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# Reproductive Health Training of Turkish Soldiers from Certain Risk Groups

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**Aims:** The 2003 Turkey Demographic and Health Survey (TDHS-2003) pointed out significant differences between East Anatolia and the other regions of Turkey. Some studies carried out among Turkish soldiers have underlined the need for more information on Reproductive Health (RH) issues for soldiers with lower educational level and coming from the eastern region of Turkey. Since marriage in Turkey is very important from a demographic perspective, this study has attempted to determine prevalence of marriage and certain characteristics of married soldiers who were involved in the RH courses. The aim of the study was to determine the results of RH training courses for soldiers born in the east region and married soldiers and to identify the prevalence of certain characteristics in the study group.

**Materials and Methods:** In the frame of the Reproductive Health Program (RHP) of the Turkish Armed Forces (TAF), all soldiers received training in RH by field trainers between April 2004 and January 2006. Soldiers were tested via a questionnaire containing 25 true-false type statements before and after training. The data including 484,949 cases from the TAF RHP database was transferred to a SPSS package program. From the total cases, 135,905 soldiers were born in the Eastern Anatolia region and 36,468 were married; analyses were carried out on these latter cases.

**Results:** Of all soldiers born in the eastern region of Turkey, 47.4% were born in Southeast Anatolia. Primary school graduates constituted the largest group (40.5%). Mean pre-course score was 63.2 ± 15.7, while post-course score was 81.4 ± 13.8 ($P < 0.001$). Among soldiers born in the eastern region of Turkey, 26% (17,325) resided in other regions before their military service. A comparison of pre- and post-test scores between those still living in the east region and those living outside the east region (pre-test 62.3 and 65.7, respectively; post-test 80.8 and 83.3, respectively) revealed significant differences ($P < 0.001$).

The overall rate of marriage among soldiers was found as 7.7%. Among all married soldiers, 70.9% were determined as in the youngest age group, what might be considered as adolescence.

37.2% of married soldiers were primary school graduates and constituted the largest group with respect to education level.

The distribution of married soldiers according to the demographic regions in which they were living before military service was determined as follows: 27.9% west, 23.6% central, 11.0% south, 9.3% north, and 26.5% east.

**Conclusions:** Living in the eastern region of Turkey is a contributing factor to low knowledge levels on issues of RH. Early marriage is one indicator of this fact. Lower general educational level seems to be the major underlying factor.

Key Words: Reproductive health, training, knowledge level, soldiers, military, marriage

## Bazı Risk Gruplarından Gelen Türk Askerlerinin Üreme Sağlığı Eğitimleri

**Giriş:** 2003 Türkiye nüfus ve sağlık araştırması (TNSA 2003) Doğu Anadolu ile Türkiye'nin diğer bölgeleri arasında önemli farklılıklar olduğunu göstermiştir. Türk askerleri üzerinde yapılan bazı çalışmalar eğitim seviyesi düşük ve Türkiye'nin doğu bölgesinden askerlerin üreme sağlığı konusunda daha fazla bilgiye ihtiyacı olduklarının altını çizmiştir. Türkiye'de evlilik demografik açıdan önemli olduğundan bu çalışma üreme sağlığı kurslarına katılan askerlerde evlilik prevalansını ve evli askerlerin belli özeliklerini belirlemeye çalışmaktadır. Bu çalışmanın amacı doğuda doğan askerlerin ve evli askerlerin üreme sağlığı kurs sonuçlarını belirlemek ve onların belli özelliklerini tanımlamaktır.

**Gereç ve Yöntem:** Türk Silahlı Kuvvetleri Üreme Sağlığı Programı çerçevesinde Nisan 2004 ile Ocak 2006 tarihleri arasında üreme sağlığı konusunda tüm askerlere saha eğiticileri tarafından eğitim verilmiştir. Askerlere eğitim öncesi ve sonrası doğru yanlış tipinde 25 soruluk testler uygulanmıştır. TSK ÜS programı veritabanından alınan ve 484.949 kişi içeren veri SPSS paket programına aktarıldı. Tüm eğitim görenlerden 135.905 doğuda doğan ve 36.468 evli asker belirlendi ve analizler bunlar üzerinde yapıldı.

**Bulgular:** Türkiye'nin doğu bölgesinde doğan askerlerin % 47.4'ü Güneydoğu Anadolu bölgesindendir. İlkokul mezunları en büyük grubu oluşturmaktadır (% 40.5). Kurs öncesi test ortalaması 63.2 ± 15.7 iken kurs sonrası ortalama 81.4 ± 13.8 dür ($P < 0.001$). Doğu bölgesinde doğan askerlerden 5262'sı (17.325) askere gelmeden önce diğer bölgelerde yaşamaktadır. Doğuda yaşamaya devam edenlerin ön test ve son test ortalamalarını (62.3 ve 65.7 sırasıyla) artık doğuda yaşmayanların aynı değerleri ile (80.8 ve 83.3 sırasıyla) karşılaştırdığımızda anlamlı fark bulunmuştur ($P < 0.001$).

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Askerler arasındaki evlilik hızı % 7.7 olarak bulundu. Evli askerlerden % 70.9'unun adolesan grup olarak değerlendirilebilecek en genç grupta yer aldığı bulundu.

Evli askerler arasında ilkokul mezunlarının en büyük grubu oluşturduğu bulundu.

Evli askerlerin askere gelmeden önce yaşadıkları coğrafi bölgeler; %27,9 batı bölgesi, %23.6 orta bölge, % 11.0 güney bölge, % 9.3 kuzey bölge, % 26.5 doğu bölgesi olarak bulundu.

**Sonuç:** Doğu Anadolu'da yaşamak üreme sağlığı konularında düşük düzeyde bilgi sahibi olmayı etkilemektedir. Erken evlilik bu gerçeğin bir göstergesidir. Düşük genel eğitim düzeyi bu durumu etkileyen önemli bir altta yatan sebep olarak gözükmektedir.

**Anahtar Sözcükler:** Üreme sağlığı, eğitim, bilgi düzeyi, askerler, askeriye, evlilik

## Introduction

Turkey has been following an antinatalist policy since the time of legalizing contraception and establishing a national family planning program in 1965 (1-3). The Turkish Ministry of Health (MoH) has conducted several programs since 1965 to improve reproductive health (RH) status in Turkey (3).

