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Contents

From the Editor

We are happy to be greeting you with the first issue of the Turkish Journal of Public Health. It is always exciting to watch the birth of a journal, see it develop and mature, bringing together thousands of people through new ideas, new inspirations, and the joy of sharing scientific knowledge. This is the birthday of a new journal in the broad field of public health.

As the result of the substantial growth of the academic community engaged in public health research which has been going on for decades particularly in the developed world, many national and international journals have appeared. Unfortunately, the contribution to these journals on the part of public health professionals from developing countries remains low. As a matter of fact, their low participation in the scientific world restricts even further the limited financial support for research and results in a vicious circle.

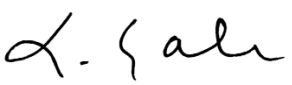
Turkish Journal of Public Health aims to serve a broad audience in the field of public health and community medicine both nationally and internationally and to provide a medium for the rapid communication of advances and new knowledge in this field.

Our purpose is to improve the quality and the presentation of the journal to attract researchers throughout the world.

We attempted to strenghten the journal with the "Hittite nail" as was used in the foundations of their constructions.

We invite all public health-community medicine professionals throughout the world to contribute to the journal.

Editor



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Aim and Scope

The Turkish Journal of Public Health (TJPH) is a peer-reviewed research journal published bi-annually and serving a broad audience in the field of Public Health and Community Medicine both nationally and internationally. TJPH aims to provide a medium for the rapid communication of advances and new knowledge in this field. The editor anticipates receiving manuscripts from the following areas of research: health policy and management, biostatistics, epidemiology, environmental health, health economics, medical demography, social sciences for health, health education, public health laboratory, community nutrition, infectious diseases, disaster management, accidents, women's health/reproductive health, child health, chronic diseases, and occupational health.

Submission of Papers

The following types of contributions are welcomed:

1. Original research articles: papers reporting original research findings in a relevant area (maximum 5000 words).
2. Short reports: preliminary/short reports of research findings (maximum 1500 words).
3. Critical reviews: authors are advised to contact the editor prior to submission of critical review papers (maximum 4500 words).
4. Notes from the Field: Highlighting practice-based programs, initiatives of widespread interest, experiences to share with the public health community (maximum 1000 words).
5. Letters to the editor: a limited number of letters to the editor concerning the published papers in the TJPH will be published (maximum 300 words).
6. Data: Data from nationally or sub-nationally representative surveys will be published (maximum 35 tables and figures).

Submissions will be considered on the understanding that they comprise original, unpublished material and are not under consideration for publication elsewhere. A cover letter to this effect should be enclosed with each submission, signed by all authors of the paper.

All papers are published in English although submission of articles in Turkish is encouraged and will not prejudice editorial consideration. The authors may use either the British or the American spelling, but they should be consistent throughout the paper. Submissions undergo a two-tiered review process. The editorial board for overall quality and interest screens them initially. Papers accepted for formal review will be sent anonymously to at least two independent referees.

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All authors must sign the letter, with one named correspondent (give postal and e-mail addresses and telephone and fax numbers). Disclose all possible conflicts of interest (e.g. funding sources for consultancies of studies of products). A brief indication of the importance of the paper to the field of public health is helpful. You may suggest up to 4 knowledgeable reviewers (include postal and e-mail addresses and telephone and fax numbers).

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The text of the article should include the following: Abstract (up to 250 words, followed by up to 6 keywords), Introduction, Materials and Methods, Results, Discussion, and Acknowledgments. Each section should begin on a new sheet.

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Chapter in a book

Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: Pathophysiology, Diagnosis, and management. 2nd ed. New York: Raven Press; 1995. p. 465-78.

Online book or web site

Garrow A, Winhouse G. Anoxic brain injury: assessment and prognosis. In: Up To Date Cardiovascular Medicine [online]. Available at: www.UpToDateInc.com/card. Accessed February 22, 2000.

Acknowledgements

Prepare acknowledgments on a separate page. Upon acceptance, you will be asked to certify that you have listed all persons who have contributed substantially to the work but who do not fulfill authorship criteria and that you have obtained permission for listing them. Also required is disclosure of all financial and material support. If human subjects are involved, you must report approval by an institutional review board. TJPH adheres to the Declaration of Helsinki of the World Medical Association (JAMA 1997; 277: 925-926).

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Psychological changes of medical students: a prospective study - the third year follow-up outcomes

Yesim SENOL[a], Mehmet AKTEKIN[b], Hakan ERENGIN[c], Mehtap TURKAY[d], Mustafa AKAYDIN[e]

Abstract

A prospective study was planned to assess psychological morbidity in medical students in Antalya, Turkey during their undergraduate education. The third year follow-up outcomes were presented in this article. All first year undergraduate students in the Faculties of Medicine, Economics and Physical Education (PE) were given a detailed, self report questionnaire annually. They were asked to complete the General Health Questionnaire (GHQ), the Spielberger State-Trait Anxiety Inventory (STAI)12 and Beck Depression Inventory (BDI). The findings showed that psychological scores on the GHQ, the STAI and the BDI rose significantly in medical students from year one to two but not from year two to three. Using the GHQ, with different cutting score, the percentages of medical students scoring above thresholds were higher in years two and three compared to those of economics and PE students. On the other hand both the scores and the percentage of students scoring above thresholds tended to decrease in the third year. The results indicate that there is a decrease in psychological health of the medical students in the first year of their undergraduate education.

Key words: medical students, psychological changes, medical education

Introduction

Medical undergraduate education is characterized by many psychological changes in students. Numerous studies have revealed high rates of psychological morbidity in medical students at various stages of their training[1-3]. Some studies have suggested that the greatest stress occurs during the later years of medical education, but some others found that the first year students disclosed a considerably high level of neurotic symptoms[2-8]. Medical students are also affected by several problems or events in their lives, which influence their psychological condition[9,10]. Although this is well known, the explanation for the clinical picture is complex. Some of the studies indicate that stress levels among medical students were not significantly elevated compared to those of the general population[6]. Several self-report questionnaires or inventories are used in order to determine the psychological change in students. We planned a 6-year longitudinal study, among students in the Faculties of Medicine, Economics and Physical Education (PE) in Antalya City, Turkey. The third-year follow-up outcomes are presented in this article.

Materials and methods

All first-year undergraduate students in the Faculties of Medicine, Economics and PE were asked to complete a detailed, self-report questionnaire during the registration period at Akdeniz University in 1996 (year 1). The same questionnaire was given in the next year (year 2) and in the third year (year 3), a month from the beginning of the first semester. We decided not to give any questionnaires within 2 weeks of examinations. Students who did not

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Table 1. The response rates of the first, second, and third year medical, economics and PE students

Faculties	No. of registered students	First-year responders (study cohort)	Participation rates (%)	Second-year responders	Follow-up rates (%)	Third-year responders	Follow-up rates (%)
Medicine	129	126	97.6	119	94.4	117	92.9
Economics	83	81	97.6	72	88.9	62	76.5
PE	47	33	70.2	24	72.7	18	54.5

respond to the questionnaire in the first year were not sent assessments in later years, since no baseline data were available for this group. Response rates are shown in Table 1. The study population of this research does not represent the whole country.

The questionnaire included demographic details, the 12-item General Health Questionnaire-GHQ[11], the Spielberger State-Trait Anxiety Inventory-STAI[12] and the Beck Depression Inventory-BDI[13].

GHQ-12 was chosen to evaluate the general emotional disturbance of the students. The GHQ- 12 was designed as a case-finding instrument. It was first adopted for use with the Turkish population by Kilic in 1996[14]. Means were assessed using the Likhert method, in which each item has a range of from zero to three (maximum score: 36) and prevalence estimations were assessed by using the standard method of scoring 0-0-1-1 for each item (maximum score: 12). Different levels of cut-off points with a range from 0/1 to 6/7 were used to determine the percentages of students scoring above the thresholds.

Depression was assessed using the BDI, a 21 item self-report questionnaire in which each item is scored from zero to three. Higher scores indicate a higher level of depression. It was adopted for use with the Turkish population by Oner in 1977[15].

