



Providing healthcare under ISIS: A qualitative analysis of healthcare worker experiences in Mosul, Iraq between June 2014 and June 2017

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ABSTRACT

During ISIS occupation of the Northern Iraqi city of Mosul between June 2014 to June 2017, healthcare workers remaining in Mosul continued to provide medical services. Little is currently known about Iraqi healthcare workers' personal and professional lives in the ISIS healthcare system, and how these individuals adapted. This study sought to explore their experiences during occupation through thematic analysis of qualitative data from twenty interviews conducted immediately after ISIS withdraw from Mosul in August 2017. Participants were sampled from healthcare facilities still in operation after liberation and included healthcare workers of varying disciplines, age and gender. Participants described major changes to their personal and professional lives under ISIS and an extremely limited perceived ability to negotiate the challenges of providing healthcare in the ISIS system. They described terrifying working environments, the strict separation between the sexes, restricted movement, and continuous monitoring by the Al-Hesba morality police. Infractions of ISIS law and subsequent punishment, deaths and kidnappings, changes in personal relationships, poverty and the disrupted schooling of children were also discussed. The importance of protection by supervisors, access to additional money and transportation were highlighted. Understanding these hardships may help support the recovery of health workers experiencing similar situations.

Abbreviations: HCW: Healthcare Worker; PHCCs: Primary Health Care Clinics; ISIS: Islamic State of Iraq and Syria

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Research highlights

- This study represents one of the first known qualitative analyses of the experiences of healthcare workers in Mosul, Iraq under ISIS control since the city's liberation in June 2017.
- This study expands broadly on what little is known about the economy, law and healthcare services under ISIS.
- This exploratory analysis highlights the great hardship experienced by health workers in Mosul, and underscores the need to plan appropriate interventions in order to retain healthcare staff post-conflict. Such interventions may aid in the recovery of the local healthcare services and improve the health of the population of Mosul during this vulnerable time of the city's rebuilding.

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Background

Fighters of the Islamic State of Iraq and Syria (ISIS) seized Mosul, Iraq's second largest city, between the 4th and 10th of June, 2014. During the immediate aftermath, between 200,000 and 500,000 Mosul residents fled, while migrants from surrounding rural villages and members of ISIS settled in the city to consolidate power (UN Human Settlements Program, 2016). The economy of the city quickly collapsed as factories and shops closed and many workers lost their jobs, though health-care workers (HCWs) continued to work. The ISIS administration formed 'Al-Hesba', the morality police, to monitor the city's citizens. The Diwan (House) of Al-Hesba was one of the many branches of local administration established (Al-Tamimi, 2015). In their strict monitoring of life in Mosul, Al-Hesba was also present in hospitals and clinics, in order to ensure that their religious mandates, such as proper attire and the separation of the sexes, were observed (Callimachi, 2016).

The Mosul healthcare system experienced challenges prior to ISIS's arrival. Health clinics throughout Iraq were frequently without electricity and water, and experienced shortages in staff and medicines. Some facilities had been destroyed in earlier conflict (Webster, 2016). However, ISIS occupation brought additional challenges, including a change in the economy of healthcare. Under ISIS management, reports indicate that ISIS fighters are provided health care free of charge, while costs for citizens increase (Bacchi & Limam, 2015). Those HCWs who managed to flee Mosul or refused to continue practicing were subject to seizure of personal property and other punishments, further depleting the human resources of the health system (Bedolla & Bedolla, 2016; Lafta, Cetorelli, & Burnham, 2019).

In October 2016, the Iraqi military began efforts to retake the city of an estimated 1.5 million remaining people (Gordon, 2015; Wright, 2016). Beginning in the villages east of Mosul and working through east Mosul itself, the liberation of the city ended with the capture of west Mosul on 29 June 2017 (Coker & Hassan, 2017).

The experiences of Mosul HCWs during ISIS has not previously been explored. Similarly, little evidence exists regarding how HCWs experience repressive and brutal regimes, nor do we know much about their personal suffering and loss, which may have repercussions on their ability to continue as a provider. A study of HCWs operating in Uganda pre and post-conflict (1986–2006) found that strong intrinsic motivation and the employment of specific coping strategies permitted HCWs to continue their practice. These included psychological defenses such as personal faith and fatalism, as well as pride in their ability to cope logistically by evading rebel forces (Namakula & Witter, 2014). To add to this gap in our understanding of healthcare provision in times of extreme regime change, this study explores the experiences of the Mosul healthcare workforce under ISIS and how individual HCWs coped during this time.