Since this turning point, important improvements have been achieved regarding RH indicators in Turkey (3-5). The total fertility rate (TFR) declined from 5.1 children per woman of reproductive age in 1978 to 2.2 in 2003 (5). On the other hand, shortfalls continue to exist; for example, 18.9% of pregnant women received no antenatal care and 23% of all births occurred at home according to the Turkey Demographic and Health Survey 2003 (TDHS-2003) (5). Regional difference in almost all indicators of RH was the striking finding of TDHS-2003. As an example, while TFR values in Northern, Western, Southern, and Middle Anatolia have been lower, at 1.94, 1.88, 2.3, and 1.86, respectively, this value has remained remarkably higher, at 3.65, in Eastern Anatolia (5).

As highlighted at the 1994 Cairo and 1995 Beijing Conferences (6-7), one review study has stated that men's participation in family planning and use of male contraceptive methods can ensure a decrease in fecundity and lead to long-term benefits primarily to women and then to all people (8). In this regard, the MoH has taken male involvement as a priority in its RH program in recent years. In the meantime, some studies carried out among Turkish soldiers, who constitute a remarkable portion of the young Turkish male population, have underlined the common lack of knowledge among Turkish soldiers on RH issues, especially sexually transmitted diseases, and the greater need for information on RH issues among soldiers with lower educational level and coming from the eastern region of Turkey (9-14).

The study of fertility among adolescent girls has for a long time been assimilated to that of general fertility, before it was felt necessary to specifically study this group of women. The reasons behind these studies are diverse: risks for maternal and child health, economic cost of teenage pregnancy, etc (15). Early pregnancy poses great health risks for a young woman and for her infant. Moreover, women who marry at a young age are likely to find motherhood the sole focus of their lives at the expense of development in other areas such as formal education. Because of the concern about the negative consequences of early marriage among women, the Beijing conference focused on the problems of girls marrying at young ages (16). In Turkey, marriage is very important from a demographic perspective, because, besides being prevalent throughout the country, almost all births occur within marriage. Therefore, age at first marriage is a significant demographic indicator since it represents the onset of a woman's exposure to the risk of pregnancy (5). According to TDHS- 2003 among women, 15.2% of those aged 15-19 and 59.3% of those aged 20-24 were married. In Turkey, the legal age of obligatory military service is 20 years old, just above the upper limit of the adolescent period defined by the World Health Organization (WHO) as 10 to 19 years. Since adolescence is the period in life when the individual transitions from the stage of childhood to that of adulthood, it is difficult to determine exactly where this childhood ends and adulthood begins.

Considering the combination of these facts, in 2002, Representatives of Mother and Child Health and Family Planning General Directorate of MoH, the Turkey Field Office of the United Nations Fund of Population Affairs (UNFPA), and the Gulhane Military Medical Academy (GMMA) of the Turkish Armed Forces (TAF) came together to discuss collaboration and a potential course of action to build a broad and sustainable program to

increase young male awareness through their participation in RH programs and services. The implementation of this program began in 2004 and the first evaluations were performed as presented at the European Society of Contraception (ESC) Congress-2006 held in Istanbul (17-21). A paper on the first results of this program was also published in a 2007 issue of *Military Medicine* (22). Since this paper presented the results of a large number of participants, it was not possible in that report to make a detailed evaluation of special groups. Two new papers have been published recently regarding this program (23,24).

The present study, which was part of the reports produced within the framework of the TAF Reproductive Health Program (TAFRHP), mainly focuses on the results of training of soldiers who were born in the east region and of all married soldiers involved in the program between April 2004 and January 2006. It was aimed to explore possible explanations of why the east region has had a negative impact on RH and to provide the prevalence of marriage and clarify certain characteristics of married soldiers.

## Materials and Methods

### Study Population

This study included the soldiers born in the east region of Turkey and all married soldiers from the entire country involved in the TAFRHP between April 2004 and 4 January 2006. The general characteristics of soldiers are presented as follows:

In Turkey, every Turkish male citizen is obligated to do military service at the legal age of 20 for a duration of 15 months, with the exception of certain groups, such as university graduates and workers in foreign countries for whom it may be deferred until a later age. University graduates have the right to perform their obligatory military service as military officers, but some university graduates may perform this duty as a soldier for a shorter period of six months depending on the determined need of the TAF. It is estimated that approximately 500,000 young men are recruited for their military service obligation annually and are distributed to different military units located across the country.

### Main Intervention (Training Course)

The main intervention of the program was a one-day RH training course with the following content:

Module 1: Anatomy of the male/female reproductive systems, including sexual hygiene.

Module 2: Regulation of fertility including the reversible contraceptive methods (intrauterine device, oral contraceptives, condoms).

Module 3: Sexually transmitted infections (STIs) and HIV/AIDS, particularly signs and symptoms and protection measures.

Module 4: Responsible parenthood including safe motherhood.

Module 5: Gender and violence against women.

In each session, at least one field trainer trained soldiers in numbers not exceeding 20 seated in a U-shaped design, which allowed the participants to share their own ideas and experiences. A pre-test was given to the participants at the beginning of the one-day training course while a post-test was given at the end of the session. Both tests included the same 25 questions on RH issues. Every correct answer was scored with 4 points for a maximum possible score of 100.

### Data Source and Variables

The data for all participants were registered in a standard registry notebook distributed to the RH classrooms. A database for the TAFRHP was also created within the Local Area Network (LAN) of the TAF. Unfortunately, not all RH classrooms had access to this database from the beginning. As LAN of TAF was spreading to cover all military units, the number of classrooms under its coverage also increased. A code number for each RH classroom and a user name and password for the field trainers was given in order to enter the results of courses into the database. To avoid overload to the field trainers, the scope of the database was limited to the data of basic demographic characteristics such as birth date, birth place, last location of residence, educational level, marital status, total pre-test and post-test scores, and condom practice. The first data was entered into the database in April 2004.

### Tests

A pre-test was given to the participants at the beginning of the one-day training course while a post-test

was given at the end of the session. Both tests included the same 25 questions on RH issues. Every correct answer was scored with 4 points, with a maximum possible score of 100.

### Variables

A number of variables were constructed from the data and used in exploring how each variable affected pre- and post-test scores of soldiers in the descriptive analyses that follow. These variables included birth year, educational level, marital status, hometown, and the last place of residence.

Educational level was grouped into five segments in order to examine the general RH knowledge of the soldiers in similar stages of their reproductive life. The soldiers were individually grouped by: 1, education less than primary school; 2, completed primary school but not secondary school; 3, completed secondary school but not high school; 4, completed high school but not "some college" or college, and 5, completed "some college" or college.

Hometown and the last place of residence were grouped into five regions in accordance with TDHS-2003 in order to examine the general RH knowledge of the soldiers coming from different regions of the country. TDHS-2003 allowed analyses for the 12 geographical regions (NUTS1) that were adopted at the second half of 2002 within the context of Turkey's move to join the European Union (2). According to NUTS1, the east region was divided into three subregions as Northeast Anatolia, Central East Anatolia and Southeast Anatolia.

