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Fertility Awareness and Views for Parenthood Among University Students in Istanbul

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Abstract
The aim of the study was to investigate fertility awareness and intentions for parenthood among male and female university students. This descriptive study was conducted in three faculties on social sciences (Faculty of Law, Faculty of Education and Vocational School of Social Sciences) and two faculties on sciences (Faculty of Science and Faculty of Engineering) at Istanbul University during an academic semester. The convenience sample of the study was consisted of 1030 undergraduate students who were available at data collection periods, not married and agreed to participate in the study. Demographic and reproductive health-related characteristics, basic knowledge about fertility awareness, intentions for parenthood and the factors affecting their plans have been questioned using an interview form prepared by researchers. Among the participants, 62.1% (n=640) were female and 37.9% (n=390) were male students. Sexual activity (50.5%) and contraceptive use (79.2%) rates were higher among males compared to females (14.2% and 52.7%, respectively). Knowledge about fertile ages, fertile period and father's role in determining the sex of a child was poor. Parenthood was considered "important/very important" by both genders. Two-child family was the most desired family size and desired age to become a parent was between 25 and 30 years. The main factor that positively affected the women's decision to have children was their "partners' desire" whereas "continuing generation" had a greater influence on men's decision. University students had limited knowledge of fertility awareness although they generally had positive attitudes towards being parents.

1. Introduction

Research has highlighted that knowledge is a key factor associated with fertility self-care (i.e. knowing about your own fertility potential) and the initiation of treatment (when needed), concluding that education about fertility issues is needed to prevent fear and unnecessary delay in seeking help when faced with problems conceiving [1]. Knowledge about fertility health issues may also help prevent infertility in the first instance; e.g. more information and advice regarding curable sexually transmitted diseases could reduce the number of cases of infertility, particularly in less developed countries where most cases of infertility are due to infection [1-3]. In order for a couple to have a child whenever they plan and desire, they have to learn and monitor their own

fertility signs in addition to that of their partner's [2].

Knowledge about the biological process of reproduction (e.g. when is a woman fertile, how long sperm survive) and the definition and prevalence of infertility are important to address as they help people to understand when is the optimal time for unprotected intercourse and the likelihood of having difficulties conceiving. However, equally important is knowledge about the factors that may reduce the chances of conception as a lack of knowledge in these areas may mean that people unintentionally contribute to their own future fertility problems [3].

There is a lack of fertility knowledge in the general population. A global survey of almost 17500 people (most of childbearing age) from 10 countries in Europe, Africa, the Middle East and South America revealed that on the whole level of knowledge regarding fertility and biology of reproduction was very poor. [3, 4] In addition, there is a lack of studies concerning women's and men's awareness of fertility issues. Blake et al. demonstrated that few women attending a fertility unit had an adequate understanding of when the fertile window occurred in their menstrual cycle [4].

In the present day, there is a decrease in the fecundity rates especially in many European countries. The couples usually aim to have an only child and tend to delay their births to later ages [5]. Several studies have shown that men and women regard having completed an education, holding a job, a stable income and good housing important for their decision to become parents [6, 7]. Some women report having postponed childbearing in the interest of career and self-actualization, which underscores the conflict between maintaining a career and raising a family [6]. However, Kemkes – Grottenthaler found that few female academics had actively chosen to forgo having children [8].

In Turkey, which has a dense population of youth, having children has always been significant up until the past 20 years, having children was prestigious for couples, especially for women. Advances in the fields of technology, economics and education have changed the outlook to fecundity in the present day Turkey, too, though at a low level.

Health professionals and the media should be aware of the complex interplay of factors surrounding women's childbearing plans. Health professionals need to provide women with appropriate, sensitive information and support, bearing in mind their varying perceptions of risk, in order to provide improved care and support [9].

2. Method

2.1. Aim

The aim of the study was to investigate fertility awareness and intentions for parenthood among male and female university students in Turkey.

2.2. Design

This study was planned in a descriptive design.