Methods

The aim of this study was to describe perceived changes and experiences of HCWs' personal and professional lives in Mosul occurring during three years under ISIS. Twenty interviews were conducted with HCWs in Mosul between July and August of 2017. Interviews began in the immediate aftermath of ISIS withdrawal.

Participants were purposively recruited to maximise variation in the healthcare sector, age and sex of respondents. This sampling approach was meant to ensure a wide breadth of experiences were captured (Coyne, 1997). Purposive sampling was constrained by the realities of the healthcare system in Mosul during the study timeframe. At the time of interviewing only two hospitals and four Primary Health Care Centers (PHCCs) were in operation. Recruitment occurred in both hospitals and three of the PHCCs. Eligibility criteria included being an Iraqi HCW in Mosul both before June 2014 and during ISIS governance. Participants could, therefore, comment on the changes, which had occurred. All participants approached for an interview agreed to participate and informed consent was given.

Interviewers were medical doctors from Mosul who had fled the city at the time of ISIS takeover. Interviewers received training in interviewing techniques for qualitative research prior to data collection. Interviews were conducted using a semi-structured interview guide (Appendix 1). Questions were open-ended and exploratory. The interview guide was developed through collaboration between the U.S.A. and Iraq-based research team in order to ensure the contextual salience of domains of inquiry and drew on previous surveys in Iraq (Lafta, Al-Nuaimi, & Burnham, 2018; Lafta, Cetorelli, & Burnham, 2018). Several ‘Grand Tour’ questions were posed to collect basic descriptive information about typical workdays, common patient complaints and perceived changes since June 2014. A free-listing exercise of problems faced by HCWs in Mosul was included. The interview also solicited specific information regarding the treatment of women, how relationships within personal and professional networks were affected, and the participants’ motivation to work in Mosul during ISIS. The interview ended with questions meant to solicit meaning through imaginative variation, asking participants to imagine how their life might be different had the events of June 2014 not occurred.

Interviews averaged 40 min in length and were not audio recorded due to concerns about privacy among the HCWs. Interviews were conducted in pairs, with one interviewer responsible for asking questions and the other taking extensive notes. Where possible, the interviewers attempted to capture the exact spoken words of the participant. All interviews were conducted in Arabic and were translated and transcribed into English for analysis.

Transcripts were analysed thematically to provide inductive, descriptive results. Analysis began with iterative readings of the interview notes to identify descriptive themes (Braun & Clarke, 2006). These themes formed a codebook used for line-by-line coding of the interview notes. Memoing was used during coding to capture thoughts, impressions and questions regarding the text (Birks, Chapman, & Francis, 2008). Midway through analysis, the primary U.S. analyst met with the Iraqi field team to discuss the codebook and clarify interpretations. Contact with the Iraqi field team was maintained throughout analysis. Where necessary, translations between Arabic and English were discussed in detail to ensure that the context and validity of themes were not lost in translation. The quoted segments that follow are taken directly from the notes of the field team, which aimed to replicate the exact words or sentiments of the participants.

Results

The majority of participants were 30 years old or above, with at least 10 years of experience in the health field. Participants were more likely to be female, married at the time of interview, and working as physicians in PHC clinics. Economic hardship was commonplace (Table 1).

Free-listing and emerging themes

Overwhelmingly, HCWs described changes in personal and professional lives in absolute terms, and portrayed an inability to resist these changes.

Everything that was occurring with me was by force ... the loss of my son ... the work ... my staying in Mosul ... my clothes ... my actions ... all were against my will ... They (ISIS) intended to ruin Mosul and to kill its people physically, psychologically and emotionally. We can't do anything except ask God to avenge us. (59-year-old woman, microbiologist)

While the personal and professional changes described were extensive, specific themes emerged. The free-listing exercise drew a clear initial outline of the hardships experienced with the most prevalent being continuous monitoring by Al Hesba police (Table 2).

Some themes that were not free-listed as problems were nonetheless described in detail at other points during the interview. Main themes and sub-themes were therefore identified both through the

Table 1. Participant characteristics.

