

**“We don’t have up to date knowledge about the disease”
Practical challenges encountered in delivery of cervical
cancer screening in Iraq**

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1- Introduction

Cervical cancer is one of the most common cancers among women worldwide, with an estimated incidence of 528,000 new cases annually (Villalobos *et al.*, 2016). Human papillomavirus (HPV) is a considered primary cause, with an estimation prevalence of HPV worldwide of 99.7%: in particular, types 16-18 are present in more than 80% of invasive cervical cancers (Everett *et al.*, 2011). The greatest protection against cervical cancer currently available is the combination of HPV vaccination before first sexual intercourse and a screening programme with repeated **smear tests** (Scarinci *et al.*, 2010). The World Health Organisation (WHO, 2002) argued that success of cervical cancer screening programmes depends on having sufficient number of personnel to perform screening tests and facilities where staff can undertake subsequent diagnosis, treatment and follow up.

In Iraq, cervical cancer ranks as the 12th most frequent cancer among women. However, there is no national cervical cancer screening programme (Bruni L *et al.*, 2016). The incidence of cervical cancer in Western Asia and Middle East Arab Muslim (WAMEM) countries where Iraq is located is difficult to estimate because of lack of national cancer registries in this region (Sancho-Garnier *et al.*, 2013; Bruni L *et al.*, 2016). It is universally acknowledged that there are considerable barriers to establishing and maintaining cervical screening programmes, particularly in developing countries, and there are additional barriers to setting up cervical screening in Iraq. Cultural factors are relevant, including lack of awareness about the disease, stigma and fear of the diagnosis (Redacted). There is a need for health care providers such as general practitioners (GPs) and **gynaecologists** to promote cervical cancer services by educating women about cervical cancer risks, prevention and early detection to promote their uptake of screening. In most WAMEM countries, most **gynaecological** cancers are diagnosed at later stages (Salman, 2012; Hweissa *et*

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3 al., 2016). Lack of reproductive health awareness particularly among older women combined
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5 with the cultural stigma of seeking medical advice for gynaecological symptoms typically
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7 resulted in late presentation of all **gynaecological** cancers (Ortashi and Al Kalbani, 2013; Obeidat
8
9 *et al.*,2012).

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13 Iraq is categorised as a higher to middle income country, yet cancer health systems are
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15 fragmented and mostly centered in the capital cities, with under placement of essential equipment
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17 and human resources (Al Hilfi *et al.*, 2013; Alwan *et al.*, 2017). Most healthcare services are
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19 accessed through private clinics. The Iraqi population has lived through considerable war, conflict
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21 and demographic changes and the cycle of violence continues. The Ministry of Health has not
22
23 kept pace in developing appropriate policy. Government remains heavily centralized (Al Hilfi *et*
24
25 *al.*, 2013; Alwan *et al.*, 2017). Primary healthcare facilities, where preventative healthcare such as
26
27 cervical screening should be located, are limited. Cancer diagnostic, treatment and palliative care
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29 services are restricted (Al Hilfi *et al.*, 2013; Attia *et al.*, 2018). The national healthcare delivery
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31 system in Iraq and most other Arab countries focuses on treating symptoms rather than prevention
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33 of disease (Donnelly *et al.*, 2013; Hweissa *et al.*, 2016).

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39 Health services in the city of Kirkuk, Iraq, are delivered through three hospitals: two main
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41 hospitals located in the city centre and one outside. Cervical cancer screening activities are carried
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43 out through a small public unit established by the Ministry of Health, for the purpose of early
44
45 detection of cervical cancer. Two doctors work in this Unit: a consultant **gynaecologist** who was
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47 trained on cervical cancer screening in the UK, and a GP (family medicine doctor untrained on
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49 smear test or cervical screening). Three non-specialist nurses support the delivery of services. The
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51 doctors reported that commonly smear testing is performed for unhealthy women. Women
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53 attending are usually referred by other **gynaecologists** if they suspected any abnormality in the
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3 cervix. Cervical cytology takes place mostly as a part of a consultation for another illness. In the
4
5 absence of a national population-based cervical cancer screening programme, most cervical
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7 screening is opportunistic. Little is known about medical doctors' practical experience of adapting
8
9 to such circumstances in order to identify health need and expedite treatment for women at risk of
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11 cervical cancer. This qualitative study aimed to explore the processes through which these doctors
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13 undertook screening and made decisions about appropriate referrals in the context of limited
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15 resources and infrastructure in Iraq at this time.
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19 20 **2. Methods**