To determine anxiety the total score on the STAI was obtained. "State-anxiety" indicates anxiety related to the present moment while "Trait- anxiety" indicates a stable dimension of personality. STAI has a 20-item form for state anxiety and a 20-item form for trait anxiety, and each item is scored from one to four. Each form allows a minimum score of 20 and a maximum score of 80. It was adopted for use with the Turkish population by Isik in 1991[16].

Table 2. Scores on the General Health Questionnaire, the Beck Depression Inventory and the State-Trait Anxiety Inventory for years 1, 2 and 3

		Test Scores								
Inventory	Faculties	Year 1 Mean	SD	Year 2 Mean	SD	Year 3 Mean	SD	P1[b] value	P2[c] value	P3[d] value
GHQ (0-36)	Medicine (n:117)	9.4	5.3	14.3	7.0	14.0	6.5	<0.001	NS	<0.001
	Economics(n:62)	8.3	3.6	11.3	6.8	12.0	6.3	<0.001	NS	<0.001
	PE (n:18)	10.4	6.0	9.4	4.5	10.7	6.2	NS	NS	NS
BDI (0-63)	Medicine	6.9	6.8	11.1	8.1	11.2	8.7	<0.001	NS	<0.001
	Economics	5.1	6.2	8.7	8.4	9.3	8.6	<0.01	NS	<0.001
	PE	10.1	8.6	5.3	6.1	8.2	8.0	<0.01	NS	<0.01
STAI (20-80) State scale	Medicine	39.3	10.7	42.4	11.3	40.9	12.4	<0.01	NS	<0.05
	Economics	38.0	8.5	40.3	12.1	40.2	10.5	NS	NS	NS
	PE	38.0	8.8	35.8	11.6	39.5	9.9	NS	NS	NS
STAI (20-80) Trait scale	Medicine	43.5	9.4	46.8	8.8	45.0	9.6	<0.001	<0.05	<0.001
	Economics	42.5	8.1	46.5	10.0	43.7	9.7	<0.01	<0.05	<0.05
	PE	45.3	7.7	43.3	7.9	42.0	10.2	NS[a]	NS	NS

[a] NS: Not significant

[b] P1: Paired t test (year 1-year 2)

[c] P2: Paired t test (year 2-year 3)

[d] P3: Repeated Measures ANOVA (years 1-2-3)

Paired t test, repeated measures ANOVA and Mc Nemar test were used in the statistical analysis.

Paired t test was used to examine the differences between the first two years and years two and three.

Results

Table 2 shows the differences in scores on the GHQ, BDI and STAI during the three years among the students in the three faculties. In general, the scores showed a significant rise from year 1 to year 2 and remained high in year 3 in medical and economics students. On the other hand, PE students had higher scores in the first year but the scores did not rise throughout the following years.

Authors who prefer the GHQ-1 use different cut-off points ranging from 0/1 to 6/7 to estimate the prevalence of emotional disturbance. We used all of the cut-off points to present the percentages of students scoring above thresholds. With all cut-off scores, the percentages of students scoring above thresholds were higher in medical students in year 2 compared to those of economics and PE students. The percentages above thresholds rose significantly from year 1 to year 2 and remained high in year 3 in medical and economics students (Table 3).

Using the threshold of 3/4 on the GHQ to estimate the prevalence of emotional disturbance is very common. Figure 1 shows the percentages of medical, economics and PE students scoring above the cut-off point of 3/4 in years 1, 2 and 3.

Discussion

The findings show that the psychological scores of Turkish Medical Students on the General Health Questionnaire were high during years 1 and 2 and remained high in year 3, and scores on the Beck Depression Inventory and State-Trait Anxiety Inventory rose significantly[17]. These increases indicate a decrease in the psychological health of the students. The rise in the scores of medical students was more evident than that in control students (i.e. economics and PE students). The

Table 3. Number of students in years 1,2 and 3 scoring above different cut-off points on the GHQ-12

Cut-off Scores	Faculties	Year 1		Year 2		Year 3		P1[b]	P2[c]	P3[d]
		n	%	n	%	n	%	Value	Value	Value
0/1	Medicine (n =117)	68	58.1	92	78.6	93	79.5	<0.001	NS	<0.001
	Economics (n =62)	32	51.6	41	66.1	40	64.5	NS[a]	NS	NS
	PE (n =18)	13	72.2	11	61.1	9	50.0	>0.05	NS	NS
1/2	Medicine	45	38.5	80	68.4	81	69.2	<0.001	NS	<0.001
	Economics	18	29.0	30	48.4	33	53.2	<0.05	NS	<0.01
	PE	11	61.1	7	38.9	6	33.3	NS	NS	NS
2/3	Medicine	32	27.4	71	60.7	61	52.1	<0.001	NS	<0.001
	Economics	8	12.9	23	37.1	24	38.7	<0.01	NS	<0.01
	PE	8	44.4	6	33.3	4	22.2	NS	NS	NS
3/4	Medicine	21	17.9	56	47.9	47	40.2	<0.001	NS	<0.001
	Economics	5	8.1	20	32.3	21	33.9	<0.001	NS	<0.001
	PE	5	27.8	4	22.2	4	22.2	NS	NS	NS
4/5	Medicine	17	14.5	45	38.5	39	33.3	<0.001	NS	<0.01
	Economics	2	3.2	15	24.2	13	21.0	<0.001	NS	<0.01
	PE	2	11.1	3	16.7	4	22.2	NS	NS	NS
5/6	Medicine	12	10.3	38	32.5	32	27.4	<0.001	NS	<0.01
	Economics	2	3.2	13	21.0	9	14.5	<0.01	NS	<0.01
	PE	2	11.1	1	5.6	2	11.1	NS	NS	NS
6/7	Medicine	8	6.8	29	24.8	25	23.1	<0.001	NS	<0.01
	Economics	1	1.6	9	14.5	7	11.3	<0.01	NS	NS
	PE	1	5.6	1	5.6	1	5.6	NS	NS	NS

[a] NS: Not significant

[b] P1: Mc Nemar test (year 1 - year 2)

[c] P2: Mc Nemar test (year 2 - year 3)

[d] P3: Chi Square for trends (years 1 -2 - 3)

negative effect of a long and tiring medical education on the psychological state of students has been shown in several studies done in the USA and the UK. This negative effect is quite strong among Turkish medical students, too. PE students had higher scores on all three psychological measurements in the first year. Although not significant, a tendency to decrease was observed after the first year. PE students have a physical activity-based curriculum, which is more entertaining. A conservative cut-off score of 3/4 on the GHQ-12 is very commonly used to estimate the prevalence of emotional disturbances in student samples. The percentage of medical students scoring above the 3/4 cut-off point in years 2 and 3 was higher than the percentage for control students and the percentages found in some UK studies. However, the best cut-off score to achieve optimum sensitivity and specificity may vary considerably from one setting to another, ranging from 0/1 to 6/7. We used all of the cut-off points to be able to show clearly the changes in medical students . So, with all cut-off scores, the percentage of medical students scoring above the thresholds rose significantly in year 2, remained high in year 3 and medical students had higher percentages compared to the others. A long and tiring medical education may have the strongest effect on the psychological changes noted in medical students. However, living conditions, traditions, habits and, therefore, the lifestyle of the students also, their socio-economic background, religion, status in society, different methods of teaching, including relationship with teachers-all of these may to all appearances cause different psychological changes. Therefore, further studies determining this variable may contribute to explain the detailed causes of the psychological changes.

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Hypertension prevalence, awareness, treatment, and control above 65 year olds in Mersin, Turkey

Cafer Tayyar SASMAZ[a], Resul BUGDAYCI[b], Hanife TEZCAN[c], Ahmet Oner KURT[c]

Abstract

The authors aimed to conduct a research among a population, the ages of which were 65 or above, on the status of hypertension prevalence, awareness, treatment, and control. This cross-sectional study was conducted in Mersin, southern Turkey in 2001. 1250 elderly persons were taken into the study group following sampling with respect to age-group, sex and place of residence from the household identification of the health centres. Participants were 65 years old or above. As a result of the study, it was determined that, for those above 65-years old, hypertension prevalence was 63.0% (95% CI; 60.2 - 65.8), hypertension awareness was 59.3% (95% CI; 55.7 - 62.9), the rate of receiving treatment among the hypertensive individuals was 52.2% (95% CI; 48.6 - 55.9), and the rate of control was 15.1% (95% CI;12.5 - 17.8). Hypertension prevalence was statistically higher in women ($p<0.001$) and in the urban residents ($p<0.05$). Hypertension awareness and treatment was statistically higher in women ($p<0.001$). Hypertension consciousness in the society should be increased through visual and printed media in order to increase hypertension awareness and effectiveness of treatment. Hypertension assessment should be conducted for each adult coming to primary health care centres and treatment should be monitored in individuals diagnosed as having hypertension.

