Health literacy, shared decision making and health inequalities: what do we know and what can we do better?

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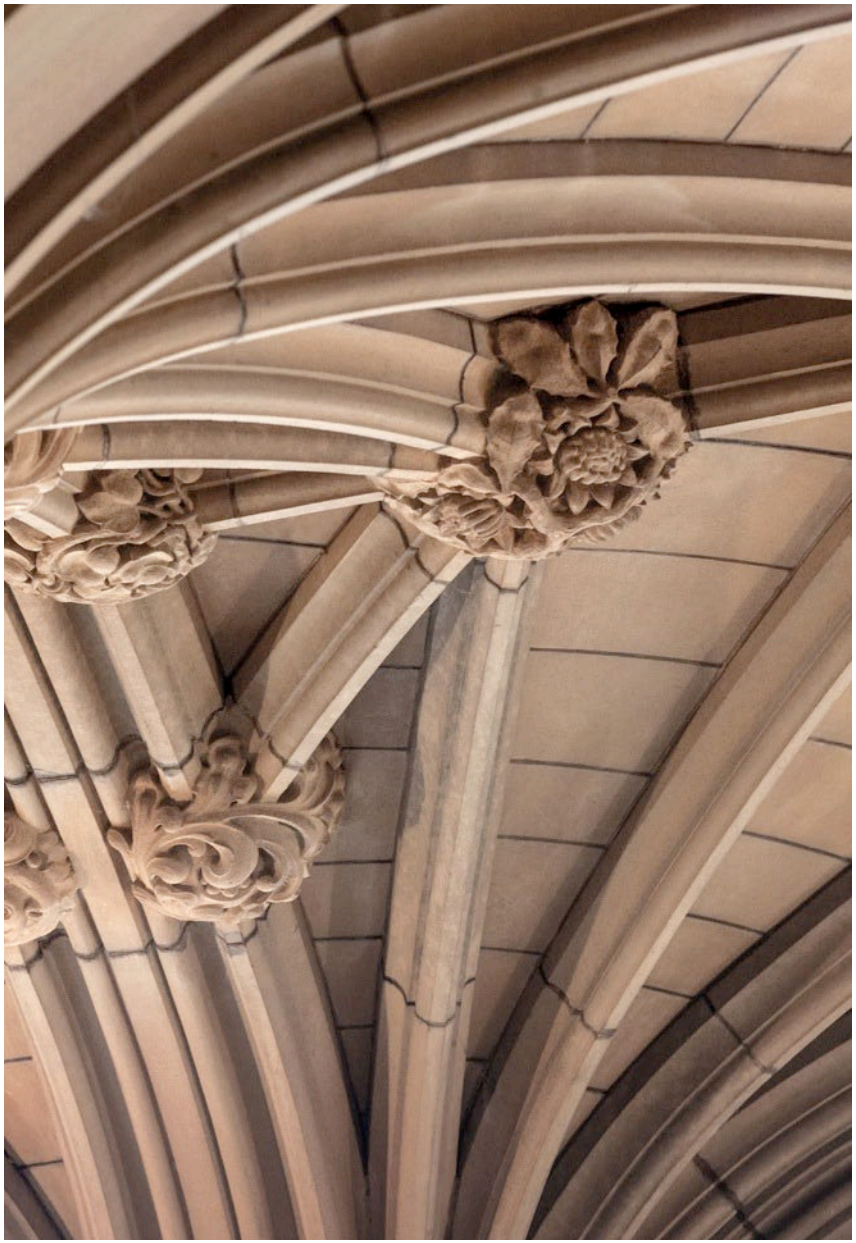

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Sydney Health Literacy Lab

Acknowledgements

SHeLL Team: Dr Danielle Muscat, Dr Julie Ayre, Dr Carissa Bonner, Dr Jolyn Hersch, Dr Erin Cvejic, Dr Rachael Dodd, Dr Brooke Nickel, Jenna Smith, Jennifer Isautier, Olivia Mac, Dr Kristen Pickles, Dr Tessa Copp, Carys Batcup, Sam Cornell, Thomas Dakin, Dr Marguerite Tracy, Dr Kristie Weir.

Professor Don Nutbeam, A/Prof Jesse Jansen

Overview

1. What is health literacy and why does it matter?
2. Conceptualising health literacy and shared decision making
3. Findings from recent HL & SDM research? (Marie-Ann & Kirsten McCaffery)
4. What can we do better (Marie-Ann & Kirsten McCaffery)

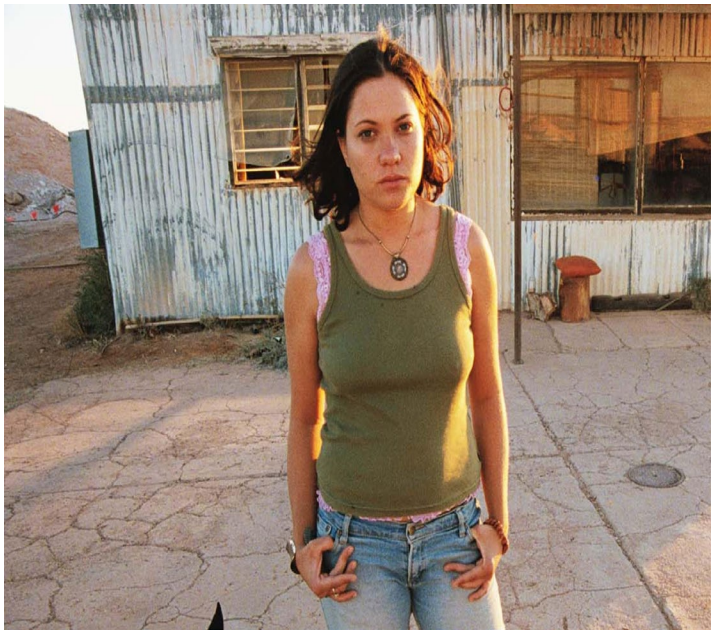
A story….. Edward

Edward works in publishing. He lives on a waterfront house in Sydney . Edward got his two doses of vaccination for COVID as soon as he could. He was concerned about the risks and read about it and talked at length to his GP to make a decision. Feeling confident it was the right decision to make he went ahead. Pretty much all his friends and family are vaccinated.

Omicron hit Australia hard in December. There was a sudden rush for vaccines and boosters.

Edward quickly googled and found the fastest place he could to get a booster. It was the Aboriginal Medical Centre in central Sydney (lots of spare doses). He walked straight in and was boosted after a 20 minute wait. He also found out where to get his children immunised as soon as the kids vaccinations opened – and quickly booked an appointment.

Shani



Shani is a proud Aboriginal young woman who lives in Taree (a regional area many hours drive from Sydney). She lives in public housing with her partner and 3 young kids. Shani has only had one vaccine so far – she read a lot of misinformation on Facebook and through social media and she is really hesitant. She didn't know who to talk to. She finally got her first dose of vaccine late last year – her mum was pestering to do it her but her partner isn't vaccinated nor are the kids.

Shani now wants to be vaccinated but supplies to Taree are limited, there are doses available but she is not sure where so she is still waiting for her 2nd dose, her partner and kids are still unvaccinated. She doesn't know when vaccination will be available for the kids but she doesn't know if she wants if for them anyway. She's seen many scary stories online.

Meanwhile Omicron is spreading fast >50,000 cases per day and increasing …

What is Health Literacy?

Health literacy variously defined but at its core….

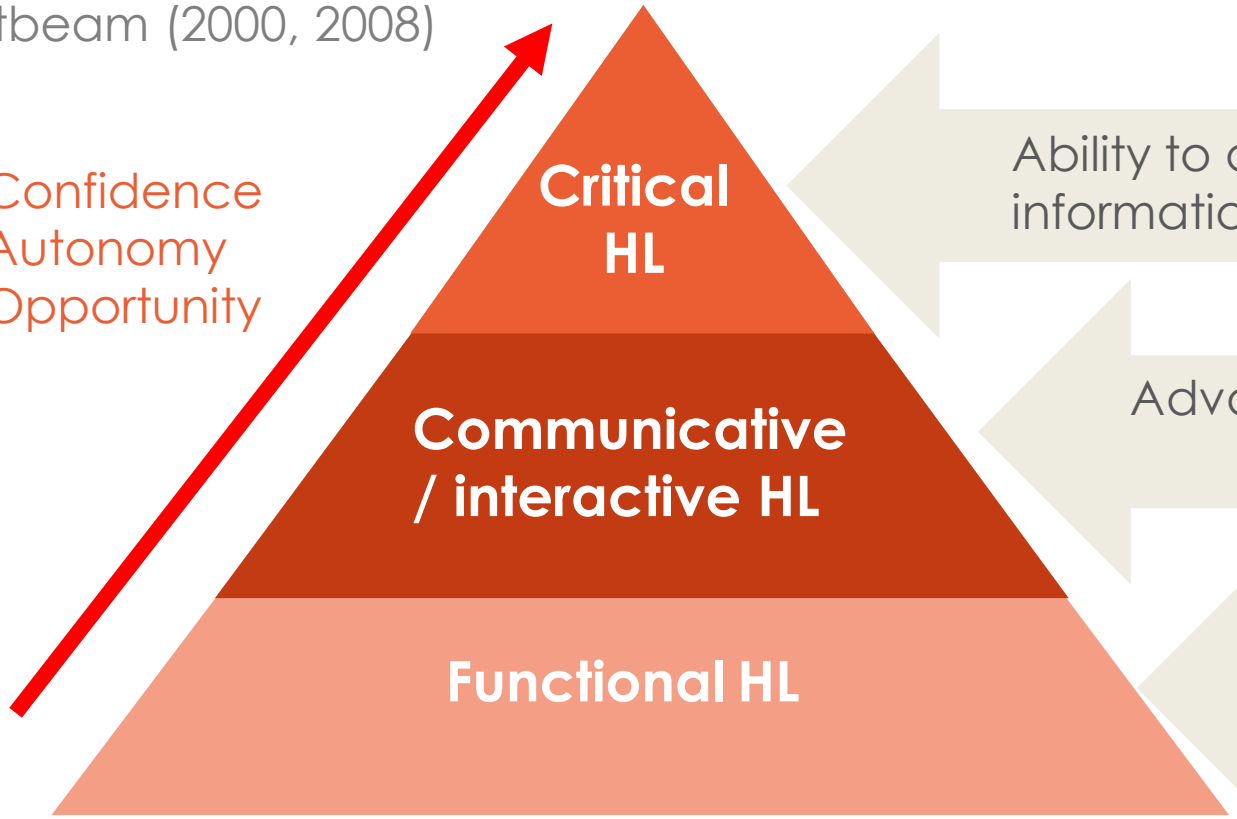
- ***Health literacy*** is the possession of literacy skills (reading, writing and numeracy) and the ability to perform the knowledge-based literacy tasks (acquiring, understanding and using information) that are required to make health related decisions in a variety of different situations*
- ***Health literacy*** describes an observable set of skills that will vary from individual to individual.
- **Heath literacy** can be considered as a clinical risk, or personal asset

