



MALMÖ HÖGSKOLA
Hälsa och samhälle

HYGIENE ROUTINES FOR NURSES WHEN TAKING BLOOD SAMPLES IN HIGH RISK AREAS

AN OBSERVATIONAL STUDY

ERIKA SJÖSTRÖM
KATARINA GARPENFELDT

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Sjöström, E & Garpenfeldt, K. Performance of hygiene routines when collecting blood samples. An observational study about how nurses follow basic hygiene routines when collecting blood specimen in areas with a high prevalence of infection diseases.

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Background: Healthcare related infections complicates the care of millions of people world wide every year and is shown more frequent in developing countries. How nurses follow basic hygiene routines has a great impact of the spreading of such infections. Collecting blood is an invasive procedure and even though it is a routine procedure for most nurses it can still be related to a great risk of exposure for both patient and performer.

Objective: To observe and describe how nurses follow hygiene routines when collecting blood samples in areas with high prevalence of infection diseases.

Methods: Empirically structured observational study with a qualitative approach, carried out in a hospital in Mpongwe district, Zambia. The result has been analyzed through manifest content analysis.

Result: Basic hygiene routines were often not followed when collecting blood specimen in the hospital who served as setting for this study. A majority of the nurses did not wash and disinfect hands in accordance with guidelines recognized by the hospital. Protective equipment was often not used, at all, or in a correct way even when available. The environment did not promote hygiene routines when collecting samples.

Conclusion: The result indicate a need for more financial means as well as more persistent education and campaigning regarding the importance of performing hygiene routines when collecting blood samples. This to promote a change in performance and attitudes among staff members regarding the importance of those routines.

Key terms: blood collection, blood samples, blood specimen, hygiene routines, nurse.

HYGIENRUTINER FÖR SJKSKÖTERS KOR VID BLODPROVSTAGNING I HÖGRISK OMRÅDEN

EN OBSERVATIONSSTUDIE

KATARINA GARPENFELDT
ERIKA SJÖSTRÖM

Garpenfeldt, K & Sjöström, E. Hygienrutiner för sjuksköterskor vid blodprovstagning i högrisk områden. En observationsstudie. *Examensarbete i omvårdnad, 15 högskolepoäng*. Malmö högskola: Hälsa och samhälle, Utbildningsområde omvårdnad, 2010.

Bakgrund: Sjukvårdsrelaterade infektioner komplicerar vården av miljontals patienter varje år och är mer frekventa i utvecklings länder. Hur sjuksköterskor arbetar med hygienrutiner har ett stort inflytande över spridningen av dessa sjukdomar. Att ta ett blodprov är en invasiv procedur och trots att det för många sjuksköterskor är rutin så kan det vara förenat med risker för patient och sjuksköterska.

Syfte: Att observera och beskriva hur sjuksköterskor utför hygien rutiner vid blodprovstagning i högrisk områden.

Metod: En empiriskt strukturerad observationsstudie med en kvantitativ ansats, genomförd på ett sjukhus i Mpongwe distriktet i Zambia. Resultatet har blivit analyserat med hjälp av manifest innehållsanalys.

Resultat: Sjuksköterskornas arbete med hygienrutiner vid blodprovstagning följde ofta inte från sjukhuset uttalade riktlinjer. Majoriteten av de observerade sjuksköterskorna tvättade och desinfekterade inte händerna enligt angiven procedur. Skyddsutrustning användes ofta inte alls eller på ett felaktigt sätt. Omständigheterna för arbete uppmuntrade inte till utförande av hygienrutiner.

Slutsats: Resultatet indikerar ett behov av mer finansiella medel såväl som mer utbildning och förespråkande för vikten av hygienrutiner vid blodprovstagning. Detta för en ökad förståelsen av värdet av dessa rutiner.

Nyckelord: Blodprov, blodtagning, hygienrutiner, sjuksköterska

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INTRODUCTION

After spending several weeks at the hospital in Mpongwe mission area the authors have made many reflections. Medical staffs working in Mpongwe district often face situations most likely not dealt with in most hospitals or clinics in more developed countries. They lack medicines, food, medical and other necessary equipment. Many patients are troubled by contagious infections diseases and the possibilities for isolation is very limited, often these patients just gets located close to a window. Most patients are in great need of a more developed nutrition. Hospitalized patients are more or less forced to bring a caretaker; a relative or friend who helps out with food, toilet habits and other daily activities. Most patients are located in rooms together with 15 other patients and their caretakers, which leaves very small possibilities for privacy. Hygiene facilities are shared between 32 patients and are located outside the wards.

The long distance patient's likely needs to travel often by foot or other uncomfortable transportations create great difficulties for patient in need of longer treatments to follow the treatment. As a result patients often remain in the hospital for several days or weeks without being in need of hospitalization or not showing on set appointments. This tear the hospitals already troubled financial situation and creates a risk for the patient to develop resistance to curtain treatments or to not get the treatment needed in time.

The hospital staffs makes their own disinfecting liquid and try to provide information about the importance of hand hygiene through written information on posters and billboards. Plenty of equipment and cloths are provided through the mission as gifts from for example Sweden. But the lack of educated staff, the most important medicines and proper nutrition are most likely the greatest problems.

When discussing Zambian guidelines for hygiene routines with nurses and other staff members at the hospital, it is said that guidelines are taught out in nursing school, but none of the nurses asked had any literature regarding the topic more then their own notes from lectures.

BACKGROUND

How healthcare professionals follow basic hygiene routines has a great impact on the spread of healthcare related infections. Collecting blood through vein puncture is an invasive procedure which leads to an even greater risk of exposure for patient and performer. The authors of this study chose to observe nurses performance of hygiene routines when collecting blood specimen in an area with a high prevalence of infections diseases for those two reasons.

Infectious diseases

Infectious diseases are a global health issue (Pittet et al, 2006). According to the homepage of Läkemedelsvärlden (2010-01-14), in many developing countries,

such as most countries in Africa, a large part of the population is troubled by different kinds of infections.

According to Pittet et al (2006), healthcare related infections complicate the care of millions of people every year in all countries. One of the most important steps in preventing the spread of infections is, for healthcare staff, to use basic hygiene routines such as hand hygiene and correct safety routines when handling blood or injections.

A great risk in processes involving invasive needle methods is the risk of transferring blood borne viral diseases (BBV), this due to a possible unsafe practice of needle, syringes, vaccines, suture-needles and more.

A study about injection safety done in two rural districts in north India showed a lack in correct and safe use of equipment when taking blood sample. The way nurses performed hygiene and safety routines left the patient and the nurse at risk of being exposed to BBV (Kermode et al, 2005).

There are certain factors increasing the risk of infections among hospitalized patients, for example underlying diseases, decreased immunity, and the use of invasive diagnostic methods (Pittet et al, 2006). Healthcare infections tend to be 2-20 times more frequent and serious in low-income countries (Morris, 2008), this due to for example the lack of water, basic facilities and malnutrition (Pittet et al, 2006)

In Zambia approximately 16 percent among the age group 15-49 years are infected with HIV or AIDS (Republic of Zambia, 2006) and the district of Mpongwe are a heavily malaria stricken area (Evangeliska frikyrkan, 2009).

According to Kermode (2004), the prevalence of healthcare related infection is most likely even higher in low-income countries than reported, the long incubation time for diseases as HIV and Hepatitis could make it difficult to associate the disease to a healthcare procedure done a long time ago.'

In developing countries baseline infrastructure often is severely deficient, patients room are lacking, water, soap and clean towels. Major achievements concerning hygiene routines have been shown through the use of locally produced alcohol hand-rub, alongside education, observation, monitoring, and feedback. These implementations are presented as a part of the World Health Organization (WHO) program "clean care is safer care" which shown an increase in performance of hand hygiene from eight to 21, 8 percent within a year (Morris, 2008).