Soldiers were grouped as married and unmarried based on their self-report, without regarding the legal status of marriage.

Mean difference and mean of change percentage in pre-test score were also computed based on the mean scores.

### Outcomes

The main outcome was the difference between the level of awareness before-course and after-course also taking into account the sociodemographic characteristics of participating soldiers. Percent of change in mean pre-test score was also estimated as another outcome.

### Statistical Analyses

Data management and analysis were performed using SPSS software (v11.0). Descriptive analyses were performed at the beginning by selecting data for those born in Eastern Anatolia. These were repeated by selecting data for married soldiers. The prevalence of marriage among soldiers was also estimated. Total mean scores were computed according to pre- and post-test results. Total pre- and post-test mean scores were compared between groups according to hometown, region of residency, educational level, marital status and condom practice. Cross-tabulation between those from the east region and those from other regions was also performed. Cross-tabulation between married and unmarried soldiers was also prepared according to region and educational level by evaluating valid cases. The ANOVA test was used to compare the pre- and post-test mean scores between more than two groups of soldiers, such as educational level and regional categories, and if a significant difference was determined, Bonferroni test was used as a post hoc test to determine the group causing the difference. T-test for independent samples was used to compare mean scores for two groups such as under "marital status". T-test for dependent samples was used to compare pre- and post-test mean scores belonging to any one subgroup or the same group. Chi-square was used to compare the differences among numbers distributed in cross-tabulation.

## Results

The total number of soldiers registered in the database between April 2004 and 4 January 2006 was 484,949. Of that total, the number of soldiers born in the east region was 135,905 as seen in Table 10, but the results for only 67,246 soldiers with complete entries of pre- and post-test scores could be analyzed, since one of the test scores of the other soldiers born in the east region was missing in the database. The total number of married soldiers was extracted as 36,468 (7.7%).

The distributions of birth year, educational level, geographical region, and marital status of soldiers born in the east region of Turkey in this study are listed in Table 1. Since data collection was continued more than one year, participants were grouped according to date of birth without converting into age years, as seen in Table 1. The distribution of soldiers according to birth year was found as 39.8% (26,888) in 1984, 32.6% (22,001) in 1985 and 13.2% (8,927) in 1983. Of all conscripts who were born in the eastern region of Turkey, 47.4% were born in Southeast Anatolia. Primary school graduates

constituted the largest group, at 40.5%, and the proportion of those having less than primary school education was remarkable, at 12.2%. The proportion of married soldiers was 8.6%. Among soldiers who were born in the eastern region of Turkey, totally 26% (17,325) used to reside in the other regions before starting their military service (Table 1).

Table 1. Distribution of sociodemographic characteristics of soldiers born in the east region.

| | | n | % |
|---|---|---|---|
| Birth Years | (Age) | | |
| 1983-1985 | (20-22) | 57816 | 85.6 |
| 1980-1982 | (23-25) | 6490 | 9.6 |
| < 1980 | (>25) | 2973 | 4.6 |
| No data | | 267 | 0.4 |
| Educational status | | | |
| Less than primary school | | 8208 | 12.1 |
| Primary school | | 27323 | 40.5 |
| Secondary school | | 13490 | 20.0 |
| High school | | 14786 | 21.9 |
| Some college/College | | 3660 | 5.4 |
| No data | | 79 | 0.1 |
| Region of birth | | | |
| Northeast Anatolia | | 17332 | 25.7 |
| Central East Anatolia | | 18207 | 27.0 |
| Southeast Anatolia | | 32007 | 47.4 |
| Region of residence | | | |
| West | | 12908 | 19.1 |
| Central | | 1559 | 2.3 |
| South | | 2662 | 3.9 |
| North | | 196 | 0.3 |
| East | | 50013 | 74.0 |
| No data | | 208 | 0.3 |
| Marital status | | | |
| Unmarried | | 61502 | 91.1 |
| Married | | 5789 | 8.6 |
| No data | | 255 | 0.4 |
| OVERALL | | 67546 | 100.0 |

Comparisons of pre-test mean scores between groups based on the given variables are presented in Table 2. According to educational levels, soldiers with a higher educational level had significantly higher scores than soldiers with a lower educational level, which was effective in each pair of subsequent groups ($P < 0.05$), and soldiers with higher education level had the highest scores (73.7 ± 15.1). No significant difference was found between married and unmarried soldiers. There were significant differences between pre-test scores of those who were born in and still resided in the east region (62.3) and those who were born in but had lived outside the east region (65.7) ($P < 0.001$). Soldiers who were born in Southeast Anatolia had lower pre-test mean scores than soldiers born in Northeast and Central East Anatolia.

Comparisons of post-test mean scores between groups based on the given variables are presented in Table 3. Like pre-test mean scores, findings revealed that soldiers with higher education level had the highest post-test mean scores (90.0 ± 9.8), and the difference between the groups of each subsequent pair were significant. Interestingly, despite pre-test mean scores, unmarried soldiers scored significantly higher than married soldiers. A comparison of post-test scores between those who were born in and still resided in the east region (80.8) and those who were born in the east but lived in different regions (83.3) revealed significant differences ($P < 0.001$). Like with pre-test scores, post-test mean scores of soldiers born in Southeast Anatolia were lower than those of soldiers born in Northeast and Central East Anatolia.

Table 4 shows comparisons of pre- and post-test mean scores according to certain variables. Comparisons for each category of a given variable such as marital status, educational level, region of hometown, and region of residence demonstrated a significant increase in knowledge level. Table 4 also presents the mean differences between post-test mean score and pre-test mean score for each category of these variables. Based on these mean differences, percents of increases in pre-test mean scores were also estimated. With respect to education level, the highest increase in pre-test mean was found for soldiers with education less than primary school (40.3 ± 49.3). Soldiers who lived in the east region had a higher increase (37.0 ± 40.5) than soldiers born in the east who lived in other regions (33.0 ± 36.7).

