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## REPRODUCTIVE HEALTH AND CONTRACEPTION USE BY UKRAINIAN SERVICEWOMEN IN THE CURRENT WAR ZONE: QUESTIONNAIRE SURVEY

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**Ключевые слова:** *женщины-военнослужащие, зона военных действий, методы контрацепции, незапланированная беременность, менструальная супрессия, анкетированный опрос*

**Abstract.** **Reproductive health and contraception use by Ukrainian servicewomen in the current war zone: a questionnaire survey.** **Burlaka O.V., Vahnier V.O.** *The aim of the study is to define awareness level and use of different contraception methods by servicewomen in the current armed conflict in the East of Ukraine. Between October 2018 and September 2019, 507 military women serving in the Joint Forces Operation Zone in eastern Ukraine and 100 civilian women from the frontline region participated in the questionnaire-based survey. The survey was focused on the knowledge and use of different methods of contraception and STI preventing by military women in conditions of armed conflict in Donbas. Servicewomen reported using of different methods of contraception in 48.3±4.3% of the cases, which is 1.5 times less than civilian women (RR=1.5; 95% CI: 1.2 – 1.7, p=0.001). Among those who reported using contraception, hormonal methods were chosen by 8.2±3.4% of active duty military women, which is two times less than*

by civilians (RR=2.1, 95% CI: 1.1-4.1, p=0.03). The low use of effective methods of contraception by active-duty servicewomen according to results survey is one of the reasons for the disruption of female reproductive health during military deployment. The primary reserve of preserving women's health in the current war environment, besides access to modern contraceptives and counseling, is improving the education of military medics in the gender-specific issues of reproductive health and contraception.

**Реферат. Репродуктивне здоров'я та застосування методів контрацепції українськими жінками-військовослужбовцями в зоні діючого збройного конфлікту: анкетоване опитування. Бурлака О.В., Вагнер В.О.** Метою дослідження було визначення рівнів поінформованості та використання жінками-військовослужбовцями різних методів контрацепції в зоні діючого збройного конфлікту на сході України. В анкетованому опитуванні взяли участь 507 жінок-військовослужбовців, що виконували обов'язки військової служби в районах проведення операції Об'єднаних сил, та 100 цивільних жінок з прикордонного регіону. Опитування було сфокусовано на питаннях обізнаності й застосування різних методів контрацепції та профілактики інфекцій, що передаються статевим шляхом (ПІСШ), жінками-військовослужбовцями в умовах військового конфлікту на Донбасі. Жінки, що виконували обов'язки військової служби, застосовували різні методи контрацепції у 48,3±4,3% випадків, що в 1,5 рази рідше за цивільних жінок (RR=1,5; 95%CI: 1.2–1.7, p=0,001). Серед тих, хто повідомив про використання контрацепції, гормональні методи обрали 8,2±3,4% військових жінок, що в два рази менше порівняно з цивільними (RR=2,1, 95% CI: 1.1-4.1, p=0,03). Низький рівень використання жінками-військовослужбовцями ефективних методів контрацепції, згідно з результатами проведеного опитування, одна з причин порушення гінекологічного здоров'я під час військових розгортань. Резервом збереження жіночого здоров'я у воєнному середовищі, крім доступу до сучасних методів контрацепції і консультацій, є покращення освіти військових медиків з гендер-специфічних питань репродуктивного здоров'я і контрацепції.

Increasing attention to health care of servicewomen is related to the worldwide tendency of growth of female representation in the security and defense sphere [10, 21].

With the increasing number of women in the military sphere, the number of women who have faced prolonged deployment in combat environments has been increasing [10, 28]. Ukraine, as a wartime society, has a unique experience of broad integration of women into the defense sphere, precisely in the current conditions of armed conflict in the eastern districts of the country [8].

Effective integration of women into traditional male military roles requires addressing gender-specific medical problems, such as birth control, increased regulation of menstruation, hygiene issues and pregnancy [1, 7].

According to literary sources, active duty servicewomen have a high level of unwanted pregnancies and low usage of contraceptive methods, which may be related to the lack of awareness and limited access to birth control [9, 11].