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23 A qualitative approach was adopted building on a prior integrative literature review
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25 (REDACTED) which showed the gap in understanding the lived experience of health
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27 professionals faced with advanced cervical cancer presentations in Iraq. This study was a
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29 collaboration between the research-practitioners in Iraq (authors, 1, 3) and the academics in the
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31 UK (authors, 2, 4, 5). The first author is a nurse academic in Iraq and carried out the empirical
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33 work under supervision of the team. A purposive sample of 12 gynaecologists and the one GP
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35 (sometimes referred to as family medicine doctor) working in two main hospitals and the
36
37 healthcare centres in Kirkuk, Iraq were recruited (n = 13). These groups of doctors are collectively
38
39 accountable for women's gynaecological health in this area. However, in the context of Iraq, there
40
41 is currently no national cervical screening programme, so the roles and responsibilities of
42
43 gynaecologists in this regard, are not standardized. Gynaecologists are responsible for
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45 undertaking **smear tests** in hospital settings, where women are unwell and/or have been referred to
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47 them for this purpose. **Smear tests** are not routinely available in the primary healthcare centers,
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49 GPs were not performing **smear tests** but it was expected they had some knowledge of the need to
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51 refer to gynaecologists.
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3 The purpose of interviews with gynaecologists and GPs was to develop a better understanding of
4 factors that might affect the implementation of successful cervical cancer screening services in
5 this region. Semi-structured interviews were based on an open-ended questionnaire guide
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10 (Galletta, 2013). The Scientific committee at ['REDACTED'] ethically approved the study. The
11
12 framework for interview questions (Table 1) were based on prior literature review [REDACTED]
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14 and outcomes of a preliminary (pilot) study in which 25 women who were referred to the unit for
15
16 a **smear test** were interviewed to determine the factors that influenced women's access to cervical
17
18 cancer preventative services, in Kirkuk. Interviews with the gynaecologists in this unit helped to
19
20 contextualize the situation regarding the cervical cancer prevention services they provided. The
21
22 preliminary information provided also formed the background to this qualitative study.
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26
27 Recruitment involved sending an invitation letter with a flier describing the study, to a purposive
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29 sample of 20 gynaecologists and GPs working in obstetrics and gynaecologic healthcare services
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31 in the main hospitals and primary health care centres. Twelve gynaecologists and three GPs
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33 accepted the invitation. Recruitment, interviews and data analysis continued apace until saturation
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35 was reached, with no new categories emerging (Strauss and Corbin, 1996; Guest, Bunce, &
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37 Johnson, 2006). Twelve gynaecologists and one GP proceeded to interview (n=13). Informed
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39 consent was obtained before conducting the interviews.
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44 **2.1 Procedure**

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47 Semi-structured interviews were conducted with 12 gynaecologists and one GP over three months
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49 from June to September 2015. Data were collected and digitally recorded in Arabic and
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51 transcribed and translated into English. The translations and verbatim transcriptions were peer
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53 reviewed by third author (Iraqi gynaecologist (REDACTED)), four participants requested to read
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3 their transcripts, which did not result in requested changes. Involvement of the participants in peer
4 review enhanced transparency of the process and verified the core themes emerging. Further, the
5 primary researcher's background as a 'known Iraqi female', where she had local nursing history,
6 her awareness of healthcare services delivery in Iraq played an important role in the study process
7 by improving participant engagement. While this was an advantage in enabling us to interpret the
8 data, we took steps to reduce social desirability bias by ensuring raw data was second coded by an
9 experienced author (REDACTED) to ensure the trustworthiness of the findings. Additionally,
10 direct quotes were used to represent emergent themes. Most interviews were carried out in a
11 regional public hospital, while some of the doctors requested interviews in their private clinics.
12 The interviews began with demographic characteristics such as: 'Job title', 'qualification' and
13 length of experiences. Afterwards, gynaecologists were asked about their experience related to
14 cervical cancer and cervical screening (Table 1). In depth interviews took between 30 -60 mins.
15 Participants were assigned pseudonyms and identifying material was removed.

2. 2 Analysis

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37 A grounded theory (GT) (Corbin & Strauss, 2014) approach was used to build understanding about the
38 unknown lived experience of gynaecologists working in Iraq. Classic grounded theory aims for
39 conceptual understanding of social behavior, rather than the constructivist focus on interpretive
40 understanding of participants' meanings (Charmaz, 2003). Our philosophical position was to
41 adopt an 'applied' grounded theory approach that differed from traditional grounded theory
42 method in the sense that we focused on participants lived *reported* experience from the field. The
43 understanding is therefore partial and time-bound, yet offers vital insights into an unknown,
44 unreported aspect of cancer screening practice and research in the context of Iraq.

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3 The grounded theory approach produced a useful framework for key categories to emerge.
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5 Constructing an audit sequence included memos describing the first author coding decisions with
6
7 emerging linkages between themes. Obtaining participant and peer feedback increased the
8
9 trustworthiness of the process. A constant comparative process resulted in 70 codes created from
10
11 line by line analysis (Table 2). This comparative process continued until we reached ‘theoretical
12
13 saturation’ with no new concepts or categories emerging (Corbin & Strauss, 2014). Eight categories
14
15 were inductively derived (Table 3) using the “Standards for reporting qualitative research: a
16
17 synthesis of recommendations” (SRQR) as a reporting guideline (O'Brien et al., 2014).
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24 **3. Results**

25 26 27 **3.1 Demographic characteristics of the doctors**

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29 Twelve participants had specialist qualification as gynaecologists, and one participant was a GP
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31 (family medicine). **All the participants were female (n=13).** I will refer to them as ‘doctors’ for the
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33 reporting of results. The mean length of experience as a medical doctor was 18 years, while mean
34
35 length of experience as a gynaecologist was 13 years, with a range of three to 27 years.
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39 **3.2 Identification of cervical cancer services needs**

