

KNOWLEDGE ABOUT AND PRACTICE OF SAFE INJECTION AMONG SUPERVISORS OF PRIMARY HEALTH CARE FACILITIES IN KASKI DISTRICT, WESTERN NEPAL

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ABSTRACT

Safe and rational use of injections prevents transmission of blood borne infections and safeguards health resources. The present study was conducted to study and compare injection use and assess knowledge and practice of safe injection among supervisors of primary health care facilities in urban and rural areas of Kaski district, western Nepal. The descriptive, cross sectional and mixed (quantitative and qualitative) methods study included a questionnaire-based survey, interview with supervisors (prescribers) and observation of health care facilities. The quantitative data was analyzed using computer software while the qualitative data was analyzed manually by deductive content analysis. A total of 69 primary health care facilities supervisors were included. Almost one quarter of the supervisors were neither trained nor qualified for injection administration but were providing injections. Even though, the median number of patients visiting primary health care facilities was less in rural areas (150 vs 135), the median number of patients prescribed with injections was higher (15 vs 20) compared to urban area. All supervisors were knowledgeable about at least one pathogen transmitted through the use or re-use of unsterile single use disposable syringes. HIV, hepatitis/jaundice and HBV (specifically) were named by 99%, 58% and 25% of respondents respectively. Awareness about safe injection practice and use of sterile disposable syringes for injection was found to be satisfactory. Community awareness about the importance of receiving injections from qualified and trained personnel should be improved.

Key words: Injection, Nepal, Safe injection

INTRODUCTION

Unsafe and excessive use of injection could endanger life by transmitting various blood borne infections including human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) etc [1]. Unfortunately, unsafe and excessive use of injection is a common characteristic of health systems in developing countries [2] including Nepal. Excessive and unsafe use of injection not only threatens life but also utilizes scarce resources in developing countries that could be utilized for other basic needs of the population.

A safe injection requires administration of a rational injection using a sterile device (syringe, needle etc) observing proper aseptic technique by qualified and well trained injection providers. It also requires proper disposal of the injection and sharp (needle) so that the injection providers, waste handlers, and other persons in the environment could be safeguarded against needle stick injury (NSI) and its complications [1]. Unsafe injections not only harm injection receivers (patients) but are also harmful to injection providers and the community [1]. Although the safety of all three stakeholders is essential for safe injection, the safety of injection providers is more important in

developing countries like Nepal where health care workers (HCWs) have a more influential role in making therapeutic decisions. Qualified, trained, and well protected injection providers may work confidently and may also convince patients to opt for rational and safe use of injection [3] and can be assets to health institutions and impact positively on health care systems.

The government of Nepal provides essential health care services free of charge to all citizens from primary government health care facilities. The government run primary health care facilities in Nepal are Sub Health Post (SHP), Health Posts (HP) and Primary Health Care Centers (PHCC). These health care facilities are mostly managed by health assistants (HA), community medicine auxiliaries (CMA), Auxiliary Nursing midwives (ANM), and Community Health Workers (CHW) [4]. The HA undergoes basic medical training for 36 months after completing 10 years of schooling. Similarly, the CMA and ANM training are for 18 months after completing 10 years of schooling [5]. These paramedical personnel are trained to diagnose and manage common illnesses by prescribing a few selected medicines. They could also refer patients to higher centers for more specialized care if required [5]. As per Nepal

Health Service Act 2053 and Nepal Health Service regulation 2055, the government health employee can do private practice after taking prior permission from the concerned authority.

Ayurvedic (traditional) health services are also provided by the government through community, district, and zonal level Ayurveda centers and hospitals [4]. The government of Nepal also coordinates and encourages private sector and non-governmental organizations (NGOs) to provide health care facilities to people of Nepal. The health care services provided by the private sectors and NGOs are monitored by the government [4].

In Nepal, there is no clear guideline, policy or qualification for injection providers [6]. Studies from Nepal [5-7] have reported that injections are administered by various personnel including unqualified/untrained individuals and quacks, and the injection devices are disposed unsafely after their use, making the injection practice unsafe. Authorized persons (heads) of health care facilities were considered as a supervisor of the health care facilities. The present study was conducted to 1) study the main indications for injection use in primary health care facilities 2) assess knowledge and practice about injection safety among supervisors of primary health care facilities and 3) compare the use, knowledge and practice among supervisors of primary health care facilities in urban and rural areas in Kaski district of Western Nepal.