According to the small studies, rates of unintended pregnancy among American military women range from 50 to 65% of the total pregnancies in this population [16, 26, 27]. Thus, the range of unplanned pregnancies among the US servicewomen is higher than within the general population (72 pregnancies per 1,000 servicewomen compared with 52 per 1,000 of the general population) [12].

Unwanted pregnancies may also be the result of high-risk sexual practices and ineffective use of con-

traception, which in turn decreases military resources and responsiveness of military deployments [16, 18].

Servicewomen primarily work in a male environment and often want to minimize physical differences [18, 19]. Physiological events of woman's health, such as pregnancy and menstrual cycles, could become a problem for servicewomen in military service [5, 14, 20, 24].

That is why the benefits of hormonal contraception, namely the foolproof birth control and increased regulation of menstruation, may be more attractive to active duty women than to women in the general population. These medications, traditionally indicated for contraception, should be considered essential for female troops during training and deployment [3, 7, 17, 18].

Researches of the factors important for female reproductive health in a changing military environment can improve health care delivery and outcomes in this unique socio-professional group [4, 6].

The aim of study: to explore awareness and the index of usage of different contraceptive methods by servicewomen in the current armed conflict in the East of Ukraine.

The survey on awareness and use of different methods of contraception and prevention of STDs by servicewomen had been conducted in the military operations zone. The information obtained from the first sources will allow us to understand better the real state of the gender-specific medical problems of modern Ukrainian servicewomen and will facilitate the elaboration of the mechanisms of its tackling.

**MATERIALS AND METHODS OF RESEARCH**

Between October 2018 and September 2019, we conducted a questionnaire-based survey among Ukrainian servicewomen in the current war zone. The survey was focused on the knowledge and use of different methods of contraception and STD preventing by servicewomen in conditions of armed conflict in Donbas.

507 military women serving in the Joint Forces Operation Zone in eastern Ukraine and 100 civilian women from the frontline region took part in the questionnaire. Civilian women without gynecological disorders were questioned on the base of Municipal Establishment "Regional Rehabilitation Hospital" of Kherson Regional Council.

The questionnaire designed for the study was developed by the author. Respondents completed a self-administered anonymous questionnaire which consisted of 34 questions, both closed- and open-ended regarding demographics, awareness of the contraception methods, contraceptive use, reasons for not-use contraception and other. Women could answer questions at will. Special attention in the questionnaire was given to issues of hormonal contraception use by servicewomen.

As the data in the samples were not normally distributed, statistical comparisons of data between groups were made using the nonparametric Mann-Whitney U-test for age. The chi-squared test ( $\chi^2$ ) was carried out for a comparison of the proportion of "yes" and "no" responses between military and civil women for each single item. Data were analyzed using the licensed software programs IBM SPSS Statistics Subscription Trial (Classic) 26.0. If not mentioned otherwise, all data are displayed as median (interquartile range) or frequency  $\pm 95\%$  confidence interval. Significance level was set at  $p \leq 0.05$  [15].

The study was approved by the bioethics committee of the Institute of Pediatrics, Obstetrics and Gynecology of the National Academy of Medical Sciences of Ukraine (6/2018-09-13).

**RESULTS AND DISCUSSION**

Questionnaires were filled in by 607 women (507 servicewomen in the current war zone and 100 civilian women of reproductive age from the frontline region).

Groups are comparable by age. The age of the servicewomen is  $Me=34$ , IQR: 25-42, the age of civilians –  $Me=32$ , IQR: 29-37. The sociodemographic profile of the women interviewed is presented in Table 1.

Military and civilian women were distinguished by socioeconomic level ( $\chi^2=18.1$ ,  $p=0.001$ ) and family status ( $\chi^2=13.6$ ,  $p=0.001$ ) with a statistically significant difference.

Among civil women married ones made up statistically significant majority, 63.0% versus

39.1% among military ( $\chi^2=19.5$ ,  $p=0.001$ ). Among servicewomen, women with high socioeconomic level (monthly expenses for themselves) made up a statistically significant majority in comparison to civil (30.3% versus 9.7%, ( $\chi^2=16.7$ ,  $p=0.001$ ).