2.3. Sample

Istanbul is a cosmopolitan city, which has been receiving high amounts of migrating people from almost all regions of the country, has a population from many different cultures living together. Istanbul University is the oldest and well-established university in Turkey and located in this great city. Therefore, Istanbul University has a student population from different regions of Turkey due to the location and features of the university. In this study, the regions of Turkey where students lived longest were examined according to the level of development and classified roughly as developed western regions and less developed/developing "central & eastern" regions. The population of the study consisted of single students at the faculties and high schools of Istanbul University, who were studying about social or applied sciences other than the health sciences, during an academic semester. The study was conducted in there faculties on social sciences (Faculty of Law, Teacher Training Faculty and Vocational School of Social Sciences) and two faculties on sciences (Faculty of Science and Faculty of Engineering). The convenience sample of the study was consisted of 1030 undergraduate students who were available at data collection periods, not married and agreed to participate in the study.

2.4. Data Collection

Data were collected using an interview form prepared by researchers according to the literature. Demographic and reproductive health-related characteristics, basic knowledge about fertility awareness, intentions for parenthood and the factors affecting their plans have been questioned in the interview. The purpose of the study was explained and self-administered questionnaires were given to each participant by nursing students (two of the authors) during the breaks in the classrooms or cafeterias at university buildings. Informed verbal consent was obtained from the participants. The study was carried out following ethical approval of Istanbul University and related faculties.

2.5. Data Analysis

Percentage calculation was used in the evaluation of students' characteristics, knowledge about fertility awareness and intentions for parenthood. The Chi Square analysis was used to evaluate the differences between genders.

3. Results

A total of 1030 students were enrolled during study period. Among the participants, 62.1% (n= 640) were female and 37.9% (n= 390) were male students. The mean age of the participating students was 20 (SD=2) and ranged between the ages of 16 and 37 (female=20.3±1.9; male=20.6±2.1). The rate of the sexual active students were significantly higher among male students (50.5%) compared to females (14.2%) (p=000). Sexual activity were found to be significantly more

common among both female and male students coming from western regions of Turkey (females: western=16.3%, central & eastern=9.4% χ^2=5.311, p=.024; males: western=59% central & eastern= 37.7% χ^2=15.742, p=.000).

There was an obvious difference about the number of sexual partners among sexually active students. Great majority of sexually active females (92%) had only one sexual partner while about half of the men (47.2%) had more than one sexual partner (p=000). Contraceptive method use among sexual active students were found to be significantly lower (p=000) in female students (52.7%) compared to males (79.2%). The most common methods among males were condom (58.4%) and withdrawal. The rate of condom use was low (19.8%) among females. The data about the demographical characteristics of university students and differences between genders were presented in Table 1.

Table 1. *Demographical Characteristics of University Students.*

(N=1030)	Female		Male		χ^2, p
	n	%	n	%	
Faculty					
Faculties of Social Sciences	508	79.4	318	81.5	χ^2=.714, p=.421
Faculties of Science (excluding health sciences)	132	20.6	72	18.5	
Years at university					
1st year	214	33.4	185	47.4	χ^2=22.54, p=.000
2nd year	243	38	131	33.6	
3rd year	113	17.7	45	11.5	
4th year	70	10.9	29	7.4	
Family Type					
Nuclear family	502	78.4	285	73.1	χ^2=5.47, p=.065
Extended family	82	12.8	54	13.8	
Single parent family	56	8.8	51	13.1	
Region of Turkey where she/he lived longest					
West of Turkey (Marmara, Aegean)	392	66	210	59	χ^2=12.01, p=.002
Central &East of Turkey (Mediterranean, Black Sea, Central Anatolia, Eastern, Southeastern)	202	34	146	41	
Missing/other countries (not included in analysis)	46	7.2	34	8.7	
Place of Residence					
Dormitory	316	49.4	118	30.3	χ^2=45.68, p=.000
With Family	223	34.8	156	40	
With Relatives	22	3.4	21	5.4	
Home (alone/with friends)	79	12.3	95	24.4	
Economic Status					
Low income	140	21.9	102	26.2	χ^2=4.68, p=.096
Middle income	303	47.3	190	48.7	
High income	197	30.8	98	25.1	