Pittet et al (2006) also writes that the most effective methods for decreasing healthcare related infections are simple and widely recognized, for example hand hygiene and education of the staff members. The WHO program addresses some of the risk conditions for health-care associated infections as, blood products and their use, injection practice, clinical procedures, water safety, basic sanitation and waste management. According to guidelines recognized by the hospital in Mpongwe, basic hygiene related to blood collection should be performed in a way which assumes the need for clean water, good clinical procedures and equipment (Pittet et al, 2006).

The WHO program particularly focused on Africa as the first challenge, different countries within the continent were invited to develop national policies and raise

awareness around hygiene, especially related to handling blood products and the re-use of syringes and needles. In the second year of the program focus were set to promote hand hygiene and infection control (Morris, 2008).

Health Care in Zambia

The healthcare sector in Zambia is experiencing a human resource crisis, which is undermining capacity to provide basic health care services to the people. Currently, the sector is operating at 50 % of capacity, with nearly 45 % of the rural health centres run by unqualified healthcare workers. In some provinces such as the Northern Province, the doctor to population ratio is as high as 1:69,000 compared to the World Health Organization recommended ratio of 1:5,000 (Republic of Zambia, 2006)).

Mpongwe mission area

Swedish Baptist missionary Anton Johansson with family came to and started developing the mission area in 1931. The place that is now known as Mpongwe mission area was at that times nothing but bush. Mr Johansson had very limited medical skills but were tested in an unexpected way, he had done a short course for laymen in tropical medicine, now they brought him a man who was badly injured by a leopard, he treated him under a tree as best as he could and the man recovered. A thatch roofed hut was put up near the church building and for many years it served as a medical treatment building (MBA, 2005).

The hospital

The mission hospital in Mpongwe was official opened in 1978. It was founded partly by the government of Zambia (ministry of health) and partly by payments from a farm situated 12 km west of Mpongwe. The hospital now has 18 employed nurses, 1.5 physician and 4 clinical officers (MBA, 2005) called COs, which according to the homepage of AMREF (2010-01-10) has a three year medical education and can perform approximately 60-80% of physician tasks. The lack of educated staff is common in rural districts (Republic of Zambia 2006).

The hospital annually serves more than 35,000 patients. In 2006 the government prohibited the hospital to charge the patients, which markedly increased the number of patients and worsened the economic situation. The hospital is now, just like many rural hospitals in developing countries, dependent on financial support from other countries (Evangeliska frikyrkan 2009).

A capacity building project financed by SMR/SIDA was started 2007. Other sources of income are smaller governmental allowances and allowances from läkarmissionen and Bröd till Bröder- Ge för livet (Evangeliska Frikyrkan, 2009).

The hospital has a hundred beds in six different medical units. There is also an HIV/AIDS clinic at the hospital area where it is possible to have a voluntary HIV tests taken. The clinic provides medicines and counselling to patients by specialized staff. An important part of the work at Mpongwe Mission Hospital is primary care. There are health care teams who visit villages where they vaccinate, give medicine and educate the inhabitants (Evangeliska frikyrkan, 2009).

No written guidelines for basic hygiene routines used in Zambia were found, even after contact with centres of learning, doctors, nurses and executive managers of hospitals all over the country, the conclusion that there might not be any was drawn. To compensate for this in the study, a questionnaire (Appendix 1) based

on guidelines for basic hygiene routines used in Sweden was put together (SOSFS 2007:19), sent to and filled out by the nurse in charge at Mpongwe mission hospital, confirming which guidelines they use.

Collecting blood specimen

One can read on the homepage of nursing encyclopedia (2009-12-27) that even though obtaining blood specimens is a routine function for most nurses, it is a risky procedure. To increase safety, the performer should avoid using syringes and instead use vacuum tube blood-collection devices, preferably one with needle-stick prevention features. The use of a needle less system draws the blood directly into the container. The performer should not use the exposed needle to inject blood into specimen containers or vacuum tubes.

Blood specimens can be gathered through arteries, veins or capillaries. When collecting through vein puncture, blood is drawn from a vein to establish for example blood group, enzymes or electrolytes. Many institutions, hospitals and clinics establish local guidelines for specimen collection. Most blood samples are drawn through vein puncture. Analysis is done on full blood, plasma or serum. Blood should be drawn in to a vacuum container, it is off great important that the top off the container isn't removed because that may effect the vacuum and the blood sample (Björkman & Karlson, 2008).

If not being able to use a needle less system, one great risk for accidents such as stinging and blood containing when handling the needle is the procedure of putting the used needle back in the cap (Kermode, 2004). To reduce this risk as far as possible the performer should use the one hand grip which means that only one hand is used to get rid of the needle. A technique were both hands are used should be avoided (Björkman & Karlson, 2008).

The nurse is responsible for preparing the patient in a way consistent with guidelines. She is also responsible to make sure that correct sample is drawn from correct patient and that the samples as soon as possible are sent to a laboratory. When test results returns from the laboratory the nurse need to stay updated about possible changes and make sure that the physician is being informed when needed (Björkman & Karlson, 2008).

Hygiene routines when collecting blood specimen

When drawing blood, the health care professional should follow *universal precautions* set by the Centers for Disease Control and Prevention (CDC). Precautions reduce the risk of exposure of the performer and include the use of several different protective equipments, such as gloves, masks, gowns, and eyewear. Good hand washing practices before and after drawing blood also reduce the risk of exposure both for patient and the healthcare worker according to the homepage of nursing encyclopedia (2010-01-10).

Since collecting blood samples through vein puncture is an invasive procedure and according to Pittet et al (2006) a correct use of hygiene, related to invasive procedures and handling of blood is of great importance for not spreading infection diseases.

Below follows a summary of the most important hygiene and safety routines related to blood sample collection.

Hand hygiene

Transferring pathologic organism through hand contact is the most common way for health care staff to expose patients (Region Skåne 2006). Hand hygiene, which is very simple to maintain is the primary measure to reduce healthcare related infections. The lack of performing hand hygiene among healthcare staff worldwide is problematic (Pittet et al, 2006).

CDCs guidelines say that hands should be washed when visibly dirty, contaminated or visibly soiled with blood or other body fluids. Hands should be washed with soap and water. If they are not visibly soiled, an alcohol-based hand rub should be used for disinfection in all clinical situations or be washed with an antimicrobial soap and water (Boyce et al, 2002).

Hands should be disinfected before having direct contact with patients, before putting on sterile gloves when inserting a central intravascular catheter, before inserting peripheral vascular catheters, or other invasive devices that do not require a surgical procedure. Also Disinfect hands after contact with a patient's intact skin (when taking a pulse or blood pressure or lifting a patient), after contact with body fluids or excretions, mucous membranes, non intact skin, and wound dressings if hands are not visibly soiled and if moving from a contaminated-body site to a clean-body site during patient care. Use disinfection after contact with objects such as medical equipment in the direct surroundings of a patient and also disinfect hands after removing gloves (Boyce et al, 2002).

Before eating and after using a restroom, hands should be washed with soap and water also if suspected or known exposure to *Bacillus anthracis*. Washing hands related to this is recommended because most antiseptic liquids are not fully effective against those bacteria. No recommendations are made regarding the use of *non* alcohol-based liquids for hand hygiene in health-care settings because it is still an unresolved issue (Boyce et al, 2002).

According to CDC guidelines the procedure when decontaminating hands with an disinfections liquid is to apply liquid to the palm of one hand and rub hands together, make sure to cover the whole hands and fingers and continue until they are dry, the manufacturer's recommendations regarding suitable volume should be followed.

When washing hands with soap and water, they should be wetted before applying soap, followed by a minimum 15 seconds rubbing to cover all surfaces of the hands and fingers, rinse and dry with a throwaway towel and use the towel to turn the water off, multiple-use cloth towels are not recommended for use in health-care settings. Avoid using hot water since repeated exposure to hot water can increase the risk of dermatitis.

