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Infection control practices of home care nurses in the department of Seine and Marne, France 2012

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Abstract

The number of healthcare associated infections is of global concern, as is their increasing resistance to antibiotics. The complex patient environment and the autonomy of home care nursing practice pose a specific challenge for infection control practices in the patient's home. The objective of this study was to identify key areas of concern in home care nursing practice with a view to improving patient safety and infection control practices.

After a review of current evidence for infection control practices and hygiene in the home care setting, a postal questionnaire was designed to evaluate current practice. 206 home care nurses responded of the 866 polled in the Department of Seine and Marne (Paris region) in 2012 (24%).

The results suggest that independent home care nurses in the Paris region are experiencing difficulties in implementing standard infection control practices. Only 8.7% of the sample group complied with all the legal requirements for clinical waste management. Availability of personal protective equipment was limited. The lack of hospital liaison when patients are discharged to home care services is a major source of risk for patient and professional safety.

This study will enable the heath authority to define a strategy to respond to the difficulties encountered by home care nurses, thus improving patient and practitioner safety.

Keywords: Infection control, home care nursing, personal protective equipment, clinical waste management, hospital liaison.

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1 Introduction

Demographic changes and shorter hospital stay require that vulnerable patients are cared for at home. Home based care is becoming increasingly technical and patients' conditions are increasingly complex [1, 2].It is also widely recognised that home care nursing is an autonomous practice which varies in accordance to the environment of the patient and the nurse's personal motivations [3].

The emergence of community acquired Methicillin-Resistant *Staphylococcus Eureus* MRSA [4,5] and other multi-resistant bacteria, requires home care professionals to review current practice with a view to improving patient and practitioner safety in the home care environment.

Home discharge is privileged in the event of hospital acquired infection or when a patient is discovered as being a carrier of multi-resistant pathogens in order to reduce the risk of cross contamination to other services [1].

There is no sharing of medical records between hospital, family doctor and nurse. Protocol requires that the patient is informed that they are infected or carrying a resistant pathogen. It is the patient's privilege to determine whether they share this information with the home care nurse. Disclosure is also dependant on the patient fully understanding their situation.

Home care nurses in France are generally independent practitioners paid only for the act of nursing prescribed. Personal protective equipment and clinical waste disposal and the associated costs, are the responsibilities of the individual nurse.

The health protection unit in Seine and Marne decided to explore the practices of home care nursing staff to assess their capacity to respond to the risks posed from discharge of patients infected or carrying multi-resistant pathogens. The objective of the study was to examine practice and identify the potential dangers and critical risk factors.

The results would enable the heath authority to define policies which respond to the difficulties encountered by home care nurses, thus improving patient and practitioner safety.

2 Methodology

A full literature search was executed using PubMed to analyse current evidence based practice for infection control in the home care setting. A parallel review was performed for unpublished research in France. One particular study executed by the French Health Department Region Centre in 2004 [6] examined the infection control practices of home care nurses, certain information from this paper was deemed relevant when creating the questionnaire for this study.

A postal questionnaire was designed with the support of the regional infection control specialist to take account of present recommendations for practice and the international research consulted. This questionnaire was tested by a number of nurses working or having worked in the home care setting. After initial testing certain questions were remodelled and others removed to limit the questionnaire to three pages. The questionnaire was accompanied by a letter of explanation and a pre-paid envelope for the return. The return postage date was limited to 6 weeks and a reminder was issued after one month via the local nursing board and the union representatives. The anonymity of respondents was guaranteed to encourage an honest assessment of their practice.