	N (%)
<i>Age</i>	
20–29	2 (10)
30–39	5 (25)
40–49	6 (30)
50+	7 (35)
<i>Gender</i>	
Male	7 (35)
Female	13 (65)
<i>Marital status</i>	
Single	1 (5)
Married	17 (85)
Divorced	1 (5)
Widowed	1 (5)
<i>Occupation</i>	
Physician ^a	8 (40)
Nurse	4 (20)
Laboratory Worker	2 (10)
Dentist	2 (10)
Other Healthcare worker	4 (20)
<i>Length of time in healthcare (years)</i>	
0–4	0 (0)
5–9	3 (15)
10–19	8 (40)
20–29	5 (25)
30+	4 (20)
<i>Place of work</i>	
Primary Health Care Center (PHC CLINICS)	13 (65)
Hospital	6 (30)
Private Practice	1 (5)
<i>Economic status</i>	
Very poor (not enough money for food)	7 (35)
Poor (but not food insecure)	7 (35)
Fair (can't afford luxury items such as car or computer)	5 (25)
Good (can afford some luxury items)	1 (5)
	N = 20

^aPhysicians reported specialties including family medicine, obstetrics and gynaecology, dermatology, and paediatrics.

Table 2. Free-listing Exercise: What problems did healthcare workers in Mosul have under ISIS (professional or personal)?

Problem	Number of participants who listed (out of 20)
Continuous surveillance 'They were everywhere'	IIII IIII IIII III (18)
Psychological distress 'Above my potential'	IIII IIII IIII (14)
Poverty 'The Economic Problem'	IIII IIII III (13)
Restrictions on movement	IIII III (8)
Disrupted schooling of children 'The study stopped'	IIII III (8)
Deaths or kidnappings 'A great loss'	II (2)
Problems with drugs and instruments	II (2)
Could not leave Mosul	I (1)
Forced labour	I (1)

analysis of the free-listed data as well as through inductive content analysis of the entire text. This resulted in ten final descriptive themes (Table 3).

Continuous surveillance 'They were everywhere.'

While all public areas were monitored by Al-Hesba, the scrutiny of HCWs was described as particularly keen. Al-Hesba were present daily in healthcare facilities to ensure that ISIS moral codes were observed by both patients and HCWs. This was described as a 'strict supervision' and a 'continuous

Table 3. Main themes.

1. Bad, tense work conditions
2. Strict separation between the sexes
3. Restrictions on movement
4. Continuous surveillance 'They were everywhere'
5. Infractions and punishments 'A great sin worth the slaughter'
6. Deaths or kidnappings 'Great loss'
7. Changes to personal relationships
8. Poverty 'The economic problem'
9. Disrupted schooling of children 'The study stopped'
10. Psychological distress 'Above my potential'

monitoring' with several participants saying, 'They were everywhere.' HCWs discussed their intense fear given that Al-Hesba had great latitude in the enactment of punishment and even unintended infractions were severely punished. For this reason, HCWs described the necessity of exercising great caution while in the workplace. While many ISIS members were non-Iraqi, Al-Hesba were described as local men mainly from peripheral areas of Mosul, largely uneducated. These men were described as violent, unpredictable, ever-present and unable to be reasoned with.

Infractions and punishments 'A great sin worth the slaughter.'

All participants described personally experiencing or witnessing a punishment by Al-Hesba (Table 4). Punishments for violations could be immediately carried out by Al-Hesba, or deferred to the courts. In the case of court referrals, Al-Hesba confiscated the individual's government identification card, requiring them, or in some cases their husband, to report to an ISIS judge to retrieve the ID and be sentenced. HCWs whose IDs had been confiscated indicated they would often not report to the court, for fear of the punishment they would receive.

Punishments varied widely in severity, even for infractions HCWs themselves considered benign. Female participants described being censured or their husbands being beaten if they wore clothing of a restricted colour. Men similarly described being censured for wearing pants that were too long, or

Table 4. Infractions and punishments experienced by healthcare workers in Mosul, Iraq under ISIS.

