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Assessment of Safe Injection Practices among Healthcare Providers in Chandragiri mandal, Chittoor District, Andhra Pradesh

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Abstract: ***Background*:** Injections are preferred by patients because they believe they provide rapid relief and more effective than oral medications. Worldwide statistics suggested that unsafe injections account for 32% of new Hepatitis B, 40% new Hepatitis C and 5% of new HIV infections. The prevention of disease transmission through injection requires good knowledge and practice regarding safe injection practices. The present study was undertaken to determine awareness on safe injection practices among healthcare providers, to find out the current injection practices among healthcare providers and to compare the knowledge and practice regarding injection safety among various classes of healthcare providers in Chandragiri Mandal, Chittoor district. ***Methodology:*** A hospital based cross sectional study was conducted for 24 months i.e. November 2019 to October 2021 in Chandragiri mandal of Chittoor district among 203 healthcare providers in one area hospital, one community health centre, one primary health centre, one rural health training centre and 5 private clinics. Data collected was entered in MS Excel and analyzed using SPSS Version 16. ***Results:*** Among the 203 participants, mean age was found to be 33.65± 8.39 years with a range of 21-73. Majority of the subjects were females (83.7%). Differences were noted among knowledge and practice in preparing and administering injections. ***Conclusions:*** The present study shows that though the knowledge about safe injection practices is good among healthcare providers, the practice is poor. Unsafe practices like not washing hands, not wearing gloves and not following the correct steps in giving injections were observed in many.

Keywords: Assessment, injection safety, Healthcare providers, Chittoor district.

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INTRODUCTION

Globally around 16 billion injections are administered every year. The majority of the injections (90%) are given for curative purposes. Around 5% are given for immunization purposes among children and adults while another 5% are given as injectable contraceptives and other procedures. The majority of these injections are not warranted but given by providers indiscriminately.[1]

An injection is considered to be safe when it does not harm the recipient, does not expose the health care worker to any risk and does not result in waste that is dangerous to the community.[2] This is accomplished by utilising a sterile device (syringe, needle, etc.) to administer an injection, using sterile technique by a qualified and well-trained individual, and disposing the used devices in a puncture-proof container particularly designed for proper disposal. Any flaw in the method renders the injection dangerous for both health personnel and patients.[3]

An unsafe injection is a difficult problem to solve. Injections that aren't safe put patients and doctors at danger of infection. Millions of people are infected as a result of intentional reuse of syringes and needles. Hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) can all be transmitted by unsafe injections (HIV). Infection with these viruses frequently causes no symptoms and spreads silently. For hepatitis B, 1.8 percent for

hepatitis C, and 0.3 percent for HIV, the risk of contracting blood-borne illnesses via a needle used on an infected patient is 30%, 1.8 percent for hepatitis C, and 0.3 percent for HIV.[4,5,6]

Global estimates have suggested that unsafe injections account for 32% of new hepatitis B virus (HBV) infections, 40% of new hepatitis C (HCV) virus infections and 5% of new HIV infections.[7]

A high proportion of injections given in India might be unsafe, mainly due to the reuse of needles/syringes which are also scavenged for resale to confound the situation. The popularity of curative injections remains high due to various factors influencing the behaviour of prescribers/injection givers as well as clients. A large proportion of these injections are unnecessary.[8,9]

According to injection practices in India (2012), injections administered for curative purposes constituted 82.5% and a large majorly of these were prescribed for common symptoms like fever/cough/diarrhoea. The use of glass syringes was consistently associated with the potential risk of blood-borne viral transmission. Satisfactory disposal of injection waste was observed to be 61.3% (95%CI: 58.2-64.3) at the health facilities and at 50.9% (95%CI: 46.7-55.2) at the immunization clinics. Significant differences were observed in the injection prescription pattern in public and private facilities as well as rural and urban areas.[10]

The prevention of disease transmission through injection requires good knowledge and practices regarding safe injection practices. Studies conducted across various parts of India had reported a low level of knowledge and inadequate practices among injection providers.[11-15] A study conducted in Andhra Pradesh had also found a vast difference between knowledge and practice while assessing safe injection practices.[16]

Hence both knowledge and practices regarding injection safety are very much essential for good patient care, prevention and transmission of disease. As there was no study conducted in the study area for a long time, this present study was conducted to assess the safe injection practices among health care providers both in government and private hospitals in Chandragiri Mandal, Chittoor district.

