Real Time Measurement of Work-Related Stress & Well Being in Critical Care Nurses: A Feasibility Study

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Job Demand-Resource Model Concepts

(Bakker & Demerouti, 2014)
Aims of this Presentation

• To outline the processes in electronic diary development.

• To present the results of the feasibility & acceptability test of the diary & study protocol, used to measure work-related stress & well being within critical care nurses (CCNs).
Ecological Momentary Assessment (EMA)

“EMA...allows subjects... to report repeatedly on their experiences in real-time, in real-world settings, over time and across contexts”.

(Shiffman, Stone & Hufford, 2008, p3)
Summary of Method for Electronic Diary Development & Feasibility Testing

1. Selection of Measures & Diary Structure

2. Developing, Programming & Preliminary Tests of PDAs (i) Research Team; (ii) Participants.

3. Testing the Study Protocol (i) Recruitment; (ii) Supporting Participants; (iii) Data Transfer

4. Determining Acceptability & Feasibility
1. Method - Measures

**Job Demands**

*Pace of Work* (3-items), *Emotional* (1-item), *Physical* (1-item), *Mental* (1-item), *Work Organisation* (1-item), *Complexity of Work* (3-items), all responses on VAS (0-100; Labelled ‘No’ to ‘Yes’) (Van Veldhoven et al, 2015). *Incident Involving Relatives* (End of Shift Only), responses free text comments.

**Job Resources**

*Autonomy* (2-items), *Support from Colleagues* (2-items), *Support from Supervisor* (2-items), *Clarity of Task* (1-item), *Control* (3-items) all responses on VAS (0-100; Labelled ‘No’ to ‘Yes’) (Van Veldhoven et al, 2015).

**CCN Outcomes**

*Stress* (stressed, nervous, calm & relaxed) (4-items); *Hedonic Tone* (happy, cheerful, sad, angry) (4-items); *Fatigue* (tired, sluggish, alert, energetic) (4-items), all responses on VAS (0-100; Labelled ‘No’ to ‘Yes’) (Kamarck et al, 1998; Waterston et al 2011). *Job Satisfaction* (1-item) (Van Veldhoven et al, 2015); *Exhaustion* (1-item) (Maslach & Jackson, 2001), responses to both items on VAS (0-100). *Recovery from Last Shift* (beginning of shift only), responses on VAS (0-100) (Van Veldhoven et al, 2015).

**Organisational Outcomes**

*Patient Safety* (end of shift) (1-item), categorial response format, where 0=failing, 1=poor, 2=acceptable, 3=very good, 4=excellent; *Quality of Care* (end of shift) (1-item), categorial response format, where 0=poor, 1=fair, 2=good, 3=excellent (Mallidou et al 2011). *Care Left Undone* (end of shift) (12-items), binary response category (yes/no); *Risk to Patient* (end of shift) (12-items), all responses on VAS (0-100) (Ball et al, 2012).
1. Method - Item Response Categories

Visual Analogue Scales

Radiobutton
1. Method – Diary Structure
2. Method - Programming PDAs

- Personal Digital Assistants (PDAs) - Hewlett Packard iPAQ 114.
- Diary software programme 'Pocket Interview' (Morrison et al, 2009).
- GNC for Scotland (Education) Fund 1983 & Margaret Callum Rodger Midwifery Award.
- UREC, Sponsorship NHS Tayside & R&D Approvals.
- Preliminary Testing amongst Research Team.

Single tertiary referral centre, N=28 CCNs volunteers from Phase I (September 2018).

Recruitment – to contact volunteers.

Participant Support – documentation, contact for help.

Infection control.

Transfer Data from PDA → Pocket Interview → Data Analysis Package.

Data Management Plan.
# Results – Participant Demographic & Professional Information

<table>
<thead>
<tr>
<th>Characteristics of Participants</th>
<th>Result Phase II Feasibility (N=8)</th>
<th>Range</th>
<th>Result Phase I: Total Cohort Sample (N=557)</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>M=42.1 (SD 11.5)</td>
<td>28-56 years</td>
<td>M=40.37 (SD 10.19)</td>
<td>21-63 years</td>
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<tr>
<td>Gender (Female)</td>
<td>8 (100%)</td>
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<td>498 (90.1%)</td>
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<td>Scottish/UK/Welsh/English</td>
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<td>523 (94.4%)</td>
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<td>Children (Yes)</td>
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<td>322 (58.1%)</td>
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<td>Married/Steady Relationship</td>
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<tr>
<td>Single</td>
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<td>458 (82.8%)</td>
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<td>Widowed</td>
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<td>64 (11.6%)</td>
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<tr>
<td></td>
<td>1 (12.5%)</td>
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<td>6 (1.1%)</td>
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<td>No. Years as RN</td>
<td>M=20.63 (SD 11.73)</td>
<td>6-35 years</td>
<td>M=15.93 (SD 10.05)</td>
<td>.55 – 43 years</td>
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<td>No. Years CCN</td>
<td>M=17 (SD 12.5)</td>
<td>3-35 years</td>
<td>M=11.72 (SD 9.0)</td>
<td>.55 – 40 years</td>
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<td>Fulltime Contract</td>
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<td>379 (68.7%)</td>
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<td>Band 5</td>
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<td>396 (72.1%)</td>
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<td>Band 6</td>
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<td>117 (21.3%)</td>
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<td>Masters</td>
<td>1 (12.5%)</td>
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<td>27 (4.9%)</td>
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</table>
Results – Recruitment, Retention

Data Collection Period

Recruitment Rate = 28.6%  
(N=8/28) of volunteers.

Retention Rate = 100%

- Across 35 Shifts (Nights & Days)
Diary Completion Rate

- Overall, 261 (82%) diary entries completed.
- Two diaries 100% completion rate.
- Diaries with missing entries, completion rates ranged 40%-93%.
- Overall, 9 ‘Incidents’ were recorded.

Completion Time

- **Standard Diary Entry**: Median = 1mins 51 secs (Range: 22 secs – 1hr 41mins)
- **End of Shift**: Median = 3 mins 16 secs (Range: 38 secs – 21 mins 1 sec)

Snooze Time

- Modal Snooze Time = 10 mins; overall total of 114 (36%) entries were snoozed.
Results

Testing Cycle One (N=4)

• One participant with 100% completion
• Technical Issue – Pattern analysis identified the ‘Snooze Function’ as the source (choice of 5-mins, 10mins, 15-mins, 30mins or 60mins).
• Reboot corrected the issue.

Testing Cycle Two (N=4)

• Based on Cycle One PDA software updated & ↓ no. ‘Snooze’ options.
• One participant with 100% completion.
• Technical Issue - One device faulty, completely replaced.
Conclusion

- Electronic diaries are an acceptable method of data collection in CCNs. Recruitment rates were good & retention rates excellent.

- Question items & the diary structure were acceptable to participants. Compliance & completion rates were as good as those observed in other populations (Johnston et al, 2006; Hensel et al, 2012).

- The study protocol was effective. EMA can be used to generate real-time data capturing the determinants of work stress & wellbeing & the effects on CCNs, with the aim of improving the working lives of CCNs & patient safety.

- Progress to Phase II, the main EMA study containing a larger group of CCN participants (N=40).
References


