Safe elderly Program: another way to reduce the injury in RCHE

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Kwai Tsing District

- 523,300 population
- 75% living in public housing estate
- 21 housing estates
- 35 secondary schools
- 41 primary schools
- 67 kindergartens
- 1 higher education institute
- 1 acute general hospital
- 1 psychiatric hospital
- 43 nursing homes
- Mean income $14,500
Collaborations

• Center for safety promotion and injury prevention of Kwai Tsing Safe Community and healthy City association

• Princess Margaret Hospital

• Social Welfare Department

Sponsored by Kwai Tsing District Council
Background

• Had established Injury Surveillance System in Kwai Tsing District

• Average 100 OAH injury-related hospital attendance per month

• 28% of them need hospital admission; 16% need operative intervention

• Hospital injury cost above HK$ 25,000 per day,

• Euro 944 per elderly fall in institutional care (Nurmi I & Luthje P. 2002)

• High injury severity and delay recovery (Bergland A et al., 2006)

• Need to prevent the injury and improve the outcome with sustainable effect
It is necessitate preventing the injury and improving the outcome with a sustainable program
Indicators for Safe Elderly

Safe Elderly in a Safe Community setting have:

1. An infrastructure based on partnership and collaborations,
governed by a group of managers, elderly and their voluntary
organisations representatives, technical staff, and safety
professionals that is responsible for safety promotion for elderly
people; The group should be chaired by a local administration
representative with a Voluntary Organisation representative as a
co-chair;

2. Safe Elderly policies developed by the Group in a Safe Community
setting;

3. Long-term, sustainable operational programs covering both
genders, all age groups, environments, and situations;

4. Programs that target high-risk groups and environments, and
programs that promote safety for vulnerable groups;

5. Programs that document the frequency and causes of injuries –
both non-intentional (accidents) and intentional (violence and
self-inflicted);

6. Evaluation measures to assess their policies, programs, processes
and the effects of change;

7. Ongoing participation in Safe Elderly networks – at community,
national and international levels.
Objective

(1) To develop a new approach in safety promotion program in RCHE

(2) To identify a simple and cost effective way to reduce injury in RCHE with sustainable effect
Center for safety Promotion and Injury Prevention

• Maintain liaison within team members
• Coordination of related activities and resource utilization
• Statistic support and program evaluation
Community Nurse

- Participates and collaborates in multi-disciplinary team to plan, implement interventions, evaluates the safety promotion pilot project.

- Help in monitor the injury rate, the accuracy of reporting record and analyze the circumstance around the injury.

- Assessing and screening resident’s risk of injury, advising injury prevention measures and making a referral to allied health professional when indicated for further assessment and interventions.
**Role of team members**

**Occupational therapist**
Provide advice on environmental screening and assessment to prevent elderly falls in pilot RCHE
Provide advice on fall prevention education program in pilot RCHE
Provide hip protectors to ambulant frequent fallers without incontinence

**Physiotherapist input**
Mainly for screening of mobility in terms of its height, ferrule condition and walking aids condition
Provide advice on fall prevention education program in pilot RCHE

**Social Welfare Department**
Provide advice on injury prevention program in the perspective of social welfare and RCHE license issue

**Representative from District Council**
Provide advice on injury prevention program in the perspective of District Council and liaison with concerned government agency
Task 1:

Descriptive study RCHE injuries in Kwai Tsing via an emergency department injury surveillance system

- Assess the **prevalence** of OAH injuries in Kwai Tsing
  - Via the surveillance system >> descriptive analysis
  - Intrinsic & Extrinsic factors analysis (Ozanne-Smith et al., 2002)

- To identify the **potential subjects** for the study
  - Inclusion criteria with population size of 50 or above
  - Cluster randomization and random assignment

- To investigate the **injury factors**
  - Case study protocol; holistic & in-depth investigation (Feagin et al., 1991)
  - Incidence case study approach
  - Based on mix of quantitative and qualitative evidence (Yin, 2002).
Age On Latest Selected Encounter (Year)
### A&E to IP Ward: OT Magnitude * Traumatic Type Crosstabulation