According to the obtained data, 48.3 $\pm$ 4.3% (245/507), female soldiers used different methods of contraception during deployment. Compared to civilian women, 70.0 $\pm$ 9.0% (70/100) among which have used contraception, servicewomen practiced contraceptive methods 1.5 times less (RR=1.5; 95%CI: 1.2–1.7) with a statistically significant difference ( $p=0.001$ ).

Age-related contraceptive use is shown in Table 2.

When stratified by age, in the age group under 25 years, methods of contraception were used by 53.2 $\pm$ 9.3% (59/111) of servicewomen; 25-34 years – 49.3 $\pm$ 8.3% (68/138); 35-44 years – 48.8 $\pm$ 7.5% (83/170); older than 44 years old – 48.6 $\pm$ 11.5% (35/72) (Table 2). The frequency of use of contraception did not have a statistically significant difference between different military age groups ( $\chi^2=0.62$ ,  $p=0.89$ ).

In the age group up to 25, methods of contraception were used by 81.8 $\pm$ 23.9% (9/11) of civilian women; 25-34 years – 70.6 $\pm$ 12.5% (36/51); 35-44 years – 71.0 $\pm$ 16.0% (22/31); older than 44 years old – 42.9 $\pm$ 39.6% (3/7). Using contraception was the same as for servicewomen, statistically significantly did not depend upon age group for civil women ( $\chi^2=3.21$ ,  $p=0.34$ ).

Civil women aged 25-44 years use contraception 1.5 times more often than military ones (from 25 to 34 years –  $\chi^2=6.84$ ,  $p=0.01$ , RR=1.43, 95% CI: 1.12-1.83; from 35 to 44 years –  $\chi^2=5.15$ ,  $p=0.02$ , RR=1.45, 95% CI: 1.11-1.90). In the age group up to 25, methods of contraception were used by 81.8 $\pm$ 23.9% (9/11) of civilian women and by 53.2 $\pm$ 9.3% (59/111) of military women ( $p=0.07$ ).

Servicewomen reported using hormonal contraception methods in 4.0 $\pm$ 0.9% (20/507) of cases versus 12.0 $\pm$ 3.2% (12/100) in civilian women.

The use of hormonal contraception by the servicewomen statistically significant does not differ from civilians in the age group of 25-34 years ( $\chi^2=0.52$ ,  $p=0.47$ ). Up to the age of 25, civilians use hormonal contraception statistically significantly more often  $\chi^2=4.16$ ,  $p=0.04$ , and statistically significantly more often use hormonal contraception in age of 35 – 44  $\chi^2=4.86$ ,  $p=0.03$ , and older than 44 –  $\chi^2=10.42$ ,  $p=0.002$ . From 35 to 44 years, the probability of contraception use by the servicewomen is 2.7 times less than that of civilians RR=2.74, 95% CI: 1.11-6.76, before 25 and over 44 years, the probability of non-use increases.

