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How safe is telenursing from home?

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Summary
Objective: To compare the work of telenurses working from home with that of their colleagues working in a health call centre.
Design: A retrospective review of existing clinical and other data.
Setting: NURSE-ON-CALL, the telephone triage and advice line operated for the Department of Human Services, Victoria by McKesson Asia Pacific.
Subjects: Nurses employed by McKesson Asia Pacific, Victoria, Australia working in their call centre and from home.
Main outcome measures: Comparison between nurses working from home with those working in the centre: demographics and dispositions of callers, management of mystery callers, frequency of risk incidents, productivity, and satisfaction.
Results: Callers sought triage for the same range of symptoms and were triaged to similar dispositions; mystery callers were managed similarly; there were a similar number of risk incidents. Nurses working from home were more productive, took fewer days sick leave and had a lower attrition rate. Nurses working from home identified more flexible hours and less travel as advantages. No disadvantages were identified.
Conclusions: Nurses who worked from home were provided with adequate education for their role, full technological facilities, decision support software, ready access to supervision and continuing education. They managed a similar range of cases as nurses working in a health call centre, did so as safely, were more productive and expressed high levels of satisfaction.
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Introduction

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To telework is defined as: to work from home or outside the traditional office or workplace, using a computer and

telephone connection; also called telecommute (Webster's, 2003).

Between 2005 and 2006 the number of full time teleworkers in the United States of America rose by 20% to 14.7 million. Almost 29 million Americans worked remotely at least one day per month. These increases followed the proliferation of high speed wireless internet access, as well as the willingness of more employers to consider their employees' work-life balance (Worldatwork Telework Advisory Group, 2007).

McKesson is a leading telephone health service provider in the United States of America. Nurses working for McKesson have increasingly been doing so as teleworkers in a program called 'Work@Home'. McKesson's goals in initiating a teleworking program were specific: enable recruitment of telenurses in new geographic regions, retain existing staff, and reduce the real estate footprint (Kistner, 2007). Since the program began, only one of (previously) five call centres remains operative (Bednarz, 2006). This was achieved while retaining service levels, clinical governance systems, and their clinical safety record.

While there are other providers of telenursing services in other countries, none has published a study of nurses providing telenursing services from home or compared the work of telenurses working from home with that of their colleagues working in a health call centre.

In Australasia, McKesson Asia Pacific provides triage and chronic disease management services in the public and private health care sectors and has adopted a similar Work@Home model building on the USA experience. As this is a relatively new model for Australian health care, questions have arisen as to clinical safety, data and privacy issues, and productivity in relation to nurses working from home.

Teleworking offers benefits to employers, but also to employees and to the wider community—for example by reducing the environmental impact of car travel. In the USA, the Telework Coalition has produced best practice benchmarks (The Telework Coalition, 2006). European Telework Online has reported the risks and benefits of teleworking, based on the views of experienced teleworkers and managers (ETO, 2000). These can be summarised as.

Benefits for employers

- Cost savings in premises, office overheads, parking.
- Increased productivity.
- Improved motivation; employees respond well to the signal of trust and confidence.
- Skills retention; employees can be retained if the family moves, in illness, family crisis and in pregnancy and childrearing; fewer work absences.
- Organisation flexibility; in the event of restructuring people can continue to work without disruption.
- Flexible staffing; staffing level can reflect workload without the need for travel.
- Resilience; transport disruptions do not cause lateness or absence.

Benefits for employees

- Reduced travel time and costs, greater personal safety, lower costs for clothing, grooming.
- Work opportunities not limited to jobs within commuting distance.
- Less disruption to family life; reduced need for relocation to take up job changes.
- Better balance of work and family life.
- Participation in the local community when commuters are still travelling to work.
- More flexible hours.

Benefits for society

- Reduced traffic congestion.
- Reduced total travel and thus pollution.
- Wider employment opportunities.
- Access to work for people with specific difficulties.
- Economic regeneration.