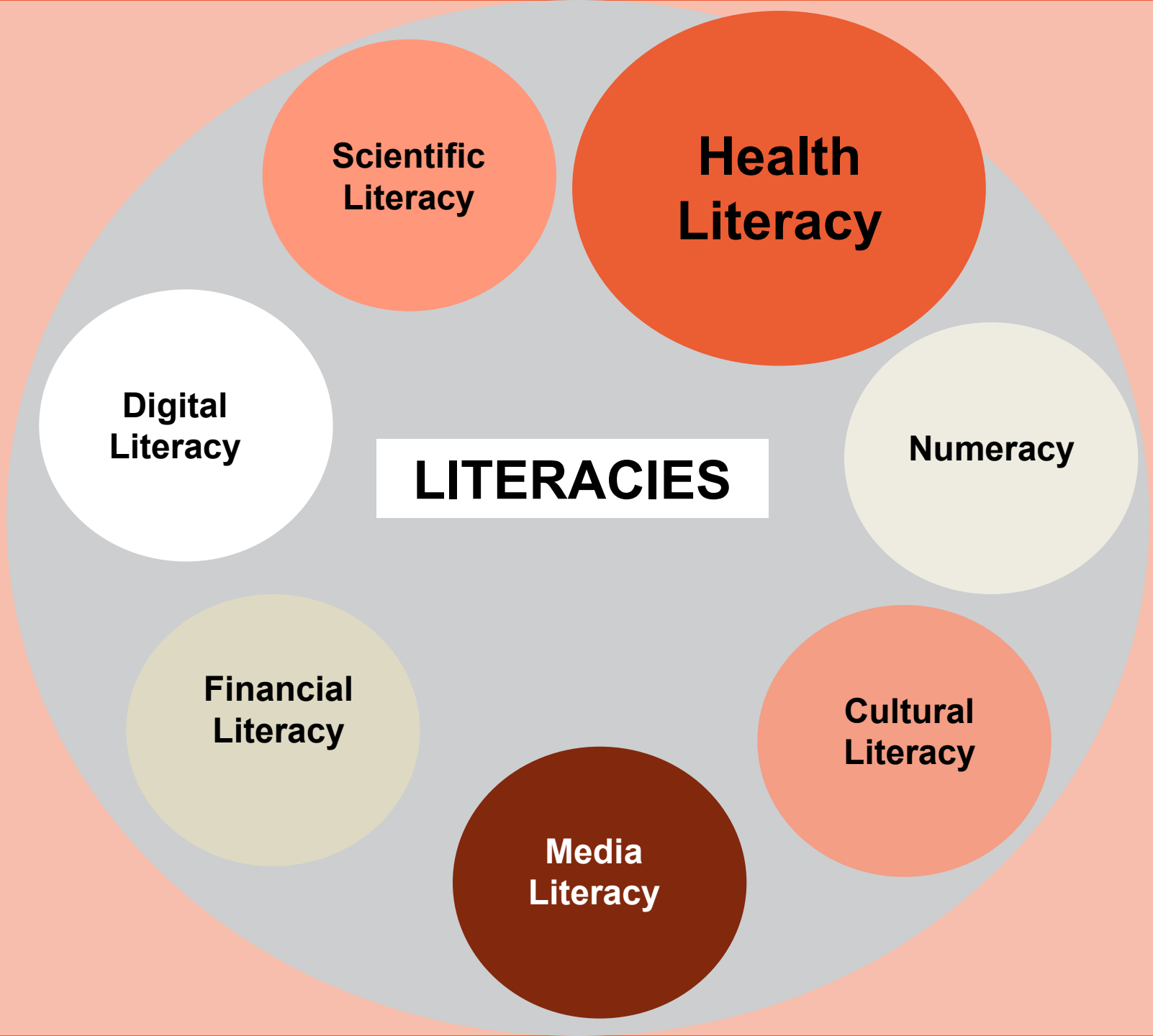
Health literacy is more formally described by WHO as: *the* cognitive and social skills *which determine the motivation and ability of individuals* **to gain access to, understand and use information** *in ways which promote and maintain health** (WHO/HPR/HEP/98.1)

See also: Nutbeam D. Health Promotion Glossary (1998) *Health Promotion International,* 13(4): 349-364.

MULTI LEVEL MODEL OF HEALTH LITERACY

Nutbeam (2000, 2008)




Scientific Literacy
Health Literacy
Digital Literacy
LITERACIES
Numeracy
Financial Literacy
Cultural Literacy
Media Literacy

WHAT IS HEALTH LITERACY?: an integrated approach

4 dimensions and 3 domains of health literacy

	Access/obtain information relevant to health	Understand information relevant to health	Process/appraise information relevant to health	Apply/use information relevant to health
Health care	Ability to access information on medical or clinical issues	Ability to understand medical information and derive meaning	Ability to interpret and evaluate medical information	Ability to make informed decisions on medical issues
Disease prevention	Ability to access information on risk factors for health	Ability to understand information on risk factors and derive meaning	Ability to interpret and evaluate information on risk factors for health	Ability to make informed decisions on risk factors for health
Health promotion	Ability to update oneself on determinants of health in the social and physical environment	Ability to understand information on determinants of health in the social and physical environment and derive meaning	Ability to interpret and evaluate information on health determinants in the social and physical environment	Ability to make informed decisions on health determinants in the social and physical environment

Sorensen, K., et al (2012). Health literacy and public health: A systematic review and integration of definitions and models. BMC Public Health, 12(1), 80–80.

What is health literacy?

Osborne, R. H., Batterham, R. W., Elsworth, G. R., Hawkins, M., & Buchbinder, R. (2013). The grounded psychometric development and initial validation of the Health Literacy Questionnaire (HLQ). *BMC public health*, *13*(1), 658.

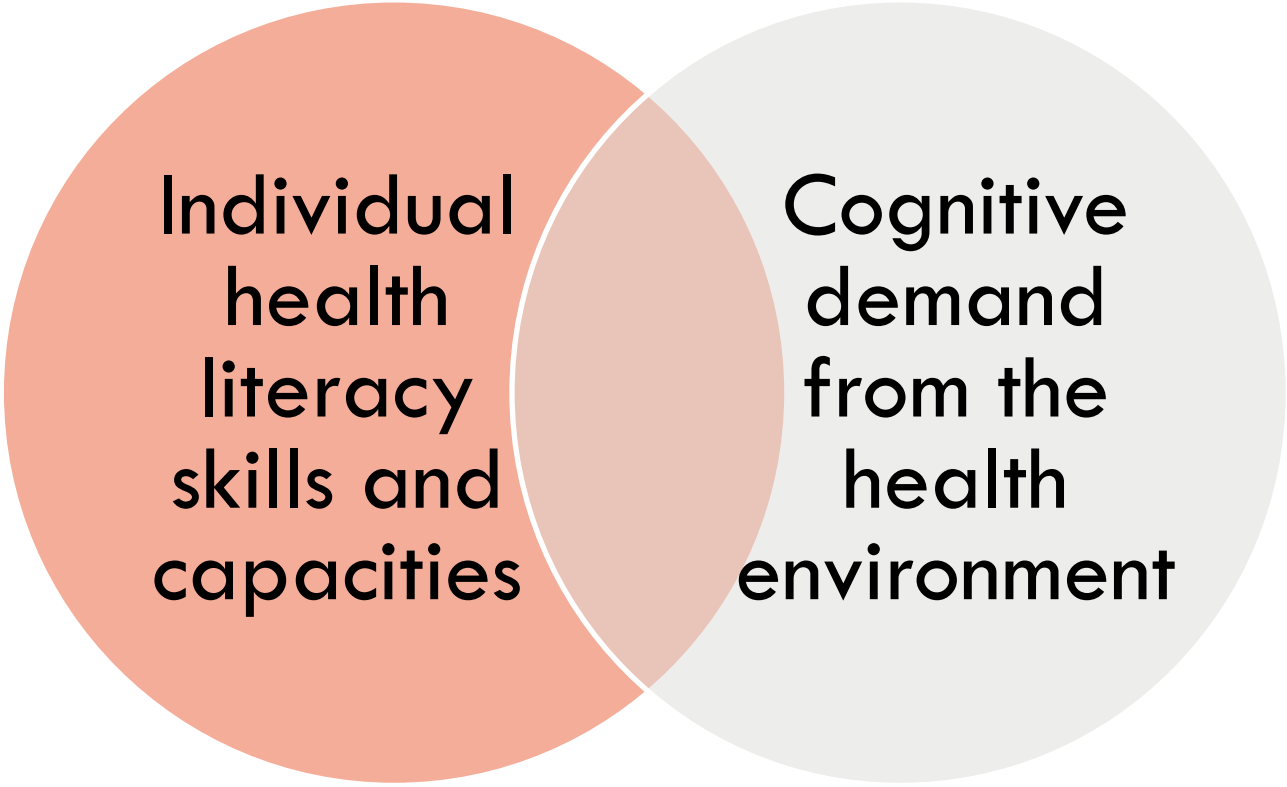
FURTHER CONCEPTS IN HEALTH LITERACY…

- **Distributed health literacy** - the way health literacy is dispersed through a social group (e.g. family or social network) and used as a collective resource to manage health (Edwards et al 2015).

- **Health Literacy Responsiveness -** the way in which services/organisations/ systems make health information and resources accessible to people with lower health literacy (also called *organisational health literacy*)

- **Digital health literacy** – or eHealth literacy – the ability to seek, find, understand, and appraise health information from electronic sources (Norman and Skinner 2017)

Health Literacy




Individual
health
literacy
skills and
capacities

Low health literacy is common worldwide

Rates differ because of differences in measures and thresholds – using performance based measures:

- 59% of Australians had 'very poor' or 'marginal' health literacy (Australian Adult Literacy and Life Skills survey 2008, nationally rep sample adults aged 15-74 years)

- UK/US national surveys (Kutner et al 2006; OECD 2005):
  - 36-48% '*limited*' / '*inadequate*' health literacy.

