Schoolchildren’s experience of myopic prevention and progression: a qualitative study

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PRESENTATION OUTLINE

- Introduction
  - Background
  - Literature Review
  - Aim, Objectives & Research Question
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- Ethical Approval
- Data Collection & Data Analysis
  - Trustworthiness
  - nVivo 9
- Findings
  - *The 3M Barriers Model of Myopia Care*
- Discussion
- Limitations
- Implications
- Conclusions
- References
BACKGROUND

• Myopia was defined as spherical equivalent refraction (SER) of −0.50 D or less. For high myopia, it is −6.00 D or less (Fan et al., 2004)

• Common ocular disorder in worldwide causing visual impairment or even blindness (Dandona et al., 2002; Fang, Chung & Wu, 2010; Fan et al., 2004; Villarreal et al., 2003)

• More severe in East Asian countries such as Hong Kong, China, Taiwan, Singapore, Malaysia and Japan (Fan et al., 2004; Fan et al., 2011; Lam et al., 1999; Lam, Goldschmidt & Edwards, 2004; Mak et al., 2006; Qiang & Zhao, 1994; Saw et al., 2004; Saw et al., 2005; Wu & Edwards, 1999; Yeh et al., 2007; Zhang, Hu & Xu, 2008)

Since 2005, the Eye Care Program of Project Vision has been delivered to all students in Hong Kong (Siu, 2011)
# BACKGROUND

<table>
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<tr>
<th>Previous Study</th>
<th>Location Conducted</th>
<th>Age-specific Prevalence of Myopia in Children</th>
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<tr>
<td></td>
<td>Age &lt; 7</td>
<td>7</td>
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<tr>
<td>Fan (2004)</td>
<td>Hong Kong</td>
<td>17.0</td>
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<td>Saw (2002)</td>
<td>Singapore</td>
<td>-</td>
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<td>He (2004)</td>
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<td>5.9</td>
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<td>Goh (2005)</td>
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<td>Naidoo (2003)</td>
<td>South America</td>
<td>4.6</td>
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<tr>
<td>Murthy (2002)</td>
<td>New Delhi, India</td>
<td>5.9</td>
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(Pan, Ramamurthy & Saw, 2012)

The highest prevalence of myopia in HK children at age ≥ 11, and accelerated mostly between aged 10 to 11 (Fan et al., 2004)
Literature Review

Worldwide studies:

Quantitative: - Adopt questionnaires to detect prevalence of myopia (Cheung, Schmid & Woo, 2007; Dandona et al., 2002; Murthy et al., 2002; Saw et al., 2005; Villarreal et al., 2003)

- Detect the myopic barriers through surveys for preschoolers and college students (Cochrane et al., 2007; Deng, Gwiazda & Thorn, 2010; Kemper, Uren, & Clark, 2006; Lv et al., 2008; Shix et al., 2010; Zhang, Hu & Xu, 2008)

Qualitative: - Use focus group interview to understand the elders’ attitudes towards eye care (Ellish et al., 2007; Owsley et al., 2006)

HK studies: Quantitative Only

- Focus on investigating parental and environmental factors on myopic progression rather than intrinsic factors (Fan et al., 2011; Lam, Goldschmidt & Edwards, 2004; Wolffsohn et al., 2003; Wu & Edwards, 1999)
LITERATURE REVIEW - KNOWLEDGE GAP FOR MYOPIC PREVENTION & PROGRESSION IN CHILDREN

- **Lack of qualitative research** for myopic prevention & progression in children (esp. in Hong Kong) (Edwards et al., 2002; Fan et al., 2004; Goldschmidt, Lam & Opper, 2001; Lam et al., 1999; Lam, Goldschmidt & Edwards, 2004)

- Previous studies focused mainly on myopia prevalence and risk factors

- No in-depth exploration of barriers among knowledge (K), attitude (A) and practice (P) on myopia control in primary school students (esp. in HK) (Shix et al., 2010)
LITERATURE REVIEW - KNOWLEDGE GAP FOR MYOPIC PREVENTION & PROGRESSION IN CHILDREN IN HK