Key words: Hypertension, isolated systolic hypertension, prevalence, treatment, awareness, elderly

Introduction

With the decrease in infant deaths and increased control of infectious parasitic diseases, the average life duration in most of the developing countries has increased and diseases of the cardiovascular system (CVS) have become the most fatal health problem[1,2]. Today, the same process is experienced in Turkey, too, where it has been reported that 49.7% of the deaths are due to CVS diseases[3].

Hypertension (HT) is one of the most important modifiable risk factors for cardiovascular disease. In our country, the limited number of studies conducted on the adult age group report that HT prevalance varies between 30.1-52.5%, HT awareness rate varies between 47.6-81.8% and the rate of having treatment varies between 32.2-61.4%.[4-8]. In addition, it is reported that the lack of physical activity, and increased smoking in men and increased weight in women may contribute to the rise in HT prevalence and complications[9,10].

Although HT is a disease, the results of which are well known, which is easily determined and which can be treated, even in developed countries, a substantial portion of the hypertensive patients are not aware of their disease and the diagnosed patients can not be adequately treated[11]. This study aims to conduct a research on a sample of the population of Mersin aged 65 years or above, on the HT prevalence, awareness, treatment, and control.

Materials and methods

Study design: This cross-sectional study was conducted in 2001 in Mersin in southern Turkey, on the coast of the Mediterranean Sea. A standard form was used to collect the data. On the form, questions concerning the age, sex, education, marital status, and subjects' place of residence were asked, and also whether they had hypertension and whether they used any medicine for this. These participants were visited at their homes by the research-physician

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between 01 September and 31 December 2002. They were informed of the study. On obtaining their approval for contribution to the study, the data forms were filled using face-to-face question-and-answer technique.

Population: The study environment was individuals residing in the city center and in the villages connected to the city centre, who were 65 years old or above. The total population of this region was then 759,785 persons, of which 29,440 (3.9%) were 65 years old or above. Studies conducted report that HT prevalence for this age group varied between 56% and 70%[4,12,13]. Assuming an HT prevalence of 60%, CI 95%, an error of ± 3% and a population of 29,440, the minimum sample size was calculated to be 1000 persons. Proportional stratified sampling according to age-group, sex and place of residence was conducted by household identification of 14 primary health centres. 1250 persons were taken into the study group by random sampling within each stratified category. Of this total, 870 (69.6%) resided in the city center and 380 (30.4%) resided in villages. 1143 persons participated in the study and the rate of contribution was 91.4%. 102 (8.2%) could not be accessed and 5 persons (0.4%) refused to contribute.

Blood pressure (BP) measurement: BP measurements were taken with an aneroid sphygmomanometer (AnerSph) type Erka. The accuracy of the AnerSph was compared to a mercury sphygmomanometer (MercSph). In a closed system, the MercSph was 50.0, 100.0, 150.0 mmHg and the AnerSph was respectively 50.5, 100.5, 151.0 mmHg. Considering the results of these measurements, the decision was made to use the AnerSph as it was.

All measurements were taken by the same research-physician using the same sphygmomanometer at the same time of day, between 10:00 and 14:00 o'clock. The subject rested quietly for a minimum of 10 minutes and was asked not to eat or smoke for least 30 minutes before the measurement. Following this resting period, two measurements from the left arm were taken in a sitting position with a 10- minute interval between them and these were then recorded. The pressure at which the sounds (phase I) are first heard is the systolic blood pressure (SBP). The diastolic blood pressure (DBP) is the pressure at the point when the sounds disappear (phase V). The arithmetical average of the systolic pressures measured was recorded as the systolic blood pressure; and the arithmetical average of the diastolic pressures measured was recorded as the diastolic blood pressure[14,15].

Hypertension is defined as an average systolic BP ≥140 mm Hg and/or an average diastolic BP <90 mm Hg, and/or self-reported current treatment with antihypertensive medications[14,15].

Isolated systolic hypertension (ISH) was defined as an average systolic BP ≥140 mm Hg and an average diastolic BP<90 mm Hg.

Awareness of hypertension was defined as self-report of a high BP measurement in the past. The subjects were asked the question: "Have you ever had your blood pressure checked?" If the reply was affirmative, they were asked, "Was it normal or high?" If high, it was decided that they were aware of hypertension.

Treatment of hypertension was defined as a positive response to the question, "Do you currently use drugs for treatment of high blood pressure?".

Control of hypertension was defined as an average systolic BP <140 mm Hg and an average diastolic BP <90 mm Hg with the use of antihypertensive medications.

Statistics: The data collected were recorded on the computer. In summarizing the data and in comparing the variables chi-square supplementary statistics were used.

Results

A total of 1143 persons contributed to the study, of which 583 (51.0%) were men and 560 (49.0%) were women. 850 (74.4%) of the contributors were in the 65-74 age group, 250 (21.9%) were in the 75-84 age group and 43 (3.7%) were 85 years old or older. 67.5% were married, 62.8% were literate and 70.0% were city residents (Table 1).

Hypertension was determined in 63.0% (95%CI; 60.2-65.8) of those included in the study. It was observed that hypertension prevalence in women and urban residents was high. Sex distribution was similar in the rural and urban areas. There was no relationship between increase in age over 65 and HT prevalence (Table 2)

In 25.5% of those included in the study (24.5% men, 26.4% women), ISH was observed. ISH prevalence was 23.9% between 65-74 years of age, 30.4% between 75-84 years of age and 27.9% above 85. ISH constituted 40.4% of the hypertension patients. This ratio was determined to be 45.7% in men and 36.4% in women. It was determined that the ISH ratio in male hypertension patients was higher (x^2=6.39, DF=1, p=0.011).

Table 1. Demographical characteristics of individuals participating in the study

Demographical characteristics	Total		Men		Women	
	n	%	n	%	n	%
Men	583	51.0	–	–	–	–
Women	560	49.0	–	–	–	–
Age 65-74	850	74.4	437	75.0	413	73.8
75-84	250	21.9	124	21.3	126	22.5
85 and above	43	3.7	22	3.7	21	3.7
Married	772	67.5	498	85.4	274	48.9
Other	371	32.5	85	14.6	286	51.1
Literate	718	62.8	487	83.7	231	41.2
Illiterate	425	37.2	96	16.5	329	58.8
Urban	800	70.0	416	71.4	384	68.6
Rural	343	30.0	167	28.6	176	31.4

Above 65, hypertension awareness was 59.3%, the ratio of antihypertension drug usage was 52.2% and HT control rate was 15.1%. In women and urban residents, HT awareness and treatment receiving rates were higher. In women, HT control was better (Table 2,3).

Discussion

It has been reported that after the age of 65, HT prevalence changes between 48.0-69.4% in men and 54.5-76.6% in women and that in this age group HT prevalence is higher in women[12-13,16-18]. In the studies conducted in Turkey, Sonmez et al.[4] report that after the age of 60, HT prevalence is 30.1% in men and 51.4% in women. Cetinarslan et al.[5] report these rates in the same age group as 50.8% and 52.5% respectively. In this study, it was also observed that HT prevalence in women was higher (53.7% in men, 72.7% in women). However, the difference between them for women was much higher compared to other studies.