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42 Eight categories were identified from interviews with the gynaecologists and GP (see Table 3).
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45 **3.1.1 Doctors experience of cervical cancer**

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48 All participants had post-qualifying years of experience; however, most of them reported lack of
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50 experience in terms of cervical cancer and cervical cancer screening, despite the majority
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52 specialist gynaecological training.
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3 When the doctors were asked if they had ever seen women with cervical cancer, most doctors had
4
5 seen women with late-stage cervical cancer. Only one doctor had never seen a case.
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9 *'I have seen, but we refer them and mostly we see them during the end stages, they run to the end*
10
11 *stages that is the problem because there is no screening, we are seeing them in the end stage and*
12
13 *there is no hope! Hopeless case' [D7]*
14
15

16 Doctors explained a lack of experience in terms of end stage cervical cancer.

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18
19 *'Never seen cervical cancer during the end stages but have seen the early stage CIN1 and*
20
21 *referred them for Smear test' [D4]*
22
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25 One of the doctors expressed her concerns about doctors' current knowledge of cervical
26
27 cancer/screening:
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31 *'let me tell you because we don't see numerous cases we don't have up to date knowledge about*
32
33 *the disease, for instance when I face such cases I will return to the book to read more about it for*
34
35 *example, I graduated as specialist gynaecologist in 2000, we had a unique outpatient in Baghdad*
36
37 *for colposcopy so we were reading more and searching more up to date information but now here*
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39 *is so different' [D9]*
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43 Many doctors pointed to the lack of knowledgeable leaders and lack of doctors experienced in
44
45 cervical cancer as challenges to cervical cancer screening programme.
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49 *'One of the challenges is lack of doctors who have experience related to cervical cancer, for*
50
51 *instance if I diagnosed a women with cervical cancer I would not be able do anything so I will*
52
53 *refer her to XX or if they are my relative or if they are wealthy, I will advise her to go to Turkey*
54
55 *because I am not experienced and we don't have facilities to treat CIN1 or CIN2, CIN3'' [D10]*
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3 This finding reveals lack of baseline information on how to identify and treat cervical cancer.
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5 Doctors mainly expressed the need for educational programmes and guidelines on cervical cancer
6
7 and cervical cancer screening.
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10 11 **3.1.2 Staff Training** 12

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14 Many doctors indicated that they had not attended any training courses on the smear test. Three of
15
16 them had attended a local training course held by a doctor in a local hospital over two days,
17
18 comprising one day of theory and one of practice.
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21
22 Most doctors had learned how to undertake a smear test in outpatient clinics without any formal
23
24 training.
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27 *'No I haven't, I have just learned from my practice in the outpatient or in the unit of colposcopy'*
28
29 *[D8]*
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33 One of the doctors trained herself using videos from YouTube:
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36 *'No training, I have trained myself from YouTube, well done, this is a good study to recommend*
37
38 *training for us (laughing)'* [D5]
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42 In general, all interviewed doctors reported lack of training and expressed a desire to attend more
43
44 training courses on smear test and cervical cancer screening.
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47 48 **3.1.3 Cervical cytology (smear test) practice among doctors** 49

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51 All doctors were asked about smear tests in their practices. All except two had performed it; one
52
53 of these was a recent graduate.
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3 R: Can you tell me about the use of **smear test** in your practice?
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6 *'I haven't done it yet, but I read that these patients should be referred to urinary medicine unit*
7 *but we don't have such unit here, when I was in XXXX during my studies, they had a special unit*
8 *for smear test' [D6]*
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14 Another was a general practitioner who was working in the health care centre where **the smear**
15 **test** is not available:
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18
19 *'We don't have smear test here in the health care centres' [D2]*
20
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22 Many of the doctors referred to **smear test as** a diagnostic test; most indicated that they used it in
23 cases of cervical erosion, offensive discharge or postcoital bleeding.
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28 *'Indeed I am doing smear test for every suspected case of cervical erosion, especially after 30*
29 *years old or even before that age if the cervix has ugly or abnormal shape' [D4]*
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33 Another doctor stated that she was only offering if the patient had an 'unhealthy cervix'.
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35

36 *'Not usually unless if she has unhealthy cervix or has a problem or if she complains of any*
37 *cervical erosion' [D1]*
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42 Another doctor reported pelvic inflammatory disease as an indicator for doing a test:
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45 *'In my practice when I see women with PID (Pelvic inflammatory disease) or cervical erosion I*
46 *always advise them to do the test, but there is no screening in Iraq' [D3]*
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50 Almost all doctors agreed that cervical screening should be a part of routine duties.
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3.1.4 Barriers to cervical cancer screening uptake

Barriers related to cervical screening uptake among women were important.

Many doctors pointed to the lack of systematic healthcare services as a barrier to uptake.

