Understanding the Work of Intensive Care Nurses; a Time and Motion Study

Michael Peter Abbey
RN BN (Hons), Grad Cert (Intensive Therapy)
School of Nursing and Midwifery
Griffith University

Submitted in fulfilment of the requirements of the degree of Master of Philosophy

February 2008
Abstract

Internationally and nationally it is recognised that there is a shortage of Registered Nurses (RNs), which is occurring within a context of increasing costs of health care and limited funding. The specialist area of the Intensive Care Unit (ICU) is one area that requires numerous resources. The patients admitted to ICU need advanced specialist care involving significant human resources (nursing, medical, allied health) and equipment. One method that is utilised to manage the ICU nurse resource is workload tools. Workload tools guide manager’s decisions related to the allocation of ICU nurses. In order to develop workload tools that are applicable to the Australian context, it is important to first understand what the Australian ICU nurse does as they work.

The aim of this study was to describe and analyse ICU nurses’ activities during the day shift. A non participant time and motion observation method was utilised. Ten ICU nurses were observed for their day shift in a private hospital in South East Queensland. First, the number of activities undertaken was analysed to determine the frequency of undertaking multiple activities at one time. Next, the data were categorised into four major and 25 minor work activity categories. The major categories were direct patient care, indirect patient care, unit related activities and personal activities. Finally, the observed nurses’ activities were classified according to a schema of six work activities. This schema included ‘routineness’, ‘discretion’, ‘intensity’, ‘multiplicity’, ‘complexity’ and ‘accessibility’. Data analysis was performed using Microsoft Excel and Statistical Package for Social Sciences.

The ten ICU nurses were observed for 76 hours 26 minutes. In total 3,081 activities were observed. The ICU nurses were observed performing two simultaneous activities for 43% of their time. The major work activity categories data indicated that the ICU nurses’ time was divided up into direct nursing care activities (60.3%), indirect nursing activities (32%), personal activities (4.5%) and unit-related activities (3.2%). The schema of work activity findings indicated that the ICU nurses’ activities were predominantly ‘routine’ (94.2%), versus ‘non-routine’, requiring ‘discretion’ for 95.8% of their work activities. The ‘discretion’ category indicating the autonomy of the ICU nurse as they worked. In total, 95.6% of activities were ‘not intense’, and 41.2% of them required multiple activities (‘multiplicity’). A total of 25.2% of the work activities that
were ‘complex’ and 94.9% required nurses to use their knowledge as they worked (‘accessibility’).

This study identified that the ICU nurses spent approximately two thirds of their time involved in direct nursing care and almost a third of their time involved in indirect nursing care. The simultaneous activities that ICU nurses performed equated to greater than 40% of their time. The actions of the ICU nurses were predominantly routine, autonomous and not intense. The work activities were principally regular, however there were complicating factors for this group of ICU nurses, such as multiple and complex activities. This level of analysis of ICU nurses’ work is not commonly undertaken, yet it provides valuable information that can be used to inform workforce planning.

It is recommended that the development of workload tools in the Australian context should consider the broad complex nature of providing care for the ICU patient to capture potential workload for the ICU nurses. Research into the frequency with which ICU nurses undertake simultaneous activities suggest that without adequate concentration, errors may occur. Future research exploring the work undertaken during all shifts utilising time and motion observations and the schema of work activities would provide a broader contextual view of their work. The schema of work activities has been adapted and employed for the first time in the ICU environment. Future studies utilising the schema of work activities will provide a comparison and critique of the categorisation of the ICU nurse work activities. Allocation of time for specific direct nursing activities alone does not consider other activities that nurses undertake nor does it consider the complexity of these activities.
Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

........................................