The basis of the study sample was defined according to information held by the social security database of self-employed nurses certified to charge for home care nursing in the department of Seine and Marne in September 2012. To ensure a representative sample and the maximum response, the questionnaire was sent to all the nurses identified.
In the department of Seine and Marne there are 19 associations offering nursing care in the home setting, these nurses are employed by the individual association and are therefore not included in the results.
The questionnaire was divided into themes: identify length and character of home care practice, vaccination, hand hygiene, personal protective equipment, needle stick injuries, management and disposal of clinical waste and professional communication.
206 questionnaires were returned, a response rate of 24% (206/866), not all respondents replied in full. A space for free expression was included in the questionnaire which 33% of the nurses responding chose to complete detailing the problems they experience in their practice
The questionnaire was digitalised in Google® questionnaire and the responses recreated for each respondent, to avoid human error. The data collected was then analysed using Excel®. At this time in France an electronic questionnaire would not have been possible. Neither the health authority, the nursing board, nor the Social Security Administration hold a database of electronic addresses for home care nurses.
The Chi2 statistical analysis test was used to analyse data which could be compared.

3 Results

3.1 Characteristics of the respondents

The characteristics of the sample population are detailed in Table 1 and 2.

Table 1: Working Environment

Working environment	N=197
Independent (working alone)	101(51%)
Collaboration (one or more Independent nurses)	62(31%)
Professional structure (two or more nurse working in direct cooperation)	34(17%)

Table 2: Length of Independent Practice

Years of practice as a an independent home care nurse	N=199
< 1	6(3%)
1 > 5	67(34%)
5 >20	78(39%)
+20	48 (24%)

Professional Structures may include nurses grouped together in the same building or having formed a business partnership.
There is no reliable data source on the length and type of practice in the home care setting either at a local or national level, collaboration between nurses is often informal to cover weekends or holiday periods and the number of formal structures is limited.
The sample population could not be compared to any reliable data source to confirm if it was a reliable representation of home care nurses either at a local or national level.

3.2 Vaccination

Occupation health services in France are well developed and the employer has a legal responsibility to monitor the vaccination status of healthcare professionals. However, independent nurses are responsible for their own health status and for maintaining their vaccinations up to date. The vaccination status of 54% (110/202) of the respondents was up to date for the following vaccines (DTP, whooping cough, measles and Hepatitis B). The vaccination for seasonal flu was excluded from the questionnaire due to the hostile view towards this vaccine held by many healthcare professionals; only 25% of care workers were vaccinated against seasonal Influenza in 2009 (Institute de Veille Sanitaire). As shown in figure 1 there is a significant difference, ($p<0.05$), between the vaccination statute of nurses in independent practice for less than 5 compared to those who have been independent for more than 5 years. This implies that vaccination status is better in the years immediately following hospital based practice, and that over time the vaccination status of independent nurses suffers due to lack of attention.

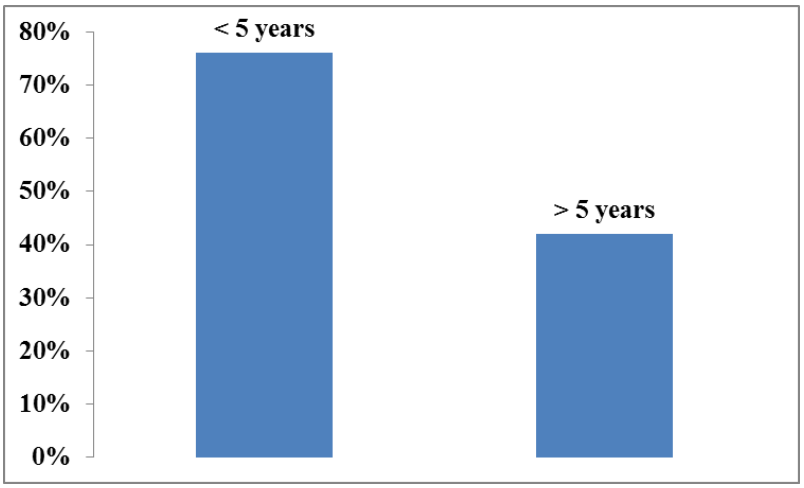

Figure 1: Vaccination status in relation to number of years in independent practice ($p<0.05$)

3.3 Training

There is no statutory training for independent home care nurses in France, the minimum requirements to be eligible to practice in the home care environment is 2 years of hospital experience. The questionnaire showed that 71% (N=145) of respondents felt a specific training in infection control in the home care environment would be useful.