Negatives

- The employee: home based telework is not for the poorly motivated, young people in first employment, or those for whom the workplace is an important social centre. A dedicated space is needed that is quiet, free of distractions and meets occupational health and safety standards.
- The employer organisation: managers may lack the confidence to 'manage at a distance', or suspect home based workers may underperform.
- The work: some tasks gain synergy from the interactions of a team working together.

In telenursing, there is the additional need to ensure clinical safety and data privacy. Network World (Bednarz, 2006) reported on McKesson's telenursing activities in the USA. Remote nurses handle confidential information, so access to software applications and central data sources must be secure. No data are actually stored remotely: telenurses are linked through Citrix and Wyse terminals to the central information technology (IT) network to ensure data integrity and privacy. Real time communications use instant messaging (IM) technology, and are encrypted so that no personally identifiable information is sent in clear text; the system archives messages for auditing. Audio records of calls are retained for supervision and review. Although the system allows for paperless record keeping, a shredder is supplied to each telenurse so that any sensitive paper notes can be destroyed. The requirement to maintain privacy and confidentiality of caller information is enshrined in employment agreements with the telenurses and formal privacy training is undertaken each year.

Clinical safety is ensured by thorough induction and training, along with adequate supervision and monitoring, and participation in clinical governance and continuing professional development activities.

McKesson employs web collaboration tools to train staff by distance learning, using webcasts and online modules, and to conduct annual performance reviews. Scheduling software gives telenurses and supervisors access to sched-

ules and performance statistics. This software is used to forecast call volumes, identify when staff will be needed, and adjust schedules to fill gaps. Calls are reviewed for customer service and clinical content and nurses coached accordingly.

Real time communication (IM) is essential to ensure home based telenurses can access assistance when they need it. A nurse working in a call centre could wave if a call came in that required help from a supervisor or an ambulance dispatch. With IM, a nurse who receives a critical call can message a supervisor and start the process of dispatching emergency services without interrupting the patient call.

Given that in this Work@Home model the nurse working from home has (in theory) the same access and support as a call centre based nurse it is hypothesised that their performance should be similar both operationally and in terms of clinical safety. This paper aims to assess the safety and productivity of Work@Home telenurses by comparing their activities with those of call centre nurses.

Method

Since June 2006 NURSE-ON-CALL (NOC), a Victorian Government health initiative operated by McKesson, has provided health information and advice 24 h a day, seven days a week to people living in Victoria, Australia. Over 390,000 calls were answered in the first 12 months of operation. These are calls direct from the public as well as health enquiry calls transferred from over 40 public hospital switchboards.

Registered nurses employ a range of tools to ensure safe and accurate triage of patients over the phone. McKesson's Care Enhance Call Centre (CeCC)™ clinical decision support software houses over 500 clinical guidelines. The clinical content of these guidelines is quality assured by a regional team of McKesson medical advisers. General health information is accessed through approved resources including the Victorian Government's Better Health Channel. Following a clinical triage callers are advised on the appropriate level and urgency of the care they should seek. This advice or disposition can range in acuity from an ambulance transfer to self-care advice. Incoming calls are always directed to the next available nurse, so Work@Home (W@H) nurses are not distinguished from call centre nurses (W@C) for that purpose.

NOC records were accessed to assess different measures of nurse performance. The studies were retrospective, using samples of convenience, but all were data from 2007. During 2007 about 60% of nurse hours were working at home hours with 40% in the call centre. Internal reporting and quality measures were used as indicators of safety.

Demographics and dispositions

Although the calls are randomly allocated to next available nurse, the data were reviewed to assess whether the nature of calls managed by W@H nurses were measurably different from calls managed by W@C nurses. The symptom mix was compared for triaged calls taken by the two cohorts during April to June 2007. The dispositions reached for these calls were also compared to identify any difference between W@H and W@C nurses' behaviour.

Mystery callers

As part of its quality assurance activities, NOC contracts an independent body to conduct a 'mystery shopper' exercise. Actors call NOC simulating different clinical scenarios and the results are assessed by an independent medical adviser. Calls are based on established vignettes that have an agreed clinical outcome. In both November 2006 and May 2007, 100 calls were placed by the independent body. Calls managed by W@H and by W@C nurses respectively were identified.