Table 5 compares soldiers born in the east region with soldiers born in other regions of Turkey regarding marital status, educational level and mean scores of both pre- and post- test within the entire population with perfect data entry. The percent of married soldiers was significantly higher among soldiers born in the east region (9.0%) than among soldiers born in other regions of Turkey (7.1%) ($P < 0.001$). The educational levels of

Table 2. The pre-test mean scores of soldiers born in the east region according to sociodemographic variables.

| Variables | Number of soldiers | Mean pre-test score | SD | Test Value |
|---|---|---|---|---|
| Educational status (n: 67,467) | | | | |
| Less than primary school | 8208 | 56.8 | 17.0 | |
| Primary school | 27323 | 60.9 | 15.1 | |
| Secondary school | 13490 | 63.9 | 14.4 | F=1290.1* |
| High school | 14786 | 67.6 | 14.7 | |
| Some college/College | 3660 | 73.7 | 15.1 | |
| Region of residence (n: 67,338) | | | | |
| West | 12908 | 65.8 | 15.3 | |
| Central | 1559 | 66.5 | 15.2 | |
| South | 2662 | 64.8 | 16.2 | F=161.5*[1] |
| North | 196 | 66.8 | 15.2 | |
| East | 50013 | 62.3 | 15.7 | |
| Marital status (n: 67,291) | | | | |
| Unmarried | 61502 | 63.1 | 15.6 | t= -1.0 |
| Married | 5789 | 63.4 | 16.8 | |
| Region of hometown (n: 67,546) | | | | |
| Northeast Anatolia | 17332 | 64.4 | 15.5 | |
| Central East Anatolia | 18207 | 63.8 | 15.8 | F=136.0* |
| Southeast Anatolia | 32007 | 62.1 | 15.7 | |
| Region of residence (n: 67,338) | | | | |
| Other regions | 17325 | 65.7 | 15.4 | t=25.1* |
| East | 50013 | 62.3 | 15.7 | |
| Condom practice on model (n: 66,940) | | | | |
| Yes | 62937 | 63.2 | 15.6 | t=3.7* |
| No | 4003 | 62.2 | 16.9 | |
| GENERAL | 248,796 | 65.7 | 15.4 | |

*The mean difference is significant at the level of 0.05.
1-The mean differences between each pair of two regions are significant at the 0.05 level according to Bonferroni test with the exception of mean difference between central and north regions.

soldiers born in the east region also differed significantly from the others. While the illiterate group in soldiers born in the east region was as high as 13.9%, it was just 2.5% in soldiers born in other regions of Turkey. In contrast, the sum of percents of high school and some college/college groups in soldiers born in the east region (26.1%) was lower than the corresponding percent among soldiers born in other regions of Turkey (41.1%).

Table 5 also shows that both pre- and post-test mean scores of soldiers born in the east region are significantly lower than the corresponding values for soldiers born in other regions of Turkey. In contrast to this finding, percentage increase in pre-test mean was higher among soldiers born in the east region of Turkey.

Table 6 presents marital status and educational levels of soldiers born in the east region according to regions in which they currently lived. Regarding percentage of married soldiers, a remarkable decrease was shown for soldiers who lived in the west region (7.1), while a remarkable increase existed among soldiers who lived in

Table 3. The post-test mean scores of soldiers born in the east region according to sociodemographic variables.

| Variables | Number of soldiers | Mean post-test score | SD | Test Value |
|---|---|---|---|---|
| Educational level (n: 67,467) | | | | |
| Less than primary School | 8208 | 74.1 | 16.7 | |
| Primary school | 27323 | 79.2 | 13.8 | |
| Secondary school | 13490 | 82.6 | 12.0 | F=1793.9* |
| High school | 14786 | 86.4 | 11.0 | |
| Some college/ College | 3660 | 90.0 | 9.8 | |
| Region of residence (n: 67,338) | | | | |
| West | 12908 | 83.5 | 12.8 | |
| Central | 1559 | 84.1 | 12.7 | |
| South | 2662 | 82.2 | 13.9 | F=117.4*[1] |
| North | 196 | 82.1 | 14.2 | |
| East | 50013 | 80.8 | 14.0 | |
| Marital status (n: 67,291) | | | | |
| Unmarried | 61502 | 81.5 | 13.7 | t= 3.3* |
| Married | 5789 | 80.8 | 14.7 | |
| Region of hometown (n: 67,546) | | | | |
| Northeast Anatolia | 17332 | 82.5 | 13.1 | |
| Central East Anatolia | 18207 | 81.8 | 13.7 | F=121.2* |
| Southeast Anatolia | 32007 | 80.6 | 14.1 | |
| Region of residence (n: 67,338) | | | | |
| Other regions | 17325 | 83.3 | 13.0 | t=21.0* |
| East | 50013 | 80.8 | 14.0 | |
| Condom practice on model (n: 66940) | | | | |
| Yes | 62937 | 81.6 | 13.7 | t=18.9* |
| No | 4003 | 77.4 | 14.7 | |
| GENERAL | 248,796 | 90.0 | 9.8 | |

*The mean difference is significant at the level of 0.05.
1 -The differences between each of two regions are significant at the level of 0.05 according to Bonferroni test with the exception of difference between north and south regions.

the south region (10.3) compared with the 8.9% rate among soldiers who lived in the east region.

Regarding educational level, all soldiers had better educational levels compared with soldiers living in the east region (see Table 6).

Table 7 compares the marital status and educational levels of soldiers born in the east region according to the three subregions of East Anatolia. Soldiers born in Southeast Anatolia had the higher married percent (9.4) and lower educational levels, with an illiterate group of 15.1%.

As presented in Table 8, 70.9% of all married soldiers were born between 1983 and 1985. Nearly 40% of all married soldiers had primary school or lower education level. The largest groups of married soldiers were born in east and central regions, with consecutive percents of 33.6 and 25.7. However, when considering the region of residence, the percent decreased to 26.5 for the east region while it increased to 27.2 for soldiers living in the west region.

Table 9 presents the comparisons of married and unmarried soldiers according to certain variables. Among

Table 4. Pre-test and post-test mean scores and mean differences and percent of increase in mean according to educational levels of soldiers born in the east region.