In the elderly, ISH is an important risk factor with respect to cardiovascular morbidity and mortality[19,20]. ISH frequency increases with age and above 50, it becomes the most common HT subtype[21]. Lloyd-Jones et al.[22] report that, below the age of 60, 19%, and, above that age, 53% of the

Table 2. Hypertension prevalence and awareness according to demographical characteristics

Variable	HT Prevalence		HT Awareness[a]	
	%	%95 CI[b]	%	%95 CI[b]
Total	63.0	60.2–65.8	59.3	55.7–62.9
Men	53.7^{+++}	49.6–57.7	43.1^{+++}	37.6–48.6
Women	72.7	69.0–76.4	71.7	67.4–76.1
Age 65-74	62.1	58.9–65.4	59.8	55.7–64.0
75-84	66.4	60.6–72.3	59.6	52.2–67.1
85 and above	60.5	45.9–75.1	46.2	27.0-65.3
Urban	65.0^{+}	61.7–68.3	62.3^{++}	58.1–66.5
Rural	58.3	53.1–63.5	51.5	44.6–58.4

[a] The proportions of awareness, are the proportions among the hypertensive participants
[b] 95% Confidence Interval
+p<0.05 ++p<0.01 +++p<0.001

Table 3. Hypertension receiving treatment and control according to demographical characteristics

Variable	HT Treatment[a]		HT Control[a]	
	%	%95 CI[b]	%	%95 CI[b]
Total	52.2	48.6–55.9	15.1	12.5–17.8
Man	38.0+++	32.6–43.4	11.5+	8.0–15.0
Woman	63.1	58.5–67.8	17.9	14.2–21.7
Age 65-74	54.0	49.7–58.2	15.0	11.9–18.0
75-84	47.6	40.0–55.2	15.7	10.1–21.2
85 and above	46.2	27.0–65.3	15.4	1.5–29.3
Urban	56.2+++	51.9–60.4	15.2	12.1–18.3
Rural	42.0	35.2–48.8	15.0	10.1–20.0

[a] The proportions of treatment and control are the proportions of the hypertensive participants
[b] 95% Confidence Interval
+p<0.05 ++p<0.01 +++p<0.001

hypertension patients are ISH. Jo et al.[16] report that above 55 ISH prevalence is 10.5% in men and 11.9% in women and that in this age group there is no relationship between sex and ISH prevalence. Joffres et al.[12] report that between ages 65 and 74, ISH prevalence is 34% in men and 39% in women. On the other hand, Mann[23] gives ISH prevalence above 60 as 11.7% and reports that in women the prevalence in the black race is 50% more. In a study conducted in Turkey, ISH prevalence was observed to be 12.5% in those over 60[6]. In this study, ISH prevalence in those above 65 was observed to be 25.5% and the ISH rate in hypertension patients was 40.4%. There was no relationship between sex and increase of age; however, ISH rate in male hypertension patients was observed to be higher than that in female.

Burt et al.[24] report that HT awareness is 56% and 68% respectively in Non Hispanic white men and women over 70 years old. These rates are given by Bursztyn et al.[18] for those over 70 years of age as 71.4% and 81.9%; by Joffer et al.[12] for between 55-74 years of age as 81% and 91%; by Lang et al.[25] for 50 years of age as 59.9% and 76.6; by Pan et al[17] for over 65 years of age as 45% and 52%. In the studies conducted in Turkey on older populations, HT awareness varies between 47.6% and 81.8%[6,7]. In this study, 59.3% of the hypertensive were aware of their disease; this rate was determined to be 43.1% in men and 71.7% in women. Although the fact that awareness is greater in women complies with that of the literature, it is observed that the total awareness rate is lower than that given in similar studies (except that of Pan). In this study, unlike other studies, it is observed that the difference in awareness rate between men and women is very high. Another study conducted in Turkey reports that in Turkey women give more importance to their health problems and demand health services more than men. Their using more health services might explain this difference[26].

Pan et al.[17] report that above the age of 65, 32% of the male hypertension patients and 40% of the female hypertension patients receive antihypertension treatment. These rates are reported respectively as 46% and 58% above 70 years by Burt et al.[24]; 69% and 84% between 55 and 74 by Joffres et al.[12]. Meissner et al.[27] gives this rate as 44.5% for those aged 45. In studies conducted in Turkey, these rates are given as 32.2% and 54.1% for those above 30 by Onat et al.[8] and 35.7% and 61.4% between ages 35 and 64 by Sonmez et al.[4]. In this study, this rate was determined to be 38.0% in men and 61.3% in women. Although among the studies conducted the rate of receiving treatment is lower, it is apparent that the ratio of women receiving treatment is higher. This difference was more pronounced between this study and the other studies.

Pan et al.[17] report that above 65 years, the blood pressure is under control in 8% of the male hypertension patients and in 6% of the female hypertension patients. These rates are given respectively as 16% and 19% above 70 years by Burt et al.[24]; and 46% and 69% between ages 55 and 74 by

Joffres et al.[12]. Meissner et al.[27] report that above 45 years, in 16.6% of the hypertension patients over 45, the blood pressure is under control. In this study, the control rates were determined to be 11.5% and 17.9% respectively. Although the control rates change among the studies conducted, it is observed that blood pressure control is better in women (except Pan et al).

In this study, the fact that the rates of awareness and treatment receiving are lower although the hypertension prevalence is lower in the rural areas, indicates that diagnosis, treatment and follow up is inadequate in the rural areas.

In conclusion, in this study, it was determined that hypertension prevalence is high, awareness and treatment receiving rates are low and blood pressure control is very low above 65 years. In women, hypertension prevalence is higher but awareness, receiving treatment and blood pressure control are better. In male hypertension patients, ISH rate was higher. In rural areas, hypertension prevalence is lower but awareness and treatment receiving rates are lower. These results indicate that HT is not considered to be important by the elderly and that the HT management is poor.

Blood pressure evaluation should be conducted in every adult applying to health institutions. Treatment should be started in those diagnosed as a hypertension patient and the effectiveness of the treatment should be monitored. Using mass communication, an intensive health campaign concerning hypertension and its causes should be given to the public, thus increasing social consciousness.

We can not generalize the results of this study which was conducted on a regional base. However an HT study on a sample that represents Turkey should be conducted and this should be repeated periodically.

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Validation of verbal autopsy method in determination of causes of infant deaths

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Abstract

In Turkey, it is difficult to determine the causes of infant deaths due to the frequency of deaths at home, and the inadequacy of routine recording systems. This study has been set up in order to validate a verbal autopsy method in determining the causes of infant deaths.

The relatives of 149 out of 198 infants (75.3%) who died in the hospitals in Antalya City Centre between 1.1.1993 and 31.12.1993 have been interviewed by a physician, and pre-mortal symptoms and findings have been determined by means of a questionnaire. Results have been evaluated according to the SEARCH "probable diagnosis" criteria to find out through verbal autopsy the cause of infant death. References for the cause of death have been determined by consulting the hospital files of the infants. Hospital diagnoses have been compared with verbal autopsy diagnoses in order to validate the verbal autopsy method for different categories of disease. The sensitivity and specificity of verbal autopsy diagnoses have been found to be quite high, varying between 90.0% and 100.0% for prematurity, small for date, diarrhoea, pneumonia and malnutrition. Sensitivity and specificity were between 77.1% and 96.0% for respiratory distress syndrome, birth trauma/asphyxia and sepsis. It can be concluded that a verbal autopsy method provides adequate information for the determination of causes of infant deaths.

Key words: Causes of infant deaths, SEARCH criteria, verbal autopsy

Introduction

It is important to obtain information on diseases associated with infant deaths in developing countries, both to determine public health priorities and to evaluate the impact of disease-specific health-interventions on infant mortality[1]. In Turkey, the death registration system covers only urban settlements. Mortality rates and death causes obtained from death registries are not reliable. Up to now the State Statistical Institute has managed the death registration system in Turkey. A standard death registration form is filled out by a physician at the hospital (in the case of a hospital death) or by a physician from the municipality health directorate (in case of death at home). Three copies of this form are made, one of which is sent to State Statistical Institute for national data processing. With regard to the quality of the death notifications, two main problems of reliability are possible in this system. One is that the staff-member who fills out the death-certificate may be a member of the auxiliary health-staff instead of a physician, especially in the case of home deaths. On the other hand the death rate may be accepted as unreliable since an important number of deaths included in hospital records are, deaths of those living in rural parts of the country. So, in calculating the exact official mortality rate figures for rural deaths, a denominator problem has occurred. The infant mortality rate is determined by the Demographic and Health Survey (DHS) for Turkey carried out every 5 years (42.7‰ in 1998)[2]. The causes of infant deaths can only be obtained from the individual field studies mainly conducted by public health departments of medical faculties in different educational and research districts of the country. According to research districts' data[3,4], the most common causes of infant deaths were prematurity, birth injury/asphyxia, pneumonia, congenital malformation and diarrhoea. In brief, in Turkey, data on causes of infant deaths are poor because

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deaths at home are frequent (78.8%), death registration is mostly incomplete and even when death certificates are available, and the certifiers often report non-specific diagnoses[5]. A diagnostic tool is needed to obtain reliable data on causes of infant deaths.