METHODS

Study design

The descriptive, cross sectional and mixed (quantitative and qualitative) methods study was conducted from September to December 2012 in a hilly district (Kaski) of western Nepal. The study included a questionnaire-based survey and interview with supervisors (prescribers) and observation of the primary health care facilities.

Sampling method and sample size

A household survey was conducted to obtain information on the primary health care facility visited (preferred) by the people in urban and rural areas for their basic health care needs especially for injections. The two cities of Kaski district i.e. Lekhnath municipality and Pokhara sub-metropolitan city were stratified as urban while 43 Village Development Committees (VDCs) of the district were stratified as rural. Three hundred households from each stratum (urban and rural) were selected by probability proportionate sampling (PPS) and the household heads of each selected household were asked to name the primary health care facility utilized by their family. As per their answers the primary health care facilities were chosen and the supervisors of the respective facilities were approached for the study. The medical dispensaries that were providing medical consultation facility were also considered as

primary health care facilities and the supervisors of the dispensaries were included in the study. Medical dispensaries include all the medicine shops (pharmacies) which are run by pharmacists (or assistant pharmacists) and other paramedical personnel and may have a visiting doctor to provide consultation services [5].

The supervisors working in primary health care facilities of Kaski district for more than 6 months were included in the study. The study included sixty nine supervisors. The supervisors are heads (authorized persons) of the health care facilities. They might be an owner in most of the medical dispensaries. They may also be proprietors of private medical dispensaries or private practice clinics. They may also prescribe medicines (including injections) and administer the prescribed injections to patients. Occasionally supervisors were also found to administer injections prescribed by consultants at tertiary care [5].

Study tools and procedure

The study used a questionnaire containing close-ended and open-ended questions. Statements were included in the questionnaire as per discussions among the authors and inputs from experts in the field in Nepal. The experience obtained from a pilot study at Baglung district [8] was used to finalize the questionnaire. The finalized questionnaire was then forward translated to Nepali language and finally back translated to English by persons not involved in the study.

Supervisors of the selected health care facilities completed the self-administered questionnaire in Nepali language and interviews were conducted to understand the reasons behind the answers provided by the supervisors in the questionnaire. The interviews were conducted in Nepali language immediately after the administration of the questionnaire at the supervisor's work place during working hours. The interview was not conducted till the point of data saturation and the important points which came during the interview were noted in Nepali language. The notes were then shown to the respondents and they were asked to go through the same and mention points which may need modifications, further clarification or which may need to be deleted. Repeat interviews were not conducted.

To triangulate the information (responses) provided by the respondents, the activities, and infrastructure at the facilities was observed. The observation was done by SG (corresponding author of the article) during the time of visit to the facilities. The observation was based on their reply to items in the questionnaire and the interview.

The study protocol was approved by the Departmental Review Committee (DRC), Suresh Gyan Vihar University and the Nepal Health Research Council (NHRC), Kathmandu, Nepal. The participants were explained about the study

and it was clarified that participation was voluntary and they could withdraw from the study at any time, if they want to do so. Written informed consent was obtained from each participant before conducting the study and anonymity and confidentiality of respondents was strictly maintained.

Data analysis

Statistical Package for Social Sciences version 17.0 for Windows was used to analyze the quantitative data. The data were presented as mean, median, standard deviation (SD), and inter-quartile range (IQR) for continuous variables. Frequency and percentage (%) were calculated for categorical variables. Data from the urban and rural areas were compared using Pearson chi-square test. A p value <0.05 was considered as statistically significant and <0.001 was considered as highly significant.

Qualitative data analysis was done using deductive content analysis [9,10]. The interview notes were translated into English by persons who were knowledgeable in both languages and who were not associated with the study. The information from interviewees was placed in different categories which were then analyzed using deductive content analysis. Literature review was used to develop categories and subcategories for coding and analysis. Direct quotes were contextualized, rendered readable and presented in the habitual language of the interviewees. The quotes were also translated from Nepali to English.