- 55% South Asians have low health literacy (Rajah et al 2019)

- Meta-analysis of 99 studies "*1/3 to 1/2 Europeans have low health literacy*" [substantial variation depending on measures used and sample studied, Baccolini et al JGIM 2020]

Low health literacy is common worldwide

Low HL is associated with

- Lower formal education
- Speaking another language at home
- Older age
- Chronic disease
- Other markers of social disadvantage

High proportion of people struggle with the health literacy requirements of every day life!

Health environment is too demanding for most lower health literacy consumers

Health environment **60-95% of health info too complex**

Health environment is too demanding for most lower health literacy consumers

Examples

- 95% of chronic kidney patient information > grade 6; 70% > grade 8 (Morony et al 2016)
- 95% of Australian health websites written > grade 8 (Cheng et al 2015)

Health environment **60-95% of health info too complex**

Recommendations:
Reading grade for:
- general population GRADE 8 or below
- low literacy population GRADE 6

Steps to follow should be clear and concrete

PROBLEM?

Individual HL

30-50% population have lower HL

Health environment

60-95% of health info too complex

WHY DOES HEALTH LITERACY MATTER?

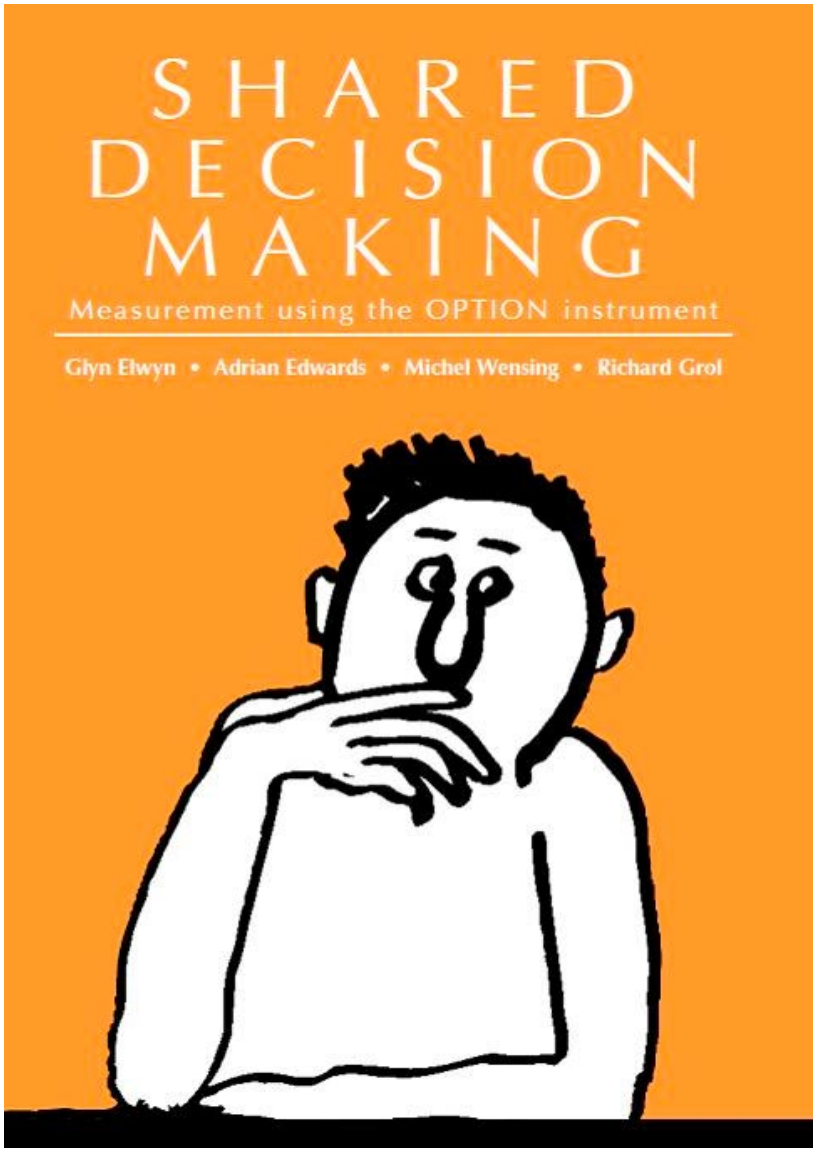
Low health literacy is associated with poor health independent of all other known risk factors:

- Higher rates of chronic illness (e.g. CVD, diabetes, obesity)
- Higher rates of mortality (all cause)
- Higher hospitalisation rates and use of emergency services
- Lower rates of preventive services such as screening, vaccination
- Poorer self management skills
- Greater medication errors
- Lower levels of knowledge about disease
- Lower ratings of satisfaction with doctor-patient communication
- Less question asking
- Higher healthcare costs

(AHRQ DeWalt et al 2004; Berkman et al 2011)

Health literacy costs billions…..

- Accounts for **3-5%** of ALL healthcare costs – in UK GBP2.8–5 billion per year (2013-14).
- Cost to health and quality of life is huge



SHARED DECISION MAKING

WHAT IS SHARED DECISION MAKING (SDM)?

SDM occurs when (Elwyn *et al* JGIM 2012):

- Patients are informed of the ***benefits*** and ***harms*** of different healthcare options using evidence
- Encouraged to express their preferences
- Encouraged to be involved in decision making to the extent that they desire
- Aim is to enable patients to make a decision consistent with their values and preferences
- 'the pinnacle of patient-centred care' (Barry M. NEJM 2012)

SHARED DECISION MAKING: What it means for patients

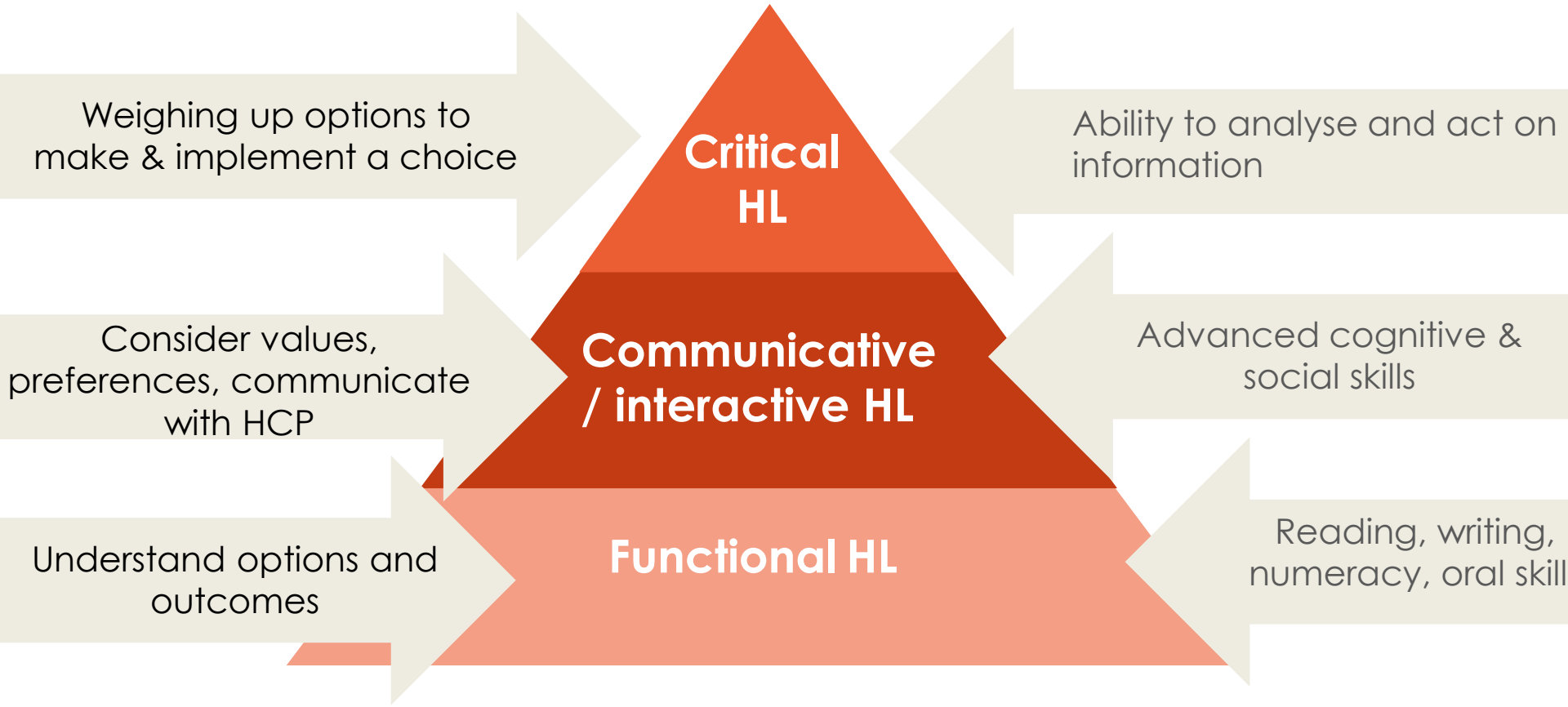
- Understanding evidence on options and outcomes
- Knowing you have a choice and have the right to participate in making a decision
- Ability and confidence to discuss options with HCP and weigh up benefits and harms
- Express individual values and preferences – discuss with HCP
- Find and locate patient decision aids and other support tools
- Have confidence to be involved in decision making with a HCP