Different forms of plain soap are acceptable when washing hands with a non-antimicrobial soap and water. To improve hand-hygiene performance among staff members an alcohol-based hand rub should be available at the entrance to the patient's room or bedside, in other locations were easily accessed, pocket-sized containers can be carried around (Boyce et al, 2002).

Recommendation are yet to be made regarding presence of jewelries in health-care setting, but several studies shows that the skin underneath rings collect more

bacteria then skin elsewhere. Further studies are needed to know for certain if wearing jewelry contributes to spreading infections or not. Healthcare staff should not wear artificial fingernails or extenders when having direct contact with patients at high risk (in intensive-care units or operating rooms). Nails should be kept natural with a tips less than 1/4-inch long. Freshly painted nails do not increase the number of bacteria but chipped one likely do. It is not clear whether or not artificial nails contribute to the transmission of bacteria or not, however staff members wearing them are more like carry gram negative pathogens on their fingertips, even after careful hand washing. Even the length of nails is discussed, and not certain whether it has an effect or not, most bacteria is collected under the first 1 mm of the nail close to the finger (Boyce et al, 2002).

Education and hand washing promotion can lead to more than a 50 percent reduction of disease burden (Pittet et al, 2006). Healthcare workers in low-income countries can be professionally and geographically isolated. Limited access to education and other resources can make it difficult to learn and stay updated about injection safety (Kermode, 2004). It is important to educate staff members about the types of patient-care activities that can result in hand contamination and the advantages and disadvantages of various methods used to clean their hands (Boyce et al, 2002).

Working clothes

To be able to use correct hand hygiene routines, all staff member should use short sleeved working cloths. Working clothes should only be used in working areas and changed on daily bases if being wet or visible dirty (Region Skåne, 2006).

Protective equipment and environment

One needle stick injury from a needle used on an infected patient carries the average risk of transmitting HBV, HCV and HIV with approximately 30 percent. In the year 2000, contaminated syringes caused 21,7 million hepatitis B infections, 2 million hepatitis C infections, and 260 000 HIV infections. The WHO guidelines for injection safety strategies promote to implement national guidelines for safe and appropriate use and access to high quality injection equipment. They also include; promotion of optimal hand hygiene at time of injection and actions for disposal sharps to be able to get wasted in a correct way (WHO injection safety, 1999).

Water, basic sanitation and waste management are needed to create a safe environment when delivering healthcare. Clean water is a must to prevent from spreading infections of different kinds, water quality and cleanliness are also required to ensure effective hand washing during patient care.

The possibility to safe disposal of waste such as syringes, needles and body fluids are as mentioned essential to protect the healthcare staff and the community from infections (Pittet et al, 2006). Also Kermode (2004) discuss the importance of availability to access of clean water and electricity, claiming them to be necessary for healthcare workers being able to maintain correct hygiene and safety routines.

CDC recommend healthcare workers to wear gloves to for one, reduce the risk of transferring infections from patients to staff member, second to prevent the healthcare workers flora to transfer to the patient and third to not transfer bacteria from one patient to an other. Health care workers should wear gloves when

contact with blood or other potentially infectious materials, mucous membranes, and non intact skin could occur (Boyce et al, 2002).

Gloves should be removed directly after caring for a patient. The same pair of gloves should not be used for the care of more than one patient, never to be washed and re-used, they should be changed during patient care if alternating work with a contaminated body site and a clean body site (Boyce et al, 2002).

Kermode (2004) writes that an unsafe practice related to injections (such as vaccines or blood collection) often is performed in low-income countries. An unsafe handling of injections includes for example: recapping needles, not discarding needle immediately after and at the place of use, leaving the contaminated sharps to be disposed of someone other than the user and separating the needle from the syringe prior to disposal.

It is important to be able to work with good lightning and in a comfortable position when collecting blood. The skin of the patient should be cleaned and left to dry if the skin is wet there is a risk for a hemolytic process (Björkman & Karlson 2008).

AIM OF THE STUDY

To observe the nurses' routines in basic hygiene when taking blood samples in a country with a high prevalence of infection diseases.

Definitions

Below follows a definition of the terms basic hygiene routines and infections diseases as they have been referred to within this study.

Basic hygiene routines: are defined by information gathered from SOSFS 2007:19, which consist of the 11 points who serve as foundation for the checklist (**appendix 2**) used in this study.

Infections diseases: are according to the homepage of WHO, (2010-01-20) caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi and can be spread through direct or indirect contact with a diseased person.

METHOD

In this study observations were made and analyzed through a qualitative approach based on Burnards (1991) content analyze.

Design

The design chosen for this study is observational, according to Polit & Beck (2006), the field of nursing is well suited to observational research and the method is applicable in many health care studies. Observations are especially adaptable

when gathering data about behaviours, but can also be used for information about attitudes, status, and communication. The method gives the observer an opportunity to study both verbal and non verbal communication. Furthermore, observational methods can provide information of great depth and variety. In the study of behaviour, there are advantages in using observation as a method instead of interviews because the data are not dependent on the memories of participants (Hartman, 2006).

Polit & Beck (2006) writes that the largest shortcoming of the observational approach is the vulnerability of observations to bias. Factors that can interfere with objective observations are, for example, emotions, prejudices and values of the observer. Other sources of bias include personal interest and commitment, observer's affect and seeing what the observer wants to see. Another possible shortcoming could be the *Hawthorne effect*, which results from subjects' awareness that they are participating in a study.

In a qualitative study the observer can be open or hidden (Polit & Beck, 2006).

Open observations refers to the participants being informed about what is observed and that observers are visible. This study was performed by open observations using *multiple positioning*, such as different wards and in the outpatient clinic connected to the hospital.

Hartman (2006) explains multiple positions as when the observations take place in different settings.

According to Mulhall (2003) there is a difference between *structured* and *unstructured observations*. Which of these methods to choose depends on the research question and the underlying paradigm of each study. In this study structured observations was performed, meaning that the researcher used a check list in order to document physical and verbal behaviour. The authors were completely objective and did not play any part in the activity that was being observed. Polit & Beck (2006) refers to this as to attend a complete outside perspective.

The field notes can be categorized according to their purpose. *Descriptive notes* consist of objective descriptions of events and conversations. To get a complete picture of the observation, notes must include a description of the time and place where the observation takes place and description of the persons being observed (a a).

Since the observations in this study were based on prewritten guidelines and the author's field notes consisted of objective descriptions of events, it was most suitable to work with descriptive notes. During the observation moment, two types of field notes were used, the pre written checklist and a list of guideline questions with the possibility to write open reflections (appendix 2). The field notes were recorded by *paper- and- pen methods* (Polit & Beck, 2006).

The check list (appendix 2) is an instrument used to record observed phenomena. It is designed as a list of actions on the left and space for tallying their frequency on the right. Categories of behaviours' that may or may not be demonstrated by participants are listed. This system is called *non exhaustive system* (a a).

Beyond the field notes and the check list, the authors wrote reflective notes after each observation. These consisted of theoretical reflections concerning the theory behind the study as well as personal notes.

Because no written guidelines for hygiene routines in Zambia were found, it was compensated with the questionnaire (Appendix 1) based on guidelines for basic hygiene routines used in Sweden (SOSFS 2007:19). The questionnaire was sent to Mpongwe Mission Hospital. The nurse in charge answered the yes or no questions and was invited to write as many comments as she wished. She was also asked to add information about hygiene routines that were used in this hospital that were not listed in our questionnaire. Using information from the questionnaire, the list of actions which resulted in the structured checklist was developed.

According to Granskär & Höglund (2008), in studies that have a quantitative approach the researcher strives for attending a complete outside perspective but in a qualitative approach the researcher combines closeness with distance. To keep distance in a qualitative study it is suitable to use structured checklists and non participant observations where the researchers make themselves as invisible as possible not to interfere with the actions taking place.