'Our health system is not systematic and this needs a well-planned health system. So, first of all, this should be start from the GPs and the general practitioners should be well trained to perform the smear test' [D13]

One doctor stated that stigma around the word 'cancer' might be a barrier

'Patients often are afraid and ask if there is something wrong or if I suspect cancer' [D6]

Lack of information for women was mentioned:

'Women never requests cervical screening, because they don't have any information, they don't know the simplest things because we don't have any health awareness or public health education' [D5]

The cost of the **smear test** was identified as a barrier:

'The screening should be offered by the health system and it should be cheap because if I suggest it in the private clinic most women won't accept to pay for the test unless she has got the disease and I would not consider this as screening' [D9]

Women's embarrassment was viewed as a frustrating cultural barrier to life saving intervention.

'I had three cases, with regret they passed away, they had postcoital bleeding but were embarrassed to say and then they presented at the end stage of the disease and [we] couldn't control the disease, even though we did all the therapy including radiotherapy' [D4]

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3 Doctors' disclosed a variety of obstacles to cervical screening uptake mostly related to poorly
4 organized healthcare services, lack of specialised knowledge and staff, and poor awareness of the
5 disease among women. Embarrassment and fear of the test among women living in Kirkuk was
6 shown to have a detrimental impact on screening uptake.
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13 **3.1.5 Current country crisis impacts on the need for cervical screening**

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16 An issue raised by the doctors was that the risk for cervical cancer appeared to have increased
17 with the recent crises in the country.
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21 *'Currently the risk factors for cervical cancer have been increased, I mean such as, multiple*
22 *partners and the risk of HPV. I think the disease was uncommon previously but currently it has*
23 *become more common, we see there is an increase in both the incidence of cervical cancer and*
24 *the rate of the risk factors' [D11]*
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31 Women travelling out of the country were perceived by one doctor to be an increasing risk.
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35 *'Women should be screened, because the cervical cancer is common in the world and our people*
36 *frequently travel outside the country, so they might get HPV viruses or multiple partners' [D1]*
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40 Whatever the reasons, including the likelihood of violence against women during war and
41 conflict, the widespread view of the doctors was that risk factors such as sexual transmitted
42 disease and HPV have increased with the recent country crisis.
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3.1.6 Promoting cervical screening care infrastructure and care services

There was a considerable agreement among doctors that cervical screening should start from the primary health care centres. One of the doctors suggested the antenatal care point and emphasised the family medicine role.

‘... If we start from antenatal care in the healthcare centres because many women are visiting there, it is near their house and family doctor is very important in this field. Screening is a very good programme but if we make it active according to our situation, I mean the security problems and the ignorance of women health’ [D3]

There was a high level of willingness among the doctors to establish an organized population based cervical cancer screening with a desire to establish a specialist centre.

HPV vaccination was also suggested:

‘If the patient has HPV we have to do smear test for her and we should try to bring vaccination for HPV’ [D12]

Overall, while considerable medical will and frustrations were evident, the gap in knowledge and experience among the gynaecologists was a compounding feature of the practical challenges. We developed the following practical theory to reflect the doctors’ lived experiences of inadequacy at this time.

‘Most gynaecologists reported lack of practical knowledge and experience regarding cervical cancer screening. The main challenge was the perceived shortage of adequately trained staff to deliver screening in the Iraqi context. Training education in cervical cancer cytology and smear

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3 **test** techniques was desirable, learning from the U.K experience, towards a developing
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5 infrastructure in Iraq?
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8 9 **4. Discussion**

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12 This qualitative study is the first to focus on the perspectives of gynaecologists and a GP on
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14 cervical cancer screening in Iraq. Multiple factors influenced their capacity to undertake cervical
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16 screening to identify, treat or prevent cancer; the main issue is the absence of a national cervical
17
18 cancer screening strategy that advocates and promotes specialist training and skills.
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22 To date, international guidance on cervical cancer screening, including UK guidance, is not
23
24 adopted in Iraq. The possible transfer of knowledge about screening techniques is novel. We
25
26 partly explored this in a literature review (REDACTED) and concluded that a health policy
27
28 change was urgently needed to promote cervical screening in WAMEM countries, to reduce
29
30 morbidity and mortality from cervical cancer. There is a parallel need for research into culturally
31
32 appropriate approaches to adoption of cervical screening in these countries.
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37 Lack of experience among gynaecologists dominated this study. Gynaecologists frequently
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39 declared need for training courses on recent developments in cervical cancer prevention.
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41 Screening for cervical cancer has undergone a significant evolution since the introduction of the
42
43 **smear test** in 1941 (Obeidat *et al.*, 2012; BWH and NHS, 2017). One major advance in cervical
44
45 cancer screening technology was liquid based cytology (LBC) (Royal College of Obstetricians
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47 and Gynaecologists, 2016; BWH and NHS, 2017). With the migration of experienced doctors
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49 from Iraq, there have been concerns about the quality of health services and the ability of training
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51 facilities to replace those migrating, especially those with advanced specialty training (Burnham
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53 *et al.*, 2012; Attia *et al.*, 2018).
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3 The doctors in this study referred to **smear test** as a diagnostic test and that it was performed only
4 on unhealthy women, rather than for early detection of cervical cancer. **Smear tests** take place
5 mostly during **gynaecological** visits as part of a consultation for illness. In Iraq most women visit
6 doctor's private clinic when they or their family members are ill. Thus, the physician-initiated
7 discussion on cervical cancer might be the only opportunity for those women to be educated about
8 cervical screening. Typically, the major barrier to cervical cancer prevention is not the cost of the
9 screening test, which is relatively inexpensive, but the cost and complexity of providing the
10 infrastructure required for the screening programme [Redacted]. WHO (2017) reported that the
11 healthcare system in Iraq is centralised, curative and hospital-oriented. It lacks capacity to address
12 the major health problems faced by the majority of the population in a sustainable and equitable
13 pattern; primary healthcare is not capable of responding efficiently to the growing health needs of
14 the population. Rapid demographic and epidemiological transitions are significant. The
15 population of Iraq was estimated to be 32.2 million with annual growth of 2-3% in 2013 (Al Hilfi
16 *et al.*, 2013) compare to 36.94 million in 2016 (WHO, 2016). The country faces noticeable health
17 challenges as the political instability and violence continues after decades of war and occupation
18 (WHO2016). To address these issues, changes to health policies are required; however this may
19 be difficult in a health service where there are failures in policy processes (Shabila *et al.*, 2012;
20 WHO, 2016). Nevertheless, these findings do suggest potential barriers such as stigma and fear
21 need further exploration in order to offer culturally acceptable cervical screening to women in this
22 community. Evidence from this study showed that the majority of the gynaecologists wished to
23 establish a national screening programme to inform local screening in the city of Kirkuk, which
24 they believed should start from the primary healthcare centers. Gynaecologists suggested
25 introducing screening during antenatal care and emphasized the family medicine role.
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3 Furthermore, this study suggested willingness to explore use of the HPV vaccination in a targeted
4 population (*i.e.* girls aged 13-18 years), which would require critical appraisal for Iraq contexts.
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8 **Limitation of the study**

