The Hong Kong Council of Social Service (HKCSS) Impact Assessment Support Scheme (IASS) -Cohort 2

Innovation of Medication Instruction Labels

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Our Team



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Agenda

- 1. Introduction
- 2. Methodology
- 3. Finding and Analysis
- 4. Limitations
- 5. Recommendations
- 6. Conclusion

References





- Overview of Drug Icon CC's project
- Literature review
- Logic model

"Innovation of Medication Instruction Labels" Project

Drug Icon CC aims to

- **○** Provide **easier medication instructions → Enhance medication compliance**
- © **Empower the patients**, the locals & ethinic minorities (EM), in **self care** management

This report focuses on the **short-term** social impact evaluation:

- O Delivery of education workshops
- O Distribution of pillboxes & drug icon labels

1.1 Project Overview

Key stakeholders

- Patients with long-term medication
- Family carers who are responsible for serving drugs
- (EM with limited healthcare support in Hong Kong)

Secondary stakeholders

- Partnering organisations, i.e., Community Drug Advisory Council (CDAC), Hong Kong Federation of Women's Centres (HKFWC), Health In Action (HIA)
- Reaching out activities, i.e., Street booth, training workshops for carers, health career workshop
- ➤ Short-term objective: Raising awareness and knowledge of correct drug use





















1.2 Literature review

Title	Major findings	Remarks
Drug non-adherence and associated risk factors among Chinese geriatric patients in Hong Kong (Lam et al., 2007)	 37% non-adherence in over 65 patients with chronic diseases (N = 209). Other studies with 50% Complicated regimen is a risk factor Presence of caregiver (help pack meds), use of pillbox is protective 	 Non-adherence: omission, self-deviated Complicated regimen: medication involved ≥ 3 types/ freq/ times All sampled elderly were outpatient and without regular/ institutional carer Chong et al (1997) 33% of the non-compliance could be related to forgetfulness, decreased cognitive functions, or change of medication regimens
Knowledge about hypertension and factors associated with the non-adherence to drug therapy (Barreto et al., 2014)	 43% non-adherence in 18 years old or more and to have started drug therapy for at least one year (N = 422) Risk factors: Little knowledge of disease and medicine (2.1) → dissatisfaction with medical service (1.9) → Complex drug regimen (1.4) 	 *simplifying medication: combine into single dose VS free combination *even though knowledge is important, drug adherence is mediated and moderated by emotional, social, biological and cultural factors. Awareness is important as well (Chong et al., 1997)

1.3 Logic model

Input

R&D, Design development, materials (pill boxes), liaison with community partners

Intervention activities

Drug label creation & dissemination (i.e., through street booths)

Education & training workshops for drug label usage

Outputs

~2000 sets of Drug icon stickers & pill boxes (1220 sets for the elderly, 650 sets for carers, and 350 sets for EM)

Training materials (i.e., leaflet & videos) &

workshops

Drug icon stickers in Chinese, English, & Urdu languages:



Training materials - videos & leaflets introducing drug label usage:



1.3 Logic model (cont.)

Short term outcome

[Patients & family caregivers]

1. Increased awareness about correct drug use

(Fewer instances of drug misuse)

2. Knowledge built on correct drug use

(Better understanding of medical regimen)

Mid-to-long term outcome

[Patients & family caregivers]

- Simpler drug taking process
- Easier drug assortment
- Increased skills & confidence in self-care/caretaking
- Reduced stress in drug taking/caretaking
- Improved health

[Professional caregivers]

(i.e., community nurses)

- Reduced stress in helping service users
- Increased work efficiency

1.3 Logic model (cont.)

Short term outcome

[Patients & family caregivers] **Cognitive Change:**

- 1. Knowledge gain (Better understanding of medical regimen)
- 2. Awareness development (Fewer instances of drug misuse)

Attitudinal Change:

3. Psychosocial wellbeing (Enhanced empathy & family relationships)

Behavioural Change:

4. Accuracy of applying drug icons (Effectively choose the correct medical regimen)

Mid-to-long term outcome

[Patients & family caregivers]

Cognitive Change:

- 1. Stronger understanding of medical regimen **Attitudinal Change:**
- 2. Increased confidence in self-care/caretaking
- 3. Reduced stress in drug taking/caretaking **Behavioural Change:**
- 4. Improved health with high rate of medication adherence

[Professional caregivers (i.e., community nurses)] **Attitudinal Change:**

- 5. Reduced stress in helping service users **Behavioural Change:**
- 6. Reduced the service time per patient with unchanged or even higher service quality

1.3 Logic model (cont.)

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Training materials (i.e., leaflet) workshops

Short term outcome

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Attitudinal Change:

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(Effectively choose the correct medical regimen)

Mid-to-long term outcome

[Patients & family caregivers] **Cognitive Change:**

1. Stronger understanding of medical regimen

Attitudinal Change:

- 2 Increased confidence in self-care/caretaking
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Behavioural Change:

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[Professional caregivers (i.e., community nurses)]

Attitudinal Change:

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Behavioural Change:

6. Reduced the service time per patient with unchanged or even higher service quality

2. Methodology

- Qualitative research
- Quantitative research

2.1 Qualitative research

© Conducted 6 in-depth interviews with primary & secondary stakeholders

Ms L, patient Miss A, family carer

Keith,
NGO
representative

Ms P, patient Miss K, family carer

Janet, a community pharmacist

Primary stakeholder 1: Ms L, Elderly (patient)

- © 63 years old
- Taking more than 5 types of medicines
- Some pills should be taken during daytime
- Some are only needed before & after dinner

Difficulty faced:

- Often forgets to take the pill before dinner
- Pills needed to be taken every other day may be confusing
- Lacks an effective and organised way to handle her medicines, even though
 she tried to store different pills in separate drug boxes

Primary stakeholder 2: Ms P, Elderly (patient)

- ~70 years old
- Lives alone
- Take 3 drugs daily
- O Deteriorating eyesight and memory

Difficulty faced:

- Sometimes forgets to take medicine, & thinks she might have mistook medicine because textual information is difficult to understand
- She likes the stickers because the icons are large and simple to understand, which helps considering her eyesight

Primary stakeholder 3: Ms A (carer)

- Takes care of her parents who both need to take various types of medicines every day
- Her mother takes 6 different medicines per day
- Miss A serves her father 16 pills per day (7 in the morning, 3 in the afternoon, 6 at night)

Difficulty faced:

- Too busy that she forgets to serve her father medicines
- Served her father the wrong medicines twice (i.e. pills should be taken at night were served in the morning)
- Worried about making mistakes when serving her parents medicines

Primary stakeholder 4: Ms K (carer)

- ~70 years old
- Takes care of her husband who takes 5 medicines each day
- O Her husband suffers from cognitive decline and has difficulty swallowing pills

Comments on Drug Icon CC's products:

- Pillbox can be more user-friendly (easier-to-open, larger compartments, sounding system)
- O Current design is good for outdoor use
- Particularly liked the stickers because of their flexible use
- Willing to buy and distribute the stickers to friends & family
- She is also confident that she can teach people to use Drug Icon CC's products after the training session

Secondary stakeholder 1: Keith, CDAC, NGO representative

CDAC (Community Drug Advisory Council)

- Aim: drug misuse prevention through raising awareness (complimentary aims with Drug Icon CC)
- Service targets: EM (+2300 persons) & the elderly

Street booth for information and product dissemination

- © 100 out of 500 sets of products were distributed
- Popular with elderly, users thought it "provided [solution] for daily life issues"
- O Users suggested using colours in stickers.
- © Future plans for collaboration: purchase pillboxes and stickers from Drug Icon CC

Challenges of EM:

- © Cultural differences (i.e., excessive condiments & pursue 'natural' treatment → increase non-adherence
- Inaccessible quality education
- O Drug Icon CC's work addresses education problem, but policy awareness remains low

Secondary stakeholder 2: Janet, HIA, Community pharmacy representative (former professor at HKU Pharm)

HIA (Health In Action)

- Aim: Eradicate healthcare inequity in the community
- Service target: Elderly, latest focus on EM (hundreds)
- Challenges of EM: language barrier, culture and institutional