To be able to maintain the aim of keeping distance in this qualitative study, the authors were located in a place that did not draw too much attention to it. This location helped avoiding that the observations interfered with the nurse or patient behaviour. The use of a structured checklist also increased the distance in this study.

Collection of data

A search for literature was done in order to establish what is known about the subject and what the results of earlier research have shown. The database PubMed was used when searching for scientific articles. The research was limited to articles that were found in full text through Malmö University. As a complement other sources of information such as literature related to Malmö University nursing program, papers found through MUEP and other information sources on the internet was being used.

The data was gathered through *event sampling*, which according to Polit & Beck (2006) means that the observers will be in the area on agreed time and will observe integral behaviours or events taking place in that area. Event sampling requires researchers to either have knowledge about the occurrence of events or to be in a position to wait for their occurrence.

The authors did a briefing of the topics in the check list before the observations started in order to observe on the same basis. The briefing also included a discussion about the support questions for the field notes. To gather sufficient data, the observations were conducted during the nurses' regular working hours. The focus was on blood sampling only in order to make the data as reliable as possible.

A *pilot study*, a trial run of the major study (Polit & Beck, 2006), was done in order to make smaller adjustments and improvements in the method, including the organization and the structure of the free notes. The decision not to include the pilot study was made.

Selection

The recruitment of the nurses was done at the morning meeting each day which gave the opportunity to make a plan for the study according to the nurses' work schedule. We observed the nurses that were going to draw blood during that day.

The inclusion criterion for participation in the study was to be a nurses working at the hospital. Both male and female nurses with any amount of experience were included. According to Granheim & Lundman (2003), choosing participants with various levels of experience increases the possibility of shedding light on the research question from a variety of aspects.

Everyone that fitted those criteria's had the same opportunity to participate in the study. When the same nurse had been observed five times, he or she was excluded from further participation.

Daily observations during 6 weeks were conducted, which resulted in 23 observations. They were done the same day the blood sample was taken. The decision about the exact hour or place/unit for observation was based on the daily schedule presented in the morning report meeting. The nurses' work load and schedules were always considered.

Trustworthiness

According to Poilt & Beck (2006) when discussing the term trustworthiness one should consider following; *Credibility*, refers to the believability of the data, confidence in the truth of the data and interpretation. *Dependability*, data stability over time and over condition. This can be received through stepwise replication which means to handling data separately, this achieves two independent inquires through which data and conclusions can be compared. *Confirmability*, objectivity, neutrality of the data, the potential for congruence between several independent people about the data currency, relevance or meaning. *Transferability*, the extend to which the data can be transferred over to other groups or sites. This can be extend by discussing the result with practitioners from other settings, who confirm the accuracy.

Credibility

Credibility can be increased through *triangulation*, *peerdebriefing* and *member checks*. Triangulation can be achieved through the use of more then one observer, In this study there were always two observer at every observation occasion, which is referred to as *investigator triangulation* and is used to overcome the bias that come from single observer studies. Triangulation helps to capture a more complete and contextualized view of what is being studied and to overcome the intrinsic bias that comes from, for example, single observer studies (Polit & Beck, 2006). Also by handing the material over to a college (Dr Goine) for discussion about the analysis process the studies trustworthiness was further increased according to Polit & Beck (2006).

Dependability

In this study stepwise replication were used to increase dependability. The two researchers read through the data of the observations and made marginal notes for coding, codes were then compared and revised until agreement was reached. Once

coding was completed a college at the hospital (Dr Goine) reviewed the in tired outcome of all observations and validated the findings with the two researchers.

Confirmability

The largest shortcoming of the observational approach is the vulnerability of observations to bias. Factors that can interfere with objective observations are, for example, emotions, prejudices and values of the observer (Polit & Beck, 2006). Other sources of bias include personal interest and commitment, observer's affect and seeing what the observer wants to see.

In this study a prewritten checklist and field notes based on the hospitals own guidelines according to the nurse in charge were used. Since it was not possible for the authors to choose another perspective then the one chosen before starting the observation and this was based on the hospitals own hygiene instructions and not our opinions, the risk for observation bias such as prejudice or emotions were minimized.

Transferability

A way to increase transferability is to hand the result over to practitioners with experience from other sites (Polit & Beck, 2006). The authors showed the findings to practitioners (Dr Goine, Sister Erna) who had been working on a number of different sites in both developing countries and in western communities; they perceived the result as congruent with their previous practice experience. Another way to increase transferability is the importance of describing the setting, in other words describing the environment and surroundings where the data was collected. In this study this information is described under the headline method and in the introduction.

Analysis of the research data

The gathered data was analyzed through Burnard's (1991) method description of *content analysis*. In this method the most important parts in the text are identified, and all the data that are not necessary for the result of the study will be put aside in order to find the source of the message. The purpose is to put together a systematic list of themes and issues found in the collected data and to put this in categories.

According to Granskär & Höglund (2008), content analysis is suitable when working with a quantitative as well as in a qualitative approach. In a quantitative approach it's used to quantifying and analyzing frequencies. A qualitative approach focuses on behaviour and is often used in healthcare science in order to describe differences and similarities in a text, for example, diaries, journals or observation documents. The differences and similarities are shown in themes and categories at different levels.

Since the aim of this study was to observe the nurses' routines in basic hygiene when taking blood samples in a country with a high prevalence of infection diseases, the behaviour of the participants was in focus and therefore the authors found a qualitative approach being suitable. The result was divided into four broader categories containing subheadings.

Granheim & Lundman (2003), state that *content area* can be used to highlight specific parts of the content. A content area can be a part of a text that refers to a

specific topic in an observation guide. The term *unit of analysis* should be used when referring to whole interviews or observation protocols.

The authors highlighted four different content areas, referred to as categories. Unit analysis contains all data collected regarding one observation.

Granskär & Höglund (2008), states that *meaning units* are parts of the text that belongs to each other through its content, this could be words as well as whole sentences. A *code* is a way to shortly describe the content of the meaning units. When the code is created it is of great importance that the context of the text is intact. Interpretation of a text therefore assumes that the researchers have knowledge about the context in which the study is taken place, for example the living conditions of the participants.

The authors coded the meaning units, creating subheadings. The subheadings were then grouped into the four categories. In the methodological approach of the data analysis the researchers used an *inductive method*. Granskär & Höglund (2008) refers to an inductive method as when the researcher is open minded during the analysis of the text.

The analysis process based on Burnard (1991)

Burnard (1991) describes the analysis process in 14 steps, the analysis of collected data was done with this 14 steps as base. Below follows the authors analyze process.

1. After each observation day notes were made regarding the specific observation performed during that day. The notes include the researcher's memos which were made to structure the material when the observation was still fresh in mind. The notes were also used to record over all reflections about the data and experiences that day.
2. All transcripts were read through by both researchers. Notes were made to divide the material in to content areas, creating general categories.
3. Transcripts are read through again; as many codes as necessary are written down to describe all aspects of the content in meaning units. Unusable fillers, explained as issues unrelated to the topic, were excluded but marked in order to be able to go back and look through them again. The codes were then transformed into subheadings which accounted almost all the data, this process is known as coding.
4. The list of subheadings was looked through to find the ones similar and group them together to broader categories.
5. The new list were looked through again to possible reduced the number of categories even more, after consideration the authors (ES, KG) agreed to keep the all of the four created categories which were considered internal homogenous and external heterogeneous and easily separated from each other, but still covering all relevant data.
6. To increase the validity of the study the gathered material were handed over to Dr Goine who was a college at the hospital which served as the setting for the study and to the mentor at the author's home university. The notes were worked through independently without seeing the researchers list of subheadings and categories. The list of categories was then discussed, and an agreement about previous chosen categories was reached.
7. Transcripts were reread alongside with chosen subheadings and categories to make sure that they cover all relevant material.

