
goals

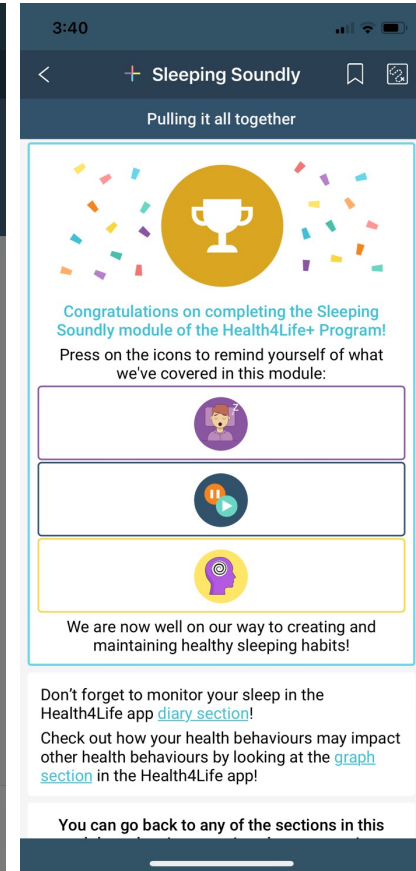
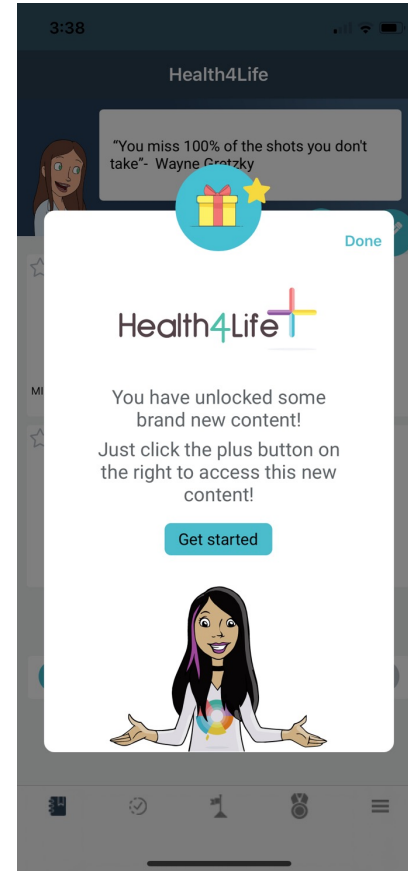
Tracking daily  
behaviours

Set goals



# The Health4Life Booster App

- “Health4Life+” booster content
- Delivered 12- and 24-months after initial intervention to ‘at risk’ students
- Uses CBT and motivation enhancement principles
- Also available via the website



# Cluster RCT of Health4life compared to control in 6640 students

Students assessed over three years via self-report surveys:

	Baseline	Health4Life Program + App	Post-Intervention F/U	1-year F/U + Selective intervention	2-year F/U + Selective intervention	3-year F/U
Time	Term 3/4, 2019	Term 3/4, 2019	Term 3/4, 2019	Term 3/4, 2020	Term 3/4, 2021	Term 3/4, 2022
Age	12-13yrs	12-13yrs	12-13yrs	13-14yrs	14-15yrs	15-16yrs
Grade	Year 7	Year 7	Year 7	Year 8	Year 9	Year 10
N	6640	-	85%	83%	75%	75%





# Do digital platforms work ?

Trials in over 24,000 adolescents have found that interventions using digital cartoon storyboards improve student health by:



**Increasing knowledge about alcohol, cannabis, MDMA and new psychoactive substances**



**Reducing alcohol consumption and binge drinking**



**Reducing cannabis and ecstasy use**



**Slowing the progression of anxiety symptoms**



**Reducing psychological distress**



**Reducing harms related to the use of alcohol and ecstasy**



**Reducing intentions to use MDMA, psychostimulants, new psychoactive substances and synthetic cannabis**



**Improving attitudes towards alcohol**

# 4. Where to from here ?



1. Replicated evidence that digital platforms for prevention have long-term lasting effects for drinking and binge drinking
2. Need more evidence for depression and anxiety prevention.
3. Indirect targets (sleep, diet, physical activity) a promising new area.
4. Larger international studies and investment in digital prevention and implementation models



# International: Hong Kong Case Study



# KELY – Hong Kong



# KELY – Hong Kong





# OUR *Futures*



# Thank you!

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[@Mteesson](#)

To find out more visit:  
[ourfuturesinstitute.org.au](http://ourfuturesinstitute.org.au)



Maree Teesson and Nickie Newton are founding directors of Climate Schools PTY LTD and Ourfutures Institute, a not for profit joint venture established to disseminate education resources. We acknowledge NHMRC, MRFF and Australian government funding. Multiple collaborators, students and schools across Australia.