Verbal autopsy was developed as a diagnostic tool to be used in areas where deaths are under-reported or poorly recorded. The method is based on an interview with relatives after the death of an infant, for collection of information about the disease causing death[1,6]. The verbal autopsy technique has been more widely used to determine causes of childhood deaths[7-14]. The technique is also useful for perinatal deaths, maternal deaths and adult deaths[15-17]. Many validation studies have been conducted on verbal autopsy and diagnostic combinations of the symptoms and findings of many diseases have been categorised. Across these studies, however, not only the causes of death, but also the methods, questionnaires and diagnostic symptom/finding combinations differed. Today, the lack of both a standard questionnaire and standard diagnostic criteria are important problems of this method. In order to solve this problem, a group of researchers in India (Society for Education Action and Research in Community Health: SEARCH) have proposed specific diagnostic criteria based on certain symptom/finding combinations for each disease category for those under the age of three[1,6].

The purpose of our study was to obtain validity for the standard verbal autopsy criteria developed by SEARCH in determining the causes of infant deaths in Turkey. We also aimed at determining which combination of symptoms or signs are the most pathognomonic of specific disease diagnoses.

Materials and methods

The study group for this validation study was 198 infants, all of whom died in hospitals in Antalya City centre between 1.1.1993 and 31.12.1993. During the same period, there were 36 infant deaths at home (15.4% of a total of 234 deaths). Of the study group, we could not gain access to the parents of 21 infants; no death cause was recorded in the hospital files of two infants; and the parents of 26 infants did not see enough of their offspring before death, and were, therefore, not worth interviewing for a verbal autopsy analysis. As a result, verbal autopsy analysis was conducted on 149 (75.3%) of 198 infants who died in hospitals. Neonatal deaths comprised 74.5% (n: 111) of all deaths while 25.5% (n: 38) were post-neonatal. 26 (53.1%) of the deaths for which parents could not be interviewed were neonatal while 23 (46.9%) of the deaths were post-neonatal.

The standard criteria of SEARCH and some questionnaires previously used for verbal autopsy analyses were reviewed by a paediatrician and structured questionnaires for the neonatal and post-neonatal periods, with all the symptoms and findings of the disease categories, were prepared. Study data were collected through face-to-face interviews with parents of the infants. Completion of each questionnaire took about 20 minutes. Interviews with parents of the infants were conducted some time after the death-not less than one month nor more than one year in any of the cases. All interviews were conducted by a physician speaking the same language as the parents of the dead infant (Turkish). Interviewers were not informed about the cause of death of the infant prior to the interview with parents. During the interview, even if parents disclosed the information given to them at the hospital about the cause of death of the infant, such information was not recorded in the questionnaire.

Following interviews with the parents, the questionnaires were reviewed according to the SEARCH criteria, and verbal autopsy diagnoses were determined according to standard criteria. SEARCH grouped symptoms and signs (criteria) into three categories, namely essential (E), confirmatory (C) and supportive (S). Essential criterion is the criterion which must be fulfilled to make the diagnosis, but is not sufficient evidence for diagnosis; confirmatory criterion clinches the diagnosis (if "E" is also fulfilled); supportive criterion helps in making a differential diagnosis from other possible causes of death and provides circumstantial evidence to support a diagnosis. Verbal autopsy diagnoses were made only if the essential, confirmatory and supportive criteria were in compliance with the different combinations determined by SEARCH for each disease category. According to standard criteria, there are two different sets of criteria-combinations for each cause of death: probable diagnosis and highly probable diagnosis. In determining the standard criteria diagnoses of the cases, compliance with at least the "probable diagnosis" criteria has been considered sufficient[6].

Essential, confirmatory, supportive criteria, probable diagnostic criteria combinations and most

probable diagnostic criteria combinations for post-neonatal pneumonia, respiratory distress syndrome (RDS), birth injury/asphyxia, neonatal and post-neonatal sepsis are shown in the footnotes to Table 2-5. The criteria and diagnostic criteria combinations for prematurity, small for date, congenital malformation, malnutrition and diarrhoea are listed in the Appendix.

The diagnosis recorded in the hospital files by the practising physician of the hospital was accepted as the true death cause (reference diagnosis). Reference diagnoses were recorded separately from the questionnaires. As autopsy was performed in only 2.3% of the infants, autopsy diagnoses have not been taken as reference diagnosis.

At the final stage, verbal autopsy diagnoses based on SEARCH standard criteria were compared to reference diagnoses determined in the hospitals.

Reference diagnoses indicate 1 cause of death for 42.9%, 2 causes of death for 49.0%, 3 causes of death for 7.4% and 4 causes of death for 0.7% of infants. We included all the causes of death in the analysis of our study. The method of calculating the validity measures was individual-based.

All of the reference diagnoses for respiratory distress syndrome (RDS), birth trauma/asphyxia, prematurity (<37 gestational weeks) or small for date (>37 gestational weeks and <2500 gm) were in neonates and all of the reference diagnoses for malnutrition were in post-neonates. Therefore, analysis of RDS, birth trauma/asphyxia, prematurity and small for date was conducted in the 111 neonatal deaths, analysis of malnutrition in the 38 post-neonatal deaths, and analysis of diarrhoea, pneumonia, sepsis, and/or congenital malformation in all 149 neonatal and post-neonatal deaths.

Sensitivity, specificity and positive predictive values were used in validation assessment of verbal autopsy diagnoses. The sensitivity of a test is defined on the percentage of persons with the disease of interest that have positive test results. The specificity is defined as the percentage of persons without the disease of interest who have negative test results. Positive predictive value is defined as the percentage of persons with positive test results who actually have the disease of interest[18].

Results

Sensitivity and specificity of verbal autopsy diagnoses based on standard criteria were found to be rather high, varying between 90.0% and 100.0% for prematurity, small for date, diarrhoea, pneumonia and malnutrition. Sensitivity and specificity were between 77.2% and 96.0% for RDS, birth trauma/asphyxia and sepsis (Table I).

In disease categories where verbal autopsy was administered, the sensitivity and specificity of various symptoms/signs and their combinations were determined.

Table 1. Sensitivity, specificity and positive predictive values of verbal autopsies for detecting major causes of childhood deaths, based on SEARCH CRITERIA

Causes of deaths	Number of diagnoses (hospital diagnoses)	Sensitivity %	Specificity %	Positive predictive value %
Neonatal period (n:111)				
Respiratory distress syndrome	24	83.3 (20/24)	90.8 (79/87)	71.4 (20/28)
Birth trauma/asphyxia	36	83.3 (30/36)	84.0 (63/75)	71.4 (30/42)
Prematurity	51	100.0 (51/51)	98.3 (59/60)	98.1 (51/52)
Small for date	8	100.0 (8/8)	100.0 (103/103)	100.0 (8/8)
Post-neonatal period (n:38)				
Malnutrition	5	100.0 (5/5)	100.0 (33/33)	100.0 (5/5)
Neonatal and Post-neonatal period (n:149)				
Sepsis	22	77.2 (17/22)	96.0 (122/127)	77.2 (17/22)
Diarrhoea	7	100.0 (7/7)	100.0 (142/142)	100.0 (7/7)
Pneumonia	21	90.4 (19/21)	93.7 (120/128)	70.3 (19/27)
Congenital malformation	25	60.0 (15/25)	100.0 (124/124)	100.0 (15/15)

Table 2. Sensitivity, specificity and positive predictive values of various symptoms / signs in diagnosis of pneumonia, comparing 18 post-neonatal pneumonia-associated deaths and 20 non-post-neonatal pneumonia deaths*

Symptoms / signs	Sensitivity (%)	Specificity (%)	Positive predictive value (%)
Cough (E)	50.0	85.0	75.0
Fever (S)	72.2	45.0	54.2
Tachypnoea (C)	88.8	95.0	94.1
Cyanosis (S)	83.3	90.0	88.2
Grunt (S)	66.6	85.0	80.0
Respiratory distress or dyspnoea (C)**	83.3	70.0	71.4
Cough + dyspnoea	44.4	50.0	44.4
Cough + tachypnoea	44.4	50.0	44.4
Cough or dyspnoea or tachypnoea	94.4	70.0	73.9
Cough + dyspnoea or tachypnoea	88.8	80.0	80.0
Cough or tachypnoea	94.4	80.0	80.9
Tachypnoea + cyanosis	77.7	80.0	77.7
Tachypnoea + dyspnoea	83.3	80.0	78.9
Tachypnoea + dyspnoea + cyanosis	72.2	95.0	92.8

* According to SEARCH, essential (E), confirmatory (C) and supportive (S) criteria
** Severe indrawing of suprasternal, intercostal or subcostal region
Possible diagnosis: 1 E + 1 S
Most probable diagnosis: 1 E + 1 C

Sensitivity, specificity and positive predictive values were found to be extremely high for premature deaths as, in fact, infants' families stated the gestation age correctly in almost all of the premature infants with verbal autopsy diagnoses. In the small for date diagnosis, most of the mothers also correctly stated the criterion as "being too small at birth".