The challenges of home care practice are addressed during initial nurse training, but not in any depth. 31% (N=63) of respondents reported having received specific training for the home care environment either during initial nurse training or for continued professional development.

A guide to hygiene for health professionals working in Primary care exists [7] but even of the nurses who reported having received specific training in home care nursing 60% did not know of the existence of this guide.

Independent home care nurses have access to financial aid in order to attend training. However, the demands of independent isolated practice are reported as being a major obstacle to nurses accessing training for continued professional development. At the present time in France the legal obligations concerning continued professional development of nurses remain difficult to enforce.

3.4 Hand Hygiene

The research showed there is a strong dependence on alcohol gel, 81% of respondents (168/206) reported that they use uniquely this method of hand hygiene. Whilst only 77% confirmed that they ensure the product is anti-viral. Alcohol gels are now widely available at a reduced price, in general retail outlets but not all products are anti-viral. Although this does not impact the control of multi resistant bacteria it does pose concern with regards to the transmission of viral pathogens including viral gastro-enteritis and seasonal influenza.

51% (106/205) of respondents conformed to the guidelines concerning nails (short and without varnish). However, 5 nurses admitted to wearing false nails, a practice which has

been shown to permit hand colonization and contribute to cross infection [8,9].
Jewellery is also a potential source of cross infection [10,11]; in this study only 37% (76/206) of respondents declared wearing no jewellery on the hands.
The use of gloves not only protects the health professional from potential contamination from biological fluids, it also reduces the risk of cross contamination between patients. Only 29% (59/202) of respondents reported that they use gloves systematically during nursing procedures.
Globally only 7 of 206 respondents (3.4%) satisfied all the recommendation concerning good hand hygiene.

3.5 Personal Protective Equipment

The standard precautions for Infection control practice include the use of personal protective equipment to protect the professional against exposure to aerosols, blood, saliva, or other bodily fluids that may carry infectious materials [1].

Table 3: The availability of personal protective equipment

	Yes	No	Not applicable
Single use gloves (N=203)	98%	1%	0%
Single use apron (N=181)	23%	*74%*	3%
Mask (N=196)	64%	*34%*	2%
Eye protection (N=177)	7%	86%	7%
Hard surface disinfectant (N=167)	29%	65%	6%
Sterile field (N=172)	64%	33%	3%

The results in table 3 show that despite the wide availability of single use gloves, some other items of personal protective equipment are not generally available to a large number of nurses. The lack of single use aprons (74%) is of specific concern with regards to the spread of Clostridium difficile in the elderly population [12]. It appears that nurses do have available the material (sterile field) or product (hard surface disinfectant) which will allows them to put in place a suitable environment in which to perform nursing procedures.
Whilst availability does not imply use, if personal protective equipment is not available then the nurse is not prepared to deal with potential risk.

3.6 Single use Disposable materials

The use of single use disposable equipment is recommended when this material is available as it allows a procedure to ensure maximum patient safety. However 50% (N=102) of the sample continue to use reusable materials which require disinfection. The nurses reported that single use materials are expensive and patients have difficulty in meeting the increasing costs of providing this material for their nursing care. The quality of surgical tweezers in standard dressing packs are poor and nurses reported using reusable equipment to maintain effective aseptic technique.
Of the 102 nurses still using reusable materials, 20% continue to use a dry heat sterilising process which has been proscribed in hospitals as it is ineffective. Primary healthcare

professionals have been strongly advised to avoid the use of this method, whilst legislation is in preparation to extend its ban to primary care [13].