SHARED DECISION MAKING: What it means for patients

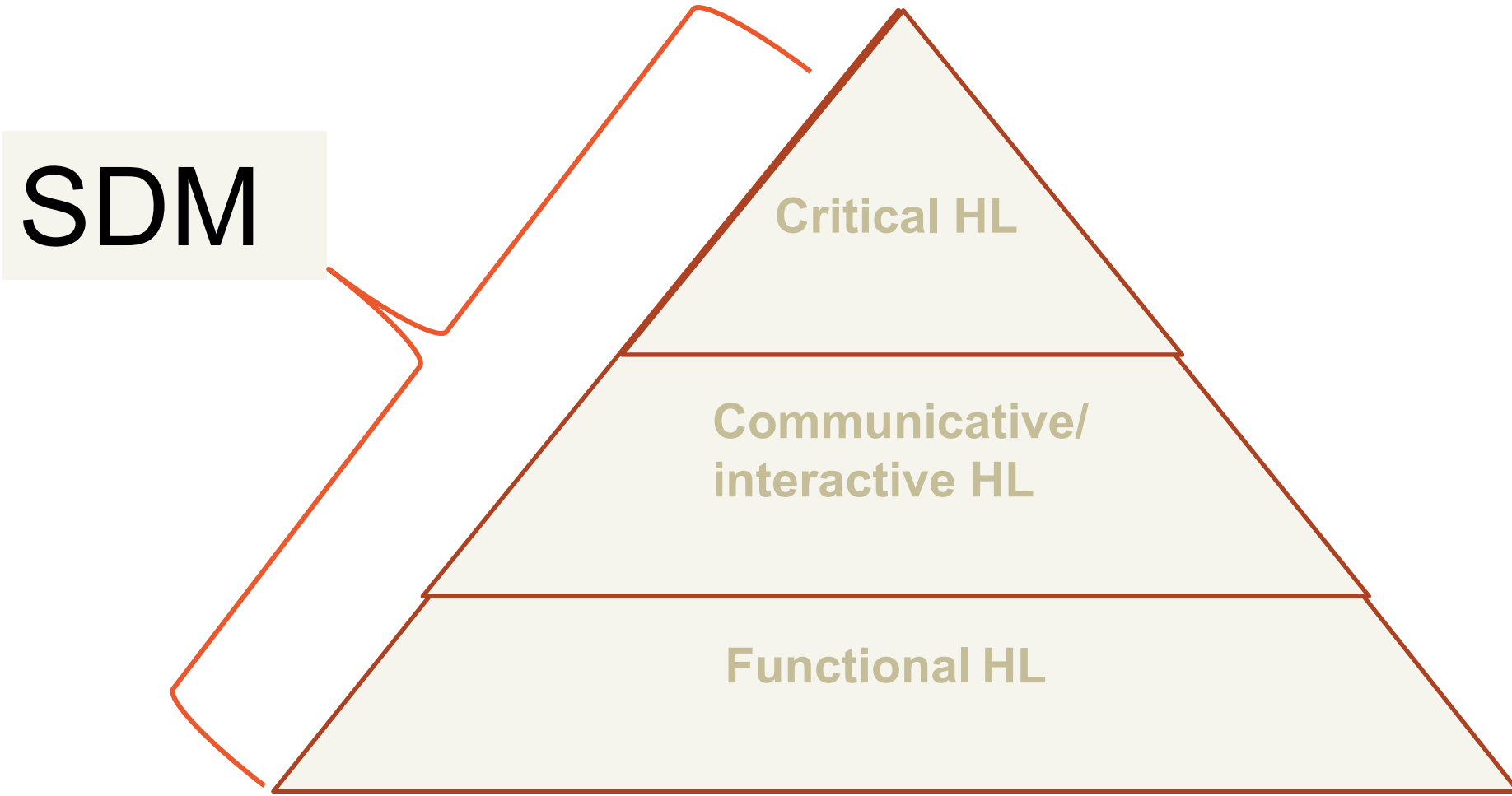
- Understanding evidence on options and out[illegible]s:
  - Literacy and numeracy skills
- Knowing you have a choice and h[illegible]e right to participate in making a decisi[illegible]
- Ability and confidence to [illegible]ss options with HCP and weigh up benefits and [illegible]s
- Express individual[illegible]es and preferences – discuss with HCP
- Find and [illegible]e patient decision aids and other support tools
- [illegible] confidence to be involved in [illegible]ecision making with a HCP

THIS REQURES HEALTH LITERACY

SDM AND HEALTH LITERACY



SDM is the pinnacle of health literacy



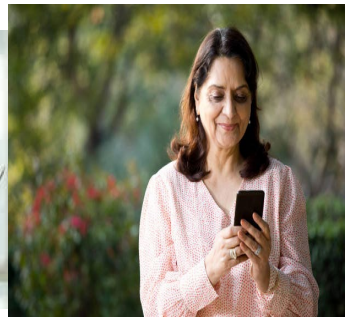
But SDM requires skills many people do not have

But SDM requires skills many people do not have

If we fail to address health literacy in SDM we risk exacerbating existing social and health inequalities

Health literate as information rich with access/support for SDM & choice

Lower health literate as information poor & little access/support for SDM & choice



Overview

1. What is health literacy and why does it matter?
2. Conceptualising health literacy and shared decision making
3. Findings from recent health literacy & SDM research?
    - IPDAS PtDA review
4. What can we do better

Addressing health literacy in patient decision aids: an update from the International Patient Decision Aid Standards

Acknowledgements: Dr Danielle Muscat

Sydney Health Literacy Lab, The University of Sydney

Team: Kirsten McCaffery, Marie-Anne Durand, Danielle Msucat, Jenna Smith, Olivia Mac, Tamara Cadet, Anik Giguere, Ashley J Housten, Aisha Langford, Sian Smith-Lickless.

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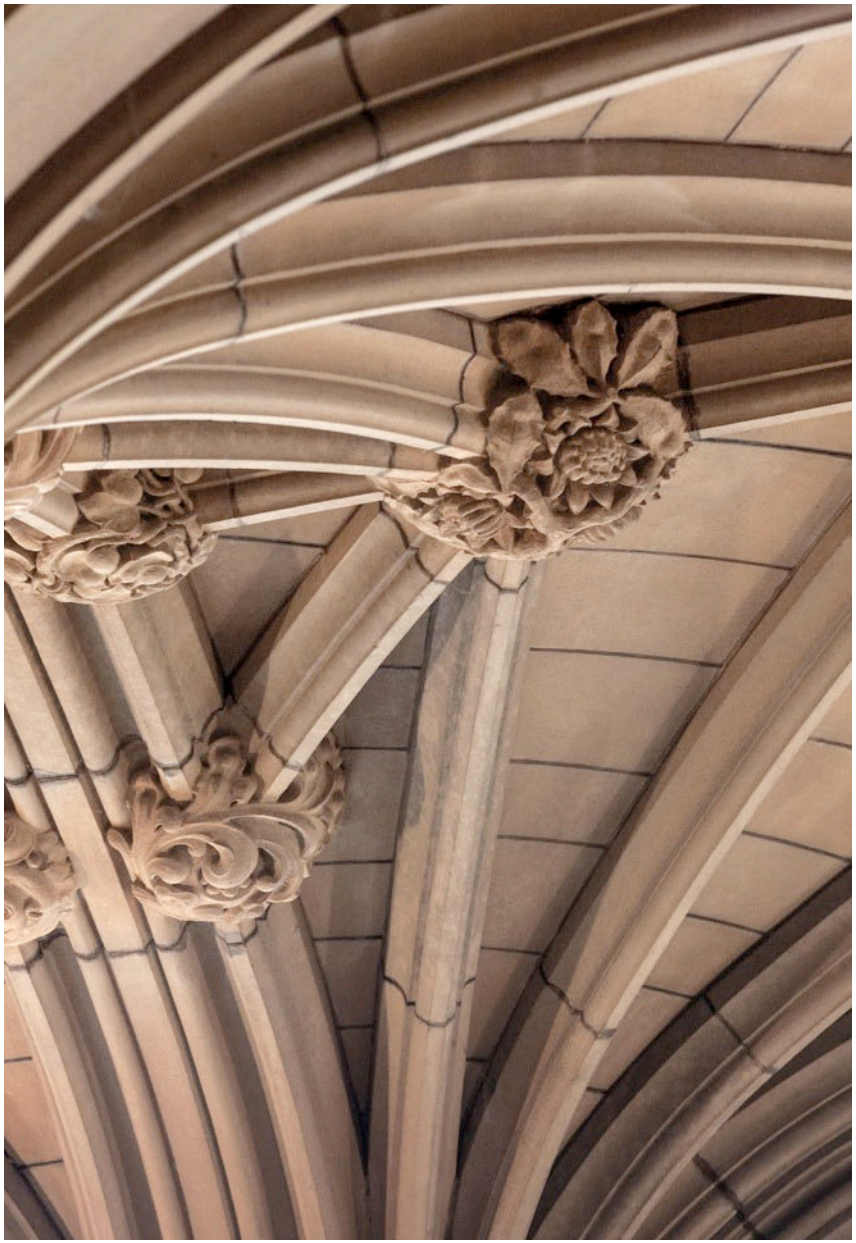


Global Health Literacy Summit | October 2021

Background – International Patient Decision Aid Standards

- The International Patient Decision Aid Standards (IPDAS) Collaboration is a group of researchers, practitioners and stakeholders from around the world that was established in 2003.

- The purpose is to enhance the quality and effectiveness of patient decision aids by establishing a shared evidence-informed framework with a set of criteria for improving their content, development, implementation, and evaluation.

Aims

- As part of the IPDAS update we aimed to examine the extent to which PtDAs are designed to meet the needs of lower health literacy/socially disadvantaged populations.

Methods

- Systematic review

- We searched the reference list of the Cochrane reviews of randomised controlled trials (RCTs) of PtDAs (2014, 2017 and upcoming 2021 versions)

- Included RCTs that assessed the impact of PtDAs on people with lower health literacy or other socially disadvantaged groups (i.e. ≥50% participants from socially disadvantaged groups and/or subgroup analysis in socially disadvantaged group/s).

Socially disadvantaged groups…

Literacy and/or health literacy

Educational attainment

Poverty or lower socio-economic status

Ethnicity or race

Language

Geographical location

Numeracy

Insurance

Methods

- All studies were assessed for risk of bias (either as part of the Cochrane Reviews or by our review team) using the revised Cochrane tool.

Methods

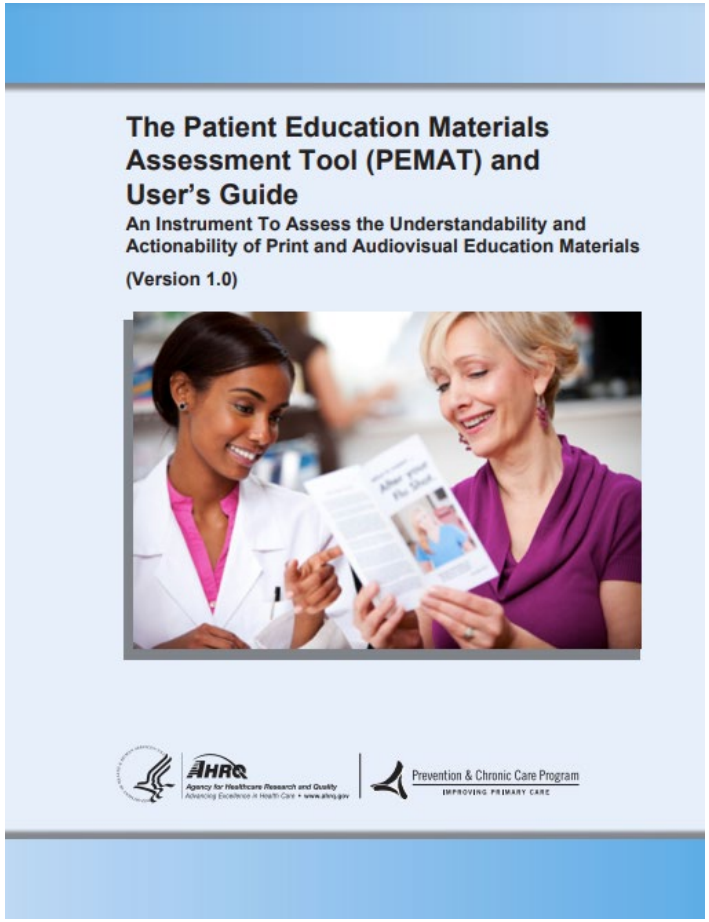
- **Narrative synthesis**
  - How decision aids had been tailored (incl. similarities and differences across studies)

- **Meta-analysis**
  - Subgroup meta-analysis analysis of knowledge (scale 0-100) and decisional conflict according to whether studies reported on:
    - strategies to reduce cognitive demand
    - readability
  - Built on a companion paper with meta-analysis of all outcomes.