Risk incidents

McKesson's Operational Risk Management (ORM) is an ISO 9001 certified clinical governance and quality assurance process to manage feedback about its health services. All negative feedback about NOC triggers a 'risk incident' and is reviewed by a staff quality specialist and (where relevant) medical adviser, to identify root causes. Root causes include 'process issues'; including substandard customer service; failure to follow an operational protocol correctly; poor clinical decision making; or errors in documentation or use of the clinical decision support software. We reviewed ORM data for NOC over the period January to June 2007 to identify whether there were any discernable differences in frequency of risk incidents for W@H versus W@C nurses.

Productivity

We assessed the productivity of W@H nurses compared to W@C nurses by comparing the average number of calls during the quarter April to June 2007 per full time equivalent (FTE) nurse in each setting.

Satisfaction

We compared nurse attrition and sick leave rates for the year 1 June 2006 to 31 May 2007 as a proxy for staff satisfaction.

Findings

Demographics and dispositions

Of the 391 individual symptom based guidelines used during April to June 2007 only one ('Medication queries' guideline) showed a significant difference in utilisation rate between work locations. Utilisation was higher with the W@C nurses. There was no difference in the rate of utilisation of the other 390 guidelines between groups.

During the quarter, 61,580 disposition recommendations were made by the NOC service, 31,959 by W@H nurses and 29,621 by W@C nurses. There were no significant differences in disposition outcomes although the W@H triages were somewhat less likely than W@C triages to result in an acute ambulance referral: 1581 (4.8%) for W@H compared with 1771 (6.0%) for W@C; and slightly more likely to provide home/self care advice, 9797 (30.6%) compared with 8626 (29.1%) for W@C.

Mystery callers

Over the two 'mystery shopper' exercises, 200 calls were made. Of these nine calls were identified as having a potential impact on clinical safety and have been included in the McKesson internal quality processes. Of the nine, five were managed by W@H and four were managed by W@C. Over this period W@H nurses worked about 60% of the total hours (and thus took about 60% of the calls). Correcting for hours worked, deviations were a little less likely from W@H nurses, but the difference was not significant ($p > 0.05$).

Risk incidents

During January to June 2007, NOC handled 173,189 calls and there were 40 risk incidents (0.023%). None of these resulted in critical outcomes for the caller and all were managed within McKesson quality processes. Of these, W@H nurses were involved in 21 (52.5%), while W@C nurses were involved in 19 (47.5%).

W@H nurses worked about 60% of the total hours during that time and when correction is made for hours worked, risk incidents were more likely to occur in the call centre: for every thousand hours worked from home an average 2.6 risk incidents were logged, compared with 3.5 in the call centre. The difference is even greater when the different number of calls per hour is accounted for.

Productivity

In the April to June 2007 quarter, W@H nurses took 3.55 calls per hour, while W@C nurses took 3.08. This should be read in the context of W@H nurses being more likely than W@C nurses to work at busy times of the day and week.

Over the same period, W@H nurses took 8.3% of their days as sick leave, while W@C nurses took 10%. Thus W@H nurses took 17% less sick leave than W@C nurses.

Satisfaction

NOC W@H nurses were surveyed in January 2007. There were 13 respondents. They listed the advantages of W@H as: flexible hours and their positive effect on home life, and the advantages of lack of travel (time, safety, and cost). No disadvantages were identified.

Fits in much better with young family and husband's working hours, flexible shifts...

More flexible hours (with) shorter and more frequent shifts not available in hospitals.

Family friendly hours—will be able to pick up children from school.

I am able to mix my family life and work easier that way.

Convenience with a family, allows two working parents to better coordinate their rosters.

Gives more flexibility for home life, I can adjust my shifts, including splitting them to accommodate family life with working life.

