



# Knowledge, attitudes and practices among healthcare workers at risk of acquiring Crimean-Congo Haemorrhagic Fever

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## Introduction

Crimean-Congo haemorrhagic fever (CCHF) is tick-borne zoonosis mainly transmitted by tick bite. Healthcare workers (HCWs) can potentially be exposed to CCHF virus through needle stick injuries, splash or direct contact with blood and body fluids of infected patients. <sup>1</sup> Nosocomial transmission of CCHF has been well described in South Africa, <sup>2</sup> Pakistan, <sup>3</sup> Iran, <sup>4</sup> Russia, <sup>5</sup> Germany <sup>6</sup> and Turkey <sup>7</sup>.

CCHF had been an emerging zoonosis in Turkey since 2002. <sup>8</sup> 9787 confirmed cases had been reported to Ministry of Health of Turkey between 2002 to 2015 with a 4,8% case fatality rate. <sup>9</sup> During the outbreak in Turkey unfortunately five HCWs have died due to exposure to CCHF virus (CCHFv). A recent retrospective survey identified 25 nosocomial cases with laboratory confirmed infections of total CCHF 51 exposures to CCHF in HCWs of whom four died. <sup>10</sup>

During the CCHF season the number of admissions with a history of tick bite and presumed CCHF infection increases, resulting in high bed occupancy and workload in hospitals in endemic areas. <sup>11</sup> This study was conducted to assess knowledge and practices of HCWs who work in reference CCHF treatment centres in Turkey.

## Material & Methods

### Study design

This cross sectional study was conducted in 10 hospitals in Turkey in 2015. These hospitals are designated as CCHF referral tertiary care centres and are distributed geographically throughout CCHF endemic region and members of Crimean-Congo Research Network of Turkey (CCRNT). <sup>12</sup>

The questionnaire utilised had four parts; part one: socio-demographic characteristics of healthcare workers (medical doctors, nurses and allied health personnel), part two: knowledge on CCHF transmission, part three: organizational and behavioural factors, and part four: occupational exposure to CCHFv.

### Study population

Study participants included infectious diseases and emergency medicine specialists and fellows, nurses and allied health personnel who work in infectious diseases or emergency departments. The participants were sub-divided into two groups; group I: HCWs who worked for management of CCHF, group II: HCWs who did not work for management of CCHF.

### Data collection

After focus group discussions and a pilot questionnaire, a self-administered questionnaire was designed to obtain quantitative data. The four-page questionnaire included 59 multiple-choice questions. Respondents who did not answer the questions regarding socio-demographic characteristics such as, age, sex, job, and workplace were excluded from the final analysis.

### Ethics statement

The questionnaire and study protocol were approved by the Ondokuz Mayıs University Clinical Research Ethics Committee (OMU KAEEK 2015/72).

### Data analysis

Data were entered and analyzed using SPSS version 21 (SPSS INC Chicago, Illinois, USA). The Chi-square test was used to analyse for associations in nominal data and Fisher's exact test was used for non-variable measurements. P-values < 0.05 were considered statistically significant. Missing data was left out on a case-by-case basis.

## Results

- A total of 966 forms was distributed, and 626 (64,8%) were evaluated out of 649 returned. Out of 626 participants 333 (53,2%) were females, 293 males (46,8%). 399 of them worked in Emergency Department (ED) (Table 1). Knowledge scores and the influence of demographic characteristics were evaluated. There was no significant relationship between knowledge on CCHF transmission and age, sex, work experience and profession (p>0.05).
- 345 of the responders (55,1%) had experienced for the management of CCHF (Group I). Group I and II had similar knowledge scores. (p>0.05). The rates of getting education in groups I and II were 87.5% and 52.5% respectively (p< 0.001). 71,2% and 60,5% of group I respondents felt themselves had adequate knowledge and skill where as 28,8% and 15,6% in group II, respectively (p< 0.001).
- Rate of hand washing before entering the room were similar in both of groups (98,8% vs 98,5%) (p>0.05). Rate of recapping of needles were 13,7% and 27,7% in group I and II, respectively (p>0.05). Among group I cases 96.5% used personnel protective equipment (PPE) and 98,8% performed hand washing entering the room of a patient with CCHF. Usage of PPE was higher in HCWs in Infectious Diseases Department (IDD) than that of ED (p<0.001).
- Fear of death due to being infected with CCHF was present 44,6% in group I and 86,9% decided to leave job.
- 38 HCWS (6,3%) reported that they have injury. 57,1% are needle stick injuries and 42,9% were splash. There was no difference regarding sex, occupation and work groups I and II (p>0.05)
- Whereas 80,2% of HCWs in IDD were stated that sufficient prevention measures was present, only 47,2% of HCW in ED was considering it (p<0,001).
- Whereas 22,4% of IDD staff was stated the number of HCWs was not enough, the ratio was 18,6% in ED staff (p=0,398).
- When we questioned, "Is the number of isolation bed or room" 36,5% of IDD staff answered yes enough, but the ratio was only 22,8% in ED staff (p=0,007).