| Subgroups | n | Pre-test mean ± SD | Post-test mean ± SD | Mean difference ± SD | Mean of % change in pre-test ± SD |
|---|---|---|---|---|---|
| Marital status (n: 67,291) | | | | | |
| Unmarried | 61502 | 63.1 ± 15.6 | 81.5 ± 13.7 | 18.3 ± 15.7 | 35.9 ± 39.6 |
| Married | 5789 | 63.3 ± 16.8 | 80.8 ± 14.7 | 17.4 ± 16.7 | 35.4 ± 41.5 |
| Educational level (n: 67,467) | | | | | |
| Illiterate | 8208 | 56.8 ± 17.0 | 74.1 ± 16.7 | 17.3 ± 19.3 | 40.3 ± 49.3 |
| Primary school (1-5 years) | 27323 | 60.9 ± 15.2 | 79.2 ± 13.8 | 18.3 ± 16.4 | 37.3 ± 41.1 |
| Secondary school (6-8 years) | 13490 | 63.9 ± 14.4 | 82.6 ± 12.0 | 18.7 ± 14.7 | 35.3 ± 35.8 |
| High school (9-11 years) | 14786 | 67.6 ± 14.7 | 86.4 ± 11.0 | 18.8 ± 14.0 | 33.6 ± 35.0 |
| Some college/College (>12 years) | 3660 | 73.7 ± 15.1 | 90.0 ± 9.8 | 16.2 ± 13.3 | 27.3 ± 32.3 |
| Region of hometown (n: 67,546) | | | | | |
| Northeast Anatolia | 17332 | 64.4 ± 15.5 | 82.5 ± 13.1 | 18.1 ± 15.3 | 34.9 ± 39.1 |
| Central East Anatolia | 18207 | 63.8 ± 15.8 | 81.8 ± 13.7 | 18.0 ± 15.9 | 35.2 ± 39.8 |
| Southeast Anatolia | 32007 | 62.1 ± 15.7 | 80.6 ± 14.1 | 18.4 ± 16.1 | 36.8 ± 39.8 |
| Region of residence (n: 67,338) | | | | | |
| Other regions | 17325 | 65.7 ± 15.4 | 83.3 ± 13.0 | 17.6 ± 14.8 | 33.0 ± 36.7 |
| East | 50013 | 62.3 ± 15.7 | 80.8 ± 14.0 | 18.5 ± 16.1 | 37.0 ± 40.5 |
| Condom practice on model (n: 66,940) | | | | | |
| Yes | 62937 | 63.2 ± 15.6 | 81.6 ± 13.7 | 18.5 ± 15.8 | 36.3 ± 39.8 |
| No | 4003 | 62.2 ± 16.9 | 77.4 ± 14.7 | 15.2 ± 15.9 | 31.4 ± 36.6 |
| OVERALL | 67546 | 63.1 ± 15.7 | 81.4 ± 13.8 | 18.3 ± 15.8 | 35.9 ± 39.6 |

the youngest group, 6.5% were married, while 23.6% were married in the oldest group, demonstrating a significant difference ($P < 0.001$). We also looked at the marriage trend among the youngest group by separating them into three cohorts based on birth years, and the results revealed a clear decline in marriage percent as follows: 7.9% in the 1983 cohort (n = 85,491), 6.6% in the 1984 cohort (n = 194,430), and 5.4% in the 1985 cohort (n = 114,926).

With respect to educational level, the percent of married soldiers was higher in those with education less than primary school (14.0%) and in the some college/college group (13.5%).

The difference in number of marriages between soldiers living in the east region and all other soldiers was significant ($P < 0.001$).

Married soldiers had a significantly higher pre-test mean score than unmarried soldiers but no difference was found between post-test mean scores for married and unmarried soldiers (Table 9).

As seen in Table 10, the relocation rate from the east region to other regions differed significantly according to educational level ($P < 0.0001$).

## Discussion

Findings of the present study demonstrated that soldiers born in the east region had lower knowledge level at both pre- and post-test compared with those soldiers born in other regions of Turkey (Table 5). This finding was obtained in many previous studies conducted among Turkish soldiers that attempted to determine the

Table 5. Cross-tabulation of region resided with marital status and educational level among all soldiers with complete data entry.

| | Region resided | | | | | | Test value | P |
|---|---|---|---|---|---|---|---|---|
| | East | | Other | | Total | | | |
| | n | (%) | n | (%) | n | (%) | | |
| Marital status (239725) | | | | | | | | |
| Married | 4572 | (9.0) | 13355 | (7.1) | 17927 | (7.5) | F = 208.7 | <0.001 |
| Unmarried | 46386 | (91.0) | 175412 | (92.9) | 221798 | (92.5) | | |
| Total | 50958 | (100.0) | 188767 | (100.0) | 239725 | (100.0) | | |
| Educational level (240347) | | | | | | | | |
| Illiterate | 7115 | (13.9) | 4716 | (2.5) | 11831 | (4.9) | F = 14424.7 | <0.001 |
| Primary school | 20857 | (40.8) | 62196 | (32.9) | 83053 | (34.6) | | |
| Secondary school | 9767 | (19.1) | 44694 | (23.6) | 54461 | (22.7) | | |
| High school | 10844 | (21.2) | 56903 | (30.1) | 67747 | (28.2) | | |
| Some College/College (>12 years) | 2506 | (4.9) | 20749 | (11.0) | 23255 | (9.7) | | |
| Total | 51089 | (100.0) | 189258 | (100.0) | 240347 | (100.0) | | |
| Means ± SD | | | | | | | | |
| n | 51141 | | 189508 | | 240719 | | | |
| Pretest | 62.4 ± 15.7 | | 66.3 ± 15.2 | | 64.4 ± 15.4 | | T = 51.6 | <0.001 |
| Posttest | 80.8 ± 14.0 | | 84.2 ± 12.4 | | 83.5 ± 12.8 | | T = 53.3 | <0.001 |
| Mean difference | 18.5 ± 16.1 | | 17.9 ± 14.6 | | 18.0 ± 14.9 | | T = 7.5 | <0.001 |
| % increase in mean | 36.8 ± 40.4 | | 33.1 ± 37.2 | | 33.9 ± 37.9 | | T = 19.7 | <0.001 |

Table 6. Cross tabulation of both marital status and educational levels with regional areas that soldiers lived according to 5 regions among soldiers born in East Region.

| Subgroups | West | | Central | | South | | North | | East | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | (%) | n | (%) | n | (%) | n | (%) | n | (%) | n | (%) |
| Marital status (n: 67,291) | | | | | | | | | | | | |
| Married | 909 | (7.1) | 137 | (8.8) | 272 | (10.3) | 17 | (8.7) | 4.433 | (8.9) | 5.768 | (8.6) |
| Unmarried | 11.950 | (92.9) | 1.418 | (91.2) | 2.381 | (89.7) | 178 | (91.3) | 45.415 | (91.1) | 61.342 | (91.4) |
| Educational level (n: 67,270) | | | | | | | | | | | | |
| Illiterate | 736 | (5.7) | 96 | (6.2) | 294 | (11.1) | 12 | (6.2) | 7.047 | (14.1) | 8.185 | (12.2) |
| Primary school (1-5 years) | 5.165 | (40.1) | 476 | (30.5) | 1.056 | (39.7) | 59 | (30.3) | 20.502 | (41.0) | 27.258 | (40.5) |
| Secondary school (6-8 years) | 2.953 | (22.9) | 346 | (22.2) | 563 | (21.2) | 38 | (19.5) | 9.553 | (19.1) | 13.453 | (20.0) |
| High school (9-11 years) | 3.122 | (24.2) | 441 | (28.3) | 573 | (21.5) | 56 | (28.7) | 10.558 | (21.1) | 14.750 | (21.9) |
| Some College/College (>12 years) | 919 | (7.1) | 200 | (12.8) | 173 | (6.5) | 30 | (15.4) | 2.302 | (4.6) | 362 | (5.4) |