Students' responses to questions regarding the basic knowledge about fertility awareness and differences between genders were presented in Table 2. Most of the respondents correctly believe that women's fertility is highest between the ages of 21-30. On the other hand, about half of the female and male students incorrectly believed that the fertility declines markedly beginning after 40's. However, students' knowledge was inadequate about fertile days, lifetime of egg (ovum) and sperm cells before fertilization, frequency of intercourse to get pregnancy and predicting the fertile days. The most common answer to these questions was "I do not know, I have no idea or missing". The number of female students who knew the correct lifetime of egg (<2 days) and sperm cells (1-5 days) were significantly less than male students ($p<0.05$). The frequency of intercourse to get pregnancy was believed to be significantly more often (4-7 times a week) among male students (p=.000). Great majority of both female and male students could not predict the most fertility days and do not know any methods to increase the chance of pregnancy when trying to get pregnant. Also, there was a significant difference between female and male students about the knowledge of father's vital role in the determination of a child's sex. The number of students who were not aware of this fact were significantly higher among males (p=.001). In addition the correct knowledge about the father's role on determination of child's sex was more common among females from central & eastern regions of Turkey (n=133; 66%) compared to female students from western regions (n=209; 53%) (p=.023). The rate of students, who reported that they would begin to think that a couple could be infertile if they have been trying just less than 12 months, was significantly higher among male students. In addition, female students were significantly more concerned about being infertile in the future (p=.000).

Table 2. *Knowledge About Fertility Awareness.*

	Female		Male		χ^2, p
	n	%	n	%	
What is the most fertile age range for women?					
15-20	22	3.4	14	3.6	
21-25	268	41.9	165	42.3	
26-30	280	43.8	139	35.6	χ^2=6.940, p=.139
31-35	14	2.2	15	3.8	
36-40	6	.9	1	.3	
Do not know/missing	50	7.8	56	14.4	
At which age range does a woman's fertility begin to decline markedly?					
<30	12	1.9	4	1.0	
30-34	50	7.8	27	6.9	
35-39	193	30.2	92	23.6	χ^2=4.000, p=.262
40 and over	316	49.4	198	50.8	
Do not know/missing	69	10.8	69	17.7	
How many days in the month is a woman "fertile" and she could get pregnant?					
1-7 days	190	29.7	118	30.3	
>7 days	191	29.8	114	29.2	χ^2=.057, p=.972
Do not know/missing	259	40.5	158	40.5	
How long does a woman’s egg cell live and can be fertilized after ovulation?					
1-2 days	26	4.1	29	7.4	
>2 days	197	30.8	145	37.2	χ^2=11.917, p=.003
Do not know/missing	417	65.2	216	55.4	
How long does a man’s sperm live longest in a woman’s body in order to conceive a child					
1-5 days	152	23.8	112	28.7	
>5 days	31	4.8	44	11.3	χ^2=20.828, p=.000
Do not know/missing	457	71.4	234	60.0	
What should be the frequency of intercourse to get pregnancy?					
missing	503	78.6	239	61.3	
1-3 times a week	82	12.8	78	20.0	χ^2=43.470, p=.000
4-7 times a week	52	8.1	59	15.1	
>7 times a week	3	.5	14	3.6	
Can you predict the fertile days when you are most likely to get pregnant?					
No	557	87.0	369	94.6	χ^2=15.355, p=.000
Yes (calendar method, increase in libido etc.)	83	13.0	21	5.4	
Which one of the spouses has the main role in the formation of the baby's gender?					
Do not know/missing	87	13.6	87	22.3	
woman	8	1.2	2	.5	
man	367	57.3	144	36.9	χ^2=44.721, p=.001
Both (man &woman)	137	21.4	126	32.3	
None of them	41	6.4	31	7.9	
If a couple is trying to get pregnant with a regular sex life, when do you begin to think that they could be infertile?					
Do not know/missing	334	52.2	215	55.1	
<12 months	80	12.5	83	21.3	χ^2=22.990, p=.000
12 months and over	226	35.3	92	23.6	
Do you have concerns about being infertile in the future?					
Undecided	96	15.0	90	23.1	
No	372	58.1	259	66.4	χ^2=42.842, p=.000
Yes	172	26.9	41	10.5	

When we requested to indicate their childbearing desires and plans for the number of children at the beginning of their reproductive career at these ages; the two-child family was found as the most desired family size by both female (43.9%) and male students (38.7%). Large families with three or more children was the second most popular choice (female: 28.3%; male: 33.8%); while the percentage of people with no-child desire was very small (around 7-8%) in both groups. Desired number of children was significantly higher among male students than women (p=.003) (Table 3).