Infractions	Punishments
Inappropriate clothing or appearance	Flogging of self or guardian Financial fine Torture Seizure of ID to report to court
Arguing with Al-Hesba morality police or verbally disputing ISIS law	Flogging Execution Burning of academic credentials Seizure of ID to report to court
Missing mandatory daily work shifts	Seizure of property
Not provide free medical services to ISIS members	Seizure of property Execution
Woman traveling alone without guardian	Seizure of ID to report to court
Male and Female co-workers alone together	Execution Flogging Forced Marriage
Providing medical treatment to the opposite sex	Imprisonment Flogging
Prior political or military careers	Imprisonment Execution
Leaving Mosul	Forcibly returned to city Financial penalties Seizure of professional credentials and ID Execution
Not paying Zakat (religious tax)	Seizure of ID to report to court

having too thin a beard. One participant, a 34-year-old female nurse, discovered alone with a male co-worker, was forced to marry him in order to prevent him from being executed. A 39-year-old male general practitioner described how his neighbour's daughter, age 6, was punished by Al Hesba for cleaning outside of the home in a sleeveless dress without hijab. The girl died later that night and the physician described his suspicion that the device, an instrument that repeatedly 'bit' or lacerated her hands, may have been poisoned.

Deaths and kidnappings 'Great loss.'

Four participants described the violent loss of loved ones. A 33-year-old single laboratory technician stated that her brother was kidnapped by ISIS for approximately three months, during which time her father 'died of grief'. She stated that though she was happy upon her brother's return, 'My father who was my friend, my supporter, was dead.' Similarly, a 59-year-old female microbiologist shared the kidnapping of her son, whom she later discovered had been killed by ISIS. A female physician in her fifties discussed the loss of her husband, son and father-in-law, all killed by snipers during the liberation of East Mosul in late 2017. A 46-year-old family physician with several children said only that her husband died during ISIS rule. She described the event as 'my great loss', saying that she could not bear it anymore.

Psychological distress 'أو فوق طاقتي' Above my potential.'

This theme emerged in 70% of participants. Distress was described as both personally experienced, as well as witnessed in co-workers, patients, children and friends. Anxiety and depression were reported specifically. Children who were withdrawn from schools and kept at home due to parents' concerns for their safety and protection from ISIS indoctrination were seen to have suffered emotionally. A 53-year-old male pharmacist noted that many youths had died not only due to violence but 'death from fear' which he reported to mimic a sudden heart attack. Environments were constructed as spaces of dispersed violence and fear; a 40-year-old male nurse poignantly describing such a scene: 'We saw the bodies hanging on the electricity poles for several days. I could not bear that. It was above my potential', meaning that it was a sight that he could not endure. Fear and exposure to violence were reportedly dispersed across not only personal and professional spaces in Mosul, but also across time, with participants speaking of fear in the past, present and future tense. Participants described the loss of hope, feeling tired, lack of interest in social activities, and lack of motivation. Participants also used words such as 'disgust', 'hate', and 'humiliation' to describe their reactions to their circumstances.

Bad, tense work conditions

The working conditions of HCWs in Mosul were described by all participants as both tense and extremely difficult. This was often tied to the constant presence and behavioural monitoring of Al-Hesba, the intense fear this monitoring engendered, and the violence witnessed both within the care setting and in the community. A 55-year-old female family medicine doctor working at a PHC clinic said, 'We would pray to God daily to complete the day without trouble.' A 33-year-old female laboratory worker described that it felt as though she worked in a 'great jail'.

Problems with drugs and instruments

ISIS members frequently commandeered medical instruments from PHC clinics to be used in hospitals to treat wounded ISIS fighters. HCWs at one clinic described hiding their most valuable medical instruments in cupboards or under other objects to prevent theft by ISIS. A hospital-based physician noted that medicines delivered to the hospital by ISIS were of dubious origin and quality. Many were expired, or appeared to have been stolen in raids. This physician described being forced to use these medicines despite his objections. An HCW in a PHC clinic described frequent shortages of medicine and reflected that ISIS had little interest in maintaining the drug supply to PHC clinics, giving preference to hospitals.

Forced labour

A 34-year-old female nurse employed at a hospital noted that she was forced by Al-Hesba to be on call for 24 h every two days without leave. Daily duty was described as mandatory and HCWs described fearing being killed or having their homes confiscated if they refused to work.

Relationships with colleagues

Relationships between colleagues were largely seen to remain positive, with anti-ISIS sentiments shared by workers. Department supervisors played a vital role in protecting clinical staff. Supervisors would step in to cover shifts and made efforts to prevent female workers from being in contact with Al-Hesba. Even amongst this general comradery, relationships were described as both limited and constrained given constant observation by the morality police and the forced separation between male and female health staff.