Table 7. Cross tabulation of both marital status and educational levels with regional areas that soldiers born in Sub regions of East among born in East Region

| Subgroups | Southeast | | Northeast | | Centraleast | | Total | |
|---|---|---|---|---|---|---|---|---|
| | n | (%) | n | (%) | n | (%) | n | (%) |
| Marital status (n: 67,291) | | | | | | | | |
| Married | 2.999 | (9.4) | 1.183 | (6.8) | 1.607 | (8.9) | 5.789 | (8.6) |
| Unmarried | 288.891 | (90.6) | 16.088 | (91.1) | 16.523 | (93.2) | 61.502 | (91.4) |
| Educational level (n: 67,467) | | | | | | | | |
| Illiterate | 4.841 | (15.1) | 1.336 | (7.7) | 2.031 | (11.2) | 8.208 | (12.2) |
| Primary school (1-5 years) | 13.790 | (43.1) | 6.762 | (39.1) | 6.771 | (37.2) | 27.258 | (40.5) |
| Secondary school (6-8 years) | 5.864 | (18.3) | 3.853 | (22.3) | 3.773 | (20.7) | 13.453 | (20.0) |
| High school (9-11 years) | 6.066 | (19.0) | 4.257 | (24.6) | 4.463 | (24.5) | 14.750 | (21.9) |
| Some College/College (>12 years) | 1.414 | (4.4) | 1.094 | (6.3) | 1.152 | (6.3) | 3.624 | (5.4) |

Table 8. Sociodemographic characteristics of married soldiers.

| | | n | % |
|---|---|---|---|
| Birth Years | (Age) | | |
| 1983-1985 | (20-22) | 25843 | 70.9 |
| 1980-1982 | (23-25) | 4473 | 12.3 |
| < 1980 | (>25) | 5870 | 16.1 |
| No data | | 282 | 0.8 |
| Educational status | | | |
| Less than primary school | | 3238 | 4.8 |
| Primary school | | 13522 | 34.4 |
| Secondary school | | 6159 | 22.9 |
| High school | | 8528 | 27.8 |
| Some college/College | | 4887 | 9.7 |
| No data | | 134 | 0.3 |
| Region of hometown | | | |
| West | | 6077 | 16.7 |
| Central | | 9387 | 25.7 |
| South | | 3420 | 9.4 |
| North | | 4563 | 12.5 |
| East | | 12246 | 33.6 |
| No data | | 775 | 2.1 |
| Region of residence | | | |
| West | | 9911 | 27.2 |
| Central | | 8595 | 23.6 |
| South | | 3918 | 10.7 |
| North | | 3375 | 9.3 |
| East | | 9664 | 26.5 |
| No data | | 1005 | 2.8 |
| OVERALL | | 36468 | 100.0 |

knowledge level of soldiers concerning different RH issues (9-14). Table 5 also demonstrated that the percent of married soldiers among those born in the east region was higher than the percent of married soldiers among soldiers from other regions. One of these previous studies also showed that consanguineous marriages were more common among soldiers coming from the east region of Turkey (14). We also demonstrated a significant difference in educational levels of soldiers born in the east region compared with those from the other regions, as presented in Table 5. According to Table 5, the groups with less than primary school or primary school education were larger among soldiers born in Eastern Anatolia. In particular, the some college/college (>12 years) group of the other regions was more than two-fold that of the soldiers born in the east region. Considering the effect of general education on the RH knowledge level, as presented in Table 2, we suggest the significant RH knowledge level difference between soldiers born in East Anatolia and the other soldiers can be explained for the most part by the difference in general educational level.

We found a significant difference between the number of soldiers born in the east region and the number of soldiers living in the east region. According to this finding, 26% of the soldiers who were born in the east region resided in other regions, mostly in the west (Table 1). This provided an opportunity to compare the knowledge level of these two groups of soldiers. A comparison of post-test scores between those who were born in and still resided in the east region (80.8) with those of soldiers who were born in but no longer lived in the east region

Table 9. Cross tabulation of marital status with certain variables among all soldiers.*

| | | Marital status | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Married | | Unmarried | | Total | | Test value | P |
| | | n | (%) | n | (%) | n | (%) | | |
| Birth Years | (Age) | | | | | | | | |
| 1983-1985 | (20-22) | 25843 | (6.5) | 369004 | (93.5) | 394847 | (83.5) | chi = 9710.4 | <0.001 |
| 1980-1982 | (23-25) | 4473 | (8.4) | 48580 | (91.6) | 53053 | (11.2) | | |
| < 1980 | (>25) | 5870 | (23.6) | 18959 | (76.4) | 24829 | (5.3) | | |
| Total | | 36186 | (7.7) | 436543 | (92.3) | 472729 | (100.0) | | |
| Region resided | | | | | | | | | |
| East | | 9664 | (9.2) | 95473 | (90.8) | 105137 | (22.8) | chi = 437.4 | <0.001 |
| Other | | 25799 | (7.2) | 330682 | (92.8) | 17927 | (3.9) | | |
| Total | | 35463 | (7.7) | 426155 | (92.3) | 461618 | (100.0) | | |
| Educational level | | | | | | | | | |
| Less than Primary school | | 3238 | (14.0) | 19967 | (86.0) | 23205 | (4.9) | chi = 3022.3 | <0.001 |
| Primary school | | 13522 | (8.2) | 150446 | (91.8) | 163968 | (34,6) | | |
| Secondary school | | 6159 | (5.9) | 97393 | (94.1) | 103552 | (21.9) | | |
| High school | | 8528 | (6.1) | 130798 | (93.9) | 139326 | (29.4) | | |
| Some College/College (>12 years) | | 4887 | (13.5) | 39000 | (88.9) | 43887 | (9.3) | | |
| Total | | 36334 | (7.7) | 437604 | (92.3) | 473938 | (100.0) | | |
| Means & SD | | | | | | | | | |
| n | | 18420 | | 228835 | | 247255 | | | |
| Pretest | | 66.2 ± 16.3 | | 65.6 ± 15.3 | | 65.7 ± 15.4 | | t = -4.8 | <0.001 |
| Posttest | | 83.4 ± 13.4 | | 83.5 ± 12.7 | | 83.5 ± 12.7 | | t = 0.18 | >0.05 |
| Mean difference | | 17.2 ± 15.4 | | 17.8 ± 14.9 | | 17.8 ± 14.9 | | t = 5.2 | <0.001 |
| % increase in mean | | 32.8 ± 37.3 | | 33.4 ± 37.7 | | 33.4 ± 37.7 | | t = 2.3 | <0.001 |

* This table was prepared to compare the sociodemoghraphic characteristics of married soldiers with unmarried soldiers their test scores were not cared, so the total number of soldiers presented in the first part of this table was increased as much as 473 938.