3.7 Needle stick injuries

As the majority of home care nurses in France work independently no statistics were available for comparison with the study group as few declarations are made concerning the health professionals in this sector. Of the respondents 30% (62/205) declared having already suffered a needle stick injury, whilst only 24% (49/203) knew who they should contact. Only 27% (N=49) of the sample had a product available to disinfect a potential needle stick injury despite this procedure being a known practice in the hospital setting and essential in preventing contamination from potential blood borne pathogens[14].

3.8 Management and Disposal of clinical waste

The majority of respondents 96% (195/203) declared using the correct form of container for the disposal of sharps. However, 68% (138/203) admitted to disposing of other forms of clinical waste in the patient's general household rubbish. There is a significant difference in the attitude and practice of nurses towards the different types of clinical waste and how they are managed (see figure 2)

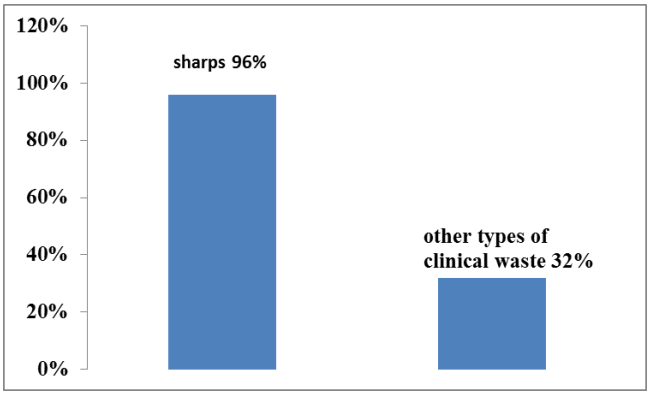

Figure 2: Compliance for Disposal of Clinical Waste ($p<0.05$)

Government regulation requires that certain conditions are met whilst awaiting disposal. Only 18 respondents in the sample group (8.7%) conformed to all the legal requirements for Clinical waste management [15]. This includes a contract with a certified company for the elimination of clinical waste (72%), disposable containers adapted for sharps and for the safe transport of other clinical waste and the delay (47%) and storage (57%) of waste awaiting collection.

3.9 Prescribing rights

The respondents reported that patients often leave hospital with an inadequate or inappropriate prescription for home care. In order to provide appropriate care the nurse is required to spend time contacting doctors in order to perform the nursing procedure. Whilst independent home care nurses do have limited prescribing rights [16] they reported that these rights do not take into account their needs with regards to effective wound management. Only 4.5% (N=9) of respondents felt that their prescribing rights allowed them sufficient flexibility to conform to effective infection control practices.
Products considered essential by the nurses for wound management are not included in the prescribing list. Certain nurses reported that they refuse to use their right of prescription in protest at the limits placed on this part of their practice.

3.10 Communication

In order to implement effective infection control practices it is important that the healthcare professional is informed of the patient's potential risk [1].There are no shared medical records in France so the home care nurse does not necessarily have access to the patients discharge summary to plan appropriate care. The law requires that a discharge summary be issued to the patient by the hospital practitioner within 8 days of discharge [17]. However, the patient is under no obligation to share the information contained in this document. For the year 2010, at national level, this document was issued for only 40% of hospital stays [17]. Even if this procedure was correctly implemented, caring for a patient for 8 days without knowing they are carrying a multi-resistant pathogen poses enormous risks both to the carer and to other patients in their care.
In this study only 1% of respondents confirmed that they always received a copy of the discharge summary, whilst 88% (176/201) reported not being informed even when a patient was infected or was a carrier of multi-resistant bacteria. Home care nurses frequently have only the doctor's prescription for care and no other information concerning the patient's condition.
When asked if they agreed that it was necessary to attain «the relevant information to assess the risk regarding their patient in order to plan care» only 9% replied that they agreed.