Strict separation between the sexes

Separation between the sexes was described in both tangible and intangible ways. Specifically, physicians at a PHC clinic noted that the upper floor of the facility was for women only, with its own private corridor. While a hospital worker described only 'an invisible red line' which existed between men and women in the working space. In either case, communication between male and female HCWs was extremely difficult or impossible, as female staff were not permitted to be alone with male colleagues.

Women only treat women, men only treat men. As an extension of the separation of the sexes, HCWs in hospitals were only permitted to treat patients of their own sex, while practitioners in private practice could treat the opposite sex so long as strict moral guidelines were followed, such as the covering of women throughout the exam. These differences in same sex treatment regulations across healthcare sites were largely due to Al Hesba's mandate to monitor hospitals and PHC clinics, wherein strict separation could be enforced. Conversely, private practices were often outside of Al Hesba's mandate, making regulations in those sites less strict, or at least less strictly enforced. This rule was extended to the treatment of children. In a strictly separated clinic, a female HCW reported a husband not being permitted entry to visit his sick wife. One anecdotal report included how HCWs sometimes felt ethically compelled to violate these regulations in life threatening situations, as in the case of two female clinicians who hid from Al-Hesba monitors in order to provide life-saving treatment to a male patient.

Restrictions on movement

Women travelling alone. Female HCWs described frustration surrounding transportation. Women were permitted to walk alone, but could not ride in a car with others unless an appropriate male escort was present, making transportation to work extremely difficult. This situation worsened for some female HCWs as their sons, husbands, or other male relatives were kidnapped or killed and cars were seized by ISIS, destroyed, or sold. Unrelated male and female co-workers could not ride together to work. However, female HCWs faced punishment if they did not report to work. Women, especially women living alone, were in a precarious and potentially unsolvable conundrum. One woman reported violating the law by taking taxis, placing her at great risk. Those without financial means reported walking long distances to work daily.

Could not leave Mosul. Without exception, all participants regretted having not fled Mosul before the end of 2014, by which point travel outside of the city was restricted by ISIS. Reasons for remaining in Mosul included fear of property seizure and leaving family. Avenues for escape were both risky and expensive (up to 4000 USD per person through Syria and Turkey). One participant stated that they had underestimated the seriousness of the situation in the early days. Participants who lived in areas surrounding the city, and some who had attempted to flee to the city of Erbil 85 km east, stated that they were intercepted and forced back to Mosul by ISIS fighters.

Changes in personal relationships

Personal relationships were impacted both positively and negatively. A male dermatologist in his 50 s described personal relationships feeling closer, 'as we needed each other'. However, many described relationships being restricted due to fear of leaving the home, lack of transportation, the dangers of socialisation, and being overworked. Social networks were also disrupted since friends and family members who fled Mosul were no longer part of their lives.

Four participants described how families were in great need of each other during this time. The emotional and financial support within families was described as a strong motivator to keep working. Those who were retired continued to receive pensions from the Iraqi government and were therefore often principal sources of financial support for the household. Some HCWs described that constant requests for money produced a strain in their familial relationships.

Similarly, spouses faced strains in their marital relationships. One female participant shared that her husband had been flogged due to her wearing clothing in violation of law. Another spoke of becoming the main household earner after her husband lost his job. The constant need for husbands to serve as escorts for their wives was also explained as burdensome.

Poverty 'the economic problem'.

Health workers described severe changes in their economic situation. Monthly salaries were reported between USD 10-100. Many reported selling cars and jewellery to survive. Local jewellers purchased gold for cash and cars were sometimes sold to ISIS. Participants with large families, sick relatives, or children with special needs particularly struggled. Few participants were able to find second jobs. 'Al Zakat', a mandatory religious tax levied on households, was noted by two participants to be an additional burden they felt they could not afford.

While income dropped drastically for many, the cost of medical services, previously free, became relatively expensive during ISIS years. Mosul residents could often not afford to receive medical treatment at a facility. One participant who owned a private practice prior to June 2014, described being forced to close the practice, as patients were no longer able to pay for care.

Disrupted schooling of children 'the study stopped'.

Participants with children discussed how school curriculums were changed by ISIS to reflect their radical ideology. Parents expressed particular concern that the new curriculums encouraged violence. Of the 16 participants with children, half discussed how they removed their children from school as a result. Parents could not object to the curriculums for fear of punishment and many parents forbade their children from leaving the home at all for fear of Al-Hesba.