Table 1

**Sociodemographic characteristics of the surveyed**

Variable	Servicewomen			Civilians			$\chi^2$ p-value
	N	P, %	CI,%	N	P, %	CI,%	
<b>Family status, n*</b>	507			100			
Single	116	22.9	3.7	14	14.0	6.8	13.6 0.001
Married	198	39.1	4.2	63	63.0	9.5	
Divorced	93	18.3	3.4	13	13.0	6.6	
Unknown	100	19.7	3.5	10	10.0	5.9	
<b>Parity, n*</b>	480			100			
0	177	36.9	4.3	19	19.0	7.7	2.6 0.28
1	147	30.6	4.1	47	47.0	9.8	
2	137	28.5	4.0	31	31.0	9.1	
>2	19	4.0	1.7	3	3.0	3.3	
<b>Partners for the last year, n*</b>	437			95			
0	39	8.9	2.7	5	5.3	4.5	4.8 0.18
1	348	79.6	3.8	78	82.1	7.7	
2-3	39	8.9	2.7	12	12.6	6.7	
>3	11	2.5	1.5	0	0.0	3.7	
<b>Education, n*</b>	463			96			
Secondary school	74	16.0	3.3	15	15.6	7.2	3.5 0.17
Specialized secondary education	254	54.9	4.5	44	45.8	10.0	
Higher education	135	29.2	4.1	37	38.5	9.7	
<b>Religious, n*</b>	470			97			
Atheist	46	9.8	2.7	6	6.2	4.8	1.3 0.26
Religiosity	424	90.2	2.7	91	93.8	4.8	
<b>Confession, n*</b>	375			91			
Christian	360	96.0	2.0	90	98.9	2.1	3.6 0.17
Moslem	2	0.5	0.7	1	1.1	2.2	
Other	13	3.5	1.9	0	0.0	3.7	
<b>Socioeconomic level (monthly expenses for themselves), n*</b>	452			93			
Low	137	30.3	4.2	42	45.2	10.1	18.1 0.001
Intermediate	178	39.4	4.5	42	45.2	10.1	
Hight	137	30.3	4.2	9	9.7	6.0	

Notes. n\* – questionnaires answered; P- frequency; CI - 95% confidence interval.



Table 2

## Frequency of contraception use according to age group

Age group, years	Total	Used contraception			Used hormonal contraception		
	N	N	P, %	CI, %	N	P*, %	CI, %
<b>Military</b>							
<25	111	59	53.2	9.3	1	1.7	3.3
25-34	138	68	49.3	8.3	7	10.3	7.2
35-44	170	83	48.8	7.5	12	14.5	7.6
>44	72	35	48.6	11.5	0	0.0	9.9
<b>Total*</b>	<b>491</b>	<b>245</b>	<b>49.9</b>	<b>4.4</b>	<b>20</b>	<b>8.2</b>	<b>3.4</b>
<b>Civil</b>							
<25	11	9	81.8	23.9	1	11.1	21.8
25-34	51	36	70.6	12.5	4	11.1	10.3
35-44	31	22	71.0	16.0	6	27.3	18.6
>44	7	3	42.9	39.6	1	33.3	53.3
<b>Total</b>	<b>100</b>	<b>70</b>	<b>70.0</b>	<b>9.0</b>	<b>12</b>	<b>17.1</b>	<b>8.8</b>

Note. P\* – regarding women who used contraceptive methods in the age group.

Among those who reported using contraception, hormonal methods were used by  $8.2 \pm 1.8\%$  (20/245) servicewomen and  $17.1 \pm 4.5\%$  (12/70) – by civilian women ( $\chi^2=4.8$ ,  $p=0.03$ ) (Table 2). Thus, the survey results indicate that servicewomen have chosen hormonal contraception two times less than civilians (RR=2.1, 95% CI: 1.1-4.1). At the same time, in the age group before 25 years, hormonal contraception

was used –  $0.9 \pm 0.9\%$  (1/111) of servicewomen; 25-34 years –  $5.1 \pm 1.9\%$  (7/138); 35-44 years –  $7.1 \pm 2.0\%$  (12/170); older than 44 years –  $0.0 \pm 5.1\%$  (0/72).

The comparative assessment of the frequency use of various contraceptive methods by servicewomen and civil ones is shown in Table 3. Women could state all methods used.

Table 3

## Comparison of contraceptive methods use between servicewomen (n=245) and civilians (n=70)

Methods of contraception	Military			Civilians			$\chi^2$ ; p-value
	N	P, %	CI, %	N	P, %	CI, %	
Coitus interruptus	108	44.1	6.2	35	50.0	11.7	0.78; .38
Male condom	87	35.5	6.0	28	40.0	11.5	0.47; .49
Spermicides	46	18.8	4.9	8	11.4	7.5	2.07; .15
Copper IUD	4	1.6	1.6	11	15.7	8.5	23.8; .001
Patch	3	1.2	1.4	3	4.3	4.7	2.73; .09
OCs	15	6.1	3.0	6	8.6	6.6	0.53; .47
LNG-IUS	4	1.6	1.6	5	7.1	6.0	5.96; .02
Other	2	0.8	1.1	1	1.4	2.8	0.22; .64

Among women using contraception, at the moment of conducting the survey, barrier methods have been used the most frequently, particularly by 54,3% of military and 51.4% of civil women, with no statistically significant difference between groups ( $p>0.05$ ).