8. Each unit of analysis was worked through and compared to the list of categories and subheadings, and coded according to this list. Each category were given a colour, the part of the unit were marked with the colour of its category using highlight pens.
9. Each coded section of the observation was cut out and all items of each code were collected together. This method was used in order to make sure that the context of the coded section was maintained.
10. Data was worked through in a computer, copy and paste were used to cut the material in to another document and the original work was saved.
11. The authors chose not to make the participants go through the material to increase validity since it was worked through with colleges and mentor.
12. All of the sections were filed together and copies of all observation field notes were saved. If anything during the process seemed unclear it was then possible to go back to the original material.
13. Once all the sections were together, the writing process begun section by section. During this process the original data were kept close for the possibility to go back to the source.
14. The authors of this study chose not to link the data examples to literature, instead the link between findings and literature were made in the discussion.

Information and approval

In order to *gain entree* to the site (Polit & Beck, 2006), preliminary contacts with key actors in the site were made to ensure cooperation and access to participants. This was done during the morning meetings held during the first week at Mpongwe Mission Hospital.

At the meeting the nurses were informed verbally about the study. The authors presented the aim of the study, the methods, eventual consequences and risks with the study. The nurses were informed that Malmo University is the research sponsor and that students are doing the study for learning purpose only.

Written information was handed out together with an approval form for all attendants (Appendix 4 & 5). If the nurses decided that they wanted to participate in the study during this meeting, they could fill in the approval form then, but they still had the opportunity to fill it in later if they wished to consider it.

The nurses were informed that the participation was voluntary, that confidentiality was guaranteed and that they could stop their participation in the study at any time. There was time left for the nurses to ask questions about the study, and they were told that if they came to think about anything later, they were free to make contact by mail or phone.

Gaining entree typically involves negotiations with *gatekeepers* who have the authority to give researchers access to the area they intend to investigate (Polit & Beck, 2006). The authors mentor, Mr. Tuesday Musaka, is the director of the hospital. He and the nurse in charge, Jane Titina, were the gatekeepers, who gave information about the appropriate time to inform the staff about the study.

Ethical considerations

According to Polit & Beck (2006), research should be practiced with concern about the ethical principles of goodness, autonomy and justice. The researcher should consider the eventual risks within the study in proportion to expected gain.

The collected data in this study was handled confidentially which means that no personal data was used, nor was information that can lead the reader to the persons that participated in the study presented in the reports (Polit & Beck). When presenting the results, all identities are unspecified; the observations were coded with numbers. The nurses participated voluntarily by informed consent, they received written and oral information about the aim and the methods of the study. They were given the opportunity to, at any time stop their participation in the study. Consent from the participants were obtained orally and written from the nurse in charge. Observations of events or behaviours that were not of importance for the study were handled with professional secrecy and not included in the study report.

In observational studies there is always a risk that the persons who are being observed feel uncomfortable, and, in the worst case scenario, it can bother them in their work. This can result in lower quality of the care given to the patient. On the other hand, the care can improve significantly during observation. To avoid these kinds of issues, and to show respect to the patients, the authors tried to be as discrete as possible (Polit & Beck, 2006).

According to Sile (2006) almost everyone working in healthcare is well aware that hygiene is a very important issue. It is possible that the nurses may felt criticized by the result in the study. It is also possible that the nurses may felt like this during the observations. To avoid this, the nurses was made very clear with the fact that this study was for learning purpose only and that no one was going to receive any kind of criticism of their behaviour.

Ethical permission

Permission for the implementation of the study has was given by Tuesday Musaka and by the local ethical rights to appeal at Health and society, Malmö University (appendix 8). Diarie number: HS 60-09/139:9

RESULT

Ten nurses participated in the study, two men and eight women. Nurses from all wards, within different age groups and with different experience were observed.

The field notes and checklist were coded and divided into five categories, those categories and subheadings are presented in table 1. Information gathered through the checklist are presented first in numbers, then in text together with relevant field notes data under related category.

Table 1. Created categories and related subheadings.

Category	Subheading
Hand hygiene	<i>Washing and disinfecting, Jewelleries and nail polish</i>
Working clothes	<i>Availability and correct use of outfit, Presence of private clothes</i>
Protective equipment	<i>Correct use of gloves, needles Correct use of waste bin for bio hazard material Correct use of aprons Correct use of other equipment used for hygiene procedures. Possibility to use and the availability of material for hygiene routines.</i>
Environment	<i>Working load and possibility to maintain a correct working position. Working situation. Is the nurse or patient stressed?</i>

Table 2. Result from information gathered through the checklist.

	Yes	No	Not possible to obs	Total
Clothes used at work have short sleeves.	9	14		23
Clothes used at work are being changed daily or in case of need, more often.		10	13	23
Hands and lower arms are free from watches and jewellery.	18	5		23
Hands are disinfected with an alcohol based disinfection liquid made for hands or any other disinfection with corresponding effect, immediately before and after every physical contact with the patient.		23		23
Hands are disinfected both before and after use of plastic gloves?	1	22		23
Hands are, if they are dirty, washed with water and liquid soap before being disinfected?	1	22		23
Hands that have been washed are dried before being disinfected.	1	22		23
Throwaway apron are made of plastic or a overall are used if there is any risk that the clothes will get in contact with body liquids or any other biological material.		23		23
Protective throwaway gloves are being used in case of contact with, or risk of contact with body liquids or any other biological material.	21	2		23

Hand hygiene

This category includes the subheadings; washing and disinfecting, jewellery and nail polish. According to the checklist only one of the observed nurses washed and dried hands before disinfecting, 22 did not. None of the nurses disinfected their hands both before and after collecting samples. Number of nurses wearing jewellery or nail polish was five against 18 who did not.

Washing and disinfecting

Most nurses did not wash their hands before using antiseptic hand gel but it was not always possible for the observers to note if hands were visible dirty and in need of washing. In some places such as the outpatient clinic and in the lab, water and soap were easily accessed and written information about the importance of washing hands to prevent the spread of infections were given through posters on a billboard. Non of the wards who served as setting for observation had access to water, but it was not consistent that the nurses who could access water and soap washed their hands either,

“The nurse came into the room and without washing or disinfecting started to draw blood from the patient, this even though water and disinfecting gel were located within one meter reach“ (observation nr 7)

“The one nurse who washed and dried hands before disinfecting worked in a setting where water, soap and disinfecting gel were very easily accessed” (observation nr 21).

On some occasions clean hands were dried on unclean working cloths and touching objects like money or work papers were not uncommon after washing and disinfection but before handling the patient.

“the nurse washed and dried her hands carefully when arriving in the morning but handled money and other unclean materials and without disinfecting went on to work with the patient” (observation nr 3)

“On one occasion the observed nurse mentioned that she was supposed to wash her hands but that there was no access to water” (observation nr 6).

Several of the observed nurses had bottles with disinfecting hand gel attached to their working cloths but did not use it most of the time. Even though none of the participants disinfected their hands both before and after working with a patient and only one of the observed nurses disinfected hands both before and after using gloves, it was not uncommon that disinfected gel was used before OR after.

Jewellery and nail polish

Watches and jewellery were not common among the observed nurses. On some occasions bracelets were noted, and several of the nurses were wearing nail polish, some were very well contained while others were partly fallen off.

“The nurse wear nail polish which partly had fallen off, no fake or long nails were observed” (observation nr 17).

Working clothes

Availability and correct use of outfit, presence of private clothes are the subheadings discussed in this category.

The result from the checklist shows that 9 out of 23 observed nurses were working with short sleeved tops. 10 were wearing clothes that obviously not were changed on daily basis, on 13 occasions it was not possible to tell if changed daily or not.

Presence of private clothes

Presence of working clothes Were common,

“For example wool sweaters or sleeveless jackets were worn” (observations nr 2, 8 and 16), sometime combined with the working outfit and some in private cloths only.

“The nurse observed when working with patients in isolation care did wear private cloths only” (observation nr 8).