Additional themes

Personal appearance and freedoms

HCWs noted the various ways their lives changed after the arrival of ISIS. Women were required to wear gloves and a 'muffler', a black cover extending from the head to the knee, covering the face. The muffler consisted of three layers, one of which was transparent and covered the woman's eyes. Female HCWs described how these garments hampered their work. Male HCWs reported being compelled to grow long beards and thin mustaches. Television, cell phones and internet use were prohibited.

Patients and illnesses treated

Changes in patient type and the nature of their complaints were reported. Gastrointestinal infections, hepatitis A and urinary tract infections became increasingly common. Infectious diseases more prevalent during that time included tuberculosis, chicken pox and measles. Anaemia and malnutrition were frequent complaints, possibly linked to widespread poverty. Scabies and pediculosis

also increased. All HCWs resoundingly described psychological complaints and injury caused by conflict, especially among youth.

HCWs noted that the types of patients they received had also changed, seeing many poorly educated patients from villages outside of Mosul. Similarly, HCWs saw a number of non-Iraqi patients, including Moroccans, Tunisians, Libyans, Europeans and Asians who came to Mosul with ISIS. Clinicians spoke of the need for translators and a 32-year-old female dentist described that it ‘was as if we were visiting the whole world without a passport’.

The medical needs of ISIS fighters were sometimes unique. A 45-year-old female laboratory worker reported handling a large volume of pre-marital tests, saying it appeared that ISIS members ‘would marry a new woman every month’. Marriages among ISIS members were thought to be mostly with immigrant women coming to Mosul through ISIS networks. However, they might rarely choose to marry a Mosul woman. For this reason, many Mosul families reportedly hastened to facilitate the marriage of their daughters to avoid pressure for marriage to ISIS fighters for women’s protection.

Members of Al-Hesba were treated free of charge and ISIS members, especially fighters, were given priority medical treatment. Due to risks involved with moving about during the day, informal medical care was sometimes provided to Mosul residents in their own homes in the evenings, out of the sight of Al-Hesba.

In the name of religion

Three participants reflected on the religious motivations of ISIS. All three participants (two men and one woman, all over the age of 40) expressed that they felt that ISIS was ‘disturbing’ or even ‘destroying’ the Islamic religion. A 40-year-old male nurse expressed ‘they stole and destroyed everything in the name of religion ... even the religion itself’.

Imaginative variation

Participants were asked to reflect on how their lives might have been different, had the events of June 2014 never occurred. Participants shared grief over their lost loved ones, regrets regarding the disruption of their own education and the education of their children, and having had dreams of travelling abroad, visiting Mecca, purchasing homes, cars and private businesses. A 34-year-old woman working as a nurse considered how her life as a woman might be different, expressing that had ISIS not arrived ‘I could defend myself and take my own rights ... I could choose my husband by myself.’

Discussion

Many hardships were discussed by HCWs in Mosul, Iraq when recounting their experiences during the ISIS occupation from June 2014 to June 2017. Specifically, they described changes to the types of patients and complaints they treated, inadequate access to quality pharmaceuticals and medical instruments, and widespread poverty. Furthermore, HCWs described changes in the workplace, including requirements regarding clothing and the strict separation of the sexes. The omnipresent Al-Hesba, or religious police, patrolled hospitals and clinics, and punishments prescribed for infractions were often brutal. Long, frequent shifts were described and restrictions on movement, especially for female healthcare workers, made transportation both difficult and dangerous. Psychological distress among HCWs was described as very common. Despite these many hardships, HCWs found ways to adapt, providing informal treatment to civilians, hiding medical instruments to prevent theft, relying on supervisors, and hiding treatment of the opposite sex. Careful interactions with the Al-Hesba police and avoidance of the ISIS courts was of paramount importance. The deteriorating economic situation was coped with by selling valuables and taking second jobs, while families played large supportive roles. Having a retired person in the household who was still receiving an Iraqi government pension, was of great assistance.

Much of what is described by HCWs interviewed in this study aligns with what we know about the economy, law and healthcare system under ISIS. Most notably, HCWs report an influx of emigrants that mirrors the international recruitment strategy and make-up of ISIS fighters (Stern & Berger, 2015). Similarly, HCW reports of injuries and illnesses treated during ISIS aligns with recent household surveys taken in Mosul (Lafta, Al-Nuaimi, et al., 2018; Lafta et al., 2019). The push to marry daughters quickly to prevent ISIS marriages was found in household surveys of the community at large (Lafta, Cetorelli, et al., 2018).