Collaboration with Drug Icon CC

- Mealth career workshop for EM: participants were very engaged
- © Pillboxes and labels were distributed on **need-basis** at HIA centre with careful assessment

Thoughts on Drug Icon CC's products

- May help solve language barrier, but had comments related to the clarity of the icons
- There is general interest to collaborate further

2.2 Quantitative research

Survey design

- 19 self-administered questions
- Chinese & English versions provided
- MC, bipolar rating scale, & scenario questions
- One-week Pilot Study
- Adjustments made:
 - Explained abstract concepts in more concrete wordings
 - Reduced the difficulty level of the scenario questions

Data collection

- Target groups: Patients & carers
- Distributed online through Drug IconCC's collaborating partners & Facebook
- O Convenience sampling
- 48 valid responses (out of 80 samples received)



2.2 Quantitative results)
(cont.)	

\bigcirc	Majority of the
	respondents are and/or
	take care of long term
	medicine users

Most of the respondents handle medicines

50% respondents take and/or serve at least 3 different medicines

Table I Duefile of ween and and

Table I. Profile of respondents	I	
Characteristics	Number of respondents	Percentage of respondents
Long term medicines		8/
Yes	34	70.8%
No	12	25.0%
Not sure	2	4.2%
Role of respondents		
Medicine users	9	20.9%
Caretakers	18	37.5%
Both medical users and caretakers	6	12.5%
Do not handle medicines	14	29.2%
Number of drugs handled		
No medicine	10	20.8%
1-2	14	29.2%
3-4	16	33.3%
5 or more	8	16.7%

Table I. Profile of respondents

2.2 Quantitative resu	ılts
(cont.)	

Characteristics	Number of respondents	Percentage of respondents
Age		0 /
<18	3	6.3%
18-30	14	29.2%
31-60	24	50.0%
61-70	5	10.4%
>70	2	4.2%

~15% of respondents aged 60 or above

~40% respondents have household monthly income at around median level or below

4	8.3%
3	6.3%
9	18.8%
4	8.3%
5	10.4%
0	0.0%
15	31.3%
8	16.7%
	3 9 4 5 0 15

2.2 Quantitative results (cont.)

0	~45% of
	respondents
	had exposure to
	Drug Icon CC's
	materials

Do not i

Most respondents are Chinese

Table I.	Profile	of resp	ondents
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Characteristics	Number of respondents	Percentage of respondents
Exposure to Drug Icon CC's intervention activities		
Attended workshop & received materials from Drug Icon CC	5	10.6%
Only received materials from Drug Icon CC	16	34.0%
Do not receive any materials from Drug Icon CC	26	55.3%

Ethnicity

Chinese	35	72.9%
Non-Chinese	7	14.6%
Do not wish to disclose	6	12.5%

2.2 Quantitative results (cont.)

Table I. Profile of respondents

The 3 most common difficulty

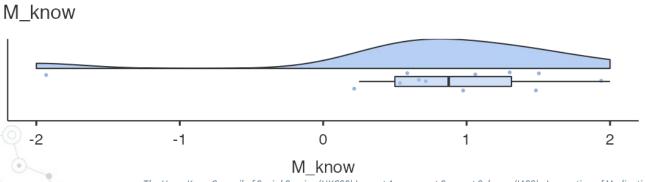
Characteristics	v	Percentage of respondents
Common difficulty		
Forget to take/ feed medicines	14	32.6%
Cannot understand the text-heavy instruction labels	6	14.0%
Cannot understand the instruction labels because of language or cultural barrier	6	14.0%
Cannot read the instruction labels due to poor eyesight	4	9.3%
Feel stressed because of taking/ feeding medicines	3	7.0%
Feel frustrated because of taking/ feeding medicines	3	7.0%
Difficulty of ingestion	2	4.7%
Taking/ feeding medicines erroneously	1	2.3%
Self-administered change in drug dosage	1	2.3%

3. Findings & Analysis

- Knowledge gain
- Awareness development
- Psychosocial wellbeing
- Application of Drug Icon in the wider society
- Effectiveness of Drug Icon usage