RESULTS

Supervisors or officiating supervisors of 69 healthcare facilities (male 58 and female 11) were included in the study. In the household survey, most people from rural areas mentioned that they preferred to consult health care workers (HCWs) at government primary health care facilities or at the HCWs' private clinics. The people in urban area preferred private medical dispensaries for their basic health care needs despite the fact that they (urban people) were having more options for health care facilities (e.g. government and private tertiary level hospitals and nursing homes) compared to rural area. The medical dispensaries may or may not have physician consultation services. Table 1 shows the details of health facilities included in the study from the two strata. In the district, a total of 3 PHCCs, 21 HPs, 27 SHPs, 5 ayurvedic centers and 350 medical dispensaries (pharmacies) were functional.

There was no statistically significant difference (Pearson Chi-square = 0.270, p = 0.604) in distribution of male and female supervisors between urban and rural healthcare facilities. Table 2 shows mean (SD) and median (IQR) of different characteristics of the supervisors and table 3 shows qualification of the respondents (supervisors) involved in the study.

One in four household heads also shared that they consult a physician (a doctor) for any medical problem. The proportion of household heads consulting a doctor for any illnesses was significantly higher (p<0.001) in urban compared to rural areas i.e. 35% vs 16%. When the mentioned health facilities were visited by the researchers, in certain cases the person indicated by the household heads were not found to be medical doctors but rather they were found to be HA or CMA. Few household heads also reported that they preferred to visit traditional healers (including ayurvedic HCWs) for their minor health care problems and for injections also.

Private practice by the HCWs working in government institutions was quite common in rural areas. Even though not admitted directly, the social status and rewards associated with private practice might have lured them for the same. One representative statement was;

"I administer diclofenac injection (not supplied to the government health care facility), for arthritis or pain I just charge medicine cost and do not demand service charge even during home visits..... some people reward my service by giving money or goods (vegetables, chicken, egg etc) whatever they have... I accept the reward but that is not mandatory....." **25-RF-HP**

Few respondents admitted that the practice was a compulsion for them. The medicines (types and quantity) supplied by the government was not sufficient to fulfill the community's basic health care needs so other medicines are required. Furthermore the supervisors thought that they were competent enough to prescribe and administer those medicines to the people. Hence the practice was justified as a compulsion. Some of the typical responses were;

"..... there is no other painkiller (analgesic) except paracetamol [in government health care facility]..... when people come with big cut or injury, I have to use diclofenac injection (from private practice clinic). I know how to use medicine then why I should not help the people in need?" **37- UM-SHP**

".....allopathic drugs are not available here (an ayurvedic health care center), the allopathic health post is very far. So rich people directly go to Pokhara (city) for treatment but seriously ill poor patients who need quick relief come to me for help. On humanitarian ground, I should help them so I carry few medicines (allopathic medicines including injections) in my bag and administer in an emergency only" **32-RM-A'HP**

Most supervisors (98.55%) were of the opinion that they did not prescribe unnecessary injections to their patients. Injectable contraceptives (Depot-Medroxy Progesterone Acetate, DMPA), tetanus toxoid and diclofenac were the most commonly prescribed injections. Table 4 shows the common

conditions for which injections were most commonly prescribed and also the names of the injections prescribed. Multi-vitamin injections (alone or mixed with intravenous fluids) were administered to the patients complaining of general weakness or neurological pain (neuralgia).

Patients' preference for dosage form in fever

One out of two (49%) respondents reported that patients accept the dosage form prescribed by the supervisors and rarely demand for any particular dosage form (Fig. 1). However, if they are given an opportunity to choose the dosage forms, the patients would prefer oral formulations (pills).