Methods

- We searched online repositories and emailed authors to access PtDAs.

- Assessed:
  - Readability (Online-Utility.org readability calculator; averaged SMOG and Gunning-Fog scores)
  - Understandability
  - Actionability



Results

- **Only 25 (12%) out of 213** RCTs of PtDAs -specifically addressed the needs of lower health literacy or other socially disadvantaged groups.

- **Grade Reading Level** was reported by study authors in **8/25 articles (33%)**, only **4% of all PtDAs (8/213)** which is recommended in previous IPDAS guidelines.

Results

- **0 PtDAs** were written at **6th grade** level or below.
- **10** met the recommended threshold for **understandability**
- Only **5** met the recommended threshold for **actionability**

	Readability	**Understandability** (% >70% threshold)	**Actionability** (% >70% threshold)
Print			
Boulware et al 2018	9.07	94.1	60.0
Marteau et al 2010	8.98	81.3	66.7
Myers et al 2005	9.99	87.5	66.7
Rising et al 2017	12.66	75.0	75.0
Smith et al 2010	8.47	93.8	83.3
Taylor et al 2006	11.49	75.0	50.0
Trevena et al 2008	11.54	87.5	60.0
Audio-visual (computerized program or video)			
Boulware et al 2018	12.82	83.3	100.0
Jibaja Weiss et al 2011	10.60	92.3	100.0
Miller et al 2018	11.49	84.6	50.0
Reuland et al 2017	11.23	84.6	75.0
Taylor et al 2006	8.25	60.0	33.3

Results

Expert involvement

- **9 studies** involved a communication or literacy expert

Consumer involvement

- **16 studies** reported involvement of consumers
  - Patient partner on the research team (n=2)
  - Involvement of patients/consumers in the development of the PtDA (n=14)
- **12** reported conducting **focus groups / interviews** with patients
- **13** studies reported conducting **pilot, user or usability testing** with target disadvantaged groups

Results

Other methods of tailoring*:

- Use of strategies to reduce cognitive burden (n=8), e.g.:

Plain language

Bullet points

Visual cues and illustrations

Glossary of key terms

Narration

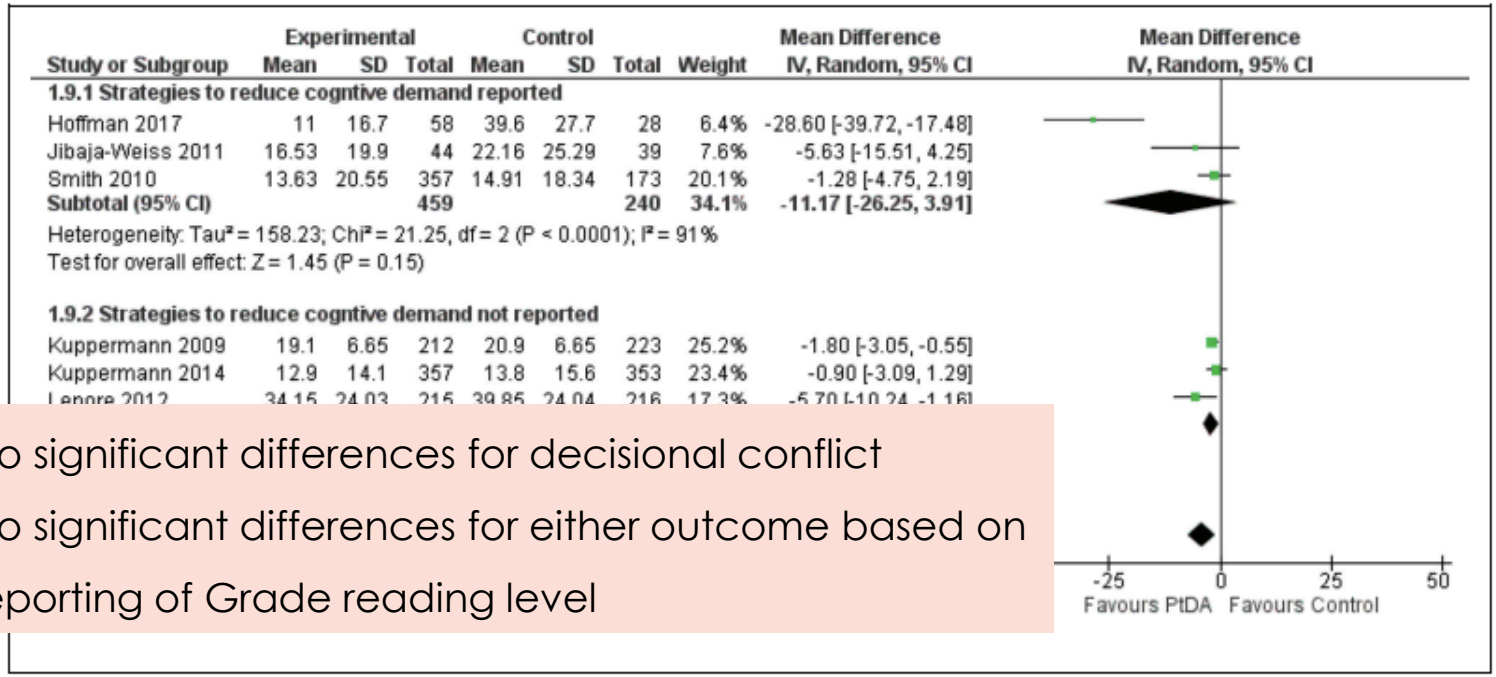
Easy navigation

- Edutainment Decision Aid Model (EDAM) (n=3)

*methods not mutually exclusive

Results of meta-analysis

- PtDAs studies that reported strategies to reduce cognitive burden* reported greater knowledge improvements (pooled **MD = 20.96** [95% CI 16.06, 25.85]; I2 = 77**%, P < 0.0001**) compared with studies that did not (pooled **MD = 8.65** [95% CI 4.50, 12.81]; I2 = 91%, **P < 0.0001**; x 2 = 14.11, P = 0.0002, I2 = 92.9%).



- No significant differences for decisional conflict
- No significant differences for either outcome based on reporting of Grade reading level

***strategies to reduce cognitive burden =** plain language, bullet points, visual cues, glossary, narration, easy navigation, edutainment model

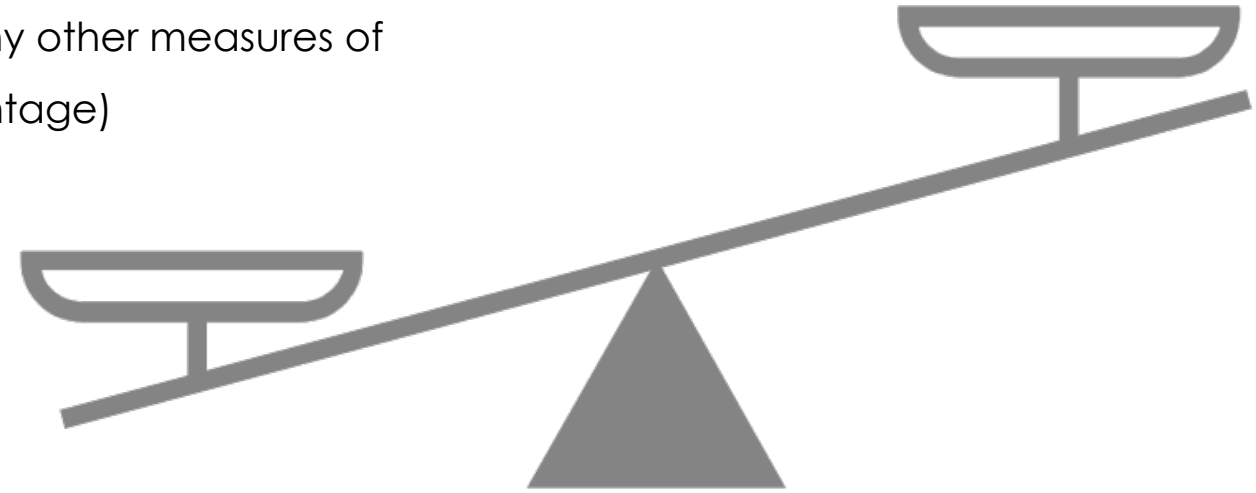
Strengths and Limitations

Strengths

- Deliberately inclusive inclusion criteria
- New version of the Cochrane Risk of Bias tool
- Screening, risk of bias assessments and data extraction by two independent reviewers

Limitations

- Unable to access 13 of 24 PtDAs
- Did not include:
  - Alternative formats for decision support
  - Studies with older adults (that did not report any other measures of disadvantage)



Conclusions

What we found:

- Diverse range of strategies used to tailor PtDAs to socially-disadvantaged populations
- Preliminary evidence to suggest knowledge improvements when strategies are used to reduce cognitive demand

What's needed:

- Transparent reporting of PtDA development processes, particularly re readability assessments and engagement of target populations
- Greater attention to and reporting of readability in PtDAs (greater consistency in readability formulas also)
- Greater accessibility of tools developed (only accessed 13/24)
- Patients included as equal partners in PtDA development - co-design
- MORE DECISION AIDS FOR DISADVANTAGED POPULATIONS

Review

MDM Medical Decision Making

Medical Decision Making
2021, Vol. 41(7) 848–869

DOI: 10.1177/0272989X211011101
journals.sagepub.com/home/mdm
SAGE

Addressing Health Literacy in Patient Decision Aids: An Update from the International Patient Decision Aid Standards

Danielle M. Muscat, Jenna Smith, Olivia Mac, Tamara Cadet, Anik Giguère, Ashley J. Housten, Aisha T. Langford, Sian K. Smith, Marie-Anne Durand, and Kirsten McCaffery