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11 It is a limitation of our study that interviews were restricted to 12 gynaecologists and one GP in
12 Kirkuk region and we did not interview all the GPs working in primary healthcare centres.
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14 Therefore, the findings may not represent the experience and knowledge of all GPs in the city.
15
16 Moreover, applied grounded theory focused on a qualitative exploration of medical doctors
17 reported views on their practical experiences at that point in time. This process enabled us to get
18 an in depth snapshot of the challenging contexts in which the doctors worked, which helped to
19 develop the practical theory regarding purported gaps in professional knowledge and experience.
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29 **Conclusion**

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32 Women and girls carry an unequal burden of illness and death in Iraqi society while working and
33 caring for their families. To improve the health of the nation there is a need to prioritize women's
34 health. This is an enormous challenge in the context of civic unrest, war and health service
35 disruption. Preventative cervical screening can help identify and protect Iraqi women from
36 advanced cervical cancer. However, before launching any screening programme, public
37 awareness should be raised and gynaecologists and GPs supported to make greater use of
38 opportunistic cervical screening, involving regular training updates. Educational cervical
39 screening initiatives should be encouraged and the primary health care systems better supported to
40 undertake vital screening in collaboration with secondary care. Improving cervical cancer
41 screening in Iraq requires global effort to reduce inequities in women's health world-wide.
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References

Al Hilfi, T. K., Lafta, R. & Burnham, G. 2013. Health services in Iraq. *The Lancet*, 381, 939-948. [https://doi.org/10.1016/S0140-6736\(13\)60320-7](https://doi.org/10.1016/S0140-6736(13)60320-7)

Ali, S., Skirton, H., Clark, M. T. & Donaldson, C. 2017. Integrative review of cervical cancer screening in Western Asian and Middle Eastern Arab countries. *Nursing & Health Sciences*, 1-13 <https://doi.org/10.1111/nhs.12374>

Alwan, N.A., Al-Attar, W.M., Al Mallah, N. and Abdulla, K.N., 2017. Assessing the Knowledge, Attitude and Practices Towards Cervical Cancer Screening Among a Sample of Iraqi Female Population. *Iraqi Journal of Biotechnology*, 16(2), pp.38-47. Retrieved from <https://www.iasj.net/iasj/journal/28/issues>

Attia, M.K., Ibraheem, N.M. and Ayoub, R.S., 2018. Assessing awareness towards cervical cancer screening (Pap smear) among women in Tikrit-Iraq. Retrieved from <https://www.meritresearchjournals.org/index.htm>

Bruni I, Barrionuevo-rosas L, albero G, Serrano B, Bosch fx, Mena M, Gomez D, Muñoz J & De sanjose, S. 2016. ICO Information Centre on HPV and Cancer (HPV Information Centre). Human papillomavirus and Related Diseases in Iraq. Summary Report 15 December 2016, 5-20. Retrieved from <http://www.hpvcentre.net/statistics/reports/XWX.pdf>

Burnham, G., Malik, S., AL-Shibli, A. S., Mahjoub, A. R., Baqer, A. Q., Baqer, Z. Q., Al qaraghuli, F. & Doocy, S. 2012. Understanding the impact of conflict on health services in Iraq: information from 401 Iraqi refugee gynecologists in Jordan. *Int J Health Plann Manage*, 27, e51-64. <https://doi.org/10.1002/hpm.1091>

BWH & NHS. 2017. Cytology Training Centre - Birmingham Women's Hospital Foundation Trust [Online]. Retrieved from: <http://www.bwnft.nhs.uk/healthcare-professional/courses-and-training/cytology-training-centre> [Accessed 21/08/2017 2017].