Only two (2.9%) prescribers shared that patients prefer/demand injections while 33 (47.83%) prescribers reported oral dosage forms (pills) as the patient's preference. Furthermore, the difference between urban and rural prescribers was not statistically significant. Some of the statements shared by the supervisors were:

"Generally people accept whatever we prescribe. Old people generally prefer and demand injections....." **39-RM-SHP**

"When I was posted in SHP in terai, people used to visit the health facilities regularly for Saline (IVF) and multivitamin injection... here those type of people are very less ..." **37-RM-SHP.**

"Only few patients demand injections. They visit HP every six months and demand for saline (i.v. fluids) from the door [of the Health facility]..... They say that they are dependent on saline and feel energetic after [receiving] saline... They compel us to give injections." **25-RF-HP**

"People of Terai origin prefer injection while people of local origin prefer tablet for febrile conditions" **40-UF-MD**

Note: Terai is the flat plain part of country where the population density is greater and the climate is tropical. Diseases like malaria, dengue and other diseases communicated by mosquitoes are very common.

A few elderly experienced supervisors shared that the demand for injections has decreased. However, injectable contraceptives are very popular. Some responses are;

"People generally do not prefer injections but for contraception they prefer injectable contraceptive....." **50-RM-MD**

"Few years back when injectable penicillins were effective we used to provide more injections using glass syringes and patients also used to demand the same..... Time has changed, dangerous diseases have been associated with injections and penicillins are not effective so demand for injection has decreased..... But Sangini (injectable contraceptive in depot form which acts for three months) is demanded by many females [of reproductive age]" **59-UM-MD**

Even though, people prefer oral formulations over injections, they easily accept injection if the prescriber (supervisor) so insists.

"People don't prefer injection but when we convince them they accept injection..." **32-RF-SHP**

Almost all the supervisors (96%) reported that they prescribe and administer injections to the patients. All of them reported that they use single use disposable syringe from a sealed package for injection.

Knowledge about safe injection practice

All the supervisors reported that use of unsterile syringe or reuse of single use disposable syringes transmit diseases and all of them named at least one correct disease. Sixty out of 69 (86.96%) supervisors named at least two correct diseases transmitted by such practice (Table 5). There was no significant difference in knowledge of supervisors working in an urban area or a rural area (Pearson Chi-square = 7.012, p = 0.072). Almost all (68 out of 69, 98.55%) respondents named HIV/AIDS as one of the most common diseases transmitted by unsafe injection practice (Table 5).

Observation of health care facilities

Case 1: The supervisor was staying in a room adjacent to the government health care facility. The room was used as his residence as well as his private clinic from where he used to provide health services round the clock. The room was having two beds; one (along with an intravenous fluid stand) might be used for patients. A cupboard was full of medicines. The medicines were different than those supplied by the government to the health care facility.

He was new to the locality (transferred one and half months back). He said, *"Patients use to see the effects of my medicines for few days and if they think that my medicine is not working then they will visit other private practitioners who prescribe more injections"*. He added, *"I don't want to take a chance so I also prescribe injection and antibiotics"*. He claimed that in the last 1 and half months he has already sold medicines worth Rs. 50,000 (approx. US \$ 500). *"I am helping people by prescribing injection, if I don't do then the people have to walk for an hour to see the other practitioner and get the same injection"* he said proudly.

Case 2: He used to practice in his own rented room adjacent to the government health facility and provided injections as well. *"I charge only medicine cost and accept my service charge either as goods (vegetable, milk, egg etc) or money. If the patient cannot afford then I don't take anything....."*

Case 3: Even though the person was a Health assistant trained in the ayurvedic system of medicine (herbs and others not for injection), he was using allopathic medicines including

injections. The ayurvedic medicines (supplied by the government) were dispensed free of cost but allopathic medicines were sold. He said, *“Ayurvedic medicines are very effective in chronic diseases... they don't have side effects but they are slow acting. Allopathic medicines have side effects and are fast acting. So I ask patients, whether they want fast acting allopathic or slow acting ayurvedic medicine. I go with their preferences. I am here to help them so I try to do my best..... Now a days microorganisms have become powerful (resistant) so oral antibiotics are not effective, we have to use injectable antibiotics.....”*.

Case 4: The medical dispensary was managed by a retired health care worker with CMA qualification. He had 28 years of experience in TB hospitals and had good contact with government officials. His dispensary was one of the government approved urban DOTS (directly observed treatment short-course) centers, vaccination centers and MCH (Maternal and child health) clinics. He was actively involved in DOTS activities (including administering injection streptomycin) but not in vaccination and MCH activities. For vaccination and MCH, the space of his dispensary was provided while the staff deputed from governmental health facilities provided the services. During the household survey it was found that he was trusted by his patients and they consider him as a good doctor. A few government supplied safety boxes were also present in the dispensary for disposal of the used syringes.

