An evaluation of an Infection Prevention Link Nurse Programme in Community Hospitals and development of an implementation model

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Background:

Infection prevention is a global priority, linked to patient safety, the "cornerstone" of healthcare (National Institute for Health and Clinical Excellence, 2012), therefore understanding what works to promote best practice is crucial. Interventions such as education, audit, guidance and feedback have traditionally been used (Storr et al, 2013), often driven by specialist infection prevention and control (IPC) teams. However, Safdar and Abad's (2008) systematic review of educational interventions in infection prevention found that further evidence is required to establish the impact of education alone on infection prevention practice. Moreover, whilst it is recognised that contextual factors (such as leadership, the extent of managerial support, and team morale) can influence the success or failure of implementing best practice in IPC (Gardam, et al, 2009: Griffiths, et al, 2009: Millar, et al, 2012), learning about them is rarely detailed in the literature (Sax et al, 2013). As the impact of these interventions has been variable, 'link nurse' roles have been developed to shift the focus and ownership of IPC interventions to clinical staff who have direct and regular contact with other health care workers (Royal College of Nursing [RCN], 2012).

Link role-holders in infection prevention are described as leaders and relationship nurturers (RCN, 2012) who are well placed to educate, reduce the theory-practice gap, and to link evidence and practice (Cooper, 2001: Cooper, 2004a, b: Roberts & Casey, 2004: Miyachi et al, 2007: Barry & Carter, 2010). However, the exact contribution made by people who undertake these and other roles in infection prevention is largely unknown (Williams et al, 2013). Concerns about the adequacy of attention to role-holders' educational needs have been made (Barry & Carter, 2010; Hale, Powell, Drey, & Gould, 2015). The success of programmes that focus on the role of the "champion" in infection prevention has been found to be contingent on existing organisational culture and support, and this is dependent

on collaboration across organisational and professional boundaries (Damschroeder et al, 2009). However, the successful implementation of behaviour change requires the input of more than one individual (Damschroeder et al, 2009).

In the present small study, we wanted to focus on the factors that contribute to the successful implementation of the link nurse role, and to understand more clearly which factors can influence the success of the role in community hospitals in particular. Additionally, we wanted to evaluate the impact that a bespoke educational intervention provides in preparing and supporting link nurses as educators in practice.

Study aims and objectives

The main aim of the study was to implement and evaluate an infection prevention link programme.

The study objectives were:

• to develop materials for a bespoke infection prevention programme which incorporated education, behaviour change, reward and recognition

• to evaluate the implementation of the programme, and to learn about barriers and enablers to implementation

The programme

The link nurse programme included support, education and regular contact with an infection prevention team for registered nurses. A bespoke online course was designed in collaboration between the local Higher Education Institution and the Health Board Infection Prevention Team. Ten learning units were designed which included principles of infection prevention, getting evidence into practice, standards and guidelines, audit and feedback. Additionally, the course focused on behaviour change, leadership skills, and understanding contextual influences for managing positive change. As there was no face to face contact during the course, weekly discussion boards provided opportunities for the link nurses to contact the course team (University Lecturers and Health Board Infection Prevention Team)

directly, network online with their peers, and reflect on practice in a supportive environment. We offered guidance for the link nurses to show how completion of the online course components address revalidation principles of promoting safe and effective practice through learning and reflection (NMC, 2018). MOOC (Massive Open Online Course) principles were embedded into the design and delivery of the course. For example, we chose a short (10 week) timespan, and offered credentialing through academic credits if desired, through successful completion of summative assessment, and recognition through certificate of completion. We followed best practice guidance for online teaching through monitoring course progress and creating a learning community (Miller, 2015). We also ensured high levels of visibility in our "teacher" role throughout the course (Bayne & Ross, 2014). Twenty-one link nurses commenced the course, and 11 successfully completed.

Additionally, we offered monthly face to face or remote group meetings with the Infection Prevention team. The meetings were designed to identify additional practical and educational requirements, and provide support and networking opportunities for the link nurses. Time to complete the course and attend meetings was negotiated with link nurses' managers. Regular meetings with the Infection Prevention Team continued after the completion of the intervention.