Charmaz, K. 2006. *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis*. Sage

Corbin, J. and Strauss, A., 2014. *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Sage publications.

Donnelly, T.T., Al Khater, A.H., Al-Bader, S.B., Al Kuwari, M.G., Al-Meer, N., Malik, M., Singh, R., Chaudhry, S. and Fung, T., 2013. Beliefs and attitudes about breast cancer and

1
2
3 screening practices among Arab women living in Qatar: a cross-sectional study.
4 <http://dx.doi.org/10.1186/1472-6874-13-49>
5
6

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8 Everett, T., Bryant, A., Griffin, M.F., Martin-Hirsch, P.P., Forbes, C.A. and Jepson, R.G., 2011.
9 Interventions targeted at women to encourage the uptake of cervical screening. *Cochrane*
10 *database of systematic reviews*, (5). <https://doi.org/10.1002/14651858.CD002834.pub2>
11

12
13 Galletta, A., 2013. Mastering the semi-structured interview and beyond: From research design to
14 analysis and publication (Vol. 18). NYU press.
15 <http://dx.doi.org/10.18574/nyu/9780814732939.001.0001>
16
17

18
19 Guest, G., Bunce, A. and Johnson, L., 2006. How many interviews are enough? An experiment
20 with data saturation and variability. *Field methods*, 18(1), pp.59-82.
21 <https://doi.org/10.1177/1525822X05279903>
22
23

24
25 Hweissa, N.A., Lim, J.N. and Su, T.T., 2016. Health-care providers' perceptions, attitudes towards
26 and recommendation practice of cervical cancer screening. *European Journal of Cancer*
27 *Care*, 25(5), pp.864-870. <https://doi.org/10.1111/ecc.12537>
28

29
30 Obeidat, B.R., Amarin, Z.O. and Alzaghaf, L., 2012. Awareness, practice and attitude to cervical
31 Papanicolaou smear among female health care workers in Jordan. *European journal of cancer*
32 *care*, 21(3), pp.372-376. <https://doi.org/10.1111/j.1365-2354.2011.01297>
33
34

35
36 O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. 2014. Standards for reporting
37 qualitative research: a synthesis of recommendations. *Academic Medicine*, Vol. 89, No. 9
38 <https://doi.org/10.1097/ACM.0000000000000388>
39

40
41 Ortashi, O. and Al Kalbani, M., 2013. Gynecological cancer services in Arab countries: present
42 scenario, problems and suggested solutions. *Asian Pac J Cancer Prev*, 14(3), pp.2147-
43 <http://dx.doi.org/10.7314/APJCP.2013.14.3.2147>
44

45
46 Royal College of Obstetricians and Gynaecologists. 2016. Progress in Cervical Screening
47 [Online]. Retrieved from <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/sip>
48 [Accessed 28/07/2017 2017].
49

50
51 Salman, K. F. 2012. Health beliefs and practices related to cancer screening among Arab Muslim
52 women in an urban community. *Health Care Women Int*, 33
53 <https://doi.org/10.1080/07399332.2011.610536>
54
55
56
57

Sancho-Garnier, H., Khazraji, Y.C., Cherif, M.H., Mahnane, A., Hsairi, M., El Shalakamy, A., Osgul, N., Tuncer, M., Jumaan, A.O. and Seoud, M., 2013. Overview of cervical cancer screening practices in the extended Middle East and North Africa countries. *Vaccine*, 31, pp.G51-G57. <https://doi.org/10.1016/j.vaccine.2012.06.046>

Scarinci, I.C., Garcia, F.A., Kobetz, E., Partridge, E.E., Brandt, H.M., Bell, M.C., Dignan, M., Ma, G.X., Daye, J.L. and Castle, P.E., 2010. Cervical cancer prevention: new tools and old barriers. *Cancer: Interdisciplinary International Journal of the American Cancer Society*, 116(11), pp.2531-2542. <https://doi.org/10.1002/cncr.25065>

Shabila, N.P., Al-Tawil, N.G., Al-Hadithi, T.S., Sondorp, E. and Vaughan, K., 2012. Iraqi primary care system in Kurdistan region: providers' perspectives on problems and opportunities for improvement. *BMC international health and human rights*, 12(1), p.21. <https://doi.org/10.1186/1472-698X-12-21>

Strauss, A. & Corbin, J. 1996. *Basics of Qualitative Research Techniques and Procedures for Developing Grounded theory* London EC2A 4PU, United Kingdom New Delhi 110048 India SAGE.

Villalobos C, M., Wendling C, C., Sierra H, C., Valencia C, O., Cárcamo I, M. & Gayán P, P. (2016) Supervivencia de cáncer cervicouterino escamoso y adenocarcinoma en pacientes atendidas en el Instituto Nacional del Cáncer, 2009-2013. *Gaceta Mexicana de Oncología*, 15, 263-267.