In post-neonatal pneumonia cases, sensitivity, specificity and positive predictive values for "cyanosis", "dyspnoea" and "tachypnoea" were found to be quite good, both individually and in combinations of 2 or 3. When "cough" and "its combinations with other symptoms" was taken, values for sensitivity, specificity and positive predictive value remained at a level of 50.0% (Table 2).

When the symptoms and signs for RDS, which were "onset of respiratory symptoms within 6 hours of birth," and "prematurity" were handled individually, the sensitivity was 100% for both, whereas the specificity and positive predictive values remained at much lower levels. Sensitivity and specificity values recorded for "tachypnoea" and "dyspnoea" ranged between 66.6% and 75.8%. When these four

Table 3. Sensitivity, specificity and positive predictive values of various symptoms/signs in diagnosis of RDS, comparing 20 RDS associated deaths and 91 non- RDS deaths*

Symptoms / signs	Sensitivity (%)	Specificity (%)	Positive predictive value (%)
Onset of respiratory symptoms within 6 hours of birth (E)	100.0	49.4	35.3
Prematurity (S)	100.0	68.9	47.1
Tachypnoea (C)	75.0	62.1	35.3
Dyspnoea (C)	66.6	75.8	43.2
Cyanosis (S)	45.8	56.3	22.5
Tachypnoea + dyspnoea	62.5	75.8	41.7
Prematurity + onset of respiratory symptoms within 6 hours of birth + tachypnoea + dyspnoea	62.5	100.0	100.0
Prematurity + onset of respiratory symptoms within 6 hours of birth + tachypnoea	79.1	100.0	100.0

* According to SEARCH, essential (E), confirmatory (C) and supportive (S) criteria
Possible diagnosis : 1 E + 1 C
Most probable diagnosis: 1 E + 2 C or 1 E+ 1 C + 2 S

Table 4. Sensitivity, specificity and positive predictive values of various symptoms/signs in diagnosis of birth injury/asphyxia, comparing 30 birth trauma/asphyxia -associated deaths and 81 non-birth injury/asphyxia deaths*

Symptoms / signs	Sensitivity (%)	Specificity (%)	Positive predictive value (%)
History of prolonged labour (S)	19.4	42.6	14.0
Meconium stained liquid (S)	33.3	92.0	66.7
No crying immediately after birth (late cry ≥3 minutes) (C)	69.4	66.6	50.0
Pallor at birth (S)	5.5	93.3	28.6
Cyanosis at birth (S)	41.6	78.6	36.6
Drowsy or unconscious at birth (C)	5.5	82.7	13.3
History of instrumentation by vacuum or forceps in hospital (S)	44.4	85.3	59.2
Presentation other than vertex (S)	19.4	81.3	33.3
Very large baby (S)	8.3	100.0	100.0
Small baby (S)	19.4	28.0	11.5

* According to SEARCH, essential (E), confirmatory (C) and supportive (S) criteria
Possible diagnosis: 1 C or 2 S
Most probable diagnosis: 2 C or 1 C + 1 S

symptoms were used all together, the sensitivity was 62.5% and the specificity was 100.0%. The sensitivity and specificity and positive predictive values were 79.1%, 100% and 100.0% respectively, after removal of "dyspnoea" from the quadruple combination (Table 3).

"Infant did not cry immediately after birth" was used as a diagnosis of birth injury/asphyxia; sensitivity was determined as 69.4%, compared with much lower sensitivity values for all other possible symptoms and signs. Specificity values for all possible symptoms and signs were found to be at much more favourable levels (Table 4).

Sensitivity and specificity values for the symptoms and signs of 22 cases of sepsis were computed separately for neonatal and post-neonatal deaths respectively. In 14 cases of neonatal sepsis, the sensitivity and specificity values for "refusing feeds" were 71.4% and 86.6% and for "cyanosis" 71.4% and 59%, although positive predictive value was found to be 45.5% and 20.4%. When both symptoms were used together, the sensitivity decreased, while specificity and positive predictive values increased. When "feeble cry in full- term babies" was taken into account by itself, it was possible to establish diagnoses for half of the cases. "Convulsions", "vomiting", "apnoeic spells", "drowsiness", "lethargy", "unconsciousness" and "fever" displayed a low level of sensitivity, whereas specificity for those was above 85.5%. In post-neonatal cases of sepsis, on the other hand, sensitivity for "fever" and "vomiting" was 87.5% and 62.5% respectively, while specificity values were lower. Sensitivity values for "refusing feeds", "cyanosis", "convulsions", "drowsiness" and "unconsciousness" were also at very low levels (Table 5).

"Presence of gross physical malformation" was accepted as a diagnostic criterion for congenital malformation; 60% of congenital malformations were recognised by the mothers.

Malnutrition diagnosis was present for 5 cases of 38 post-neonatal deaths. Symptoms and signs noticed by the mother were "progressive weight loss", "not eating well for>1 month prior to death" and "failing to thrive for 4 months before death". Certain standard criteria, including "oedema overfeed", "breast feeding for less than 6 months", "history of measles and whooping cough in the last 3 months", "inactivity/apathy in the last month" and "recurrent diarrhoea" were not reported by the families.

Diarrhoeal disease was determined in 7 out of 149 cases. All of these cases were acute. For all babies diagnostic criterion was "passing >3 loose watery stools per day", However, dehydration signs, such as "sunken eyeballs" in 3 cases, "oliguria or dark urine" in 3 other cases, were mentioned, whereas other dehydration signs were not mentioned in the remaining cases.

Table 5. Sensitivity, specificity and positive predictive values of various symptoms/signs in diagnosis of neonatal sepsis, comparing 14 neonatal sepsis -associated deaths and 97 non-neonatal sepsis deaths, and in diagnosis of post-neonatal sepsis, comparing 8 post-neonatal sepsis- associated deaths and 30 non-post-neonatal sepsis deaths*

Symptoms / Signs	Sensitivity (%)	Specificity (%)	Positive predictive value (%)
Neonatal Sepsis			
Refused feeds (having accepted feeds earlier) (C)	71.4	86.6	43.5
Cyanosis (S)	71.4	59.8	20.4
Refused feeds (having accepted feeds earlier)+ cyanosis	50.0	94.8	58.3
Convulsions or spasms after first 72 hours of life (S)	21.4	97.7	20.0
Vomiting (S)	7.1	100.0	9.1
Apnoeic spells (S)	7.1	85.5	6.7
Became drowsy, lethargic or unconscious 72 hours after birth (C)	14.2	86.6	13.3
Fever (S)	28.5	97.7	25.0
Feeble cry in full- term baby (S)	42.8	86.2	27.3
Post-neonatal Sepsis			
Fever (S)	87.5	43.3	29.2
Vomiting (S)	62.5	46.6	23.8
Refused feeds (C)	50.0	36.6	17.4
Convulsions (S)	37.5	56.6	18.7
Became unconscious or lethargic (C)	25.0	90.0	40.0
Cyanosis (S)	25.0	50.0	28.6

* According to SEARCH, essential (E), confirmatory (C) and supportive (S) criteria
Neonatal sepsis, Possible diagnosis: 1 C + 1 S or 2 S, Most probable diagnosis: 1 C + 2 S or 2 C or 3S
Post-neonatal sepsis, Possible diagnosis: 1 C + 1 S or 2 S, most probable diagnosis: 1 C + 2 S or 2 C or 3 S