Methods:

To evaluate the link nurse intervention, and better understand the factors that support or hinder the implementation of the link role to promote best practice in infection prevention in NHS community hospital settings, data were collected following the completion of the intervention. Table 1 shows the detail of each data collection stream as follows:

1.   Semi-structured telephone interviews were conducted with NHS community hospital staff and link nurses who had completed the programme. We used purposive sampling to ensure we obtain the perspectives of those with a stake in the findings. Our sample included: link nurses, NHS community hospital managers and clinical nurses. The design of the semi-structured interview schedule was guided by the Promoting Action on Research

Implementation in Health Services Framework (PARIHS) (Rycroft-Malone et al, 2013) in order to evaluate the process of implementation through examining context, evidence and facilitation. Interviews were conducted by telephone, and lasted between 30-60 minutes. All interviews were audio-recorded.

2.   Contact logs were completed for monthly telephone/WebEx/face to face meetings with the Infection Prevention team over the 6 month intervention period (September 2016-March 2017).

INSERT TABLE 1 HERE

Data analysis

Data were analysed using thematic analysis to capture interpretation and report patterns of meaning (Spencer et al, 2014). This process included familiarisation, coding and sorting, data summary, and display of the data (Spencer et al, 2014). An initial coding framework was developed deductively which incorporated the Framework for the Infection Prevention and Control Link Nurse Role (RCN, 2012), and key elements from the PARIHS framework (context, evidence, facilitation) (Rycroft-Malone et al, 2013). Additional data-generated codes were added as the interview data analysis progressed where data could not be captured using the existing coding framework. The analysis interpretation was verified by other members of the project team.

Ethical approval was obtained by the Academic Ethics Committee, and permissions to access sites by the relevant NHS Research & Development department.

Findings

We identified four overarching themes that, collectively, provide a model for the implementation of the link nurse role in infection prevention. The themes are labelled as: selection process, support networks, essential roots, and turning points for success.

Theme 1 –Selection Process

Theme 1 provides a representation of the factors that impacted on who was selected for the link nurse role, and which personal features appeared to be instrumental for selecting these individuals as link nurses.

Skills for the role

Although there was a lack of formal selection process for identifying who could be selected for a link nurse role, participants nonetheless spoke of desirable criteria for the role. According to one NHS community hospital manager, there were some clear criteria for role-holders to fulfil, with data showing that certain factors were deemed essential:

"you need somebody that is initially interested in that area, that has a positive approach and can be flexible and proactive in how they approach situations."

Telephone Interview P5

Personal factors about the link nurse role-holder were also rated highly. Approachability and enthusiasm were desirable, in addition to having a sound knowledge base of infection prevention issues:

"just that she or he is approachable throughout. I'm not saying that they need to be on call 24/7, but that we know who they are, and when is the best time to contact them

Telephone Interview P3

Starting point

The process of recruiting link nurses to their role in NHS community hospitals was described by participants, with individuals being personally nominated or delegated to the role. Whilst community hospital managers had been encouraged to ensure that link nurses for each community hospital were in situ for the start of the intervention, this was an ongoing and changeable process in some clinical areas:

"eventually I will be delegating the job to one of the staff nurses to take this responsibility on obviously with my support"

Telephone Interview P2

Confidence +/- Motivation

Discussions about selection processes highlighted the confidence and motivation levels of individual link nurses, and how this impacted on their desire to undertake the role, or their impact within the role. The confidence levels of appointed link nurses was noted to be variable. One participant (an experienced link nurse) associated her confidence levels with the length of time she had spent in the role:

"I have gained confidence over the years, I've had years of experience now"

Telephone Interview P1

In contact log data, experience in the role was also associated with confidence levels:

She took a confident lead in the group and gave examples of the methods she had used to motivate others and raise the awareness of IP

Contact Log F2F IP2

In other data, we noted how additional knowledge gained through the intervention was also linked to improved confidence:

They all valued more in depth knowledge of IP related topics and saw this as a way of developing themselves as "expert" within their work area and boost their own confidence

Contact Log F2F IP2

However, elsewhere, appointed link nurses sometimes lacked confidence, despite being selected for the role:

She did verbalise the need for dissemination of the increased knowledge to her colleagues but seemed to lack the confidence to progress this

Contact Log F2F IP1

The assessment of personal motivation to take on the link nurse role was sometimes missed during the selection process. Data showed that personal motivation was not always the driving force for individuals to take on the link nurse role:

"I didn't get the choice to be honest. A Band 6 was needed and the other girls were link nurses for other things, so I got this job"

<div align="right">Telephone Interview P4</div>

However, following selection, professional and personal factors were noted to be positive motivators to undertaking the link nurse role. Contact log data showed the drive behind this for one group of link nurses:

Positive outlooks and reduction in harm to the patients appeared to be their motivation to put themselves in the position of link nurses

<div align="right">Contact Log F2F IP2</div>

Other data showed how personal motivational drivers linked positively to both being a link nurse and completing the intervention online course:

She appeared genuinely positive about the idea of being a LN

<div align="right">Contact Log Tele IP1</div>

Knowledge

Knowledge of infection prevention was often discussed in the data, relating to the selection process and beyond. For the link nurse role, some specific knowledge was perceived as being required before/for selection:

"I think [link nurses] have got to show some enthusiasm and knowledge around it…it's about having somebody that's going to take that responsibility on, and follow it through"

<div align="right">Telephone Interview P2</div>

However, coding log data suggests that knowledge was not assessed in any formal way pre-selection, and this was reflected by link nurse reflections, as in this example:

Feels that she lacks knowledge at present

<div align="right">Contact Log F2F IP1</div>

Once selected to be the NHS community hospital link nurse, there were acknowledgement of personal knowledge needs in the role in the data:

"everybody turns to me…they look at me and I don't know the answer every time"

"I'm still learning in my role really"

<div align="right">Telephone Interview P1</div>

Theme 2 –Support Networks

Under the second theme, data indicated that there were different dimensions of support available for the link nurse role-holders. Support was provided by managers, other link nurses, peers and colleagues, and the infection prevention team. It was evident that support mechanisms could affect the link nurses' confidence and their abilities to undertake the role effectively.

Managers' support

The demonstration of positive support from managers for the link nurse role was noted by participants, and this was reflected in the data:

The link nurse…was very pleased that her matron had come to see her that day to give verbal support and provide a white board for her to use to communicate with staff in her new role

<div align="right">Contact Log Tele IP1</div>

Positive support from managers for individual participants in the link nurse role was also noted in telephone interview data with different participants:

""fairly well supported, we've got, obviously a matron that covers the XXXX Hospital, who's very much involved and keeping up to speed on what's going on on the ward"

<div align="right">Telephone Interview P2</div>

Managers' support extended to practical matters, as in the following example, for time to attend meetings or take part in the intervention:

"They happen to be on my days off, but I will get time back…my line manager is really good and supportive of IP…so I do get back up yes."

<div align="right">Telephone Interview P1</div>

Support from other link nurses

In addition to managers' support, the importance of support from other link nurses was instrumental to enhancing the experience for link nurse role-holders. This form of support transpired during link nurse meetings with the infection prevention team:

She was very supportive to two others who had less experience and was positive in her vocabulary"

<div align="right">Contact Log F2F IP2</div>

Regular meetings were seen as a good opportunity for supporting each other, as reflected by one participant:

"it's good, you link with other people…with other link nurses…it's nice to all link up together and be an unit really"

<div align="right">Telephone Interview P1</div>

Data also showed the potential of structured meetings to offer opportunities for supporting each other in the link nurse role, and enhancing each other's knowledge:

Group discussion took place around the best way to capture "real" hand hygiene audit results

<div align="right">Contact Log F2F IP2</div>

However, in some instances, there were missed opportunities for supporting each other in the link nurse role:

This link nurse is in a hospital which has two wards and two link nurses. No cross communication has occurred between the two"

<div align="right">Contact Log F2F IP1</div>

Support from Infection Prevention team

The Infection Prevention team were noted as a source of important support through the data. Link nurse participants expressed confidence in having the infection prevention team as a key support mechanism, especially where timely contact was required:

"[staff] they look at me and I don't know the answers all the time…but we do have a good…we email or we ring infection control, and fair play they answer us quite quickly"

<div align="right">Telephone Interview P1</div>

Data also showed that regular contact with the infection prevention team was particularly valued where link nurses were geographically distant. In one example, the intervention had been the trigger for renewed contact, and this was particularly valued by one link nurse:

"now has re-started the ball which is good…we have got dates now for our next monthly meeting"

<div align="right">Telephone Interview P1</div>

Data from contact logs showed the particular ways in which the infection prevention team provided support for the link nurse role-holder. The meetings between them provided good opportunity for reflection. Support was offered during role initiation and for practical issues:

I got the impression she was still getting to grips with her role and hadn't started. I underlined my supportive role to assist her.