Availability and correct use of outfit

Sometimes “lab” coats were put on before some working procedures. The coats were used by anyone working in the hospital and in need of it, it was left on the hospital after being used and they were often very dirty and obviously not washed

on daily basis. There is no homogenous working outfit which makes it hard to see if they are dirty.

“Most staff members worked in different cloths, some in white, some in dark blue” (observation nr 2),

Protective equipment

The subheading discussed in this category are; correct use of gloves, needles, waste bin for bio hazard material, aprons and other equipment used for hygiene procedures. Possibility to use and the availability of material for hygiene routines. None of the observed nurses were using a through away apron when risking to get in contact with body fluids or any other biological material. 21 out of 23 nurses used gloves when preceding a risk activity such as mention above. Four nurses removed their gloves directly after the activity and 19 did not.

Correct use of gloves

The same set of gloves could be used to several patients when performing activities which included handling blood, needles or other body fluids.

“One of the nurses kept the gloves, left the room, did other work tasks, rubbed her eye and then move on to handling the next patient, with the same gloves, this patient were known or suspected HIV and Hepatitis positive” (observation nr 7).

It was noted on several occasions.

“That the nurse kept one glove after sample collection to transport the blood container to the lab“ (observation nr 6)

“Two different nurses performed hygiene routine when arriving in the morning, putting on gloves but then using them as if they were a part of the working cloths outfit, handling patients the whole morning wearing the same gloves” (observations nr 10 and 14).

Correct use of needles

When drawing blood a needle and a syringe were used, to get the blood in to the blood vacuum container, the nurse needed to either take the cap of the container or push the needle through the vacuum container membrane.

“The observed nurse was the only one observed using a vacutainer“ (observation nr 22 & 23).

The one hand grip when putting the cap back on the needle were observed,

“But most often a two hand grip were used or the nurse walked around with the contaminated needle unprotected until throwing it away” (observation nr 6).

The blood container was often left in the patient’s bed or in other random places at the hospital.

“the nurses left the needle in the patients arm when leaving to do something ells, when taking it out she wiped of the bloody needle on the cotton the patient received to press against the arm“ (observation nr 19).

Correct use of waste bin

A waste bin for bio hazard material were used in all 23 observation occasions and fairly easily accessed and relocated but most often put in the reception. None of the observed nurses brought the waste bin to the patient when collecting blood samples, which led to

“The nurse as mentioned needed to either put the cap back on or walk around with an unprotected needle“(observation nr 6).

How the small biohazard waste bins were disposed after being filled up were not noticed.

Correct use of aprons

Several of the nurses used cotton aprons as a part of their working outfit, these were not changed before and after unclean working procedures. Throw away aprons were not used in any of the 23 observations or noticed anywhere in the hospital. In some places such as the outpatient clinic plastic reusable rubber aprons were noticed but never used during any observation.

Correct use of other equipment for basic hygiene routines

Other equipment and procedures used and observed as a part of hygiene routines when collecting blood samples were the cleaning of the patients' skin with antiseptic liquid and the handling of sterile packed material.

The patients skin were cleaned with antiseptic liquid before taking a sample during al 23 observations, but often not in a way consistent with literature.

“The skin was not left to dry or the nurse touched the skin again after cleaning and before drawing blood“ (observation nr 6).

The nurse often rubbed the skin of the patient hard back and fourth several times.

“the nurse cleans the patients skin very carefully, rubbing many times” (observation nr 3).

The cotton used for cleaning patients' skin before puncture was often stored in an unclean way. Material packed in sterile packages was at al times unpacked by the patients' bed and handled in a correct way.

Availability to material used for basic hygiene routines

Most of the time the material needed for the blood sample procedure was located in the “reception” or in a related room. Most nurses collected material in the reception before going to the patients' bed.

“The material was gathered in the reception and brought to the patients' bed, sterile material was unpacked and gloves put on bedside” (observation nr 6)

There were only two large rooms in every ward and no gloves, hand gel or other material were kept among the patients. Sterile or clean material was almost always unpacked bedside. Gloves were most often not hard to access.

Environment

The environment observed in this study is the environment where the observations took place, for example bedside the patient, in the outpatient clinic or in the lab. Components observed are presented as the subheadings for this category and includes; Working load and possibility to maintain a correct working position, lightning and working situation. As well as if the nurse or patient stressed? The information regarding environment were gathered through the field notes since it was not a part of the checklist.

Working load, possibility to maintain a correct working position

The environment varied a lot between the wards,

“in some the working load were heavy and the possibility to maintain correct working position or good lightening were very small” (observation nr 18 and19).

The nurses were most of the time sitting in the patients' beds or standing when drawing blood. In others like the outpatient clinic

“the conditions were often better concerning possibilities to sit in correct working position and work with good light, but the work load were often very intense, and stressful” (observation nr 23, 24).

In some of the observed situations the nurse should have been able to influence the situation, by for example bring a chair instead of sitting in the patients' bed or standing in a un correct position when drawing blood, this was not done even if the working situation seemed rather unstressed.

Working situation

Since up to 16 patients were sharing room, there were just a few smaller rooms. Each patient has a caretaker who stays with them during hospitalization which makes it even more crowded. The caretaker is close to necessary for the patients who stays hospitalized to receive support in daily activities. The observers noticed on more then one occasion

“that a caretaker loosen rubber band tied around the patients arm when the nurse was drawing blood, even if this was not asked for, during this observation the patient were located on a chair in the reception“ (observation nr 17).

Is the nurse or patient stressed?

Due to the variety of work load between the different wards the nurses were more stressed in some then others. In the outpatient clinic there were often many patient waiting and the observed nurse

“Were acting very stressed“ (In observation nr 14)

“The nurse comment that she felt stressed even with few patients in the ward“ (observation nr 6).

At times the nurse acted very calm even when the patient was stressed or in pain,

“The patient is very scared and worried but the nurse did not showed any signs of being effected“ (observation nr 2).

DISCUSSION

Below the result and the used method will be discussed.

Result discussion

After intense and result less work to find written Zambian guidelines for hygiene routines when collecting blood the conclusion were made that they don't exist or is not available. When asking nurses educated in the country it was said that guidelines mostly are taught out in lectures.

To compensate for this and to be able to discuss the found result the authors discussed hygiene routines based on international CDC guidelines, publishes scientific literature (Pittet et al, 2006), SOSFS 2007:19 and literature used in the nursing program from Malmö University, Björkman & Karlson (2008), Region Skåne, (2006).

This is not to make a comparison between countries. That the information from scientific literature about hygiene routines when collecting blood samples should be able to transfer to the Zambian hospital environment was assumed because the checklist based on Swedish guidelines together with a request to be viewed and filled out were send to, filled out and confirmed by the nurse in charge at Mpongwe mission hospital.

Hand hygiene

Lack of performing hand hygiene among healthcare staff is a global problem (Pittet et al, 2006) this is also an observed issue at Mpongwe mission hospital.

As in other developing countries (Morris, 2008) patients room/wards at Mpongwe hospital were lacking, water, soap and clean towels. None of the wards had easy access to water. Without access to water with good quality it seem very hard for healthcare staff to be able to maintain good and safe basic hygiene routines. Disinfection liquid is made by staff at the hospital, and seemed to be easily accessed. The recipe was accessible to everyone and put up in the lab. Since the hospital often were out of stock with medications and other equipment it is not curtain that ingredients always were available.

According to Morris (2008) great result relating increased performing of hand hygiene has been seen in hospitals in other developing countries when starting to produce local disinfecting gel. At Mpongwe mission hospital It often seemed like the nurse knew that she should use disinfecting liquid but not always why. The access to locally produced hand gel needs to be combined with education, campaigning, observations, monitoring, and feedback for a positive result (Pittet et al, 2006). Several of the observed nurses in this study had a bottle of disinfection gel attached to their working outfit but did not use it, this could be a result of accessibility to disinfecting gel but lack of education, feedback and more.