While the economy under ISIS varying from place to place, widespread poverty was likely in most locations. The economy of ISIS is largely thought to be extractive, relying heavily on local labour, continued payments from the governments of Syria and Iraq, widespread smuggling of resources and taxation of their citizens (Hansen-Lewis & Shapiro, 2015). Further, media has reported shortages of healthcare staff and medicines and increased rates of violent injury in Mosul beginning in 2014, similar to what has been seen in Syria since the arrival of ISIS (Cousins, 2014; Sahloul et al., 2016). Given the paucity of medical staff available in the city and in ISIS networks as a whole, controlling health services was of paramount importance.

Arguably, ISIS had sought to solidify its status as a state, rather than a terrorist organisation, by holding territory and through various state-like acts such as welfare and the maintenance of local economy and governance (Ciro Martínez & Eng, 2017). The documented brutality of this governance as it relates to the health workforce is expanded upon in this study. It is, for example, known that ISIS fighters are given priority medical treatment under ISIS law and that physicians who defy this law were executed (Arie, 2015; Ho, 2015). Participants sardonically described infractions such as these as 'great sins worth the slaughter', and patently disagreed with these laws, not believing that those being punished deserved it. This is in agreement with social marketing surveys taken of Iraqis in Sunni provinces through 2014, which found that 80% of respondents supported removing ISIS, saying that while ISIS had been tolerated in many territories, governance by ISIS was not welcome (al-Dagher, 2015).

Of particular note is the situation of female professionals in ISIS. Reports regarding the separation of the sexes in healthcare facilities and female HCWs' dress requirements have been explored in the media (Cunningham, 2014; Ho, 2015). The Islamic proto-state has struggled to include women of varying professional capacities through the creation of 'parallel institutions': women-only environments where women can work. This is seen by ISIS as a preferable alternative to both secular, mixed workforces as well as total removal of women from the workplace and is unprecedented in jihadist movements to date (Khelghat-Doost, 2017). The results of this study provide further insight into the nature and problematics of the integration of women into ISIS's workforce.

That the HCWs of Mosul found ways to adapt during this time of conflict aligns with what we know of the great resourcefulness of HCWs in other situations. Healthcare workers offering continued services through the conflict in northern Uganda in the early 2000s similarly describe employing practical coping strategies to ensure their personal safety and continue work (Namakula & Witter, 2014).

Psychologically, and unlike the HCWs in Uganda, this study's participants did not discuss strong intrinsic motivations or faith as coping strategies. The widespread psychological distress, and its relationship to the whole of the experience of healthcare work under ISIS, aligns with bioecological models of mass trauma (Hoffman & Kruczek, 2011). Efforts to promote mental health and provide treatment to HCWs experiencing these situations is warranted, given the likelihood of posttraumatic stress (Shalev, Tuval-Mashiach, & Hadar, 2004). Indeed, many healthcare workers under ISIS experienced trauma that may potentially lead to psychological distress. Future research regarding traumatised healthcare work forces might investigate the effectiveness of peer support programmes, trauma-informed care, or other trauma-based therapies for mental health prevention and intervention. Peer support may prove especially advantageous in a traumatised healthcare workforce given what is known of its relationship to mental wellbeing and the adaptability of such programmes to workplace cultures such as a hierarchical healthcare system (Jones, Roberts, & Greenberg, 2003; Lowery & Stokes, 2005).

During times of conflict, health systems may deteriorate due to the destruction of buildings, resources and loss of staff. The retention of health workers post-conflict, especially in health systems already with low human resources, is a source of widespread concern (Chirwa et al., 2014; Witter, Sok, Samai, Namakula, & Chirwa, 2011). This unfortunately often coincides with increased needs in communities for health services. The devastation wrought by 14 years of conflict in Iraq, followed by ISIS control, then by the extensive destruction of Mosul by military actions during liberation left the people of Mosul vulnerable to many health problems. The rebuilding of a health system after conflict may contribute in pivotal ways to the recovery of the state as a whole, and ensuring the recovery and retention of healthcare personnel may be a vital component (Kruk, Freedman, Anglin, & Waldman, 2010). Re-establishing health services in both the long and short term may depend heavily on the ability of the Iraqi government and international agencies to reconstruct and staff health facilities in the city. In order to fully utilise Mosul HCWs, their experiences must be explored and understood. It remains to be seen what the future plans of HCWs in Mosul will be. Ensuring that HCWs continue to work is especially important given that medical education throughout Iraq has deteriorated due to the ongoing conflict, and training new medical professionals will take time (Barnett-Vanes et al., 2016; Lafta, Al-Ani, et al., 2018).