3.1 Knowledge Gain

- Significant and large gain in knowledge after receiving Drug Icon CC's training materials
- O Individuals who received Drug Icon CC's training materials became more knowledgeable about the correct usage of the prescribed medicines, the drug icons and the medicines currently used by themselves or family members
- Training materials were effective in addressing the lack of knowledge about the disease and medicines

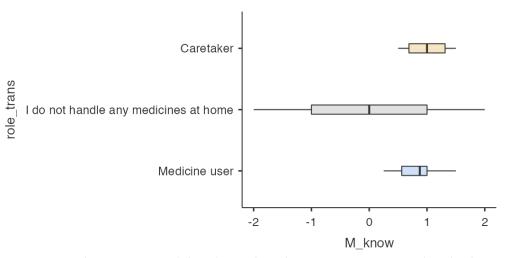


3.1 Knowledge Gain (cont.)

Knowledge Gain X Role

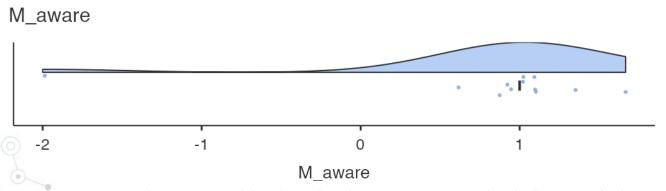
© **Caretakers benefited more** from the usage of drug icons in comparison to medicine users, but both were better than those who did not handle medicines at home

M_know



3.2 Awareness Development

- Significant and large development in the awareness of correct drug usage after receiving Drug Icon CC's training materials
- Respondents who received Drug Icon CC's training materials became more mindful of taking the prescribed medicines at the right time and at the right dosage, and were more willing to consult the relevant professionals when they were unsure about the information on drug labels



3.2 Awareness Development

Awareness Development X Role

The analysis of Awareness Development by the **role** of our respondents showed

- Caretakers and medicine takers **benefited equally** as much from the usage of drug icons in comparison
- O Both reported a greater development in awareness than those who did not handle medicines at home

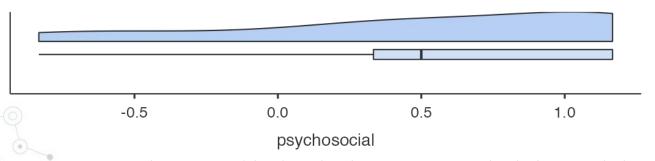




3.3 Psychosocial wellbeing

- The current measure examined the degree to which respondents obtained improvements in their psychosocial wellbeing after drug icons
- Significant improvements in their psychosocial wellbeing after using drug icons, significantly more competent at understanding others' needs, significantly less conflicts with family members
- The use of drug icons led to improvements in our respondents' psychosocial wellbeing, particularly in the domains of empathy and family relationship

psychosocial



3.4 Application of Drug Icon in the Wider Society

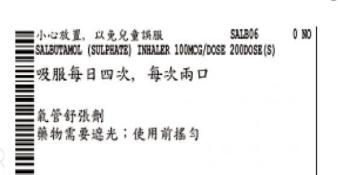
- \bigcirc Drug icons' application in the wider society and respondents' perception of the current drug labels
- Overall, respondents agreed that **drug icons should be incorporated into** both \bigcirc the public and private sectors of medical services
- Respondents agreed that the public **should adopt the drug icons** designed by Drug Icon CC
- \bigcirc Drug icons should be **more accessible** and available in the community



3.5 Effectiveness of Drug Icon usage

We operationalised the effectiveness of using Drug Icons with two subscales:

- 1. the time taken (in seconds) to answer a few scenario-based questions
- 2. the accuracy of their answers
- O In particular, respondents were given the regimen of two factitious individuals, each labeled with traditional drug labels or Drug Icons, controlling for difficulty.