Background. There is increasing recognition of the importance of addressing health literacy in patient decision aid (PtDA) development. **Purpose.** An updated review as part of IPDAS 2.0 examined the extent to which PtDAs are designed to meet the needs of people with low health literacy/socially-disadvantaged populations. **Data Sources.** Reference lists of Cochrane reviews of randomized controlled trials (RCTs) of PtDAs (2014, 2017, and upcoming 2021 versions). **Study Selection.** RCTs that assessed the impact of PtDAs on low health literacy or other socially-disadvantaged groups (i.e., ≥50% participants from socially-disadvantaged groups and/or subgroup analysis in socially-disadvantaged group/s). **Data Extraction.** Two researchers independently extracted data into a standardized form including PtDA development and evaluation details. We searched online repositories and emailed authors to access PtDAs to verify grade reading level, understandability, and actionability. **Data Synthesis.** Twenty-five of 213 RCTs met the inclusion criteria, illustrating that only 12% of studies addressed the needs of low health literacy or other socially-disadvantaged groups. Grade reading level was calculated in 8 of 25 studies (33%), which is recommended in previous IPDAS guidelines. We accessed and independently assessed 11 PtDAs. None were written at sixth-grade level or below. Ten PtDAs met the recommended threshold for understandability, but only 5 met the recommended threshold for actionability. We also conducted a post hoc subgroup meta-analysis and found that knowledge improvements after receiving a PtDA were greater in studies that reported using strategies to reduce cognitive demand in PtDA development compared with studies that did not ($\chi^2 = 14.11$, $P = 0.0002$, $I^2 = 92.9\%$). **Limitations.** We were unable to access 13 of 24 PtDAs. **Conclusions.** Greater attention to health literacy and socially-disadvantaged populations is needed in the field of PtDAs to ensure equity in decision support.

Marie-Anne Durand

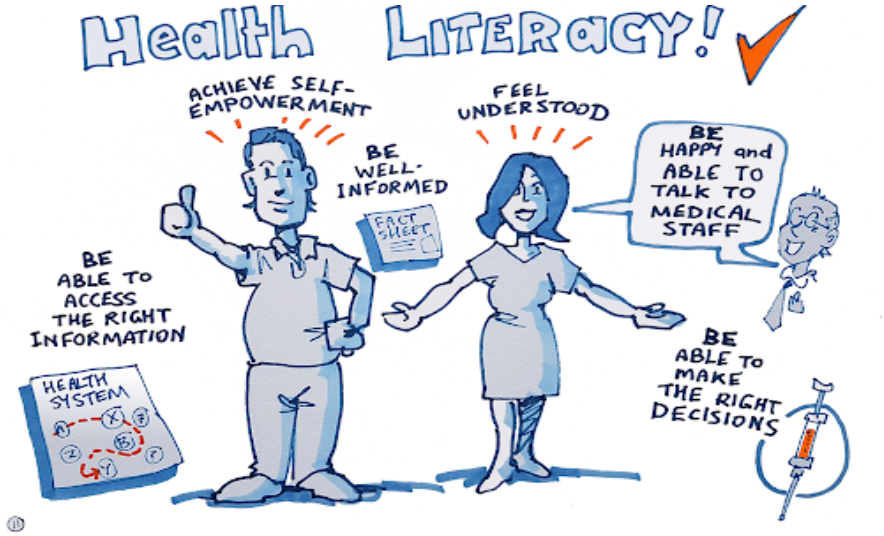
WHO ARE WE BEST SERVING IN SDM CURRENTLY?

health literate as information rich with access to choice

Lower health literate as information poor & little access to choice

- Focus attention to help those who are disadvantaged and underserved

Health literacy as both a risk and asset



- Need to address risk – by developing accessible tools and services that reduce the cognitive burden of the health care environment – so all can access and participate in SDM
- Also need to take an asset approach and develop generic skills that people can apply in different healthcare contexts.
- Think about ways to build distributed health literacy for SDM

Examples of asset based approaches to SDM

- **Ask Share Know:** Question prompt list for patients to use with doctors/ HCPs to elicit evidence-based Shared Decision Making consultations (Shepherd et al)
- **Parenting Plus:** HL & SDM program for new parents (Muscat et al HLRP 2020)
- **SUCCESS** – Chronic Kidney Disease (Muscat et al Health Promot Internl 2021)

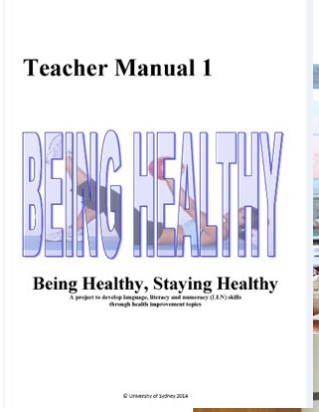
www.askshareknow.com.au

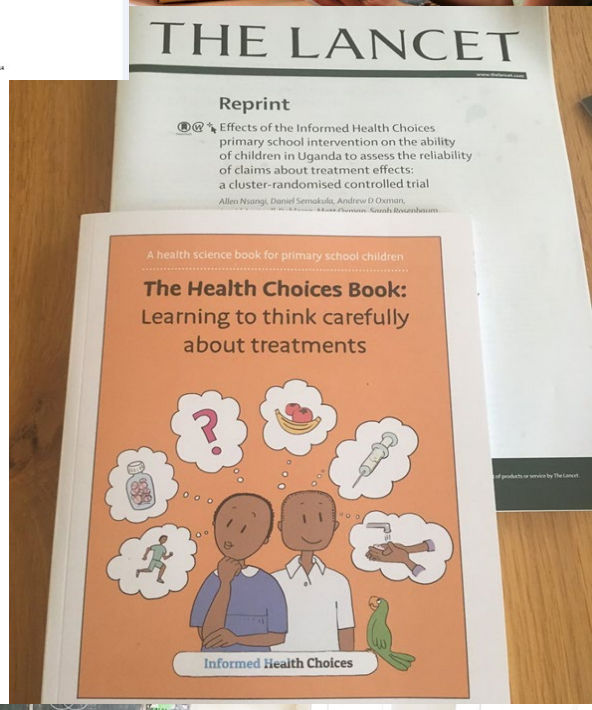
Engage with the education sector

Successful health literacy interventions:

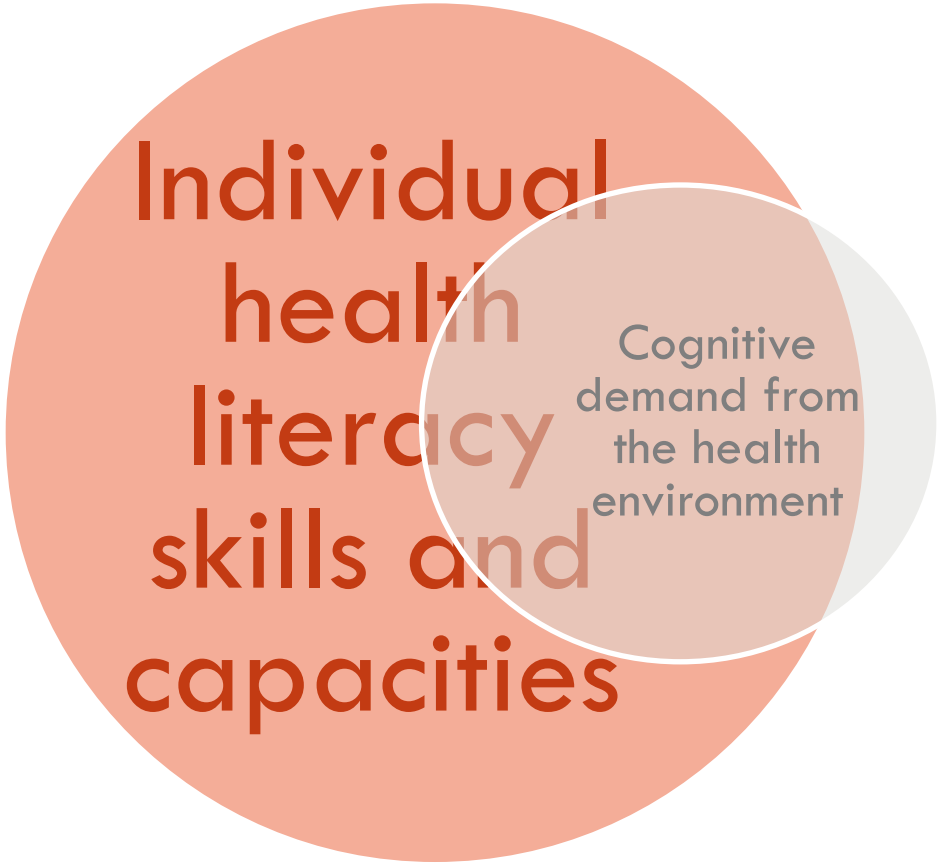
- Adult and community based education e.g. Adult Education Health Literacy Program (McCaffery et al 2019; Muscat et al 2019); Skilled for Health (UK).

- Schools: Informed Health Choices Trial (Nsangi *et al* Lancet 2016)





Health Literacy



Thank-you!