The proportion of students indicating a preference for three or more children was significantly higher among students from less developed central & eastern regions of Turkey (females: western=23%, central & eastern=35%, χ^2 =15.4, p=.004; males: western=27%, central & eastern=44%, χ^2=22, p=000). The most commonly desired age to become a parent was between the ages 25 and 30 years, for both female (68.6%) and male (61%) respondents. However, female students indicated their desire to have their first child significantly at earlier ages than males (p=.000)

The proportion of males who desired to have their first child after their 30’s (7.9%) was almost three times higher than females (2.5%). In the same way, most of the female (64%) and male (61%) students plan to have their last child between

the ages 30 and 40. However, for male students, the age they would no longer plan to have a child was significantly higher than females (p=.006). According to both female and male students' views, having a child and becoming parents were evaluated as important or very important. The importance of having a child was measured using a ten point scale and one third of students chose a score between 6 and 9 (viewed as important) and another one third of students chose 10 point (viewed as very much/extremely important). In addition, the most important factors that could positively affect their decision to have children and differences between female and male students were presented in Table 3.

Table 3. *Intentions for Parenthood and the Factors Affecting Their Plans.*

	Female		Male		χ^2, p
	n	%	n	%	
How many children would you like to have in your lifetime?					
0	45	7.0	33	8.5	
1	62	9.7	17	4.4	
2	281	43.9	151	38.7	χ^2=16.07, p=.003
3 and over	181	28.3	132	33.8	
Do not know/missing	71	11.1	57	14.6	
What age would you want to have your first child?					
Do not know/missing	122	19.1	92	23.6	
<25	63	9.8	29	7.4	χ^2=21.84, p=.000
25-30	439	68.6	238	61.0	
>30	16	2.5	31	7.9	
How important is it to you to have children? (scores on a 10 point scale)					
0 point – not important at all	47	7.3	37	9.5	
1-5 points (less/moderately important)	92	14.4	41	10.5	
6-9 points (important)	198	30.9	137	35.1	χ^2=8.63, p=.071
10 points (very much / extremely important)	231	36.1	121	31.0	
Do not know/missing	72	11.2	54	13.8	
Which of the following could positively affect your decision to have children? (more than one answer)					
The influence of pressure from family/relatives	53	8.3	36	9.2	χ^2=.277, p=.648
Partner's desire to have a child	277	43.3	146	37.4	χ^2=3.421, p=.068
To continue the generation in the family	119	18.6	163	41.8	χ^2=65.607, p=.000
Family's financial situation	213	33.3	85	21.8	χ^2=15.550, p=.000
Continuing education in their own or partner	63	9.8	38	9.7	χ^2=.003, p=1
Health problems in their own or partner	63	9.8	31	7.9	χ^2=1.049, p=.318
Business life of their own or partner	135	21.1	29	7.4	χ^2=33.76, p=.000

4. Discussion

The male students' rate of sexual activity (50.5%) was much higher in comparison with that of the females (14.2%). Furthermore, students coming from the western region are more sexually active in comparison with those from the eastern region. In terms of the number of sexual partners, it was found that the majority of students who were sexually active had one sexual partner while male students had more than one sexual partner at a significantly higher rate than female students. Turkey is a country where sexuality has been a taboo until recently, and pre-marital intercourse is forbidden, especially for girls. Orcin et al. in their study examining the sexual attitudes of Turkish university students, state that youths from both sexes are more tolerant to premarital sex when males are concerned [10]. In Pınar et al.'s study, where 350 Turkish students' attitudes towards sexual role stereotypes were analyzed; it was found that male students adopted the view "Relations with the opposite sex can be tolerated but dishonor women. Therefore, the male should be free in this respect, but the female should be controlled [11].

However, this outlook to sexuality has changed, at least to some extent, with the recent socio-cultural, economic and educational advances. The study results reflect this change, though at a small scale. Naturally, this rate of change with regard to sexuality varies depending on gender and region. These data indicate that in Turkey, girls are under more pressure in terms of sexuality when compared to boys.