- Studies have not targeted on the population aged 10 - 11 who received eye care knowledge at school and/or via the Internet

- In-depth reviews from the schoolchildren's perspectives & experience are important to identify their personal barriers, which may be related to cultural issues, education, poor adhesion and inconsistent behaviors (Cochrane et al., 2007)

- Understanding the interactions and dynamics among K-A-P will allow professionals (e.g. doctors, nurses and optometrists) to identify the barriers and conduct a more tailor-made eye care program for the HK primary schoolchildren (Kaliyaperumal, 2004)
Aim

- To explore the experience of primary 4 to 6 schoolchildren in Hong Kong about myopic prevention and progression

Research question

- What is the experience of Hong Kong primary schoolchildren regarding myopic prevention and progression?

Research objectives

- To describe and discuss the dynamics of knowledge, attitude and practice of schoolchildren regarding myopic prevention and progression

- To identify the barriers against myopic prevention and control of myopic progression
## DESIGN AND METHODS

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<td>Focus group interview (Krueger, 1994; Liamputtong, 2011)</td>
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<td><strong>Target Population</strong></td>
<td>Hong Kong primary 4 – 6 schoolchildren Exclude congenital eye diseases, without eye care knowledge</td>
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<td><strong>Composition of focus group</strong></td>
<td>3 groups from primary 4, 5 &amp; 6</td>
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<td>1 follow-up interview with primary 5 for clarification of concurrent findings</td>
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<td>6 - 8 participants per group</td>
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<td>Total 26 interviewees (A – Z)</td>
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<td><strong>Sampling method</strong></td>
<td>Purposive sampling</td>
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<td><strong>Setting</strong></td>
<td>A district primary school in HK</td>
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### Data Analysis – Aided by NVivo 9

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<th>Step 1: Transcription</th>
<th>Step 2: Making sense of the data &amp; whole</th>
<th>Step 3: Open coding &amp; coding sheets</th>
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<tr>
<td><strong>Example:</strong> X: 我果班 D 功課係比較多 D, 所以 err 有時都好 似… err err 麥欣霖咁樣 … 都會逼自己去做啲D功課先。</td>
<td></td>
<td>太沉迷睇電視，忽略護眼 專注唔到 專注睇電視所以就無休息 得閒記得先做 打機期間休息兩分鐘 有家人提醒護眼，但沒有做 有時唔記得自己有沒有護眼 有時沉迷電視會冇去實行</td>
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<th>Step 4: Grouping</th>
<th>Step 5: Categorization</th>
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<td>Ortho-K reduces myopia</td>
<td>Misconception about Ortho-K wear</td>
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<td>Ortho-K wear is effective</td>
<td>Over-attributed to genetic factors</td>
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<td>Ortho-K worn during sleep</td>
<td>Weak genetic factors</td>
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<td>Families have myopia</td>
<td>Heredity</td>
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### Barriers Model

- **Ortho-K reduces myopia**
- **Ortho-K wear is effective**
- **Ortho-K worn during sleep**
- **Families have myopia**
- **Weak genetic factors**
- **Heredity**

**Grouping of codes**: 10 Sub-categories + 4 Contextual factors

(Elo & Kyngas, 2007) 10
DATA ANALYSIS – NVIVO 9
FORMATION OF THE BARRIERS MODEL

Open coding
(Total: 559 Codes)

Elimination (232 Codes)

Grouping of codes
(Supported by 327 Codes)

10 Sub-categories + 4 Contextual factors

3 Categories
Trustworthiness

**Credibility:**
- Regular meetings and discussion
- Peer review of audiotapes
- Peer members checking for the accuracy of transcription

**Transferability:**
- Understand the phenomenon with detailed description of the data collection method and analysis process

**Dependability:**
- A follow up interview
- Report detailed research process (Audit Trail → nVivo 9)
- Conduct group interview with all members to assure comprehensive data collection
- Peer members checking

**Confirmability:**
- Audio-recording
- Audit Trail → nVivo 9
- Peer members checking
1. When asked about how did they control myopia progression, interviewee V said,

*I adopt Ortho-K lens, myopia will increase only if I persist to use my eyes, especially in watching television or reading books … I am used to wear Ortho-K lens, it can cure my myopia.*

Sub-category: Misconceptions about Ortho-K wear

Schoolchildren would easily have an inaccurate understanding that wearing Ortho-K lens can solve the problem of myopia progression; but more evidence is still needed (in particular for the older age group like 9-10 yo).