Aims & Objectives

The present study was carried out to assess the safe injection practices among health care providers both in government and private hospitals in Chandragiri Mandal, Chittoor district with the following objectives-

1. To determine awareness on safe injection practices among health care providers.
2. To find out the current injection practices among health care providers.
3. To compare the knowledge and practice regarding injection safety among various classes of health care providers.

MATERIALS AND METHODS

A Hospital based Cross-Sectional study was carried out was carried out for 24 months i.e, from November 2019 to October 2021 which included data collection, data entry, analysis and report writing. The present study was done as a part of mandatory dissertation submission for MD examinations of Dr YSR University of Health Sciences, Vijayawada.

Study area: The present study was carried out in Chandragiri mandal, in which there are one area hospital, one Community Health Centre, one Rural Health Training Centre, one Primary Health Centre and 5 private hospitals/clinics.

Study population: For better representation, it was decided to consider all the health care workers from all the above mentioned healthcare facilities.

Inclusion criteria:

All health care providers (Medical officers, Private Medical Practitioners, Staff Nurses, Auxiliary Nurse Midwives and Lab Technicians) in Government and Private Hospitals/Clinics in Chandragiri mandal were included. A total of all 203 health care providers were included in the study.

Exclusion criteria:

Health care providers who were not willing to participate in the study.

The data collected was entered in MS Excel and was analyzed using SPSS software version 16 and appropriate statistical tests of significance were applied as and when necessary.

RESULTS

In the present study, the mean age of the health care providers was found to be 33.65 ± 8.39 years with a range of 21-73 years. Majority of the subjects were between 20-29 years (53.2%) followed by 30-39 years (28.1%). In the present study, it was found that majority of the health care providers in the study were females (83.7%).

Fig 1: Age wise distribution of healthcare providers

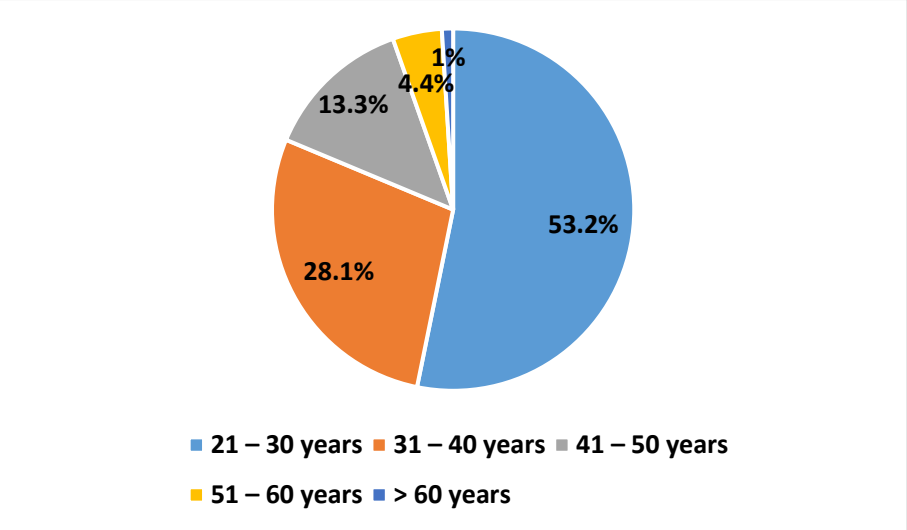
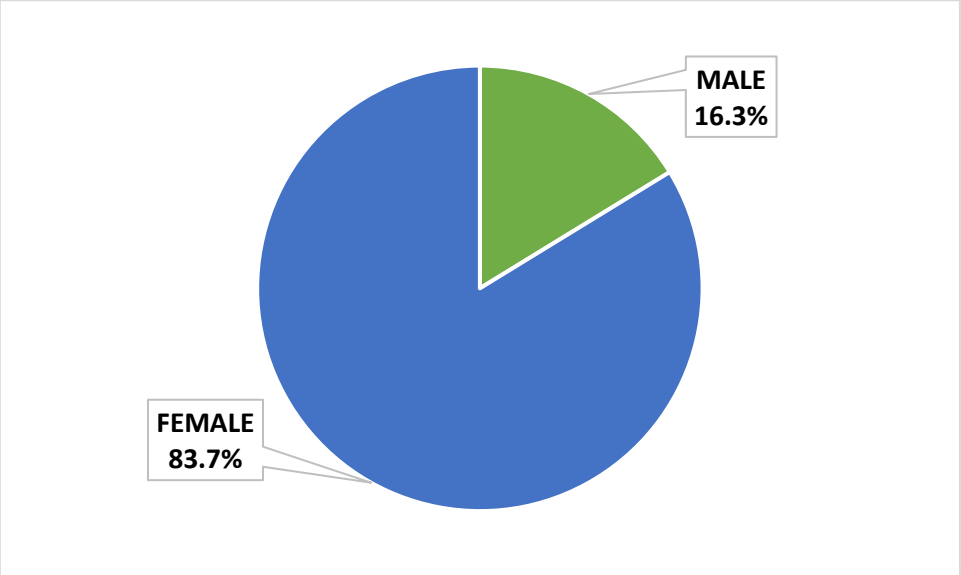