Case 5: Adjacent to the medical dispensary was a big hall with three beds. A nebulization machine was on a bed. Adjacent to the hall was a small dark consultation room with a small window. The consultation room contained a bed, a table, a chair and a stool. The used syringes were collected in buckets kept under the table and the bed. The supervisor stated that the used syringes collected in open buckets were burned openly near the river close to the dispensary. The dispensary was located in an urban area.

DISCUSSION

Government run health care facilities in rural areas and medical dispensaries in urban areas were most commonly visited by the people for their basic health care needs. So, more number of those health care facilities (government health care facilities from rural area and greater number of medical dispensaries from urban areas) were included in the present study (Table 1). Medical dispensaries covered in the survey represented about 12% of the total.

Tables 2 and 3, show that supervisors from the rural and urban health care facilities were similar in terms of the type of organization where they were working (private or government), qualification and the estimated number of patients who consulted them every week. The median (IQR) number of

patients visiting the facilities were 140 (52.5) per week and out of them, 15 (8.5) patients received at least one injection. Even though, the median number of patients visiting primary health care facilities was less in rural area, the median number of patients prescribed with injections was higher compared to urban area (Table 2). This indicated that the injection use was higher in rural area than urban area.

In Pakistan, prescribers from primary health care centers used to prescribe two or more injectable medicines per patient [11], but in Kaski district an average of one injectable medicine per patient was reported to be prescribed. As observed during another study [8], private practice by the HCWs of government health care facilities was also observed in our study. The private practice might have been done for economic benefits and was strengthened by various means e.g. use of injection or allocating some space for government programs. But the practicing HCWs expressed it (private practice) as their compulsion. In Nepal, people may have doubts about the quality of the essential medicines supplied free of cost to the community [12] which may help the private practice of the HCWs. In those private clinics, injection could also be over used than in government run health care facilities.

In government run health care facilities prescribers may have to choose drug/s from a list of drugs available in the health care facilities so they may not have many other options of drugs (including injection) to be prescribed. The point was also reported during interviews conducted during the course of this study. Furthermore, the injection prescribers and providers do not get additional financial and other additional incentives for use of injection in the government run facilities [8]. The same prescriber at their private clinics may have many options and may get additional incentives for prescribing/administering injection [13] so they may prescribe more injections. The additional incentives in the form of money or goods were also reported in our study but it was not clear whether the incentive was associated with injection use.

The supervisors were of the opinion that oral pills are preferred by the people and the respondents shared that very few people preferred injections. Unlike a previous study [14], in our study the respondents accepted that even though patients have their own preference of dosage form most of them accept the decision of the supervisors. Almost all (98.55%) supervisors were of the opinion that they do not prescribe unnecessary injections.

Contraception, injury, and pain (including back pain and abdominal pain) were the three most common conditions for which injection was commonly prescribed. This trend was different from that reported in Pakistan where most of the injections were administered for respiratory tract infections, malaria, gastroenteritis and general

weakness [11]. In Baglung district of Nepal, severe infections, pain and contraception were the important indications for injection use [8]. Studies from Nepal [5,8] have reported that injectable contraceptive is one of the most commonly used injections in Nepal which is consistent with the findings of this study.

Injectable contraceptive, tetanus toxoid, diclofenac, IVF and Vitamin B complex were the most commonly used injections (Table 4). In Nepal, injectable contraceptives (Depot preparation) are aggressively marketed through various mass media. This might be a reason for their popularity. As reported in other studies [11,15], injection vitamin B complex (plain or mixed in intravenous fluid) in case of general weakness or pain was also reported in this study which may suggest the prevalence of unnecessary injections. A review of injection registers in healthcare facilities could have provided a clearer picture.

Lack of knowledge about the risk of unsafe injection practices are main factor responsible for unsafe injection practice [7]. All supervisors were knowledgeable about at least one pathogen transmitted through the use or re-use of unsterile single use disposable syringes, including HIV (98.55%), hepatitis/ Jaundice (57.97%), HBV (25%), and others. The knowledge among supervisors of urban and rural areas were almost similar ($p>0.05$) except for Hepatitis and specifically Hepatitis B. The supervisors working in the primary health care facilities in urban areas were more aware than rural supervisors that hepatitis could also be transmitted through unsafe injection practice.