**Table 1. Demographic characteristics of survey responders**

	n=626	%
Sex		
• Male	293	46,8
• Female	333	53,2
Occupation		
• Doctor	271	43,3
• Nurse	210	33,5
• Allied health personnel	145	23,2
Degree		
• Academician	54	19,9
• Specialist	53	19,6
• Resident	164	60,5
Department		
• Infectious Diseases	227	36,3
• Emergency	399	63,7

**Table 2. Perceptions of healthcare workers for management of cases with Crimean-Congo Haemorrhagic Fever (CCHF)**

Item/responders who answer "yes"	Total		Doctor		Nurse		Other HCWs		P
	n	%	n	%	n	%	n	%	
Are you willing to provide care to patients with CCHF?	208	60,5	91	58	82	68,9	35	51,5	0.044
I have to provide care to CCHF patients (compulsory)	122	35,7	57	36,3	36	30,5	29	43,3	0.213
If it was possible I wouldn't be involved in caring for CCHF patients	170	49,7	89	56,3	45	38,1	36	54,5	0.008
Are HCWs who manage CCHF patients separate from other HCWs?	265	77,3	108	69,2	103	86,6	54	79,4	0.003
Did you ever consider leaving your work due to it involving caring for CCHF patients?	299	86,9	137	86,7	103	87,3	59	86,8	0.989
Is your workload increase in CCHF epidemic seasons?	313	91,5	142	90,4	110	93,2	61	91	0.707
Has your role of managing CCHF patients been appreciated by hospital administration?	22	6,5	3	1,9	8	6,8	11	16,7	<0.001
Do your colleagues fear you due to you managing CCHF patients?	94	27,5	32	20,5	45	37,8	17	25,4	0.006
Are you concerned of any legal issues due to managing CCHF patients?	156	45,6	79	50,3	52	43,7	25	37,9	0.205
Do you think you are paid enough for what you are doing?	32	9,4	20	12,7	8	6,8	4	6	0.139
Do you think that you have increased stress during the CCHF season?	295	86	135	86	105	88,2	55	82,1	0.51
Do you think that CCHF may be transmitted to you because of your work environment?	316	92,7	142	90,4	113	95,8	61	92,4	0.245
Did you have a fear of death because of your CCHF work?	153	44,6	59	37,6	69	58	25	37,3	0.001
Do you empathize with CCHF patients?	264	77	111	70,7	100	84	53	79,1	0.03
Do you fear transmission CCHF virus to your family?	183	53,5	64	40,8	76	63,9	43	65,2	<0.001

## Conclusions

- This study showed that knowledge related CCHF and the usage of PPE in HCWs who work for management of CCHF in both IDD and ED were adequate. Education of HCW who does not care patients with CCHF was not optimal.
- Due to occupational pressures including heavy workload, fear of nosocomial transmission and different relationships with colleagues HCWs managing CCHF frequently consider changing their jobs.
- Continuous and periodically education on prevention of CCHF, which has 5-80% mortality, is vital for all HCWs.
- Education should be targeted for decreasing stigma and fear of transmission during patient care.
- Infection control and prevention education programs should be integrated into undergraduate curricula for behavioural change.
- Adequate PPE must be provided in hospitals for prevention of CCHF.
- Rewarding of HCWs who manage and/or care CCHF patients by hospital administration may motivate them.

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