*(Cho & Cheung, 2012; Lam, 2004; Lau, Wu, Lee & Hsu, 2003; Hsiao, Yeh, Chao, Chen, & Lin, 2004)*
2. When asked about the factors that causing their myopia, interviewee V said,

*It is due to heredity! Both of my parents get -10.0D. I am already so glad that I was not born to be such serious. I think I was born to have a weaker gene.*

Interviewee Q also said,

*I think I was born to have myopia. I was told to have myopia when I was in kindergarten. At first, I thought myopia is just like getting cold and it will recover soon. Therefore, I still keep on watching TV.*

**Sub-category: Over-attributed to the genetic factors**
When asked about their understanding on the influences of myopia, interviewee Y said,

*I am totally lost when learning about glaucoma and cataract in class.*

**Interviewee N:**
*I do not understand much about glaucoma and cataract, like how they develop and the treatment of them. I only know it will affect our eyes.*

**Interviewee L:**
*I do not think it is useful as I do not suffer from myopia. I do not need to learn about it.*

**Sub-category: Not motivated to learn**
4. When asked about their thoughts of including eye care knowledge in examination, interviewee L said, 

If eye care knowledge is included in the examination, I am capable of remembering all of them.

Interviewee M also said, 

If they really do so, I can memorize them!

Sub-category: Surface learning

(Bloom et al., 1956; Biggs, 1987; Biggs, 1994; Purdie, Hattie & Douglas, 1996; Ho et al., 1999)
5. When asked about their thoughts of whether eye care could prevent myopia or control its progression, interviewee G said,

*They (students) think that myopia is not such a big deal, they do not mind it!*

**Interviewee B and E:** The eye care exercise is useless!

**Interviewee O:** It is tedious for me to do so!

**Interviewee M:** I think I should not be diligent to do it as it is still useless!

**Sub-Category: Don’t care**
FINDINGS – MISBEHAVIOR (1/4)

6. When asked about how often did they do the eye care exercises:

Interviewee M: I’m lazy for eye care exercise! I easily forget when I am watching TV!

Interviewee B: Once per few days! But I am so lazy to do so. I usually miss it.

We further asked them about the difficulties in doing eye care exercises in the follow up interview…

Interviewee N: Lazy, it is all about laziness.

Interviewee O: Yes……I am too lazy.

Sub-category: Laziness

(Miller & Brickman, 2004)
7. When asked about the reasons that affected their practice on eye care, interviewee D said,

*I have never done it* even somebody mentioned it was useful. As *I could not see the benefits* in performing eye care exercises, so there is no need for doing it.

**Interviewee D:** *I will not do it, it will bother me and waste my time!*

**Interviewee G:** *I do not perform eye care exercise as I forgot how to do it!*

**Interviewee V:** When I am *busy* on my homework, I will force myself to finish them all before allowing my eyes to rest.

**Interviewee Z:** *I feel wearing glasses is good looking. I will wear both mine and my classmates’ glasses when I cannot see the blackboard.*

**Sub-category: Neglecting eye care**
When asked about their views on wearing Ortho-K, interviewee V said,

*I am used to wear Ortho-K lens, it can cure my myopia.*

Interviewee P said,

*I’m currently using Ortho-K lens, I do not need to perform eye care exercise!*

**Sub-category: Over-relying on Ortho-K**
9 & 10. When asked about the use of electronic devices, interviewee P said,

*I always play electronic games.*

**Interviewee D:** I spend *two to three hours or more* everyday on watching television and playing electronic games.

**Interviewee E:** *I play half an hour of computer games* every day. My grandmother restrict me to play half an hour including rest within intervals, but I will then *watch television for one hour more*.