Since information and reminders about hand hygiene were located only in the outpatient clinic, it is not clear what information and reminder the rest of the staff

had access to. Even in the lab and outpatient clinic where information, disinfecting liquid and water were easily accessed the performing of washing and disinfecting were very poor. Several of the observed nurses did an attempt to work with hygiene routines but did often not do it in an correct way for example did they washed and disinfected hands but performed other unclean tasks before collecting the blood sample from the patient, were international guidelines (Boyce et al, 2002) addresses the importance of disinfect hand directly before contact with the patient.

It seemed like there was an overall lack of understanding how to perform as well as the importance of performing hand hygiene when collecting blood samples.

The fact that it was rare with watches and jewellery among the participants could possibly be explained through lack of private financial possibilities to own such things. It may also indicate that successful education and reminders regarding this field has been preceded from the hospital board and management.

According to the literature (Boyce et al, 2002) nail polish or fake nails may increase to risk of transferring bacteria, but in the checklist filled out by the hospital in Mpongwe the acceptance of nail polish was not discussed, therefore it is not known if this is a guideline to be followed by the staff at this hospital or not. Boyce et al (2002) do write that nail polish partly fallen off do collect more bacteria, this type of polish were observed on several occasions among nurses in this study.

Working clothes

Lack of financial mean or a believe that a in common working outfit is important seems to be the biggest reason for not providing working cloths for the staff at the mission hospital.

It is important that the working outfits are short sleeved due to the risk of collecting bacteria's. Even though working cloths always should be worn in working areas but in working areas only (Region Skåne, 2006), nurses were often wearing private clothes. Since private cloths almost always were short sleeved it may be that it would be better that that they always work in private cloths which easier could be changed daily and short sleeved, instead of the dirty lab coats or cotton aprons which often were put on more as protection for private cloths then as a clean outfit. The dark blue wool sweaters which often were used, may be provided by the hospital because they all looked the same, to wear a wool sweater probably rather easy collects bacteria's and dirt which wouldn't be visible.

The information given from the hospital about hygiene guidelines says that nurses are changing to working cloths at home, this makes it hard to tell if they are changed or washed on daily basis.

Since the hospital don't provide working clothes it is not possible for the nurses to change during the day which it according to Region Skåne (2006) should be if getting blood or wet for other reasons.

Even though there is laundry service at the hospital and it should be possible to wash lab coats and cotton aprons frequently, It is not clear if its anyone's responsible to look after. It seemed that there were a lack in understanding for the importance of suitable working cloths and the need for clean outfits when collecting blood.

Protective equipment

The use of correct protective equipment is of great importance to not risk spreading diseases when performing invasive procedures within the hospital settings (Pittet et al, 2006)

Boyce et al (2002) writes that gloves should be thrown away immediately after use since they get contaminated in the same way as the unprotected hands. Often gloves were put on and then used as a part of the working outfit, alternating clean and unclean tasks, leaving the room, handling money and more. It was clear that the lack of understanding or will to use gloves in a correct way were common. Gloves seemed to be used for the protection of the nurse and not for patients alternatively the staff acted with an attempted to “save” gloves even though it did not appear hard to access.

According to the webpage of nursing encyclopedia (2009-12-27) the procedure for collecting blood samples through drawing it in to a syringe and pushing the blood over to a container either through perforating the membrane or by taking the cap off, is not in accordance with instructions for using the blood container. Separating the needle from the syringe prior to disposal is according Kermode (2004) an action leading to risk for the performer.

Taking the cap off could affect the vacuum inside (Björkman & Karlson 2008). Several of the participants were handling needles in a way leading to a great risk, sometimes the one- hand grip were observed, but walking around with the contaminated needle unprotected which were common is a risk both for patients and for the nurse.

Since one sting injury from an infected needle carries the average risk of transmitting several of the different blood diseases with 30 percent (WHO injection safety, 1999) a correct and safe handling of used needles are of great importance.

The WHO guidelines for injection safety strategies promote disposal sharps to be able to get wasted in a correct way (WHO injection safety, 1999).

The waste bin was a rather small paper box and could easily have been transported over to the patients’ bed when collecting blood. Not doing this leads according to Kermode (2004) to an unsafe way of handling needles and a risk for stinging accidents.

According to guidelines recognized by the hospital in Mpongwe throw away aprons should be used when risk to get in contact with blood or other body fluids. When collecting blood samples there are always a risk for the nurse to get in contact with blood, non of the observed nurses had the opportunity to were a throw away apron since it was not available. It seemed like there was a lack of interest or finance to invest in semi expensive disposable materials which not are obviously and visible necessary for patient care. The hospital had excess to rather expensive equipment and medications but was often out of stock for important material much cheaper for example throw away aprons.

When cleaning the patients skin before collecting blood through vein puncture it is important to let the skin dry before puncture otherwise it could lead to a hemolytic process (Björkman & Karlson 2008). When cleaning the skin it was often not clear if they did so to provoke a vein to appear or to clean it. To not let

the patients' skin dry or to touch it after cleaning ruins the purpose of the action, incorrect procedures may be due to stress or inadequate education about the purpose of cleaning.

Availability to material for hygiene routines did not seem to be an issue, but it is possible that it would be easier to maintain good routines if for example clean water and disinfection liquid were available in the patients room. WHO (guidelines for hand hygiene) addresses the importance of access to water, as mentioned above none the wards had easily access to water. Even in parts of the hospital where the staff had easy access to material to maintain hygiene routines when collecting blood it was not always used.

Environment

The working situation and load seem to have limited effect on the correct use of hygiene routines when drawing blood, nurses not performing correct routines did not do so even when the workload were less but it most likely made the working situation more stressful which could contribute the nurse sometimes forgetting things.

The environment did often not promote a good working situation, safety or hygiene routines. The lack of privacy could increase stress for patients which also could affect the nurse. The work load varied a lot between wards and sometime it was doubtless contributing to a stressful environment for the nurses. Caretakers getting involved in the working situation complicated the care sometimes which possible could make it even more stressful.

According to Björkman & Karlson (2008) it is of great importance to work with good lightning in an comfortable working position.

When patients are located in the reception or in the hallway for blood collection its most of the time a lot of disturbing activities in the surroundings, which can stress both the nurse and patient more then needed.

Method discussion

According to Polit and Beck (2006) a study can be criticized through discussing how entry was gained into the observed group, the relationship between the observer and the observed, the time period of which data was collected and the method used to record data.

Because the authors gained entry to the group through staff members with authority, it possible led to them being seen more as evaluators. Participants often asked "how they did" after being observed, even though it was expressed before every observation occasion that it was for learning purpose only. This led to a possibility that participants sometime acted on beliefs of what they thought the observers wanted to see.

Obvious the authors stood out in the settings for the observation, this doubtless had an impact on the participants and the patients. Because the study is done at multiple positions, some places like the outpatient clinic, served as a setting was the observers could be more discrete, also it was possible to observe a more relaxed behavior among the nurses who were observed on more then one occasion.

When presenting the paper of approval which was planned for every participant to sign, a problem occurred, the participants did not want to sign, they expressed that it would be inappropriate for them to sign something that was already approved by the hospital board. The nurse in charge and the mentor at the home university in Sweden were informed, the nurse in charge signed the paper and it was decided to be enough with oral information to participants.

The time period during which the data was collected was set to approximately six weeks. The authors believe that this was a relevant timeframe for this study. After about 20 observations data saturation was achieved. The specific occasion (specimen collection) that was observed was not needed to be seen in context to other working routines and therefore it was possible to collect all relevant data during this timeframe.

The observation was not taped which led to high demand on the observers to note what happened as it happened and to write it down. Investigator triangulation therefore came in handy, it were possible make sure that nothing of importance was overlooked through comparing notes. After every observation day the authors collected the field notes from the day and wrote reflective notes.

Polit & Beck (2006) means that the risk when using prewritten checklists and guidelines are that the observers puts all focus on answering the questions and overlooks important events that occur outside the question or checklist. To compensate for this the authors of this study left the last point in the field note question sheet to open reflections.