World Health Organization (2002) *Cervical Cancer Screening in Developing Countries: Report of a WHO Consultation*. Geneva: [Online]. Available: <https://apps.who.int/iris/bitstream/> [Accessed 08/09 /2017].

World Health Organization 2016. *World Health Statistics 2016: Monitoring Health for the SDGs Sustainable Development Goals*. Retrieved from https://www.who.int/gho/publications/world_health_statistics/2016/en/

World Health Organization. 2006. *The World Health Report 2006 – Working Together for Health*. Geneva [Online]. Available: <http://www.who.int/whr/2006/en/> [Accessed 19/10 /2017].

World Health Organization. (2017) *National Cancer Control Programmes (NCCP)* [Online]. <http://www.emro.who.int/irq/programmes/primary-health-care.html> [Accessed 01/10/2017].

Table 1 Study guide questions

Demographic characteristics	Job title
	Qualification
	Duration of services
Interview questions	
-Can you tell me about your role here in the hospital? Do you see patients with cervical cancer?	
-In your opinion, could some women with cervical cancer be detected earlier using the Pap smear? - What are the cervical cancer preventative services you offer to women? -Can you tell me if you were trained to undertake Pap smears for cervical cancer? - Can you tell me about the use of Pap smears in your practice - Do you consider it is acceptable for a Pap smear to be included as a part of your day- to- day duties? If not, who should or could perform this role? - In your experience, do women request screening? Is this something you offer? -Prompt: -Have you ever performed a Pap smear? - Do you think more women should be encouraged to be screened? If yes, what would help to encourage more women to be screened? What could the barriers be to encouraging more women?	
-What do you think about establishing a national cervical cancer screening programme in Iraq? -what are the practical challenges facing the gynaecologists to establish population based cervical screening program	
-What do you think is necessary before a screening programme is launched in Kirkuk city for cervical screening? - Do you have any other comments?	

Table 2 list of codes from doctors' transcripts

Concepts	Free codes
Doctor's experience of cervical cancer (CC)	1. Seen women with CC 2. Hasn't seen CC cases 3. Rarely seen patient with CC 4. Has seen cases of CC, but in the end stages 5. Never seen CC in the end stage 6. Women attended at the last stage of CC 7. Seen patient with suspicious abnormality and referred them to the unit of early detection of CC 8. Seen more than 10 CC cases in the last 10 years 9. Doctors have no up-to-date knowledge of CC 10. No experienced doctors in terms of CC
Current country crisis impact on the risk factors to cervical cancer	11. Believes risk factors of CC have increased such as, more than one partner 12. Current crisis led to increased risk factors of STD & HPV
Smear test practice among doctors as a part of day to day duties	13. No smear test done in the health care centres 14. Does smear test in case of offensive discharge or post coital bleeding 15. Hasn't done smear test yet 16. Does smear test frequently in her private clinic 17. Done smear test to satisfy herself but not confident in its value 18. Doesn't consider smear test is acceptable to be included as a part of her day to day duties because of the workload 19. Consider smear test acceptable to be included in her day to day duties
Doctor's perceptions of smear test (ST)	20. Monthly cervical visualization much better than taking smear test 21. Believes CC can be detected early using smear test 22. ST not useful because of short time for development of CC
Training courses	23. Hasn't trained on smear test sample taking 24. Has trained in smear test in Baghdad 25. No training on cervical screening programme 26. Trained herself from YouTube

	27. Trained just for two days in Azadi hospital
	28. Cytologists should be also trained
	29. Has trained on smear test in Dubai and India and Amman
	30. Cytologist and nurses should be also trained
	31. Learned from her practice in the outpatient department
Practical and health system barriers to CCS	32. A lot of speculums should be available
	33. Knowledgeable leaders needed
	34. Due to the recent crisis a huge number of refugee influx into Kirkuk city
	35. Financial burden of patient affects her attendance to ST
	36. Lack of women's knowledge
	37. Women do not attend to the hospital or health care centres unless they have pain
	38. Difficulty to access the hospital
	39. Lack of experienced doctors in terms of CC
	40. Lack of organisation of health system
	41. Women feel embarrassed
Management	42. Treatment plan for CC needed as well as SP
	43. No treatment facilities for CC
	44. Vaccination for HPV would be more useful
	45. Need centre for managing CC as well as screening
Doctor's willingness to establishing a National Screening Programme in Iraq (NSP)	46. Willing to establish a centre for CS
	47. Need for local programme as cases present in the end stage when inoperable
	48. We have facilities to establish national screening programme
	49. We have a very high quality medical machine but nobody is trained in how to use it
	50. Not supporting the idea of NSP
	51. Strongly supports the idea of establishing NSP
	52. Not confident NSP can be successful
Doctor's recommendations for establishing a successful cervical screening programme in Iraq	53. Training is necessary before SP is launched in Kirkuk
	54. Education first, then facilities should be available
	55. Need for qualified cytologist
	56. Training courses for health care providers and staff
	57. Raise women's awareness through media and advertisements - doctors could speak about CC
	58. Make ST as popular as mammography through media, schools, colleges
	59. Practitioners should be trained to do ST