Table 10. Comparison of soldiers born in the east region regarding region of residence and educational level.*

| | Region of residence | | | | | | Test value | P |
|---|---|---|---|---|---|---|---|---|
| | East | | Other | | Total | | | |
| | n | (%) | n | (%) | n | (%) | | |
| Educational level | | | | | | | | |
| Less than primary school | 14061 | (85.8) | 2327 | (14.2) | 16388 | (12.1) | chi = 1573.1 | <0.001 |
| Primary school | 42736 | (76.9) | 12840 | (23.1) | 55576 | (40.9) | | |
| Secondary school | 19346 | (73.8) | 6860 | (26.2) | 26206 | (19.3) | | |
| High school | 22639 | (73.7) | 8096 | (26.3) | 30735 | (22.6) | | |
| Some College/College (>12 years) | 4501 | (64.3) | 2499 | (35.7) | 7000 | (5.2) | | |
| Total | 103283 | (76.0) | 32622 | (24.0) | 135905* | (100.0) | | |

*Test scores were ignored, so the total number of soldiers born in the east region was increased as much as 135,938.

(83.3) revealed significant differences ($P < 0.001$) (Table 3). This was also true for pre-test scores (62.3 and 65.7, respectively, $P < 0.001$) (Table 2). On the other hand, educational level of all soldiers born in east region but who lived in any other region were higher than of soldiers who were born and still lived in the east region (Table 6). From these findings, it is possible to conclude that a lower general educational level had a remarkable effect on RH knowledge of soldiers from the east region of Turkey.

As mentioned previously, the east region can be divided into three parts according to the TDHS-2003 that allowed analyses for the 12 geographical regions (NUTS1) adopted in the second half of 2002 within the context of Turkey's move to join the European Union. Soldiers born in Southeast Anatolia formed the largest group, and nearly equaled the sum of the two other subregions of the east (Table 1). However, soldiers from south Anatolia scored lower on both pre- and post-test compared with soldiers from the two other east regions (Tables 2 and 3). Thus, soldiers born in Southeast Anatolia had the higher married percent (9.4) but with lower educational levels, with an illiterate group of 15.1%, compared with soldiers born in both Central East Anatolia and Northeast Anatolia, as seen in Table 7. These findings indicate that Southeast Anatolia requires more attention regarding RH issues among the subregions of the east region.

The present study also offered us a good opportunity to evaluate marriage prevalence among young Turkish males. Unfortunately, no variable was included in the study design at the beginning to determine the exact age of soldiers at marriage. However, regarding the legal age of 20 for obligatory military service, any marriage before service for a regular soldier certainly could be considered as an adolescence marriage. Thus, from Table 8, 70.9% of marriages among soldiers born between 1985 and 1983 can be referred to as adolescence marriages. However, in one previous study, the average age of the soldiers at marriage was found as 19.2 ± 2.5; and two out of three (67.1%) among its study population had married before the age of 20 (14). The previous study also revealed that the average age of the soldiers' wives was 17.9 ± 2.6, and 79.7% of their wives had married before the age of 20. From this fact, it is clear that prevalence of early marriages among Turkish soldiers reflects a higher percent of early marriages among Turkish women.

An overall marriage rate of 7.7% was found for the total study population. It was obvious from Table 9 that the soldiers with education level less than primary school had the highest percent of marriages. This was one of the most striking findings of the study, because among all 23,025 soldiers in this group, the youngest group formed the largest group according to birth year, at 92.8%. This clearly shows that there is a strong

association between early marriages and low level of education. Marriage at younger ages might prohibit partners to continue their formal education. The second higher percent of marriages was found in the group with some college/college education. Since this group had a legal right to postpone the beginning of their military service due their ongoing education, they could start their military service at their older ages.

On the other hand, when comparing the overall marriage rate of 7.7% determined in our study with the result of 9.6% in a previous study carried out by Tekbas on 3,309 Turkish conscripts in Ankara in 1997 (9), it is possible to say that there has been a decline in marriage prevalence among Turkish soldiers over the years. Our finding regarding the decrease in marriage percent by years also supports this data. This was also consistent with the findings of the TDHS-2003, which documented an increase in the median age at first marriage across age cohorts, from 19.2 years for the 45-49 age group to 21 years for the 25-29 age group. This might be attributed to changes in social life of Turkish people, mainly representing the increase in the general education level. This was evident with the TDHS-2003 results showing considerable improvement in the educational levels of women of reproductive ages. The results of TDHS-2003 also showed a significant proportion of women (17%) had completed at least high school. Thus, the legal age of marriage was equalized to 17 by a law enacted in 2001.

The study findings also revealed marriages were more common among soldiers living in the east region. To determine if educational level had any effect on this result, we ascertained the distribution of illiterate soldiers according to regions. The findings demonstrated that of the total 23,025 illiterate soldiers, 70.5% (16,463) were born in the east region and 60.9% of them (14,212) were still living in the east region. When the east region was divided into the three subregions according to the TDHS-2003, illiterate soldiers born in Southeast Anatolia formed the largest group, with a rate of 42.2, and illiterate soldiers still living in Southeast Anatolia formed the largest group, with a rate of 36.9. These findings clearly showed that the higher percent of early marriages in the east region, especially in Southeast Anatolia, can be explained by the low level of formal education. The findings from two previous studies carried out among the same sample of Turkish soldiers in 2001 may support this claim (10,11). That sample of Turkish soldiers included 45.9% of those with primary school or lower level education and 12.0% were married.

As stated above, 26% of the soldiers born in the east region resided in other regions, mostly in the west (10). When we focused on the less educated group, the relocation rate decreased significantly to the level of 14.2% and the remaining 85.8% still resided in the east region, as presented in Table 10. The relocation rate from the east region to other regions differed significantly with educational level ($P < 0.001$). This might suggest that living in the east region influenced having a formal education, and the effect of education level on RH information as well as on early marriage is well documented in many studies.

As a result, we can say that early marriages among Turkish soldiers decrease with years dependent mainly on an increase in the general educational level. However, the rate of early marriage is still higher in the east region, where the general educational levels of the population are lower than of people from other regions.

In light of these findings, we could claim that the association between living in the east region and lower level of RH knowledge could be attributed to low level of general education and socioeconomic status. The high number of early marriages could also be explained by the lack or insufficiency of education.