Michael Peter Abbey
Table of Contents

Abstract ....................................................................................................................... ii
Statement of Originality ................................................................................................ iv
Table of Contents ...................................................................................................... v
List of Illustrations .................................................................................................... viii
Acknowledgement ........................................................................................................ ix
Chapter 1 ........................................................................................................................... 1
Introduction .................................................................................................................... 1
1.1 Overview ................................................................................................................. 1
1.2 Problem ................................................................................................................... 2
1.3 Background ............................................................................................................. 2
   1.3.1 Nursing Workload ............................................................................................ 4
   1.3.2 Skill Mix ............................................................................................................ 7
   1.3.3 Skill Mix and Intensive Care .......................................................................... 9
   1.3.4 The ICU Work Environment ......................................................................... 12
1.4 Aims of the Research ............................................................................................ 13
1.5 Significance of Research ...................................................................................... 14
1.6 Structure of Thesis ............................................................................................... 16
1.7 Summary ................................................................................................................. 17
Chapter 2 ......................................................................................................................... 18
Literature Review ........................................................................................................... 18
2.1 Introduction ............................................................................................................. 18
2.2 Legislative and Organisational Definitions ........................................................ 19
   2.2.1 International Code of Conduct and Legislation for Nurses .......................... 19
   2.2.2 National Nurse Competency and Role Descriptions .................................. 22
2.3 Theories of Work .................................................................................................. 25
   2.3.1 Work Theories in the Literature .................................................................... 25
   2.3.2 Billett’s Schema of Work Activities Theory ................................................. 28
2.4 Nursing Activities ................................................................................................ 36
   2.4.1 Defining and Describing Nursing Activities ................................................. 36
   2.4.2 Nursing Activities in the ICU ....................................................................... 44
2.5 Summary ................................................................................................................. 49
Chapter 3 ......................................................................................................................... 50
Methods ....................................................................................................................... 50
3.1 Introduction ............................................................................................................. 50
3.2 Research Question ............................................................................................... 51
3.3 Research Design .................................................................................................... 51
3.4 Setting .................................................................................................................... 53
   3.4.1 Participant Description .................................................................................. 55
3.5 Observation and Experience ................................................................................. 57
3.6 Data Collection Preparation .................................................................................. 59
   3.6.1 Observations .................................................................................................. 59
   3.6.2 Limitations of the Observation Method ....................................................... 62
   3.6.3 Data Sheet Development and Research Training ......................................... 65
   3.6.4 Group Discussions ....................................................................................... 70
   3.6.5 Pilot study ..................................................................................................... 77
3.7 Data Collection ....................................................................................................... 79
Chapter 5 ....................................................................................................................... 113
3.9 Summary ............................................................................................................... 90
4.3 Summary ............................................................................................................. 111
5.8 Conclusion .......................................................................................................... 145
5.7 Limitations .......................................................................................................... 142
5.6 Limitations .......................................................................................................... 142
5.5.4 The Complexity of Activities for the ICU Nurses ....................................... 137
5.5.5 The Observed Multiple Activities for the ICU Nurses ............................ 138
5.5.6 Accessible Actions of the ICU Nurses ........................................................ 138
5.5.7 Research Methods Utilised in the Study ..................................................... 141
5.5 Schema of ICU Nurses’ Work Activities .............................................................. 131
5.4 Types Activities Undertaken by ICU Nurses ..................................................... 121
5.4.1 Direct Care Activities .................................................................................. 121
5.4.2 Indirect Care Activities ................................................................................ 124
5.4.3 Unit-related Activities .................................................................................. 127
5.4.4 Personal Activities ....................................................................................... 129
5.4.5 Other Activities ............................................................................................. 130
5.5.1 Routine Activities of ICU Nurses................................................................. 132
5.5.2 The Discretion Activities of the ICU Nurse ................................................ 133
5.5.3 The Intensity of Activities for the ICU Nurse ............................................. 136
5.5.4 The Complexity of Activities for the ICU Nurses ..................................... 137
5.5.5 The Observed Multiple Activities for the ICU Nurses ............................ 138
5.5.6 Accessible Actions of the ICU Nurses ........................................................ 138
5.5.7 Research Methods Utilised in the Study ..................................................... 141
5.5 Limitations .......................................................................................................... 142
5.6 Limitations .......................................................................................................... 142
5.7 Implications and Recommendations .................................................................. 145
5.7.1 ICU Nurse Work Activities and Recommendations ............................... 146
5.7.2 Recommendation for Workload Models .................................................. 148
5.7.3 The ICU Nurse and the Schema of Work Activities Theory ..................... 148
5.7.4 The Skill Mix Challenge in ICU ................................................................. 149
5.8 Conclusion .......................................................................................................... 151
References ................................................................................................................ 153
Appendix A ............................................................................................................... 167
Appendix B ............................................................................................................... 171
Appendix C ............................................................................................................... 172
Appendix D ............................................................................................................... 174
Appendix E ............................................................................................................... 176
Appendix F ............................................................................................................... 179
Appendix G ............................................................................................................... 180
Appendix H ............................................................................................................... 181
List of Illustrations