Discussion

The results of this study suggest that parents are able to report retrospectively signs and symptoms of their babies' fatal illnesses. We have also demonstrated that the proposed tool -SEARCH - is a useful approach for obtaining a reliable cause of death. The results of the present study reveal that sensitivity and specificity is higher for verbal autopsy than for other studies. We found that sensitivity and specificity for pneumonia were respectively 90.4% and 93.7%, for malnutrition 100.0% and 100.0%, for diarrhoea 100.0% and 100.0% and for sepsis 77.2% and 96.0%. In studies conducted in different areas, sensitivity and specificity for verbal autopsy diagnoses were respectively 28%-72% and for pneumonia 60%-91%, for malnutrition 71%-89% and 96%-100%, for diarrhoea 36%-90% and 61%-97% and for neonatal sepsis 61% and 81% [1,19-21]. In our study, the data was collected by a physician who had worked in the region in the past and who spoke the same language as the relatives of the infants. As the mothers were asked close-ended questions about the pre-mortal symptoms and findings concerning the infants, the probability of omission of some symptoms and findings by the mothers during the interview was low. These factors probably contributed to the higher degree of validity for the verbal autopsy method, compared to previous studies. Furthermore, the evidently high level of sensitivity for disease categories in our study may have been improved by the use of various combinations of all probable symptoms and findings of the diseases, rather than the definite combination of symptoms used in other studies - i.e. looser criteria. For instance, in our study, the existence of any one of the symptoms of tachypnoea, respiratory distress, fever, cyanosis or moaning, besides cough symptom, was deemed sufficient for a diagnosis of pneumonia.

Another point worth mentioning with regard to the criteria is the low positive predictive values for the diagnosis of RDS, birth trauma/asphyxia, pneumonia and sepsis. These kinds of diseases may be confused as they show similar symptoms and findings, particularly in the neonatal period. Therefore, false positive diagnoses may have been made.

The primary limitation of the study was the selective nature of the study specimen. Because the babies in our study were treated in hospitals, we can not assess whether a verbal autopsy method and SEARCH tool may be used to determine the illnesses of babies who die without medical attention. It should also be noted that only a small number of cases in some diseases (e.g. underweight for gestational age, diarrhoea and malnutrition) were analysed in our study.

It is usual to assign a single underlying cause of death on the certificate. But clinical and epidemiological evidence suggests that mortality among infants and children in developing countries is often due to the effects of multiple acute or chronic illnesses[22,23]. Thus the conventional assignment of a single underlying cause on the death certificate fails to document the contribution made by multiple illnesses, and the lack of such information presents problems in evaluating the impact of the health program. The SEARCH team also recommended that all the causes that contributed to death (up to a maximum of four causes for each death)[6] be included. Accordingly, in our study we included in the analysis all the causes of death.

Prematurity/Small for Date

Sensitivity and specificity for both prematurity and "small for date" were excellent because the parents always reported the correct gestational age. Prematurity is also in the category of diseases with a high degree of validity in the studies carried out abroad[1]. "Being aware of the gestational age" may be associated with the level of the mother's education. The mother's accurate knowledge could originate from statements about prematurity by the physicians in the hospital. In rural areas, where maternal education is relatively low, these accuracy levels may be lower than those determined in the present study. Also, gestational age is not always known accurately in such areas where prenatal care is relatively inadequate and births usually take place at home without the supervision of any health personnel[2].

Pneumonia

In a study of Kalter et al, sensitivity was recorded as being 86% and specificity at 47% for cough and dyspnoea respectively; when "cough" and "dyspnoea lasting for longer than one day" were taken as criteria, sensitivity and specificity values were 66% and 60% respectively, and when "cough lasting for longer than 4 days" and "dyspnoea longer than one day" were taken as criteria the values were 59% and 77% respectively[19]. Subsequently, more detailed questioning about the criteria led to an increase in specificity, but a decrease in sensitivity. Mobley et al found that the percentages for "cough + dyspnoea or tachypnoea" were 72% for sensitivity and 64% for specificity[21]. However, Osinski showed that in cases where only one symptom of "cough", "dyspnoea" and "tachypnoea" was present, the above values were 58% and 82% respectively[1].

Rodriguez et al. found that the presence of dyspnoea for more than one day showed a sensitivity of 69% and a specificity of 74%, while a history of coughing showed a sensitivity of 61% and a specificity of 73%[24]. The higher sensitivity and specificity values in the present study (both above 90%) may result from the fact that the double and triple algorithms of possible pneumonia symptoms and signs are sufficient for a diagnosis in standard criteria as mentioned above. In fact, when the accuracy of certain symptoms and their algorithms for the indication of pneumonia is taken into consideration, it can be seen that "tachypnoea", "cyanosis" and "dyspnoea " have a sensitivity level of more than 80% and a specificity level of more than 70%. Double algorithms of these three symptoms also displayed sensitivity and specificity levels over 80%. In fact, in cases where "tachypnoea, cyanosis and dyspnoea" were all present, the sensitivity and specificity were 72.2% and 95.0% respectively. Moreover, false positive diagnosis in different algorithms of these three symptoms were rare. Another reason for the diagnosis of pneumonia having a greater degree of validity in this study compared with other studies is the low frequency of diseases, such as malaria, which might be mistaken for other post-neonatal pneumonia fatalities. Malaria is not common in our region, whereas it is quite prevalent in regions where some of the other studies were conducted[19].

In this study a significant finding related to pneumonia is the low sensitivity of the cough symptom, which is an essential criterion proposed by SEARCH. This may originate from the composition of the study group of infants. SEARCH proposed criteria were for the deaths of children aged from one month to three years. This method may not lead to diagnosis of pneumonia with the same degree of accuracy during the neonatal period due

to the fact that pneumonia exhibits common symptoms with RDS and sepsis during the neonatal period. For this reason three cases from the neonatal period were not included in the analyses of pneumonia while determining the accuracy of the symptom algorithms. Using this method, it may not be possible to diagnose pneumonia cases at the same level of sensitivity for the neonatal period. Therefore, more neonatal pneumonia cases need to be studied for this particular aspect of the subject.

Sepsis

Snow et al. found that sensitivity and specificity for neonatal sepsis were 61% and 81% respectively[20]. The validity of standard criteria in our study was at much higher levels (77% and 96%, respectively). The main difference may be associated with the utilisation of diagnostic sets.

Congenital Abnormality

The "presence of a gross malformation in the baby" was taken as the only diagnostic criterion among the SEARCH criteria for congenital malformation[6]. In our study group, 15 of the total 25 cases (60%) with congenital malformation had gross malformation that could be detected by the parents.

Protein Energy Malnutrition

Infants with malnutrition usually die when sepsis or respiratory infections are clinically manifested. Therefore, the establishment of criteria in the case of malnutrition is complicated. Moreover, symptoms of malnutrition may not be perceived pathologically in some cultures due to the fact that malnutrition is a chronic and common disease in these societies[25]. If the cases do not exhibit specific symptoms such as mild or moderate malnutrition and shortness of height, the families might fail to detect malnutrition. In this study the families of babies with malnutrition stated that "the baby was thin" and "inadequately fed" or "could not put on weight" rather than mentioning the usual symptoms of malnutrition. Mobley et al. found that an algorithm for malnutrition (very thin or swollen) had 73% sensitivity and 76% specificity[21]. In our study, it was impossible to say that malnutrition was defined sufficiently by the families because the number of cases was low. Studies with more cases are required to obtain more reliable data on this subject. Some symptoms such as "night blindness" and "keratomalasia", which are among SEARCH malnutrition criteria, were not asked for in this study because the families could not be expected to recognise these[6].

Diarrhoea

The results of diarrhoea have to be interpreted carefully in this study due to the low prevalence of this condition. "more than 3 loose watery stools per day" was the diagnostic criterion in all the cases of acute diarrhoea. Only "sunken eyes" and "dark urine", signs of dehydration, were recognised in a few of the cases. In a recent study[19], "frequent loose watery stools" was found to be the most sensitive criterion for diarrhoea. When the presence of "at least 6 watery stools per day", "thirst" and "sunken eyeballs" were added to "frequent loose watery stools", specificity increased while sensitivity decreased. For diarrhoea[21], Mobley et al. found loose or liquid stools had high sensitivity (89%), but low specificity (61%).