Anwar et al. evaluated the sexual behaviors of 1139 Malaysian students in the 15-20 age group. In their study, they reported that 75% of the students were sexually active. The experience of sexual relation was found to be significantly related to gender, ethnicity and the educational level. In the same study, sexual relation was significantly associated with sexuality and comparison of male and female students revealed that male students were more active than females in terms of sexual relations [12]. In a study conducted by Ozan et al. the attitudes and behaviors of Turkish university students were investigated and the rates of sexual relation were found to be higher among male students [13]. In Anwar et al's study, 38.2% of sexually active students reported that they had more than three partners. In addition, having more than one partner was only correlated with gender [12].

In the present study, it was found that the use of contraceptive method is less frequent in female students in comparison with that of male students. Female students carry out unprotected sex more often. Condom and withdrawal are

the most frequently adopted contraceptive methods. In studies over university students in Turkey, it was explained that half of the male students and none of the female students used the contraceptive method in their first sexual intercourse, while condom was the most widely used contraceptive method [14-16]. In two other studies carried out on Turkish university students, the rate of condom use was found to be 25% and 30% [15, 17]. In a study by Byamugisha et al. the knowledge about emergency contraception and fertility awareness were evaluated among 379 university students in Uganda and condoms and coitus interruptus were found to be the most common methods of contraception in their study [18]. In another study performed on 936 Greek students by Matziou et al. more than half of the students (61.2%) stated that they used various contraception methods in order to prevent unintended pregnancies. In the same study, the rate of students who did not accept contraception methods was 11.9% [19].

When the knowledge levels of the students as to reproductive health and fertility were traced, both male and female students were shown to lack related knowledge. Most students expressed the most fertile age range to be 20-30 and half of the female and male students stated that women's fertility decreased after the age of 40. Similar to our findings, Hashiloni-Dolev et al. reported that Israelite students were aware of the fact that women's fertility is age-dependent and declines as women grow older [20]. However, in a Finnish study Virtala et al. female students were found to be more aware of the impact of age on female fertility than male students. In addition over half of the men and approximately one-third of the women in their study thought that the marked decrease in female fertility begins after the age of 45 years [21].

In a postal survey of a randomly selected sample of 222 female and 179 male university students in Sweden, Lampic et al investigated university students' intentions and attitudes to future parenthood and their awareness regarding female fertility [6]. Their findings revealed that minority of participants were aware that a slight decrease in women's fecundity starts before the age of 30 years and a marked decrease occur in the late 30s. In addition about a third of male participants believed that women's fecundity decreases markedly first after age 45 years [6]. Similiarly, Svanberg et al investigated 200 female and 200 male postgraduate Swedish students' attitudes toward parenthood and their awareness of fertility issues, and reported that one of 4 respondents overestimated a woman's ability to become pregnant between 35 and 40 years of age [7].

Svanberg et al. also reported that one of 4 women and 1 of 3 men believed that women's ability to become pregnant decreases markedly after the age of 40 [7]. In the same study, about half of the women and men overestimated a young woman's chances of becoming pregnant in 1 year. Only a minority of respondents had realistic perceptions of women's fecundity at different ages. About half of the women and men overestimated a young woman's chances of becoming pregnant in 1 year. In contrast, half of the respondents had overly pessimistic perceptions regarding older women's fertility [7]. In a study among 1006 women and 500 men aged 20-45 years in Canada, Tough et al 22 reported that over 70% of men and women recognized the direct relationship between older maternal age and conception difficulties [22].

In the present study, students generally used the options "I don't know." or "I have no idea." options when answering questions on the life period of female and male productive cells and fertile days. Apart from this, the female students' accuracy in determining egg and sperm life was found to be significantly lower than that of male students. Similarly, Zhang and Maddock reported that Chinese female college students lack knowledge of sexual and reproductive health, and their knowledge was influenced by numerous socio demographic factors [23]. In Kouta and Tolma's study on 697 Greek students, the majority (63%) of the respondents reported that they had limited knowledge of anatomy and physiology of the male and female reproductive systems [24]. In another study by Rovei et al. among Italian academic students, it was reported that young people consider parenthood an important part of their life, but knowledge about human fertility and legal rules regulating assisted reproduction is rather poor, regardless of sex and type of education [25]. Similarly, in Byamugisha et al's study the knowledge about the fertile period in the menstrual cycle was found to be limited among university students in Uganda [18].