Using of intrauterine contraception by servicewomen was statistically significantly lower than by

civil women (in case of using non-hormonal intrauterine device,  $p=0.001$ ; and  $p=0.02$ , while using intrauterine system).

In this study we evaluated contraceptives use and related sociodemographic characteristics among female soldiers in the military conflict zone.

Table 4

**Association between educational level of servicewomen and hormonal contraception use**

Education	Total	Used hormonal contraception		Used OCs	Used IUS	Used TP	
	N	N	P*, %	CI, %	N	N	n
Secondary school	74	2	2,7	3,7	1	1	0
Specialized secondary education	254	8	3,1	2,1	7	1	1
Higher education	135	10	7,4	4,4	7	2	2
Total*	463	20	4,3	1,9	15	4	3

Note. Total\* – all who answered the question about education.

The frequency of hormonal contraception use among military did not have a statistically significant difference between groups with different educational levels ( $\chi^2=4.42$ ,  $p=0.11$ ). Wherein, the higher educated servicewomen were better informed than the respondents with secondary education, because they more often preferred hormonal contraception, as most effective method of birth control.

The questionnaire has included questions about reasons for the non-use of contraceptive methods in general and hormonal methods in particular.

Among servicewomen who did not use any method of contraception at the time of the survey and indicated that they did not plan to have a child soon, the most common reasons for non-use of contraception were: infrequent or absence of sex (66.4±8.1%), difficulties in obtaining consultation (4.6±3.6%), religious reasons (4.6±3.6%), the partner does not want to use contraception (8.4±4.8%), some indicated other reasons (36.6±8.3%) or more than one reason.

Reasons for non-use of hormonal contraception by servicewomen are presented in Table 5. Women could state more than one reason.

A high prevalence of concerns regarding health risks and side effects of hormonal contraception, as well as prejudice against to hormones among servicewomen draws attention.

Determining the low contraception use associated with limited awareness of servicewomen, indicates the need for improving women’s access to con-

traceptive counseling at all stages of military career, especially in military deployment.

We present the first report of the evaluation of awareness and contraception use among Ukrainian servicewomen in the zone of armed conflict in Donbas in comparison to civilians.

According to the results of the survey conducted in the war zone, the index of usage of different contraceptive methods by servicewomen in the current war zone turned out to be statistically significantly lower (48.3±4.3%) in comparison to civilian women (70.0±9.0%,  $p=0.001$ ).

Herewith civil women aged 25-44 years used contraception 1,5 times more often than military, with a statistically significant difference (from 25 to 34 years,  $p=0.01$ ; from 35 to 44 years,  $p=0.02$ ). In the age group before 25 y.o., who are among those at highest risk for unintended pregnancy, methods of contraception were used by 81.8±23.9% (9/11) of civilian women and by 53.2±9.3% (59/111) of servicewomen ( $p=0.07$ ).

According to the survey results, which are consistent with findings from other studies [4, 23, 25], contraceptive and reproductive health issues are particularly important for interviewed servicewomen, not only in medical but also in the professional aspect, especially during military deployment.

The use of different methods of hormonal contraception by women of this socio-professional group has a prophylactic value besides the contraceptive and therapeutic effect. It allows



preventing the development of menstrual-associated and cyclic complications, bleeding, and anemia, which according to literary sources, are almost 2

times more widespread among the servicewomen than civilians, even in peacetime [2, 7].