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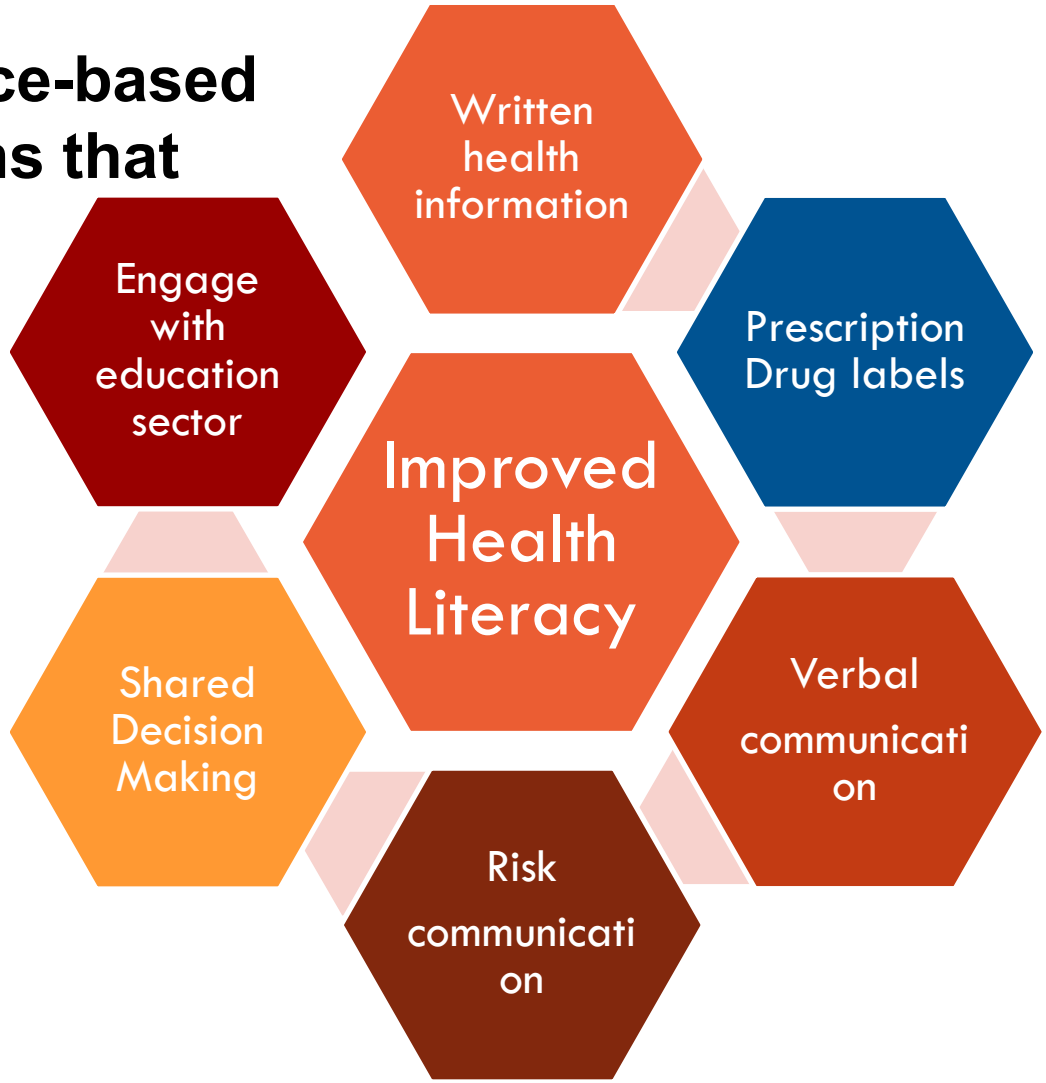
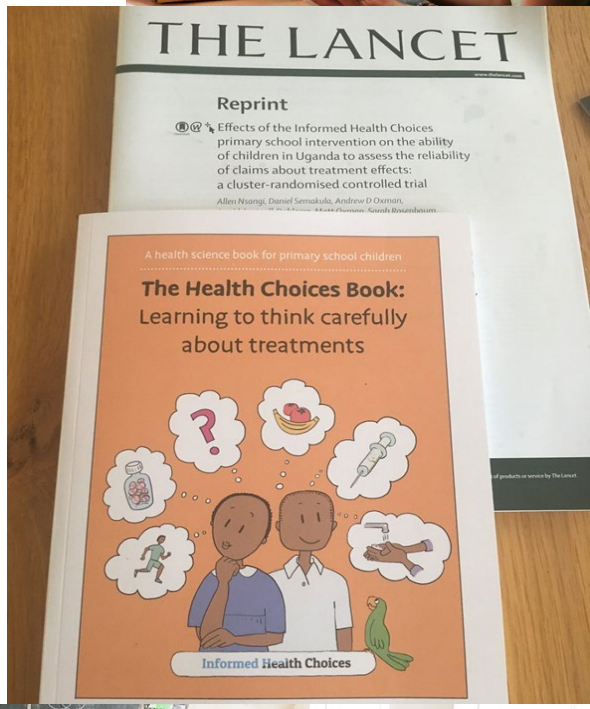
Use evidence-based interventions that work



SDM patient/ community programs to build SDM skills

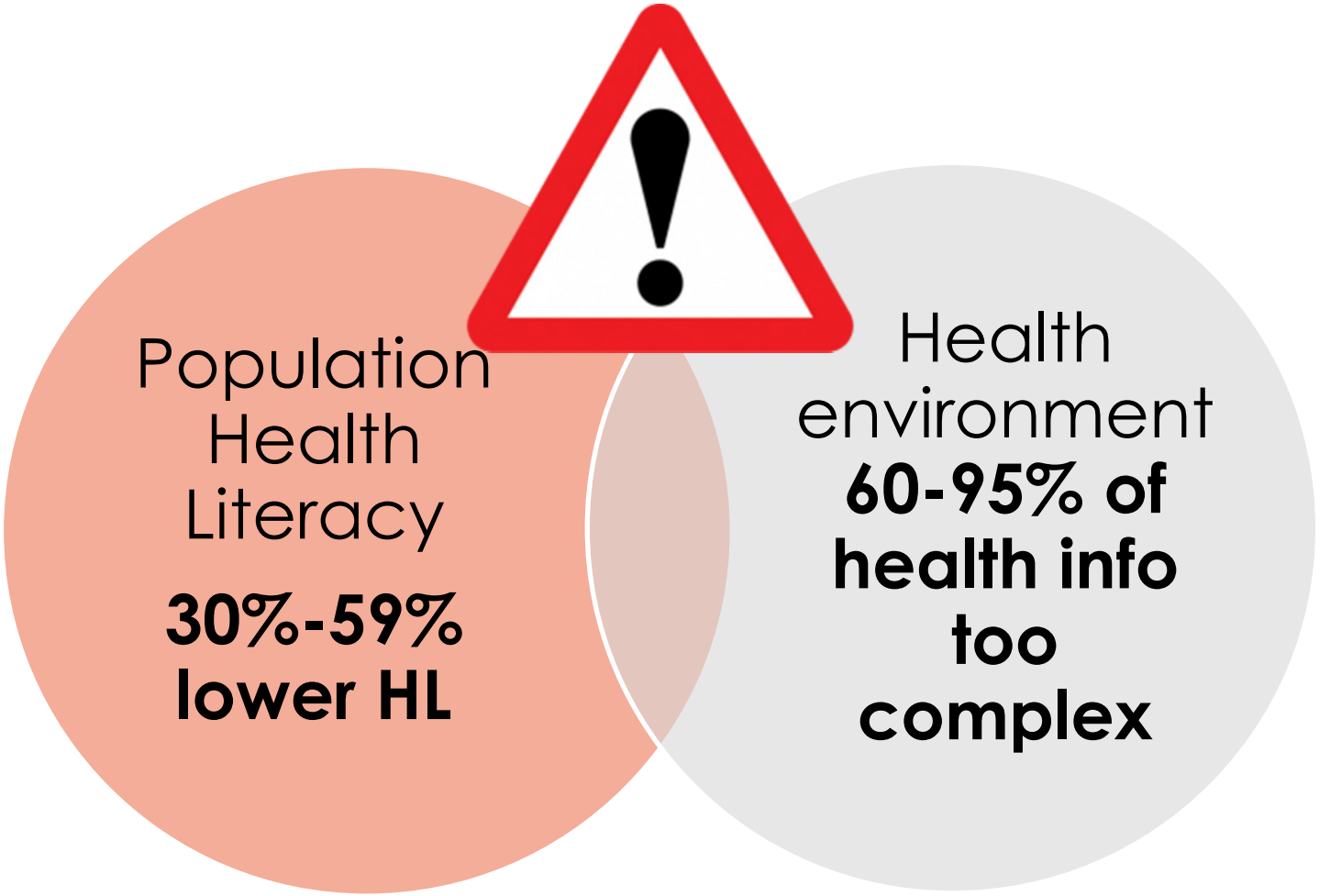
Successful health literacy interventions:

- Adult and community based education e.g. Adult Education Health Literacy Program (McCaffery et al 2019; Muscat et al 2019); Skilled for Health (UK).



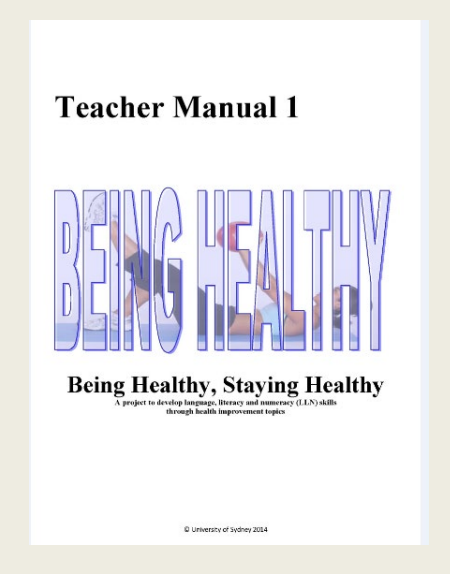
- Schools: Informed Health Choices Trial (Nsangi *et al* Lancet 2016)

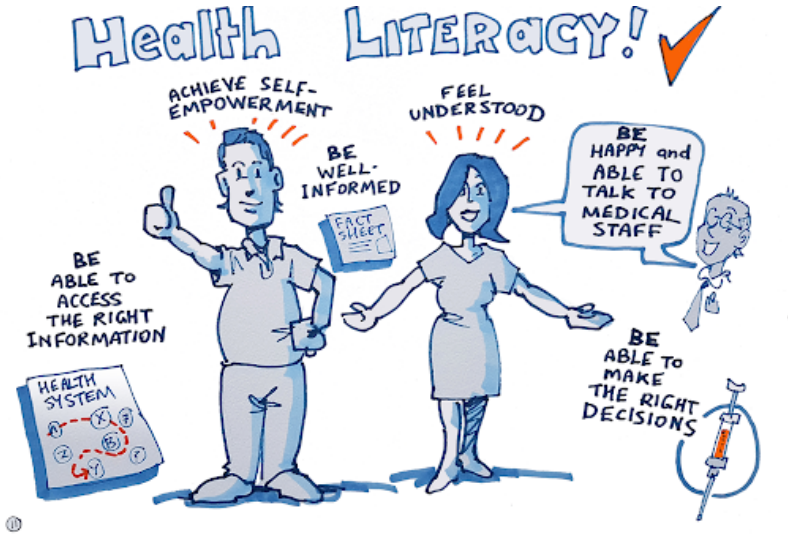
PROBLEM?