Fig 2: Gender wise distribution of healthcare providers



Knowledge of service providers:

In the present study, 86.1% of the health care providers were having knowledge about safe injection definition. With regard to knowledge on preparing and administering injections, 100% know that expiry date was to be checked before giving injection but only 73.4% knew that hand washing is necessary before administering injection. 66.5% opined that if a needle stick injury occurred, hand should be washed with soap and water immediately while 3% answered that no immediate measures were required. 72.4% were of the opinion that there was no need to report needle stick injury to the higher authorities.

Almost all the participants (99%) knew that the injection site had to be cleaned with spirit and cotton before giving an injection. 16.3% believed that no measures were required if there was an existing cut on their hands while giving an injection.

It was found that 59.6% and 53.7% health care providers had correct knowledge regarding disposal of used needles and syringes respectively where as 49.8% had knowledge regarding using of colour coded bins. Majority of them 84.2% had knowledge on complications due to unsafe injections.

Practices of Healthcare providers:
It was found that, among 203 injection providers, only 55.7% were washing hands with antiseptic soap/rub before giving injection and only 22.7% were wearing gloves while giving IV/ diagnostic purposes. Only 30.1% were following steps in giving injection and 14.3% were checking expiry date before giving the injection. 4.4% health care providers were using ampoule cutter to open the ampoule.

It was found that among 203 injection providers, 10.8% were doing hub cutting of needle. 76.8% were throwing syringe in disposal bags with needle and 18.7% were using Puncture proof container for disposal of needle. 4.4% of health care providers had left used syringe in area accessible to public. In the present study, the prevalence of needle stick injury in the last 12 months was 18.2%.

Comparison of knowledge and practice in injection administration:
It was found that among 203 injection providers, although knowledge regarding hand wash technique was present in 73.4% but only 55.7% were practicing it and 38.9% health care providers know about correct steps while giving injection while only 30.1% were following it. All the health care providers had agreed that checking expiry date before giving the injection necessary but only 4.4% were practicing it.

It was observed that among 203 injection providers, although knowledge regarding hand wash technique was present in 73.4% but only 55.7% were practicing it and 38.9% health care providers know about correct steps while giving injection while only 30.1% were following it. All the health care providers had agreed that checking expiry date before giving the injection necessary but only 4.4% were practicing it.

It was noted that doctors group had better levels of knowledge regarding hand washing (86.3%), wearing gloves during injections (84.3%), steps in giving injection (74.5%) and recapping of the needle (68.6%) compared to staff nurses and other paramedics group. The difference was also found to be statistically significant ($p<0.05$).
It was found that doctors group had good injection practices regarding hand washing (68.6%), following steps in giving injection (68.6%) and proper recapping of the needle (58.8%) compared to staff nurses and other paramedics group. The difference was also found to be statistically significant ($p<0.05$).

It was observed that doctors had slightly better practices regarding preparation of injection in aseptic technique (86.2%) compared to staff nurse (77.1%) and other paramedics (76.4%). However, the difference was also found to be not statistically significant ($p>0.05$).

The comparison of knowledge regarding injection administration and safe disposal and practice of administering injections among different healthcare providers was tabulated as follows.