3.5 Effectiveness of Drug Icon usage (cont.)

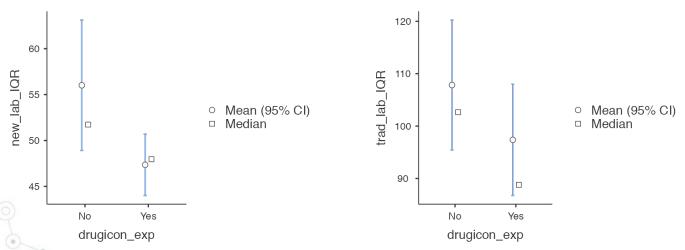
- O Found evidence that **Drug Icons are an effective tool** to **increase the ease and accuracy of drug-taking**.
- © Respondents took significantly less time when they responded DI (M = 52.5, SD = 8.22) in comparison to when they responded to their TL(M = 104, SD = 21.3)
- \odot Binomial proportion test revealed that a significantly higher proportion of the respondents who responded to Drug Icons answered correctly in comparison to those who did not, p = .002.
- © Respondents had a significantly higher accuracy answering to DI (74.4%) in comparison to that of TL (67.4%)



3.5 Effectiveness of Drug Icon usage (cont.)

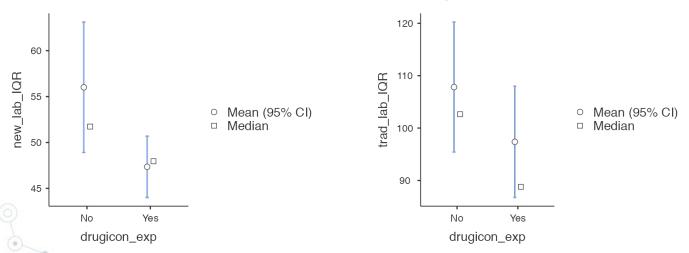
Response time X exposure to Drug Icon CC's resources

- Respondents who have received workshop training or training materials performed significantly better on the DI question (6.42 seconds less)
- For the question with TL, the respondents also spent 10.45 seconds less on the task on average, though this result was not statistically significant,



3.5 Effectiveness of Drug Icon usage (cont.)

- First-time recipients of DI still performed better than those on the traditional task – whether or not they had received workshop training or training materials
- Reflects the effectiveness of drug icons in making labels easier to understand for the general public, even for those who had not been exposed to any training as a supplement or as an alternative of the traditional drug labels

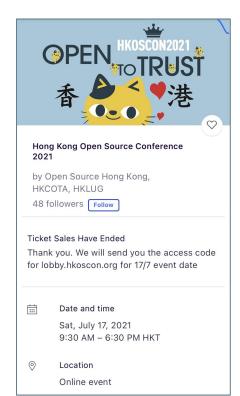


4. Limitations

- Time constraints
- Online research method

4.1 Time constraints

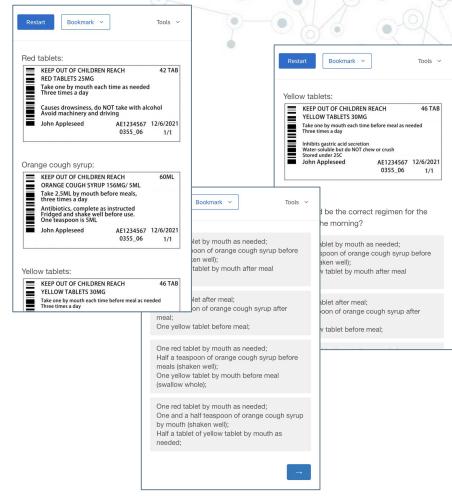
- Tight timeline (~ 1-2 months for both qualitative & quantitative research)
- Workshops shifted online
- Difficulty in reaching informants
- Small & imbalanced sample size
- Only short-term impacts were explored





4.2 Online research method

- Survey was distributed online (time constraint & social distancing reasons)
- Medium of testing
 - Some respondents did not complete the final part of the survey
 - Possibly due to the small screen of mobile devices → difficult to read the medication instruction labels
- Respondents with inadequate computer literacy
 - Limited samples received from the senior respondents



5. Recommendations

- Directing resources to medicine users and caretakers
- Adopting drug icons in the wider context
- Sustained effort in using training materials as a medium of knowledge transfer
- Suggested directions for future research