4 Limitations

With hindsight the addition of certain questions would have helped to better analyse the results. For example it would have been interesting to compare the differences between urban and rural practices, specifically in relation to the communication with other healthcare professionals. It would be interesting to compare these results with the results of a study of nurses employed by the 19 formal structures in the department using the same questionnaire:

- Is their practice affected by the availability, without personal cost, of personal protective equipment like gloves, masks and aprons?
- Does the management of this type of structure contribute to better communication between home care nurses and hospital staff?

- To compare the compliance of nurses working in these structures to recommendations for the safe disposal and storage of clinical waste management to the practice of self-employed nurses.

Concerning clinical waste, there was no notion of the quantity of waste produced asked for in the questionnaire which has an impact on the recommendations for the delay and storage awaiting collection. Neither did the questionnaire ask if the contract for waste included all forms of clinical waste or was just in relation to the disposal of sharps.

Local contacts (nursing board and union) reported that some nurses refused to reply to the questionnaire as they judged certain questions intrusive. In future questionnaires this may be addressed with the help of adding an extra anonymous layer whereby the questionnaire states that no information collected will be used against them or in connection with their practice or names.

Nurses with an interest for the subject were most likely to respond to the survey, as a result it could be considered that the results are positively biased towards best practice in the department. Furthermore it is assumed that the respondents answered truthfully which once again could lead to a positive bias. Another limitation is the potential failure in the postal system, which could have led to questionnaires being lost, future digitalization should help to control for this.

5 Conclusion

This study which collected data from 206 independent nurses in the department of Seine and Marne, France in 2012, identified certain difficulties in implementing infection control practice in the home care setting, concerning compliance with standard precautions and clinical waste management, and with regard to the quality of information received about the patient following hospital discharge.

This study allows the health authority to identify the key areas of concern with regards to the implementation of good infection control practices in the patient's home with the intention to improve the quality and safety of home care nursing:

- Access to continued professional development
- Cost and quality of single use materials
- Management of clinical waste
- Limited prescribing rights
- Poor communication between hospital and home care nurses

Nurses working outside the hospital environment have difficulty accessing continued professional development to update their practice. Isolated practice and the absence of peer pressure compounds these difficulties for independent nurses. Whilst there remains no means by which to enforce the legal requirements associated with professional development it is difficult to imagine an effective response to this problem.

A payment in relation to the nursing procedure leaves little financial scope to ensure good infection control practices. Personal protective equipment is not covered by the prescription and the cost of each item is at the nurses' charge.

Within the constraints of the present system of payment and structure of care, how could infection control practices be improved? One nurse suggested that dressing packs destined for infected wounds could contain the other necessary equipment (gown, mask, gloves) to undertake the dressing in safety. The other solution would be to expand the home care

nurses prescribing rights to include all products and materials necessary for good infection control practices.
Clinical waste management is a major problem and a sustainable solution needs to be found urgently, which encourages home care nurses to dispose of clinical waste in accordance with the legislation in place.
Certain actions are planned at a local level to improve communication between the health professionals in the department and improve the patient and professional safety. A departmental working group has been identified to refine a written nursing transmission which responds to the needs of home care nurses. This working group would help to encourage communication and the development of a team spirit between hospital and home care practitioners.
Most of the difficulties identified require an institutional response at National level. This response needs to value the place of home care nursing in a system which is attempting to change its central axe from hospital based care to primary healthcare in order to meet the demands of an aging population and the increase in chronic disease management. It is not appropriate to adapt other models of healthcare systems. France has an integrated public private financial model of home care which demands an individual solution.
The questionnaire was designed to be used as an auto-evaluation tool to assess evidence based practice in the home care environment. The hope is that the questionnaire could eventually be linked to an online training program, which enables home care nurses to identify risk and remain up to date in their practice.
Future studies are needed to compare home care nursing practice in relation to the working environment; rural versus urban, self-employed versus formal structure. Future studies on clinical waste management should include information on the quantities and type of waste produced in order to better understand compliance with regards to the legislation.

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