Table 1 : COMPARISON OF KNOWLEDGE REGARDING SAFE INJECTION ADMINISTRATION AMONG HEALTHCARE PROVIDERS

Knowledge				
	Present (%)	**Absent (%)**	**Total (%)**	
Hand washing				
Doctor	44 (86.3%)	07 (13.7%)	51 (100%)	$\chi2 = 6.98$, df = 2, p-value = 0.030 (S)
Staff Nurse	84 (71.2%)	34 (28.8%)	118 (100%)	
Other paramedics	21 (61.8%)	13 (38.2%)	34 (100%)	
Wearing gloves				
Doctor	43 (84.3%)	08 (15.7%)	51 (100%)	$\chi2 = 32.1$,

Staff Nurse	54 (45.8%)	64 (54.2%)	118 (100%)	df = 2, p-value < 0.0001 (S)
Other paramedics	09 (26.5%)	25 (73.5%)	34 (100%)	
Steps in giving injection				
Doctor	38 (74.5%)	13 (26.5%)	51 (100%)	$\chi2$ = 36.409, df = 2, p-value < 0.0001 (S)
Staff Nurse	31 (26.2%)	87 (73.8%)	118 (100%)	
Other paramedics	10 (29.4%)	24 (70.6%)	34 (100%)	
Recapping needle and syringe				
Doctor	35 (68.6%)	16 (31.4%)	51 (100%)	$\chi2$ = 43.8, df = 2, p-value < 0.0001 (S)
Staff Nurse	24 (20.3%)	94 (79.7%)	118 (100%)	
Other paramedics	5 (14.7%)	29 (85.3%)	34 (100%)	

Table 2 : COMPARISON OF KNOWLEDGE REGARDING SAFE INJECTION DISPOSAL AMONG HEALTH CARE PROVIDERS

Knowledge				
	Present (%)	**Absent (%)**	**Total (%)**	**p-value**
Disposal of used needles				
Doctor	45 (88.2%)	6 (11.8%)	51 (100%)	$\chi2$ = 27.1 df = 2, p-value < 0.0001 (S)
Staff Nurse	54 (45.8%)	64 (54.2%)	118 (100%)	
Other paramedics	22 (64.7%)	12 (35.3%)	34 (100%)	
Disposal of used syringes				
Doctor	46 (90.2%)	5 (9.8%)	51 (100%)	$\chi2$ = 37.9, df = 2, p-value < 0.0001 (S)
Staff Nurse	52 (44.1%)	66 (55.9%)	118 (100%)	
Other paramedics	11 (32.3%)	23 (67.7%)	34 (100%)	
On colour coded bins				
Doctor	38 (74.5%)	13 (25.5%)	51 (100%)	$\chi2$ = 17.2, d.f = 2, p-value = 0.0001 (S)
Staff Nurse	47 (39.8%)	71 (60.2%)	118 (100%)	
Other paramedics	16 (47.1%)	18 (52.8%)	34 (100%)	
Complications due to unsafe injections				
Doctor	46 (90.2%)	5 (9.8%)	51 (100%)	$\chi2$ = 9.44, df = 2, p-value = 0.0089 (S)
Staff Nurse	103 (87.3%)	15 (12.7%)	118 (100%)	
Other paramedics	23 (67.4%)	11 (32.6%)	34 (100%)	