5.1 Directing resources to medicine users & caretakers

Maximise the social impact in **Knowledge Gain** & **Awareness Development**

Medicine users & caretakers consistently benefited from the exposure to Drug Icon CC's training workshop and/or training materials in comparison to people who do not handle any medicines at home

Medicine users and caretakers

- had previous experience with reading drug labels & assorting medicines
- predisposed to pharmacy-related information
- more receptive to the education content disseminated during workshops or in training leaflets

5.1 Directing resources to medicine users & caretakers (cont.)

Divert resources into settings that have a good concentration of medicine users and caretakers

➤ E.g., community centres for the elderly, districts with an older population, and, if possible, public hospitals

Expected outcomes

- > Short term: Reduction in drug non-adherence
- ➤ Long term: Improvement in overall health & psychosocial wellbeing

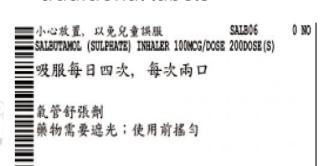
5.2 Adopting drug icons in the wider context

Respondents generally

- o prefer drug icons to be more widely available in society
- welcome the introduction of drug icons into the public medical system & a greater availability of drug icons in the community

Drug icons, as a set of visual-dominated labels designed for the public,

could be added as a source of supplementary information alongside the traditional labels





5.2 Adopting drug icons in the wider context (cont.)

Medicine users and caretakers now have

- personal motivation (e.g. acquiring knowledge for medicines, developing an awareness for correct drug use) &
- institutional motivation (e.g. the knowhow of drug icons is transferable) to adopt drug icons as a part of their medicine-taking routine.

It is advisable for Drug Icons to liaise with community centres, private clinics and related governmental entities to seek for large-scale implementation of drug icons in the future.

5.3 Sustained effort in using training materials as a medium of knowledge transfer

Strong evidence for the efficacy of training materials

in comparison to training workshops, street booths suffice as a more scalable method to disseminate drug icons





5.3 Sustained effort in using training materials as a medium of knowledge transfer (cont.)

A succinct and self-explanatory design of drug icons merited self-learning

- The emphasis on visuals in lieu of texts greatly reduced the barrier to understanding the icons and increased the accessibility of the training materials as a whole
- Visual information aids the formation of new memories in comparison to textual information (Hirst, 1990)
- Drug Icon CC's products are especially equipped to address drug non-adherence as the majority of our respondents reported difficulties related to forgetfulness and text-based difficulties

5.4 Suggested directions for future research

(i) Examine other medical professionals

From our interview, Janet (community pharmacy representative) had concerns on icon clarity.

Explore the pivotal role of medical professionals in reality, e.g.,

- Implementing drug icons with their incorporation into existing medical systems
- Examining the needs and concerns of professionals
- Consulting community nurses regarding the difficulty of adopting the
 icons

5.4 Suggested directions for future research (cont.)

(ii) Drug assortment task in in-person settings

Using mobile devices as a way of administering the survey was unsatisfactory.

Further investigations may attempt to replicate our timed questions using traditional drug labels and drug icons in an in-person environment

- Accurately investigate the effectiveness of drug icons (i.e. ease of use and accuracy)
- Superior ecological validity
- Results could reflect, to a greater extent, how the drug icons will be used
 in real world settings

Conclusion



6. Conclusion

Our findings aligned with Drug Icon CC's short term objectives - building awareness & knowledge of correct drug usage

- Approximately 2000 individuals have benefited
- Drug Icon CC has collaborated with around 11 organisations, in which pill boxes and drug icon labels were distributed (1220 sets for the elderly, 650 sets for carers, and 350 sets for EM)

Drug Icon CC has laid the groundwork for its future development, which is improving patients' medication compliance rate

6. Conclusion (cont.)

- Continuous effort from Drug Icon CC and its partnering entities would be anticipated to achieve the mid-to-long term objectives
- © Further analysis has to be conducted to examine the longer term social impacts which may lead to more behavioural changes
- © Suggested to cooperate with both private and public healthcare entities to launch the innovative medication labels in a wider context when the project development is mature enough
- Taking into account the concerns of healthcare professionals to streamline the implementation process

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Thank you!