In Turkey, there is no reproductive and sexual health course in the secondary school curricula. Within the scope of health knowledge course, brief information on reproductive health is provided. Therefore, children and youths generally learn what they wonder about productive health and sexuality through friends, the Internet, and media. Pinar et al. in their analysis of 155 university students' sexual health knowledge needs and resources reported that 59% received information on sexual health beforehand and consulted to external, non-familial resources like the media, friends and the Internet [26]. Furthermore, in Simbar et al's study on Iranian college students, the majority believed in the benefits of reproductive health knowledge for youth but felt that services were inadequate [27].

When we asked students whether they had concerns associated with infertility in the future or notin our study, female students reported to be significantly more concerned about being infertile in the future. In the same way, Lampic et al found that women, in comparison to men, were significantly more concerned about problems related to combining work and children. Both women and men had overly optimistic perceptions of women's chances of becoming pregnant [6].

Student participants usually wanted to have two children and three children as the second alternative. The rate of male students who wanted to have three children was much higher than that of female students. Similar to our findings in the present study, Lampic et al reported that a majority (83% women, 86% men) preferred to have two and three children [6]. However, in contrast to our results, men most often

wished for two children only, while women's responses were equally distributed between wishes for two, two to three, and three children. Likewise, Svanberg et al. found that most women and men in their group wanted 2 or 3 children [7]. Similar to the other studies, Tyden et al reported that the women wanted to have two to three children at the age of 29 for the first birth and 35 for the last [28]. In addition Virtala et al found that, 94% of the respondents wanted to have children in the future. From these results we see that young people have a high desire to have children in the future [21]. Similarly in Paterson et al's study on 246 American undergraduate university students, eighty-nine percent of participants indicated they want to have children in the future. Three-quarters of women and 87% of men wanted two or three children [29]. In the same study, women were significantly less certain about the probability of having their desired number of children than were men. In Tough et al's study, 76% of women and 86% of men indicated they planned to have children. Of those who did not plan to ever have children, 14% of women and 5% of men indicated that they had considered children in the past [22].

More than half of the students wanted to have children at the ages ranging from 25 to 30 years. Apart from this, female students wanted to have their first children at earlier ages than male students. Considering the previous studies, generally the first child is desired after the age of 30s. About half of women in Lampic et al's study intended to have children after age 35 years and women wanted to have their first child at a significantly lower age compared to men [6]. Similarly, Svanberg et al. found that, 13% of the women wanted their first child after the age of 35. They also reported that, the preferred mean age for having the first child was 31 years for women and 32 years for men [7]. In addition, about 75% of the participants in Tough et al's study believed that the ideal age to begin parenting was between 25 and 34 years and only 2% believed it was ideal to begin parenting after the age of 35 years [22].

Childbearing Preferences and Family Issues in Europe, the country with the lowest limit age for becoming a father is Turkey (41 years), while the countries with the highest age limits for men to become a parent were Estonia (51 years) among the youngest male cohorts, and Austria, the Czech Republic and Latvia (49 years) among the older male cohorts [30]. Considering the significance of having a child for children, one third of the students expressed that they found having children significant and one third of other students found this to be very important. In the same way, women in Lampic et al.'s study regarded having children as being significantly more important than did men [6].

In female students, especially the partner's desire influenced having children positively while in male students, partner's desires were secondary and the continuity of the family was deemed more primary. On this issue, Lampic et al reported that women put significantly more emphasis on the importance of having a good economy, access to childcare and a job that can be combined with having children. Also, roughly a third of the women, but only 10% of the men in their study reported they believed that parenthood would affect their status on the labour market negatively [6]. In another study, Tough et al. reported that factors that influenced timing of childbearing for both men and women included financial security (85%) and partner suitability to parent (80%) [22]. In Tydén et al's study the most important circumstances for women's decision to have children were found being sufficiently mature, have a stable partner to share parenthood with, have completed studies and have a good economy [28].

5. Conclusion

As a result of the study, a vast majority of Turkish university students wanted to have children in the future. Their awareness of the natural, age-related decline in female fertility was insufficient. It was concluded that Turkish university students had limited or inaccurate knowledge on productive health although they generally had positive attitudes towards being parents. These results highlight the significance of sexual and reproductive health education, guidance and providing accurate information on the subject. Health professionals who are knowledgeable and experienced in sexuality and reproductive health issues will have significant contributions to developing youths' and the society's health in a trusting and supportive environment.

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