Table 3 : COMPARISON OF SAFE INJECTION PRACTICE WHILE ADMINISTRING INJECTIONS AMONG HEALTH CARE PROVIDERS

Practice				
	Present (%)	**Absent (%)**	**Total (%)**	**p-value**
Washing hands with antiseptic soap/rub				
Doctor	35 (68.6%)	16 (31.4%)	51 (100%)	$\chi2 = 6.46$, df = 2, p-value = 0.0395 (S)
Staff Nurse	64 (54.2%)	54 (45.8%)	118 (100%)	
Other paramedics	14 (41.2%)	20 (58.8%)	34 (100%)	
Prepared injection in septic technique				
Doctor	44 (86.2%)	7 (13.8%)	51 (100%)	$\chi2 = 2.02$, df = 2, p-value = 0.364 (NS)
Staff Nurse	91 (77.1%)	27 (22.9%)	118 (100%)	
Other paramedics	26 (76.4%)	8 (23.6%)	34 (100%)	
Following steps in giving injection				
Doctor	35 (68.6%)	16 (31.4%)	51 (100%)	$\chi2 = 49.1$, df = 2, p-value < 0.0001 (S)
Staff Nurse	18 (15.2%)	100 (84.8%)	118 (100%)	
Other paramedics	8 (23.5%)	26 (76.4%)	34 (100%)	
Proper recapping needle and syringe (two handed recapping) if needed				
Doctor	30 (58.8%)	21 (41.2%)	51 (100%)	$\chi2 = 29.3$, df = 2, p-value < 0.0001 (S)
Staff Nurse	22 (18.6%)	96 (81.4%)	118 (100%)	
Other paramedics	7 (20.6%)	27 (79.4%)	34 (100%)	

DISCUSSION:

In the present study, the mean age of the health care providers was found to be 33.65 ± 8.39 years with a range of 21-73 years. Majority of the subjects were between 20-29 years (53.2%) followed by 30-39 years (28.1%). Ganesh et al[15] (2015) had reported that majority of the subjects were between 20-30 years (93%) which was high when compared to the present study which may be due to the fact that this study was conducted only among nurses. Akhtar et al [17] (2019) had reported that the mean age of study subjects was 29.96 ± 6.13 years which was similar to the present study.

In this study, it was found that majority of the health care providers were females (83.7%). Similar to the study findings, Ganesh et al[15] (2015) had reported that 89.5% health care providers were females. A study by Ismail et al[22] (2007) had also found that 74.2% of the health care providers were female.

In this study, 51.23% of the healthcare providers cited patient preference as the main indication for injection like other studies Peethala S et al[16], Vong S et al[18] and Atul K et al[19].

In the present study, the prevalence of needle stick injury in the last 12 months was 18.2%. Ganesh et al[15] (2015) had reported that 25.6% of health care providers had needle stick injury in the last 12 months. A study by Rajasekaran et al[20] (2003) had reported that the annual incidence of needle stick injury among health care providers was 23.6%. However, Vong et al[18] (2005) had reported very high (53%) annual incidence of needle stick injury among health care providers.

In this study 94.6% and 99.5% health care providers reported that Hepatitis B and HIV infections can be transmitted by unsafe injection practices respectively. However, only 77.8% of them knew that hepatitis C infection can be transmitted through unsafe injection. Akhtar et al[17] (2019) had reported that 94% of health care providers reported correctly the diseases that can be transmitted by unsafe injection practices. A study by Ernest[21] (2002) had reported that 58.3% had knowledge on the diseases that can be transmitted through unsafe injection.

In the present study, it was found that in 203 health care providers, only 3% thought that no measures were required to take after accidental needle stick injury. In a study by Paul et al[12] (2011) 31.2% thought that no measures were required to take after accidental needle stick injury.

In this study, it was found that majority of the health care providers (73.4%) know about hand washing technique, and 52.2% know that they have to wear gloves while giving IV/ diagnostic purposes. Peethala et al[16] (2017) had reported that 64% had knowledge on hand washing, 39% know about wearing gloves, 47.5% on wearing shoes. A study by Naik et

al[13] (2012) had reported that all the health care providers were of the opinion that gloves should be wore during the injection procedure.

In the present study Among 203 health care providers, only 55.7% were washing hands with antiseptic soap/rub before giving injection. In a study by Akhtar et al[17] (2019) 38.2% were washing hands with antiseptic soap/rub before giving injection. A similar study by Peethala et al[16] (2017) had reported that only 29% were washing hands which was low when compared to the present study. In contrast to the study findings only 12.5% health care providers in Paul et al[24] study were doing hand wash before giving injection.

CONCLUSION

Based on the above observations, it can be concluded that knowledge of healthcare providers about preparing and administering injections was average. Knowledge on complications of unsafe injections, diseases transmitted through needle stick injuries was good. Unsafe practices like not washing hands, not wearing gloves and shoes, not following the correct steps in giving injections were observed in many.

Limitations of the study

In the present study although the knowledge and practices for safe injection administration and disposal were assessed, the reasons for improper practices could not be assessed.
As the study was conducted in a single Mandal in a district, to generalize these results to all the health care workers a large sample of health care workers was needed.

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