Deciding to use pen and paper and exclude video recording was done partly because the authors felt that the short time period during which each observation occasion occurred was possible if not easier to record with pen and paper. It was also important to consider that taking photos or videotapes isn't always as common or excepted in all countries, many of the participants had never gotten their picture taken before and it came to be very exciting when camera photos for private use were taken, therefore it also seemed to have been a good choice to not tape the observations.

The pilot study was excluded from the used data. After the first observation occasion, details were discussed and some small adjustments were made, this lead to the exclusion of the pilot study.

Every participating nurse was observed between one and five times, after five times they were excluded. According to Polit and Beck (2006) the studies trustworthiness can be increased by longer participation and continuous observation, meaning that one person is being observed on several occasions or during a longer period of time. The possibility to observe a participant five times should then increase trustworthiness. It is possible that a person being observed several times gets more comfortable with the situation and not reflecting over their behaviour in front of the observer in the same way as a participant who only gets observed on one occasion, the authors believe that it often could see a change towards a more relaxed behaviour among participants who were observed on more then one occasions.

On the contrary it is possible that a greater range of behaviour should have been discovered if each participant only occurred one time but the authors agreed that after 23 observations including 10 different nurses data saturation was reached, this because no new behaviour had been observed in several of the latest observation. Polit and Beck (2006) write that data saturation is reached when no new information is obtained and redundancy is achieved.

To make five observations of each nurse before exclusion was chosen due to the timeframe of this study, also because it seemed relevant when considering the number of nurses working at the hospital as well as how often each nurse collecting blood specimen, since this varied between the wards.

The group of participants came to reflect the hospitals nursing staff in a relevant and correct way, all wards were included, both men and women with different ages and experience. Hartman (2006) writes that a heterogeneous group, where everyone has the same chances of participating in the study is showing a positive aspect on the selection method.

Previous research in this area is not very comprehensive. In this study, hygiene routines within a very specific area in a developing country was studied, therefore research done was very limited.

Some of the background material chosen for this study mainly dealt with problems related to injections safety, but since the procedures in many ways are very similar and the literature used about injection safety were combined with blood safety the decision were made that it covered the areas necessary for this study.

The article by Pittet et al, (2006) is a review, but the parts referred to in this study are either only published in that article and not taken from other material or another article written by Pittet, D him self, the choice were made that the risk of Pittet, D to misread his own work are slim.

Analyze

Choosing to work with Burnards (1991) content analyze was made because according to Granskär & Höglund (2008) in an qualitative approach it sets focus on behaviour which was in accordance with the purpose of this study. In this study the observation moment was fairly short which resulted in a limited amount of text related to each observation occasion, working with content analyzes then become a bit more difficult then it may have been if the written material were more comprehensive.

The majority of the gathered material consisted of data collected through the field notes and not through the checklist, this mad it easier when using Burnards (1991) content analyze because it resulted in a more comprehensive written material. Using field notes with the possibility to write open reflections therefore were necessary to be able to collect enough material for analyze.

On the contrary following the 14 steps of Burnards (1991) content analyze made it easy for the writers to present the process and for the reader to follow. Since the focus of a qualitative content analysis is to describe differences and similarities in a text, shown in themes and categories at different levels (Granskär & Höglund 2008) and this study was made through observing the same moment performed by different nurses a method used to describe differences and similarities worked well. Choosing to work with colour pens to highlight the different areas belonging

to the same category was an easy and structure way for the authors to get an overall insight of which parts of the text belonging together, this also made it easy when going back in the material looking for specific parts.

CONCLUSIONS

The result of this study indicates the need of a persistent work with hygiene routines when collecting blood samples.

This work needs to be a combination of several factors such as, education, campaigning, access to sanitary necessities and financial means. But most important seem education of staff members.

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APPENDIX

Appendix 1. Questionnaire concerning the hygiene routines of Mpongwe Mission Hospitals hygiene routines, signed by nurse in charge.

Appendix 2. Check list.

Appendix 3. Support questions for the field notes.

Appendix 4. Written information for nurses at Mpongwe Mission Hospital.

Appendix 5. Paper of approval for nurse in charge at Mpongwe Mission Hospital.

Appendix 1

Questionnaire concerning the basal hygiene routines of Mpongwe Mission Hospital, signed by nurse in charge.

Does clothes used at work have short sleeves?	yes
Are clothes used at work being changed daily or in case of need, more often?	Changed at home, not at working place
Are hands and lower arms are free from watches and jewellery?	Some staff, not always
Are hands disinfected with a alcohol based disinfection liquid made for hands or any other disinfection with corresponding effect, immediately before and after every physical contact with the patient?	yes
Are hands disinfected both before and after use of plastic gloves?	yes
Are hands, if they are dirty, washed with water and liquid soap before being disinfected?	yes
Are hands that have been washed dried before being disinfected?	yes
Are throwaway apron made of plastic or a overall used if there is any risk that the clothes will get in contact with body liquids or any other biological material?	yes
Are protective throwaway gloves being used in case of contact with, or risk of contact with body liquids or any other biological material?	yes
Are protective gloves taken off immediately after the working moment and switched between the different working moments?	yes

Appendix 2

Check list

	Yes	No
Clothes used at work have short sleeves.		
Clothes used at work are being changed daily or in case of need, more often.		
Hands and lower arms are free from watches and jewellery.		
Hands are disinfected with an alcohol based disinfection liquid made for hands or any other disinfection with corresponding effect, immediately before and after every physical contact with the patient.		
Hands are disinfected both before and after use of plastic gloves?		
Hands are, if they are dirty, washed with water and liquid soap before being disinfected?		
Hands that have been washed are dried before being disinfected.		
Throwaway apron are made of plastic or a overall are used if there is any risk that the clothes will get in contact with body liquids or any other biological material.		
Protective throwaway gloves are being used in case of contact with, or risk of contact with body liquids or any other biological material.		

Appendix 3

Support questions for the field notes

1. Does the nurse seem to have overall safety thinking?
2. Is material needed for the hygiene routines easily accessed?
 - Antiseptic hand wash (in the room?)
 - Gloves (in the room?)
 - Aprons (in the room?)
 - Waste bin?
3. Does the environment promote safety and hygiene routines?
 - Is the nurse stressed?
 - Is the patient stressed?
 - Is it lots of disturbing noise or activity in the surroundings?
4. If more than one attempted when drawing blood is needed, are correct routines followed every time?
5. Open reflections

Appendix 4

Information to the participants of the observation study:.....

This information is directed to general nurses working at the Mpongwe Mission Hospital.

We are two nursing students who during the fall semester 2009 will be writing our examination papers by doing an observational study at Mpongwe about basic hygiene routines when taking blood samples.

We will be observing 20-24 occasions when blood sampling is being performed.

We are going to be as discrete as possible when taking notes during the observation. We are going to intend a complete outside perspective, which means that we are not going to take part in any activities.

The study has been approved by executive manager at Mpongwe, Tuesday Musaka. Attendance is voluntary, and you can at any time stop participation in the study. All the participants will guarantee confidentiality.

We will visit you during a meeting held during our first week at Mpongwe, then you get the opportunity to get to know us, asking questions and sign up for attendance in the study if you wish.

We consider this topic very up to date in healthcare, and the knowledge we receive by doing this project will be very useful for us when we are working as nurses. The result will be presented for you when the study is finished, you also have the opportunity to read the final report.

Hereby you are asked for attendance in the study. If you have any questions, contact: Katarina Garpenfeldt or Erika Sjöström

Best regards,
Katarina and Erika

Appendix 5

Paper of approval for nurse in charge

I have been informed by word about the study and taken part in the written information. I am aware of that my attendance are completely voluntary and that I whenever and without explanation are free to stop my participation.

Participant:

.....

Responsible for the study:

Katarina Garpenfeldt

Erika Sjöström