60. Start from the antenatal care unites in the GPs
61. Family medicine is important
62. Emphasise the relationship between patient and health care providers
63. Laboratory facilities should be prepared before SP launched in Kirkuk city
64. Emphasis on the co-operation among health care providers
65. Updating training courses every 6 months
66. Treatment plan for CC needed as well as SP
67. Increase women's awareness by distributing leaflets on ST among them
68. Visiting home with vaccination team
69. Histopathologists are needed
70. National Screening Programme could be successful through media, primary health care centres, hospitals, ministry of higher education

For Peer Review

Table 3 Categories and Sub-categories

Categories	Sub-categories
Gynaecologists experience regarding cervical cancer (CC)	Knowledge of gynaecologists regarding cervical cancer
	Individual practices in cervical cancer cases
Shortage of trained staff	Attendance at appropriate training courses
	Gynaecologists perspectives of the training courses
Smear test practice among gynaecologists	Gynaecologists perceptions of smear test
	Gynaecologists behaviour and attitude to smear test
Barriers to cervical cancer screening (CCS) uptake	Health system barriers
	Factors that influence the uptake of CCS
	Embarrassment
Current country crisis impact on the risk factors to CC	Discussion related to the current country crisis and the potential factors influencing cervical cancer prevalence
Management	Strategies to facilitate treatments
	Vaccinations
Current country crisis impact on the need for a National Screening Programme in Iraq	Doctor's recommendations for establishing a successful screening programme
	Family medicine & antenatal care
	Relationship between patients and health care providers
Identification of future cervical cancer care needs	Raising women's awareness of screening options
	Health professional education
	Promoting cervical screening infrastructure and care services

Reviewer 1	Response	Amended text
<p>The study now has a clear focus on the qualitative data collected from medical practitioners related to screening for cervical cancer in Iraq.</p> <p>There are a small number of grammatical errors to sort out and be careful with use of acronyms such as ST this needs writing out rather than use of the acronym.</p>	<p>Thank you - -We amended the paper accordingly considering the grammatical issues, and changed ST to smear test</p> <p>Line 52,56 page 1; standardizing to the UK spelling, gynecologists changed to gynaecologist</p> <p>Line 6,8 page 3 ; gynecologists, gynecological changed to gynaecologist, gynaecological respectively</p> <p>Line 28 page 4; Grammatical error in this statement has been amended; This study was a collaboration between the research-practitioners in Iraq (authors, 1, 3).</p> <p>Lines 44 page 4 ; ST changed to smear test</p> <p>Line 49 page 4; grammar correction, ST changed to smear test</p> <p>Line 3,32 page 5: gynecologists changed to gynaecologist</p>	<p>- gynaecologists to promote cervical cancer services by educating women</p> <p>-most gynaecological cancers are diagnosed at later stages</p> <p>-seeking medical advice for gynaecological symptoms</p> <p>- presentation of all gynaecological cancers</p> <p>-This study was collaboration between the research-practitioners in Iraq (authors, 1, 3).</p> <p>-Gynaecologists are responsible for undertaking smear tests in hospital settings.</p> <p>-Smear tests are not routinely available in the primary healthcare centers, GPs were not performing smear tests but it was expected they had some knowledge of the need to refer to gynaecologists.</p> <p>- gynaecologists and GPs was to develop a better understanding</p> <p>- gynaecologists and 3 GPs accepted</p> <p>- 25 women who were referred to the unit for a smear test were interviewed</p>

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	<p>Line 17 page 5; ST changed to smear test</p> <p>Line 32 page 5; grammar correction, 3 changed to three</p> <p>-Line 17, 25, 46, 52 page 9 ; ST changed to smear test</p> <p>Line 3,14,23 page 10; ST changed to smear test</p>	<p>to determine the factors that influenced women’s access to cervical cancer preventative services, in Kirkuk.</p> <p>-Twelve gynaecologists and three GPs accepted the invitation</p> <p>- Many doctors indicated that they had not attended any training courses on the smear test</p> <p>- Most doctors had learned how to undertake a smear test in outpatient clinics</p> <p>- In general, all interviewed doctors reported lack of training and expressed a desire to attend more training courses on smear test and cervical cancer screening.</p> <p>- All doctors were asked about smear tests in their practices.</p> <p>- R: Can you tell me about the use of smear test in your practice?</p> <p>- Another was a general practitioner who was working in the health care centre where smear test is not</p>
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	<p>- Line 37 page11; ST changed to smear test</p> <p>- Line 48 page 13; ST changed to smear test</p> <p>-line 55 page 13:gynecological changed to gynaecological</p> <p>- Line 36,51,53 page 14; ST changed to smear test</p>	<p>available</p> <p>- Many of the doctors referred to smear test as a diagnostic test</p> <p>-The cost of the smear test was identified as a barrier:</p> <p>- Training education in cervical cancer cytology and smear test techniques was desirable,</p> <p>- during gynaecological visits as part of a consultation for illness</p> <p>- Screening for cervical cancer has undergone a significant evolution since the introduction of the smear test in 1941</p> <p>- The doctors in this study referred to smear test as a diagnostic test</p> <p>- Smear tests take place mostly during gynecological visits as part of a consultation for illness.</p>
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