**Interviewee X:** *I play electronic games maximally for 6 hours* every day.

**Sub-categories:** Overuse of electronic devices & Lack of outdoor activities
Misunderstanding
1. Misconceptions about Ortho-K wear
2. Over-attributed to genetic factors

Misbelief
3. Not motivated to learn
4. Surface learning
5. Don’t care

Misbehavior
6. Laziness
7. Neglecting eye care
8. Over-relying on Ortho-K lenses
9. Overuse of electronic devices
10. Lack of outdoor activities

The Basics of 3M Barriers Model of Myopia Care
When asked about how do their families assisted them in practicing their eye care, interviewee W said,

My parents *seldom care* about my eyes. They thought that I have knowledge on eye care. Due to the *lack of guidance and improper eye care*, I gradually develop myopia.

**Interviewee T:** My parents *seldom teach* me about eye care knowledge as they are busy working and they do not know my myopia problem is quite serious.

**Interviewee L:** *Parents seldom limit* my use in playing the computer.

**Family:** Improper parental knowledge and guidance on eye care
FINDINGS - CONTEXTUAL FACTOR 2

When asked about how did teachers assisted them in practicing their eye care, interviewee N said,

I think the character of school in eye care belongs to something boring. We are like being ordered to do so and they do not care about our feelings.

Interviewee P also said,

Although eye care is important, most students thought that teachers repeatedly talking about eye care knowledge is tedious!

Educational system – The teaching methods

→ Spoon-fed education promotes avoidance for deep learning (Biggs, 1987)


**FINDINGS - CONTEXTUAL FACTOR 3**

When asked whether they encountered any difficulties when practicing eye care, interviewee V said,

*The amount of homework is more intense compared to other classes, and our parents will arrange tutorial classes for us. Therefore, there is a chance of neglecting eye care as we have to finish up all our homework.*

**Interviewee P also said,**

*There are many homework being assigned for us to do everyday, I usually force myself to finish them all.*

**Educational system – Too busy**

→ Intense workload at school
When asked about the eye care experience among students, interviewee K said,

*Classmates seldom discuss on the issues about eye care with each other and even neglect it.*

Interviewee Y said,

*My class neighbour often likes to exchange with other classmate’s glasses for fun.*

**Peer influence**

→ Development of school age children - recognition from significant others, peers and acquaintances
Misunderstanding
1. Misconceptions about Ortho-K wear
2. Over-attributed to genetic factors

Misbelief
4. Not motivated to learn
5. Surface learning
6. Don’t care

Misbehavior
6. Laziness
7. Neglecting eye care
8. Over-relying on Ortho-K lenses
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Myopia & its progression

Family: Improper parental knowledge and guidance on eye care

Educational System:
- Too busy
- The Teaching methods

Peers influence

The 3M Barriers Model of Myopia Care
DISCUSSION - REGARDING THE DYNAMICS BETWEEN INTERNAL BARRIERS AND CONTEXTUAL FACTORS

- Internal barriers operate with the contextual factors
- They are inter-related and formed a **cycle**.

**Cycle of Myopia**

**Internal Barriers**

**Contextual factors**

**Interactions between the internal barriers and contextual factors**

The internal barriers and contextual factors that interact may magnify the effect of undermining myopia prevention and/or the control of myopic prevention in school children of primary 4 – 6.
Example 1:

**Not motivated to learn + surface learning**
- Doubtful attitudes towards the eye care: Students do not judge whether the knowledge is essential or not, and lacking motivation to deep learning
- Adopt a rote /surface learning style of memorizing the information (Biggs, 1987) regarding eye care
- Busy education system (contextual factor) (Yan & Chow, 2002) and characteristics of Hong Kong schoolchildren: Not willing to learn deeply on eye care knowledge

**+ Misconceptions about Ortho-K wear**
- Effects of Ortho-K Lenses were not fully understood by students $\rightarrow$ establish avoidance in learning it (Liem, Lau & Nie, 2008)
- Peer influence (contextual factors), not motivated to deeply learn eye care, pay effort to surface learning on something that will be externally rewarded - exam (Miller & Brickman, 2004)