Literature suggests that in order to recover and incentivization of the Mosul healthcare workforce immediate economic relief, additional training, promotions and other recognitions at work, as well as easing working conditions through better hours and facilities would be a warranted strategy (Herzberg, Mausner, & Snyderman, 1959; Namakula & Witter, 2014). In approaching Mosul HCWs it should be recognised that many may not have chosen to remain in the workforce during the ISIS years, rather their service was forced. This may affect their intrinsic motivation to continue working and interventions may benefit from focusing on increasing such motivation (Namakula & Witter, 2014; Serra, Serneels, & Barr, 2011). The safety of the healthcare workforce in Mosul will also require assurance, as they may be exposed to further violence, crime, or revenge attacks (Muhammedally, 2015).

A limitation to this study could be the lack of audio recording due to security concerns of health workers interviewed. The purposive sampling of HCWs from those who were still choosing to work is a further potential limitation. Future studies would benefit from more rigorous qualitative techniques; however, in this immediate post-conflict setting the methods used were considered both necessary and sufficient to achieve the research objectives. Future research will be needed to understand how Mosul HCWs continue to cope with their experiences and how interventions may offer solutions both to their wellbeing and the retention of staff in medical facilities.

Conclusion

While media reporting has provided glimpses into the lives of HCWs in Mosul after June 2014, this study represents one of the first known qualitative analyses of the experiences of HCWs in Mosul under ISIS since the city's liberation. This exploratory analysis highlights the hardships experienced by health workers in the city, and underscores the need to plan appropriate interventions in order to retain healthcare staff post-conflict. Such interventions may aid in the recovery of the local healthcare system and improve the health of the population of Mosul during this vulnerable time of the city's rebuilding.

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Data availability statement

The data generated and analysed during the current study are not publicly available due to the sensitive nature of its content and concerns surrounding privacy expressed by participants but are available from the corresponding author on reasonable request.

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Appendix 1

MOSUL HEALTHCARE WORKER SEMI-STRUCTURED INTERVIEW GUIDE

NOTE for interviewer:

The following is a guide. Try to ask all the questions below in the order given, but it is more important to maintain the flow of discussion. Suggested probes have been included. Start the interview as follows:

There are no right or wrong answers in this discussion. We are interested in hearing your story.

1. Tell me about your usual work day (within the past month)

PROBE: What are the common patient complaints that you receive?

PROBE: In situations where you are unable to treat those complaints, what are the reasons why?

2. **After June of 2014, how did your life as a health care worker change, if at all?**
3. **How did the types of illnesses you treat change starting in June 2014?**
4. **What else has changed about your patients after June 2014 that you think is significant?**
5. **What has changed about the work conditions for you or your colleagues after June 2014?**
 PROBE: How did you feel about those changes?
6. **Question: Tell me about your experiences as a health worker during the time of Daesh, what were some of the issues you faced?**
 PROBE: Tell me about your encounters with Daesh authorities? Were they positive or negative?
 PROBE: How were those encounters similar to or different from the encounters that your colleagues had with Daesh?
7. **How were female health workers or patients treated during the time of Daesh?**
8. **LIST: What problems do healthcare workers in Mosul currently have? These problems may be professional or personal in nature:**

Problem listed	Causes?	What do people currently do about it?	What can be done about it	Did it exist prior to June 2014	Can you tell more about the problem

9. **What effect has your work had on your personal relationships? In what ways have your stresses as a healthcare worker effected them?**
 PROBE: How has this situation changed or remained the same since June 2014?
10. **How do you feel about your relationships with your colleagues?**
 PROBE: In what ways have these relationships changed since June 2014
11. **In what ways have the relationships with friends and neighbors changed since June 2014?**
12. **Describe how your experiences as a healthcare worker would be different if the events of June 2014 had never occurred. How would your life be different, either personally or professionally?**
13. **Why have you personally decided to remain in healthcare in Mosul rather than leaving the city or changing your profession?**
 PROBE: Why do you think some health workers have left the city or stopped practicing medicine?
 PROBE: What motivates you to keep doing your work?