Population Health Literacy
30%-59% lower HL
Health environment
60-95% of health info too complex

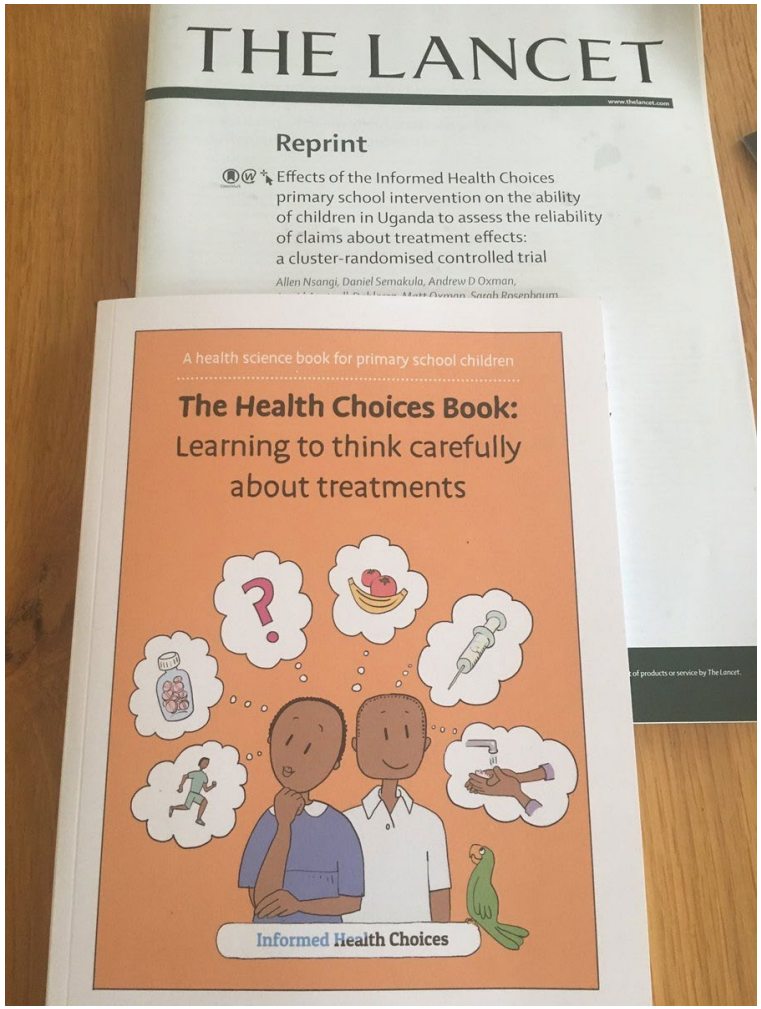
Adult Education Health Literacy Program

- Developed and evaluated an Australian Health Literacy Program for delivery in adult education colleges in NSW (TAFE)
- Based on the UK '*Skilled for health*' program
- Embedded health content into an established language, literacy and numeracy foundation skills program





People with lower health literacy have poorer health outcomes (Berkman et al 2011)


THE LANCET
Reprint
Effects of the Informed Health Choices primary school intervention on the ability of children in Uganda to assess the reliability of claims about treatment effects: a cluster-randomised controlled trial
A health science book for primary school children
The Health Choices Book:
Learning to think carefully about treatments
Informed Health Choices


HL
Functional HL
Graph lit
Critical literacy
Communicative
Numeracy
Digital HL

Strengths and limitations

Readability:

- Followed best-practice guidelines (Health Literacy Connections)
  - Text preparation (e.g., removing headings, periods that do not indicate end of sentences, sentence fragments, bullet points not in full text)
  - Averaged Gunning Fog index and the SMOG index
- Notable discrepancies between the readability statistics reported in the studies and those we calculated by our team
  - Variations in the preparation of the text
  - Readability formula used (e.g., Flesch Kinkaid Grade Level has been reported to produce reading lower grade levels)
  - Method of conducting the analysis (e.g., using an online tool, Microsoft Word function or calculating manually using the formula)

PEMAT

- Subjective
- PtDAs dual coded by trained assessors

REVIEWS

What is the Prevalence of Low Health Literacy in European Union Member States? A Systematic Review and Meta-analysis

V. Baccolini, MD MPH[1,2], A. Rosso, MD[1,3], C. Di Paolo, MD[1], C. Isonne, MD[1], C. Salerno, MD[1], G. Migliara, MD[1], G. P. Prencipe, MD[1], A. Massimi, RN, PhD[1],

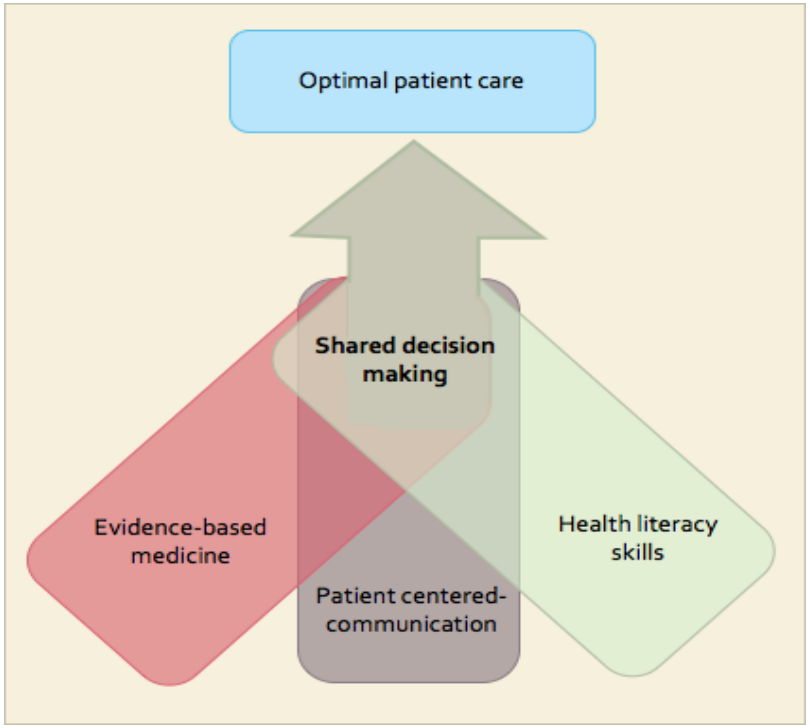
Table 2 Pooled Prevalence Estimates (PEs) and Their 95% Confidence Interval (CI) of Low Health Literacy in European Union Member States According to Different Assessment Methods

Overall		Self-reported comprehension items		Reading or numeracy comprehension items		Word recognition items		Mixed method	
	N	PE (95% CI)	*N*	PE (95% CI)	*N*	PE (95% CI)	*N*	PE (95% CI)
	38	**0.42 (0.36–0.48)**	**29**	**0.42 (0.33–0.53)**	**23**	**0.27 (0.18–0.38)**	**9**	**0.48 (0.41–0.55)**
Austria							1	0.56 (0.53–0.59)
Belgium	1	0.41 (0.40–0.42)						
Bulgaria							1	0.62 (0.59–0.65)
Croatia			1	0.58 (0.48–0.67)				
Czech Republic	1	0.44 (0.35–0.53)						
Denmark	2	0.44 (0.32-0.58)	2	0.44 (0.35–0.54)				
Finland	1	0.36 (0.31–0.42)						
France	2	0.51 (0.34–0.67)						
Germany	12	0.44 (0.38–0.51)					1	0.46 (0.43–0.49)
Greece	1	0.54 (0.45–0.63)					1	0.45 (0.42–0.48)
Hungary			1	0.41 (0.35–0.46)				
Ireland	1	0.65 (0.46–0.81)	4	0.41 (0.21–0.65)	5	0.19 (0.17–0.22)	1	0.40 (0.37–0.43)
Italy	3	0.42 (0.33–0.51)	3	0.38 (0.35–0.41)	3	0.72 (0.32–0.93)	1	0.54 (0.51–0.57)
Lithuania	1	0.33 (0.30–0.36)						
Poland							1	0.45 (0.41–0.48)
Portugal	1	0.50 (0.48–0.52)	5	0.29 (0.06–0.73)	6	0.21 (0.08–0.46)		
Spain	3	0.71 (0.47–0.87)	1	0.43 (0.34–0.52)	2	0.33 (0.06–0.80)	1	0.58 (0.55–0.61)
Sweden	1	0.39 (0.36–0.43)	1	0.21 (0.14–0.30)				
The Netherlands	2	0.14 (0.12–0.15)	6	0.68 (0.53–0.79)	3	0.19 (0.16–0.23)	1	0.29 (0.26–0.32)
UK	4	0.16 (0.12–0.20)	5	0.28 (0.17–0.43)	4	0.21 (0.09–0.43)		
Refugees	2	0.65 (0.62–0.69)						

N number of studies

Shared decision making

- Muscat et al 2020 – presents a modified version of Hoffman's 2014 model of SDM.
- Recognises the role of health literacy as well as EBM and PCC in the clinical encounter.
- Highlights that patients needs these skills or support to achieve them to engage and participate in SDM.



Muscat D, Shepherd, Nutbeam, Trevena, McCaffery. *Health Literacy and Shared decision making: exploring the relationship to enable meaningful patient engagement in healthcare*. JGIM 2020

High proportion of people struggle with the health literacy requirements of every day life!

Table 2 Pooled Prevalence Estimates (PEs) and Their 95% Confidence Interval (CI) of Low Health Literacy in European Union Member States According to Different Assessment Methods

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Denmark	2	0.44 (0.32-0.58)	2	0.44 (0.35–0.54)				
Finland	1	0.36 (0.31–0.42)						
France	2	0.5						
Germany	12	0.4					1	0.46 (0.43–0.49)
Greece	1	0.5					1	0.45 (0.42–0.48)
Hungary								
Ireland	1	0.6				7–0.22)	1	0.40 (0.37–0.43)
Italy	3	0.4				2–0.93)	1	0.54 (0.51–0.57)
Lithuania	1	0.3						
Poland							1	0.45 (0.41–0.48)
Portugal	1	0.5				8–0.46)		
Spain	3	0.7				6–0.80)	1	0.58 (0.55–0.61)
Sweden	1	0.3						
The Netherlands	2	0.1				6–0.23)	1	0.29 (0.26–0.32)
UK	4	0.16 (0.12–0.20)	5	0.28 (0.17–0.43)	4	0.21 (0.09–0.43)		
Refugees	2	0.65 (0.62–0.69)						

N number of studies

Low HL associated with
- Lower education
- Speaking another language at home
- Older age
- Chronic disease

FUNCTIONAL, COMMUNICATIVE AND CRITICAL HEALTH LITERACY

Functional: being able to read the label and correctly take the medication.

Communicative: Being able to ask questions of healthcare providers and use that information to know for which conditions this medication will be effective.

Critical: Being able to assess the reliability of online information about antibiotics; understanding why antibiotics are overprescribed and making a shared decision about an alternative.

Image: NDC. (2019). National Drug Codes List. Accessed from: https://ndclist.com/ndc/0781-6157