<div align="right">Contact Log F2F IP1</div>

Elsewhere, support by the infection prevention team was provided through the provision of encouragement and praise for the link nurse, for example, for resilience in persevering with a particular technical challenge associated with the intervention online course:

I praised her resilience as her IT skills not good, according to her, but she took time beyond her working day to complete the first unit which took two hours.

<div align="right">Contact Log Tele IP1</div>

The infection prevention team support extended to the personal qualities of individual link nurse role-holders, in this case, for their enthusiasm:

Support mechanisms available explained and also encouraged to contact the LN from the other ward in the same hospital. Her overall enthusiasm was commended.

<div align="right">Contact Log Tele IP1</div>

Support from peers and colleagues

Lastly, data showed the channel of support for link nurses by their peers and colleagues. There was a sense of collective responsibility for infection prevention:

Everyone is aware they need to do it (infection prevention practice) everyone tries their best

<div align="right">Telephone Interview P4</div>

However, particular acknowledgment of the link nurse role was reflected through validation by colleagues:

"my friend also worked in infection control, and she said "this is a good one"

<div align="right">Telephone Interview P1</div>

The role of community hospital colleagues in supporting the infection prevention agenda was deemed as indirectly supporting the link nurse in this excerpt:

Saw housekeeper role as influential in IP changes and intended to learn from the housekeeper and work together

<div align="right">Contact Log Tele IPI</div>

Theme 3 –Essential Roots

In this theme, we noted that particular leadership and workplace culture elements acted as an influencing backdrop to the success, or otherwise, of the link nurse role across the NHS community hospital settings. Collective leadership for infection prevention outlined the "everybody's responsibility" ethos, but there were also data about how the link nurse took a leadership role as well. Whilst examples of an enabling workplace culture for infection prevention were noted, there were also evidence to show how culture could hinder the efforts of individual link nurses.

Leadership –collective and role-level

Data showed the embodiment of positive collective leadership for infection prevention, with prevention being reflected as everybody's responsibility:

"everybody has a role on this ward, which will be reinforced with signage on their badges"

Telephone Interview P5

Data also showed the potential of individual link nurses at role-level to use their leadership skills and role-model amongst their colleagues:

I hope I can be a good role model showing that I think it's important and then they can see it's important"

Telephone Interview P3

In addition to support provided by the infection prevention team, they were also an important source of information which the link nurses then cascaded to colleagues:

"I ask for their advice (IP team at Hospital)… and I pass it on to my colleagues…I decanter it to all the others"

Telephone Interview P1

Enabling workplace culture

Factors noted about the workplace culture which impacted on the link nurse role were reflected upon by participants. On a positive level, there were affirmations of high levels of engagement with the infection prevention agenda, and efforts to encompass a whole team approach:

"from the audits that we do, I think the team is quite engaging in infection prevention"

Telephone Interview P5

Positive factors about the workplace were also noted in contact log data, showing the extent of role recognition:

all attendees felt that they were being approached more often for advice and felt their contribution was recognised in part by the staff

Contact Log Tele IP2

Disabling workplace culture

However, some disabling factors to promoting a positive workplace culture for infection prevention were reported. These included time constraints, and lack of resources:

"probably factors common to everyone really, staffing, time, knowledge at times about different types of infection"

Telephone Interview P5

Unfortunately, where disabling factors were presented, these sometimes impacted negatively on the link nurse role and ability to engage with the intervention:

…withdrawn from being LN registering workload and lack of time to undertake the MOOC

Contact Log Tele IP1

Theme 4 –Turning Points for Success

In the fourth theme, in addition to the supportive mechanisms, leadership and workplace culture elements reported under other themes, we noted how particular turning points

could be pivotal to the success or not of the link nurse role, and its potential to impact on practice and care delivery. The turning points were described as: bespoke mechanism for learning, communication opportunities and legitimising the link nurse role.