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Source: CDARS
Graph

Mean = 11.89
Std. Dev. = 13.016
N = 455
A&E to IP Ward: Length of Stay
Further analysis from Injury surveillance system
Injury Map
Geographic representation of the injury occurrence by patient’s address -identification of high-risk group for prevention
Fall Prevalence – Kwai Tsing

- Total injury attendance **30,000**
- Total Fall cases **2217** (21% of all captured cases)
- Male : Female (4.8 : 5.2)
- Overall Incident rate for fall is **4.2 in 1000 people per year**
- 20% required admission
- Top 3 areas for fall:
  1. Lai Yiu
  2. Tai Pak Tin
  3. Kwai Shing West Est.
Host analysis

- Number of samples: 404
- Gender: M:F = 201 : 203
- Age: Range 3 yrs old to 102 yrs
  Standard deviation: 28.53 yrs
  Mean age: 59.81 yrs

Medical history (52%, n = 210)
- CVA = 60
- Dementia = 25
- DM = 24
- HT = 19
- Psychiatric = 8
- Asthma = 8

Majority of the victims are elderly, half of them with pre-existing medical problem like CVA and Dementia
Falls in zone A  (n=160)

No. of repeated episodes (n=99, 25%)
42 cases with repeated injury (38 cases lived in OAH)

25 cases with repeated injury for 2 x
14 cases with repeated injury for 3 x
2 cases with repeated injury for 4 x
1 case with repeated injury for 5 x

30 cases with medical history (neuro = 9, CVS = 6, CVA = 5)

No. of live alone = 3

There were 42 cases identified with repeated injuries, they responsible for 99 episode, 25% of all the injury cases. Majority of the event occurred in OAH
## Environmental analysis – RCHE

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<th>Fell from Bed</th>
<th>Fell from Chair</th>
<th>Fell from wheelchair</th>
<th>Other Blunt force</th>
<th>Street</th>
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Present situation

- Elderly fall injury in OAH (n=170)
- Repeat elderly fall cases (n=43, 99 episode)
- Special measure/management to the toilets for elderly (n=30, 27 in OAH)
- Outdoor injury: n=35 (exact location could not be identified at the moment)
- High risk group with special medical history like CVA, HT and dementia
Established Local epidemiological model of RCHE injury

Environment

Host

Agent

Vector

WHO(2001)
Task 2:

Develop and implement interventions for RCHE injuries

- To design and implement **on-site assessment**
  - Surveillance system guided
  - In-region & Out-region team survey
  - Haddon matrix check list

- To **design intervention** with reference to aggregated data from ED surveillance and on-site assessment
  - Literature review
  - Based on on-site assessment and sub project 1
  - Tailored recommendation

- To **implement the intervention** to the three intervention subjects (RCHE)
  - Four months counted from the start of intervention
  - 3 intervention options: Tailored intervention, Injury surveillance
Inclusion criteria: by case volume and number of residents

- Intervention RCHE 1
  - Site assessment and plan development
  - Optional interventions, plan implementation, reporting system and regular review meeting
  - Site assessment and evaluation

- Intervention RCHE 2
  - Site assessment
  - Reporting system and regular review meeting
  - Site assessment and evaluation

- Control RCHE
  - 1st measurement
  - 2nd measurement
  - 3rd measurement
  - Evaluation on data only
Mx algorithm for identified cases

- Case identified from injury reporting system
  - Recurrent incident
  - Single Incident
    - Check for host problem e.g. gait/balance/disease
      - No problem
    - Host problem
      - Case identified from hospital injury surveillance system
        - Injury evaluation
          - Assessment includes Hx, disease, medications, vision, Gait and balance,
          - Specific multi-fact oral intervention > optional interventions
        - No intervention
Multi-factorial intervention
To RCHE - 1
Multi-factorial intervention

- Staff education
- Environmental modification
- Exercise
- Supply and repair of aids
- Regular review meeting
- Established injury reporting system
- Referral
Establish Injury reporting system
To RCHE - 2
Task 3:

Develop a RCHE based survey system for OAH residential injuries

• To develop a OAH based information system in order to capture detailed information actively and monitor the trend continuously. (create a long term effect)

• Local classification of injury data from the OAH

• Work flow analysis of OAH

• User interface design: simple, flexible, extensibility

• Two level of training : data entry and report generating

• Pilot

• System refine

• System evaluation
Minimum Data Set (MDS) - WHO

**CORE**
- Identifier, age, sex, intent, activity,
- Place of occurrence, nature if injury,
- Mechanism of Injury

**MINIMUM DATA SET (MDS)**
- Supplementary for Traffic injuries
- Supplementary for assaults

**OPTIONAL DATA SET (ODS)**
- Residence, alcohol abuse, disposition, severity
- Supplementary for specific injury

Y holder (2001)
Task 4: Impact study of injury prevention program via an emergency department injury surveillance system

- **Outcome based** of the program; 32 weeks follow-up, 4 points of measurement
  - Outcome variables: number of residential injury event
    - number of injury
    - case with repeated injury

- **Process based** (Sixten Nolen & Kent Lindqvist, 2002)
  - Written material: surveillance report from OAH & review meeting: recommendation.
  - Data: classification by structure and process, classification of opinions expressed
  - Actors, categories of activities (planning & work), positive experience and detected problems
Generic Logic model

Outcome or Impact Evaluation:
What are the outcomes associated with the program? Intended and unintended? Did the program cause the outcomes?

Process Evaluation:
Is the program being implemented as planned?

External Influences and Related Programs (mediating factors)

Sources: Gretchen B. Jordan, Sandia National Laboratories; and adapted from Wisconsin Extension Service website
### Economic evaluation

<table>
<thead>
<tr>
<th></th>
<th>RCHE-1</th>
<th>RCHE-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual ED Cost</td>
<td>HK$ 40,250</td>
<td>HK$ 15,400</td>
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<tr>
<td>Hospital annual LOS Cost</td>
<td>HK$ 970,900</td>
<td>HK$ 283,100</td>
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<tr>
<td>Direct annual injury Cost</td>
<td>HK$ 1,011,150</td>
<td>HK$ 298,500</td>
</tr>
<tr>
<td>Injury cost per incident</td>
<td>HK$ 8792</td>
<td>HK$ 6784</td>
</tr>
<tr>
<td>Injury cost per day</td>
<td>HK$ 2,770</td>
<td>HK$ 817</td>
</tr>
</tbody>
</table>

**4% injury cost**

**5% injury cost**
<table>
<thead>
<tr>
<th>% of Injury reduction</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
<th>20%</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Benefit Ratio</td>
<td>1.26</td>
<td>2.53</td>
<td>3.79</td>
<td>5.06</td>
<td>6.32</td>
</tr>
</tbody>
</table>

Graph showing the relationship between % of Injury reduction and Cost Benefit Ratio.
<table>
<thead>
<tr>
<th>% of Injury reduction</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
<th>20%</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Benefit Ratio</td>
<td>0.37</td>
<td>0.74</td>
<td>1.12</td>
<td>1.49</td>
<td>1.87</td>
</tr>
</tbody>
</table>

% of Injury reduction vs Cost Benefit Ratio graph:
- % of Injury reduction: 0% to 200%
- Cost Benefit Ratio: 0.37 to 1.87

Graph shows a linear relationship between % of Injury reduction and Cost Benefit Ratio.
Proposed model

Stage 1
- Surveillance system set-up

Stage 2
- Program development
- Stakeholders recruitment
- Injury prevention program
- Cluster monitoring

Stage 3
- Program evaluation
- Stakeholder recruitment
- Prevention program Evaluation
- Sustainable effect

↓ Injury occurrence
Anticipated benefits

Create surveillance-base injury prevention model for RCHE injury

Create an RCHE based injury surveillance system (network of surveillance among the OAH in the district)

Create a long lasting effect of intervention by a surveillance system

Identified a cost-effective way to reduce RCHE residential injury

Hospital related injury cost for this group will be reduced
Thank you