$\rightarrow$ Neglecting eye care
DISCUSSION - REGARDING THE DYNAMICS BETWEEN INTERNAL BARRIERS AND CONTEXTUAL FACTORS

Example 2:

Laziness
– The learning attitude is influenced by self-efficacy beliefs and it is supported by the “model of future-oriented motivation and self-regulation”, which demonstrates whether knowledge is worth to learn or not (Miller and Brickman, 2004)

+ Don’t care
– Uncertainty of the effectiveness of eye care knowledge for myopic prevention and control of the progression

+ Over-attributed to genetic factors
– Blaming everything on heredity seemed to be an excuse to avoid modification of their behaviours although heredity was suggested by several studies of having myopic children with both parents who were myopic (Goss, Hampton, Wickham, 1988; Mutti, Mitchell, Moeschberger, 2002; Pacella, McLellan & Grice K, 1999; Saw, Gazzard, Au Eong & Tan, 2002; Saw, Nieto & Katz, 2001; Wu & Edwards, 1999; Zadnik, 1997)

– Dramatic increase in myopic prevalence was also related to environmental factors of having improper distance of reading, persistence of near-work, non-compliance of spectacle wear and insufficient eye care exercise (Cheung, Schmid, & Woo, 2007; Lv et al., 2008; Morgan & Rose, 2005; Shix et al., 2010; Zhang et al., 2008)

→ Neglecting eye care
Schoolchildren:

**Internal barriers: The 3M**

**Misunderstanding**
1. Misconceptions about Ortho-K wear
2. Over-attributed to genetic factors

**Misbelief**
3. Not motivated to learn
5. Surface learning
6. Don’t care

**Misbehaviour**
7. Neglecting eye care
8. Over-relying on Ortho-K
9. Overuse of electronic devices
10. Lack of outdoor activities

**Contextual factors:**
1. Family: Improper parental knowledge & guidance
2. Educational System: The teaching methods
3. Educational System: Too busy
4. Peers influence

Elderly:

*(Qualitative studies)*
- Lack of symptoms
- Too busy
- Inconvenience
- Ineffective communication
- Mistrust to eye care provider
- Without social support
- Denial / pride
- Huge cost
- Insurance not covered

*(Ellish et al., 2007; Owsley et al., 2006)*
Schoolchildren:

**Internal barriers: The 3M**

**Misunderstanding**
1. Misconceptions about Ortho-K wear
2. Over-attributed to genetic factors

**Misbelief**
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**Contextual factors:**
1. Family: Improper parental knowledge & guidance
2. Educational System: The teaching methods
3. Educational System: Too busy
4. Peers influence

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Adolescent:

*(Quantitative study)*

- Knowledge deficit
- Improper position to read
- Near-work activities
- Inappropriate treatment
- Non-educated

(Zhang, Hu & Xu, 2008)
Limitations

- Environment
- School management
- Interviewing skills
- No participants checking
- Data saturation
IMPLICATIONS

A) Electronic devices

1. May reduce the use of electronic devices (however, electronic books have been promoted by Government)
2. Research on effect to eye-sight regarding the frequent near-work with electronic devices

B) Education of eye care knowledge

1. Eye care education should be made appropriate to the education levels
2. Creative education content
3. Interactive education
4. Integration to daily life
IMPLICATIONS

C) Student health service

1. Financial support for eye care
2. Regular arrangement by school
3. Pay more public health attention on eye examination
4. Optional → consider research on regular eye screening program

D) Other future studies

1. Larger studies on dealing with the barriers based on the results of this study
2. Investigate better ways to facilitates myopia prevention and health promotion planning through further quantitative studies
CONCLUSIONS

- This study described the dynamics of knowledge (K), attitude (A) and practice (P) of primary 4 – 6 schoolchildren regarding myopic prevention and the control of myopia progression.

- The 3M Barriers Model of Myopic Care is developed for clinical practice considerations and further research.

- Implications from this study facilitate the development of preventive eye care strategies.
Thank You!
REFERENCES


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