Bespoke mechanism for learning

Whilst there are recognised disadvantages to online learning relating to motivation and non-completion, in this study we found that the provision of a bespoke mechanism for learning appeared to support the link nurse in many ways. The benefits of the online course provided as part of the intervention were highlighted, thus suggesting the potential of cognitive change for the individual and positive impact for patient care:

One LN stated that previously the thinking was a UTI was a UTI but now since reading the unit one MOOC HCAIs the thought processes included why it had occurred and could the nursing care of the catheter have contributed to the UTI

Contact Log F2F IP1

The impacts from the course extended from affecting the thinking or practice of individuals, to learning that was transformative, and transported to the link nurses' colleagues:

Link nurse feels that her knowledge has already improved considerably and has received positive reactions from colleagues

Contact Log Tele IP2

In data, we additionally found that the impacts extended to broader practice, in a manner which reflected the potential of the programme to positively impact on the link nurses' practice:

More confident about challenging poor practice due to own increased knowledge

Contact Log Tele IP2

Communication opportunities

Where the intervention provided additional opportunities for enhancing communication, this was reported positively by participants. In this example from the data, the participant is discussing the regular meetings with the infection prevention team:

"I feel it's really good...it gives us an opportunity to network and share experiences and get together really. I think it's good that we are moving forward"

<div align="right">Telephone Interview P1</div>

The legitimacy of the link nurse role

When the link nurse role was embraced and legitimised, this had far-reaching consequences for clinical practice. Where managers could see the potential benefits of the link nurse role, the impacts were explained in reflections on practice:

" because I see it in the practice I observe, and I suppose the feedback I get off staff. I think the biggest thing is that staff are more confident and empowered on the importance of isolation, signage with isolation, and the importance of using PPE with isolated patients, that's improved dramatically"

<div align="right">Telephone Interview P5</div>

The data about legitimising the link nurse contrasted strongly with that which reflected a lack of value for the role:

Two replied in the negative when I asked if the ward manager or matron had communicated the existence of the role to staff

<div align="right">Contact Log Tele IP1</div>

Discussion

Collectively, the findings from our small study contribute to better understanding of the implementation of link nurses in infection prevention. The four themes construct a model to guide the design and delivery of the implementation of future link nurse programmes (Figure 1).

INSERT FIGURE 1 HERE

The model is similar to the structure of a flower, in that there are essential components that shape the successful implementation of a link nurse programme. These include ensuring a bespoke mechanism for learning and communication opportunities. We suggest that where these occur, and the role is seen to be legitimised, link nurses are more likely to "bloom" in their role. As the sepal protects the flower before it blossoms, we suggest that paying attention to the selection process and support mechanisms can ensure the successful implementation of link nurse programmes. The wider evidence base often lacks detail to show the decision-making behind selection processes for link nurse programmes. Our findings have shown that assessing knowledge and skills, and considering the starting point, confidence and motivation of potential link nurses are important factors to pay attention to during the selection process. Once established in the role, the link nurse should have access to formal and informal support mechanisms. In infection prevention, these include management, peer, infection prevention teams and other link nurses. Just as healthy roots determine if the flower blossoms or withers, leadership support, an enabling workplace culture, and promoting link nurses to develop their own leadership skills are essential starting points for successful implementation of programmes. These findings provide further evidence of the importance of context factors, for example, leadership styles on the success or otherwise of similar programmes (Saint et al, 2008). We hope the model can be used as guiding principles for establishing new link nurse programmes in infection prevention, maximising the chances of successful implementation and sustainability of the role.

The wider literature fails, to date, to show exact evidence of the link between education and infection prevention best practice through link nurse programmes. Our findings are significant because of the potential that the online programme has in instigating cognitive

changes, which extends from affecting the thinking or practice of link nurses, through to learning that is transformative and transported to the link nurses' colleagues, and to broader practice. These aspects are likely to positively impact upon patient care. Further research to show exactly how similar programmes translate into improvements in practice is needed, and we hope our small study contributes to advancing this important area of enquiry.

The findings from this study have also enhanced learning about the value of online courses for link nurse programmes. Further, we believe that our bespoke course reflects the aims of revalidation and offers a mechanism for learning and reflection to ensure safe and effective practice. The settings for this study were community hospitals, but we consider that the findings have transferability to a variety of settings, and provide guidance about the design and delivery of future link nurse programmes that can be sustained to support staff and promote best practice in infection prevention practice.

Conflict of Interest Statement

The Author(s) declare(s) that there is no conflict of interest'.

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