Tables

Table 2.1. Work Activity Studies .................................................................................... 44
Table 3.1. Pilot Study Data ............................................................................................. 78
Table 3.2. Activity Coding and Descriptions ................................................................. 82
Table 3.3. Scoring for Schema of Work Activities ....................................................... 83
Table 3.4. Snapshot of an ICU Nurse and the Schema of Work Activities Data ........... 85
Table 4.1. Years as a RN and Experience in ICU Study Setting .................................... 92
Table 4.2. Description of Patients Cared for by the ICU Nurses ................................... 93
Table 4.3. Observation Times and Numbers of Activities by ICU Nurses .................... 94
Table 4.4. Simultaneous Activities of an ICU Nurse ..................................................... 95
Table 4.5. Types of Activities and Time Involved for ICU Nurses ............................... 97
Table 4.6. Major Groups of Activity Codes ................................................................... 98
Table 4.7. Thirty Minute Snapshot: ICU Nurse Observed Performing Nursing Activities for a Stable Elective Cardiac Post Operative Patient ................. 100
Table 4.8. Thirty Minute Snapshot: ICU Nurse Performing Nursing Activities of a Critically Ill Patient .................................................................................... 102
Table 4.9. Schema of Work Activities Data for All ICU Nurses ................................... 106
Table 4.10. Schema of Work Activities Time Frequency ............................................. 107
Table 4.11. Total Time and Frequency of Schema of Work Activities for the ICU Nurses ...................................................................................................... 108
Table 4.12. Individual Participant Schema of Work Activities Scores of ‘2’ ............... 110

Figures

Figure 3.1. Informal group discussion, 'yes' responses by ICU nurses to questions related to whether activities were routine or not routine ................................. 71
Figure 3.2. Informal group discussion 'yes' responses by the ICU nurses to questions related to their discretion when completing an activity................................. 72
Figure 3.3. Informal group discussion, 'yes' responses by the ICU nurses to questions related to the intensity of an activity .......................................................... 73
Figure 3.4. Informal group discussion, 'yes' responses by the ICU nurses to questions related to multiple activities ............................................................. 74
Figure 3.5. Informal group discussion, 'yes' responses by the ICU nurses to questions related to complexity ............................................................. 75
Figure 3.6. Informal group discussion, 'yes' responses by the ICU nurses to questions related to accessibility ............................................................. 76
Figure 3.7. A graphical representation of a single activity utilising the schema of work activities theory ................................................................................. 84
Figure 4.1. A single observed direct care activity; endotracheal tube suction of a stable cardiac patient utilising the schema of work activities ............................... 99
Figure 5.1. Billett’s (2001b) Schema of Work Activities for the 10 ICU Nurses ...... 140
Acknowledgement

I would like to acknowledge the great support I received from my supervisors Professor Wendy Chaboyer and Dr Marion Mitchell. Thanks to their knowledgeable guidance and honesty I was able to complete this project.

To my wife Jen and daughters Sara and Katie, I could not have succeeded without your love, understanding, support and indeed patience.

I would like to thank Associate Professor Stephen Billett for the beneficial discussions about the schema of work activities. It was a wonderful opportunity to speak to the person who had created the schema that was used in this thesis.

I would finally like to acknowledge the participant Intensive Care nurses at John Flynn Private Hospital who allowed me into their work place to observe them as they worked.