Table 5

### Reasons for not practicing hormonal contraception in military during deployment

Reasons	N	P,%	95%CI,%
Total answered	317	100	
Fear of increasing bodyweight	130	41.0	5.4
Fear of malignant diseases	38	12.0	3.6
Prejudice against to hormonal contraception	69	21.8	4.5
Inconveniences of daily intake of pills	48	15.1	3.9
Not enough information to choose a specific method	41	12.9	3.7
Previous negative experience of using	40	12.6	3.7
Difficulties in getting counseling of contraception	31	9.8	3.3
High price	16	5.0	2.4
Difficult in obtaining	3	0.9	1.1
Other	31	9.8	3.3

Despite the apparent advantages of using different methods and regimens of hormonal contraception to reliably prevent unplanned pregnancies and menstrual suppression, servicewomen in zone of armed conflict used hormonal contraception statistically significantly less often than civilians and preferred less effective methods of birth control. The frequency of hormonal contraception use in military group was  $4.0 \pm 0.9\%$  (20/507) versus  $12.0 \pm 3.2\%$  (12/100) in civilian women.

Among those who reported using contraception, hormonal methods were used by  $8.2 \pm 1.8\%$  (20/245) of military and  $17.1 \pm 4.5\%$  (12/70) of civilian women ( $\chi^2=4.8$ ,  $p=0.03$ ). Thus, the survey results indicate that servicewomen have chosen hormonal contraception 2 times less often than civilians (RR=2.1, 95% CI: 1.1-4.1).

The data we have obtained concerning the frequency of hormonal contraception use by the servicewomen differ from the results of previous studies. According to other researchers, the rate of hormonal contraception use among servicewomen from the United States fluctuated from 24.4%-39.2% [6] to 40% every year [13]. According to the results of another study [18], the use of oral contraceptives (OC) was higher in the military (34%) than in the general population (29%,  $p<0.05$ ) and this difference increased with age.

According to the received data, the use of hormonal contraception by the military women significantly does not differ from civilians in the age group of 25-34 years. From 35 to 44 years, the probability of contraception use by the military is 2.7 times less than that by civilians, before 25 and over 44 years of age, the probability of non-use increases.

Determination of low level of awareness and use of hormonal contraception in the age group before 25 years, especially among military women from the eastern region of Ukraine, may be associated with their rather young age (15-20 years) and limited access to gynecological care at the beginning of the combat conflict in the area of their residence.

A significant percentage of planning pregnancy, which is among reasons for non-use contraception by servicewomen in the Joint Forces Operation Zone draws attention, which confirms the necessity of counseling both on contraception issues together with issues of reproductive health, namely safe motherhood, at all stages of a military career.

Preserving women's health during war is improving the education of military medics.

Based on the experience gained in the zone of military operations, we agree with international experts [4, 22] that the current level of medical knowledge, vital for providing gender-specific healthcare for the active-duty servicewomen is

critically inadequate, particularly because of lack of theoretically proved information received from scientific researches which concern issues of healthcare of servicewomen.

Our data coincides with the survey results among UK military medical professionals [23], about lack of preparation and absence of necessary experience in providing gender-specific healthcare for servicewomen during military deployments and necessity of including gynecology in medical pre-deployment training (PDT) and in Clinical Guidelines for Operations (CGOs).

The results of this study are used in the training programs of military doctors at the Ukrainian Military Medical Academy.

#### Strengths and limitations

To our knowledge, this is the first and the only research of contraception use among Ukrainian servicewomen in the armed conflict zone. A strength of the study was the possibility to obtain first-hand information about the real state of the gender-specific medical problems of servicewomen in the current war zone. The limitations of this study have been caused by the specific conditions of its organization and conduction.

#### Open questions and future research

Military experience can affect women's reproductive health negatively.

Protective capacities of different methods and regimens of hormonal contraception in conditions of

the negative impact of physical, chemical, and psychological factors of war environment need a more in-depth study in the context of the preservation of reproductive potential and successful fulfillment of reproductive life plans by servicewomen in future years.

#### CONCLUSIONS

The low level of contraception use by servicewomen serving in the Joint Forces Operation Zone increases risks of development of reproductive health disorders in this unique socio-professional group and requires improvement of access to contraceptives and effective counseling prior and at all stages of military service. The reserve of preserving women's health in the current war environment is improving the education of military medics in the gender-specific issues of reproductive health and contraception.

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