Most (almost 80%) of the primary health care facilities' supervisors were CMAs and HAs. Few facilities (9%) mostly medical dispensaries' supervisors were "Professionalists". Professionalists are the persons who have received short (less than a week) orientation training. The orientation course included basic knowledge about drugs and did not include injection practice. Majority of medical dispensaries (pharmacies) in Nepal are run by professionalists [5,16]. It was also noted that the CHWs, who were trained for immunization during in-service trainings especially before national immunization campaign, were also prescribing and administering therapeutic injections. One out of four supervisors who have completed orientation training (*Professionalists*), pharmacy course, ayurvedic course and other degree, and were neither trained nor qualified for injection administration were also providing injections to the community. Even though, they use sterile devices for injection, the injections administered by these unqualified personnel might be risky [2,17] and the risk might be over one and a half times as compared to qualified and trained providers [14].

The injections provided by unqualified supervisors may not be safe, but they were providing very essential injections (e.g. tetanus toxoid and contraceptive injections). Hence, it may not be wise to ban administration of these injections by them without making the community aware about the safe injection practice and ensuring alternative sources. Otherwise, the people either may not take the essential injection when required or may visit quacks for the same. Both the cases may have negative consequences for public health. Hence, the untrained injection providers (ayurvedic HCWs, Professionalist, CHW etc) may be trained and given authority to provide only the few essential injections safely and rationally [18].

Strength of the study

The study includes various types of injection prescribers (supervisors) at various types of facilities of the district. Responses obtained from survey and interviews were triangulated by observation.

CONCLUSION AND RECOMMENDATIONS

The supervisors' qualification and knowledge about safe injection practice among supervisors' of urban and rural areas were similar but the injection use was higher in rural area. Over all number of injections use was not alarmingly high in the district but further in-depth research is recommended to find exact number, proportion and reasons for injection by reviewing drug prescription registers at health care facilities. Significant number of injections was administered by unqualified and untrained personnel which might be unsafe hence the practice should be discouraged. Awareness about the importance of receiving injections from qualified and trained personnel should be improved among the people.

Competing interest

All the authors declare that they have no competing interests.

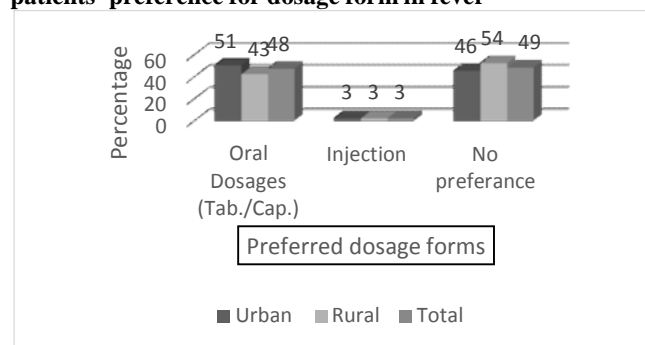
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Fig. 1: Percentage of prescribers perceiving patients' preference for dosage form in fever*



*Pearson chi square = 0.436 test P value (two-sided) = 0.804

Table 1: Details of type of health care facilities included in the study

| Types of health care facilities | Urban | Rural | Total |
|-----------------------------------|-----------|-----------|-----------|
| Sub Health Post (SHP) | 3 | 11 | 14 |
| Health Post (HP) | 1 | 5 | 6 |
| Primary Health Care Center (PHCC) | 1 | 1 | 2 |
| Medical Dispensaries | 32 | 9 | 41 |
| Community health care facility | 1 | 2 | 3 |
| Ayurvedic Center | 1 | 2 | 3 |
| Total | 39 | 30 | 69 |