Convenience-time at home. Flexibility with hours, able to do additional hours, i.e. short shifts 2—4 h ... I

can be home with the baby and work late.

Flexibility and greater availability to work shifts and more hours. Family/work balance.

Distance to travel to work.

No travelling.

Living in the country ... no travelling, parking or food costs. I... do not like travelling long distances to the city.

It is too far to travel to the office...

Not driving home following a night duty.

Taking travel time and costs out of my work day, not having to live close to work site.

Time "rich", as not having to commute.

Safer after working night shift as I dont have to drive.

A few nurses mentioned isolation, but as one nurse wrote:

Primarily because of the way the W@H computer is set up, I feel it is more socially isolating to sit at the opposite end of the office to your colleagues than working at home.

We reviewed attrition figures for nurses from June 2006 to May 2007. The rate of attrition for W@H nurses was 46% lower than that for W@C nurses.

Discussion

When compared with their colleagues working from a health call centre, nurses working from home were more likely to work weekday after hours and weekend hours, but nonetheless dealt with a similar range of clinical presentations. A single outlier (in this case 'medication queries') is to be expected statistically from 361 symptom based guidelines and there is no other cogent explanation for this difference.

The differences in disposition rates (fewer ambulance referrals and more frequent self-care advice after triage by nurses working from home) were not statistically significant. The tendency to lower rates of ambulance callout for nurses working from home suggests the calls were either of lower acuity (unlikely in view of the usually higher acuity of after hours and weekend calls—unpublished McKessons Asia-Pacific data), or that nurses working from home triaged to lower disposition levels and thus appeared to be more confident (i.e. able to use guidelines to deliver lower dispositions safely) as one would expect from their lower attrition rates and thus longer job tenure.

The clinical safety of the two groups of nurses as measured by their management of mystery callers and their risk incident rate was similar. These risk incidents vary in their clinical significance and all were thoroughly reviewed as part of quality measures at McKesson. None were deemed to have resulted in significant clinical risk to the caller.

The productivity (calls handled per hour worked) of nurses working from home was greater, however that observation must be tempered by the fact that nurses working from home were more likely to work shifts during busy call periods, hence would have been presented with a higher number of calls during their shifts.

Nurse identified advantages of working at home included the positive effects of flexible hours and the absence of travel. Proxy measures of job satisfaction (attrition rates and sick leave) suggest nurses working from home enjoyed greater satisfaction in their work than their colleagues working in the call centre.

Conclusions

In terms of the kinds of calls received, the dispositions reached after triage and clinical safety, we could detect no differences between nurses working from home and those working in the call centre. Nurses working from home were more productive and appeared to be more satisfied than their colleagues working in the call centre and they were just as safe.

Conflict of interest

All authors were, at the time of writing, directors or employees of McKesson Asia-Pacific.

References

Bednarz, A. (2006). *Distributed call center strategy pays off for McKesson Health Solutions. Network World 2006.* Available from: http://www.networkworld.com/news/2006/082806-mckesson-call-center.html?inform [accessed June 2007].

European Telework Online (ETO) (2000). *Telework (Telecommuting): the benefits—and some issues!* Available from: http://www.eto.org.uk/faq/faq03.htm#employer_bens#employer_bens [accessed June 2007].

Kistner, T. (2007). *Teleworking Nursing Care. Network World 2007.* Available from: http://www.cio.com.au/index.php/id;1753277175 [accessed June 2007].

The Telework Coalition (2006). *Telework benchmarking study: best practice for large scale implementation in public and private sector organisations.* Available from: http://www.ucn.net/Portals/0/ArticlesWhitepapers/WP_telework_benchmarking_study_March.06.pdf [accessed June 2007].

Webster's New Millenium™ Dictionary of English (2003). *Lexico Publishing Group LLC, Long Beach, California, USA.* Available from: http://dictionary.reference.com/browse/telework [accessed July 2008].

Worldatwork Telework Advisory Group (2007). *Telework trendlines for 2006.* Available from: http://www.workingfromanywhere.org/ [accessed June 2007].