In conclusion, the study results confirm that living in the eastern region of Turkey apparently influences lower scores regarding knowledge about RH issues. The higher prevalence of early marriages determined in the east region could be considered one of main indicators of this situation. Lack or insufficiency of general education seems to be a major underlying factor. This study also proves that the soldiers in deeper need of RH knowledge easily accept the training offered. On the other hand, an increased general education level would decrease the need for public education on RH issues.

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## References


1. Gursoy A. Abortion in Turkey: a matter of state, family or individual decision. Soc Sci Med 1996; 42(4): 531-42.
2. Akin A. Maternal mortalities and their causes in Turkey. Aktuel Tıp Actual Medicine A 2001; 6(1): 24–9.
3. Ozvaris SB, Akin L, Akin A. The role and influence of stakeholders and donors on reproductive health services in Turkey: a critical review. Reprod Health Matters 2004; 12: 116-27.
4. HUIPS. (1999) Turkey Demographic and Health Survey, 1998. Ankara: Hacettepe University Institute of Population Studies and Macro International.
5. HUIPS. The 2003 Turkey Demographic and Health Survey (TDHS-2003) 2004; http://www.hips.hacettepe.edu.tr /tnsa2003/data/English/
6. WHO. WHO/UNICEF/UNFPA. Action for Adolescent Health: Towards a Common Agenda. WHO/FRH/ADH/97.9. 1997 Geneva.
7. WHO. World Health Organization. Broadening the Horizon: Balancing Protection and Risk for Adolescents. WHO/FCH/CAH/0.2. 2002 Geneva.
8. Ceylan S, Tekbas OF. A complementary approach to family planning; participation of Men. Sağlık ve Toplum 2000; 10(3): 16-20.
9. Tekbaş OF. Erbaş ve Erlerin Aile Planlaması eğitimi için eğitim materyali geliştirilmesi; Unpublished dissertation study. Gulhane Askeri Tıp Akademisi, Ankara 1997.
10. Bakir B, Tumerdem N, Ozer M, Tufekci F, Ucar M, Hasde M. İstanbul ve Ankara'daki bir grup askerin aids konusundaki yaklaşımları (Approaches of a group of soldiers in Istanbul and Ankara about AIDS). Gülhane Tıp Dergisi 2003; 45(1): 19-24.
11. Bakir B, Gulec M, Kir T, Tumerdem N, Kisioglu N, Hasde M. A different look at the opinions of a group of soldiers in Istanbul and Ankara about family planning and birth control. Turk J Public Health 2003; 1: 31-8.
12. Kir T, Kilic S, Ogur R, Ucar M, Hasde M. Ankara'daki İki Askeri Birlikte Erlerde HIV/AIDS bilgi Düzeyinin Değerlendirilmesi (Evaluation of HIV/AIDS knowledge level among privates in two military units in Ankara). TAF Preventive Medicine Bulletin (Kor Hek) 2004; 3(5): 93-102.
13. Acikel CH, Babayigit MA, Kilic S, Hasde M, Bakir B. Genç Erişkin Erkeklerin Cinsel Yolla Bulasan Hastaliklar Konusunda Bilgi Düzeyleri (Ankara 2004) (Knowledge Levels of Young Adult Men About Sexually Transmitted Diseases [Ankara 2004]) TAF Preventive Medicine Bulletin ( Kor Hek) 2005; 4(1): 16-24.
14. Kir T, Gulec M, Bakir B, Hosgonul E, Tumerdem N. The frequency and effecting factors of consanguineous marriage in a group of soldiers in Ankara. J Biosoc Sci 2005; 37(4): 519-23.
15. Nafissatou J. DIOP, Ph.D. (1995). Fertility among adolescent girls in Senegal: a summary. Accessed in June 2006 at http://www. uaps.org/recherche/FERTILITY.htm
16. Susheela S, Samara R. (1996) Early marriage among women in developing countries. International Family Planning Perspectives Volume 22, Number 4, December at http://www.guttmacher.org/pubs/journals/2214896.html
17. Gungor S, Bakir B, Akyuz A, Gocgeldi E, Acikel CH, Kaya T et al. Establishing Reproductive Health Training and Counseling in Military Services: "The Turkish Model for Male Involvement" (The 9th Congress of the European Society of Contraception, 3 to 6 May, Istanbul/Turkey, Abstracts of Free Communications) The European Journal of Contraception and Reproductive Health Care 2006 p. 31.
18. Gungor S, Bakir B, Akyuz A, Gocgeldi E, Acikel CH, Kaya T et al. Reproductive Health Education of Conscripts in Turkish Armed Forces: "First Evaluation of Training Courses" (The 9th Congress of the European Society of Contraception, 3 to 6 May, Istanbul/Turkey, Abstracts of Free Communications) The European Journal of Contraception and Reproductive Health Care 2006 p. 44.
19. Kaya T, Akyuz A, Gocgeldi E, Gungor S, Bakir B, Bebis H et al. Reproductive Health Program of Turkish Armed Forces: Evaluation of Training of Field Trainers" (The 9th Congress of the European Society of Contraception, 3 to 6 May, Istanbul/Turkey, Abstracts of Posters) The European Journal of Contraception and Reproductive Health Care 2006, p. 157.
20. Akyuz A, Bakir B, Gungor S, Gocgeldi E, Acikel CH, Kaya T et al. Reproductive health and family planning trainings: analysis of data on conscripts who were born in Eastern region of Turkey" (The 9th Congress of the European Society of Contraception, Istanbul/Turkey, Abstracts of Posters) The European Journal of Contraception and Reproductive Health Care 2006, p. 157.
21. Gocgeldi E, Bakir B, Gungor S, Akyüz A, Acikel CH, Gulec M et al. Marriages in Conscripts of Turkish Armed Forces: As an Indicator of Adolescence Marriages (The 9th Congress of the European Society of Contraception, 3 to 6 May, Istanbul/Turkey, Abstracts of Posters) The European Journal of Contraception and Reproductive Health Care 2006, p. 160.
22. Gungor S, Bakir B, Akyuz A, Gocgeldi E, Acikel CH, Kaya T et al. Reproductive health education of conscripts in Turkish Armed Forces: first evaluation of training courses. Mil Med 2007; 172(12): 1254-9.
23. Albrectsen AB, Gungor S, Bakır B, Akyuz A, Gocgeldi E, Kaya T et al. Establishing reproductive health education and counseling in military services: the Turkish model for male involvement. Preventive Med Bull (Kor Hek) 2008; 7(2): 97-106.
24. Kaya T, Akyuz A, Gocgeldi E, Gungor S, Bakir B, Bebis H. Reproductive health program of Turkish Armed Forces: evaluation of training of field trainers and soldiers' experience Balkan Military Medical Review 11, 15-21(2008) access at http://www.bmmr.org/pdf/2008/vol_11_15_21.pdf