Table 2: Comparison of mean (SD) and median (IQR) of various characteristics about supervisors of the health care facilities

| Characteristics | Urban (n=39) | Rural (n=30) | Total (n=69) |
|---|---------------|--------------|--------------|
| Mean (SD) age (in years) of the respondents | 40.33 (10.25) | 38.87 (8.13) | 39.70 (9.35) |
| Mean (SD) experience (in years) of the respondents | 17.15 (11.11) | 16.20 (7.53) | 16.74 (9.67) |
| Median (IQR) number of patients seen by the prescribers per week | 150 (60) | 135 (36.88) | 140 (52.50) |
| Median (IQR) number of patients (per week) prescribed with at least | 15 (10) | 20 (8.62) | 15 (8.50) |

| | | | |
|--|-------------|-------------|-------------|
| one injection | | | |
| Mean (SD) number of injections per patient | 1.08 (0.27) | 1.17 (0.46) | 1.12 (0.36) |

*The question was multiple responses so the total is more than 100%

Table 5: Knowledge about diseases transmitted through unsafe injection practice of health care facility supervisors

primary health care facilities of Kaski district

| Qualification | Urban, n= 39 frequency (%) | Rural, n= 30 frequency (%) | Total (%), n = 69 |
|--------------------------|----------------------------|----------------------------|-------------------|
| CMA | 17 (43.59) | 18 (60.00) | 35 (50.72) |
| HA | 9 (23.08) | 5 (16.67) | 14 (20.29) |
| CHW | 2 (5.13) | 4 (13.33) | 6 (8.70) |
| D. Pharmacy | 2 (5.13) | 0 (0.00) | 2 (2.90) |
| MBBS | 3 (7.69) | 0 (0.00) | 3 (4.35) |
| Ayurvedic HA | 1 (2.56) | 2 (6.67) | 3 (4.35) |
| Others (Professionalist) | 5 (12.82) | 1 (3.33) | 6 (8.70) |

Professionalist is a person who is involved in medicine trade and has undergone a short (up to 72 hours) orientation course conducted by the drug authority of Nepal.⁵

| Number of diseases named correctly | Urban, n=39 frequency (%) | Rural, n=30 frequency (%) | Total (%) n=69 | * χ^2 (p) value |
|--|---------------------------|---------------------------|----------------|----------------------|
| One disease | 6 (15.38) | 3 (10.00) | 9 (13.04) | 5.317 (0.070) |
| Two diseases | 26 (66.67) | 14 (46.67) | 40 (57.97) | |
| Three or more diseases | 7 (17.95) | 13 (43.33) | 20 (28.99) | |
| Name of the diseases transmitted# | | | | |
| HIV/ AIDS | 38 (97.44) | 30 (100.00) | 68 (98.55) | 0.781 (0.377) |
| Hepatitis/ Jaundice | 28 (71.79) | 12 (40.00) | 40 (57.97) | 7.035 (0.008) |
| Hepatitis B | 5 (12.82) | 12 (40.00) | 17 (24.64) | 6.746 (0.009) |
| Other diseases | 9 (23.07) | 13 (43.33) | 22 (31.88) | 3.204 (0.073) |

*Chi-square and p value (two-sided) were calculated by Pearson chi-square test comparing urban and rural frequencies; #The question was multiple response so the total is more than 100%

Table 4: Most common conditions for use of injections and the names of the injections commonly prescribed

| Conditions/ diseases for use of injection* | Frequency | Percentage (n=69) |
|---|-----------|-------------------|
| Contraception | 49 | 71.01 |
| Injury | 46 | 66.67 |
| Pain | 33 | 47.83 |
| Weakness | 21 | 30.43 |
| Diarrhoea/Dehydration | 15 | 21.74 |
| Acute (severe) infections | 15 | 21.74 |
| Allergy | 9 | 13.04 |
| Names of injections commonly prescribed* | | |
| Injectable contraceptives (DMPA) | 48 | 69.56 |
| Tetanus Toxoid (TT) | 40 | 57.97 |
| Diclofenac | 31 | 44.93 |
| Intravenous fluids (IVF) | 25 | 36.23 |
| Multivitamin (Vit. B complex) | 13 | 18.84 |
| Antimicrobials | 11 | 15.94 |
| Lignocaine | 10 | 14.49 |
| Pheniramine (anti-allergic) | 9 | 13.04 |
| Hyoscine Butylbromide (Antispasmodic) | 9 | 13.04 |