In conclusion we have shown that verbal autopsy based on the SEARCH tool can determine with acceptable sensitivity and specificity the illnesses contributing to death in infants in our region. However further research is needed to determine whether such structured verbal autopsy interviews can be used successfully in other regions of our country, and whether lay interviewers rather than physicians can obtain accurate information from parents. This greatly increases the practicality of utilising post-mortem interviews for field investigations. The validity of the verbal autopsy for longer recall periods also needs to be established if the technique is to be used to estimate causes of death in periodic surveys such as the Turkish DHS.

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Appendix

Suggested criteria for diagnosis of prematurity, small for date, congenital malformation, malnutrition and diarrhoea by SEARCH[6]

Prematurity

C: history of<37 completed weeks' gestation

Most probable diagnosis: 1 C

Small for Date

E: history of ≥37 completed weeks' gestation (we have added to SEARCH criteria)

C: undersized at birth

C: Twins

Most probable diagnosis: 1 E + 1 C

Congenital malformation

C: Grossly malformed baby

Most probable diagnosis: 1 C

Malnutrition

C: did not thrive for >four months before death

C: progressively lost weight and grew thinner for >1month before death

C: Oedema of ankles

C: Keratomalacia

S: Breast-fed for less than 6 months or introduction of formula or cattle milk (invariably dilute in first three months)

S: Late introduction of supplementary food (>9 months of age)

S: Did not eat well for >1 month before death (which results in acute or chronic malnutrition)

S: Recurrent diarrhoea ≥3 episodes in 3 months before death) or persistent diarrhoea (lasted >2 weeks in the last 3 months)

S: History of measles or whooping cough in the last 3 months

S: Mother feels child was repeatedly sick in last three months

S: Inactive or apathetic in last month

S: Night blindness present

S: Child born undersized or premature

S: Family calls it malnutrition (Local term)

Possible diagnosis: 1 C or 2 S

Most probable diagnosis: 1 C + 1 S or 3 S

Acute Diarrhoea

E: > 3 loose watery stools per day

S: Vomiting

S: Restriction of fluids by the parents

C: Dehydration (any one or more symptoms of thirst, oliguria or dark urine, sunken eyeballs, or depressed fontanel)

Possible diagnosis: 1 E

Most probable diagnosis: 1 E + 1 C or 2 C

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Utilization of health services among chronic disease patients after the earthquake in the Marmara Region on 17 August, 1999

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Abstract

The aftermath of earthquakes causes important public health problems both in Turkey and throughout the world. On 17 August, 1999, Turkey experienced a powerful earthquake with a magnitude of 7.4 causing severe damage and loss. There were 17,480 fatalities and 43,953 injuries after the Marmara earthquake.

In this descriptive research, which began three months after the earthquake had occurred, two newly formed temporary field settlements composed of tents, each of which had similar characteristics with respect to number of tents, location and number of people living in the area, were determined as the research area. In the research, one person from each tent was interviewed and 161 chronic conditions were identified in these areas. 47.2% of these patients with chronic conditions reported that they had last had a check-up before the earthquake, more than half of the people who were checked after the earthquake preferred to go to hospitals and 37.3% of them were examined by the health staff who had arrived at the settlements.

It was observed that these patients with chronic illnesses had not considered the seriousness of their illnesses after the disaster. This group of patients with chronic illnesses emerged as an important and different group to be taken into consideration when planning health- services. There is a need to increase the sensitivity of both health staff and patients with chronic conditions towards their chronic diseases.

Key words: earthquake, chronic illness, utilization, health services

Introduction

The World Health Organization (WHO) defines disaster as "situations and events that have sudden, serious and unexpected results on public health"[1]. It is reported that disasters have caused three million casualties throughout the world during the last 20 years. Significantly, 95 percent of all casualties as a result of natural disasters occur in poor, developing countries where 66 percent of the world population lives[2].

An earthquake is a series of shock waves generated after the brittle failure of rocks within the earth's crust or upper mantle as a result of a build up of stress. Implications suggest that aftershocks can be as destructive to society in general and people in particular as the earthquakes themselves. Survivors in heavily-impacted cities are displaced from their homes, therefore they suffer the hardships of finding shelter; securing food and water; locating friends and family members; and, in cold weather conditions, acquiring warm clothing[3,4]. Under these negative circumstances, patients need efficient and speedy health care services after such earthquakes. Among the health problems that can often be seen are acute myocardial infarcts, diabetes, hypertension, anxiety, depression, and respiratory- system diseases[2, 5-7].

The people in Turkey face almost every kind of disaster. Earthquakes are a primary reason for loss of life in Turkey. One of the most severe and destructive earthquakes to happen in Turkey, an earthquake with a magnitude of 7.4, occurred on 17 August, 1999. The main shock of this occurred along

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the North Anatolian Fault Line. 17,480 deaths have been confirmed, with the number of injured people reaching 43,953. The research area was in one of the provinces where widespread damage or total destruction occurred. The province of Sakarya is in the Marmara region; 3,891 people died and 5,180 people were injured there during the earthquake. 57,661 buildings, in particular 23,111 of them, were badly damaged or totally destroyed in this province[8]. As a result of damaged or destroyed buildings, the people in the province started to live in temporary field settlements consisting of tents. During the research period, there were 42 temporary settlements established in the center of Sakarya province.

In the earthquake area, health personnel from the Ministry of Health, those of other state institutions or universities, foreign health teams and voluntary civil society organisations provided health services. Undamaged or only slightly-damaged health institutions in the region and health centers established in temporary settlements were used for health care services. In addition, mobile health teams provided services

Emergency services and rescue teams reached the disaster area within two days of the earthquake. One week after the earthquake, the health problems of the area and medical requirements changed drastically. Slight injuries, respiratory system infections, diarrhoea, psychological trauma, sanitation problems (such as pediculosis), and aggravation of chronic conditions due to interruption in medical treatment became major health problems[9-11].

The aim of this descriptive study is to determine the level of accessibility to health care services for patients with chronic conditions in two temporary settlements.

Materials and methods

In this descriptive research, two medium-sized temporary settlements, selected on the basis of similar features with respect to number of tents, number of persons living in the settlements and geographical characteristics of the settlements, were examined. One of the temporary settlements (B) had been established immediately after the earthquake by the earthquake victims themselves; later on it had been re-organized as a temporary settlement. The other settlement (A) was established a week after the earthquake by one voluntary civil society as an organized temporary settlement. During the research, one person from each tent was interviewed by the same researcher. During the data-gathering phase of the study, a questionnaire was answered by one person older than 18 years of age, who had information on other persons in the tent. The people in the two tents were asked if they had any of the chronic conditions described in the questionnaire. The data was then analyzed on the basis of the interviewer's statements. There were 107 and 95 tents respectively in the temporary settlements studied of which 77.7 percent and 85.3 percent of tents respectively were accessed. The questionnaire used in the study was given to 83 and 81 persons respectively in the two settlements. Information was gathered about a total of 657 persons, of whom 294 (65.1 percent) were living in temporary settlement A and 363 (76.4 percent) were living in temporary settlement B (Table 1).

Table 1. Characteristics of the study settlements of Sakarya (November 1999)

	Temp. Settl. A	Temp. Settl. B
Total number of tents	107	95
Number of accessible tents	83	81
Ratio of accessible tents	77.7	85.3
Total number of persons living in tents*	452	475
Number of persons interviewed (one person per tent)	83	81
Number of persons on whom information was collected	294	363
Ratio of persons on whom information was collected	65.1	76.4

* Although the population of the area fluctuated considerably, the numbers were obtained from the registrations of temporary settlements.

Results

Age distribution of the interviewed persons in the study was between 18-75 years and the mean age was 41.2±13.8. The people for whom information was collected were between 0-85 years.

When the distribution of persons in the two settlements was examined according to sex, 54.1 percent were male and 45.9 percent were female. In

Table 2. The distribution by sex and age group of persons living in two temporary settlements after the earthquake on August 17, 1999

	Temp. Settlement A		Temp. Settlement B		Total	
	Number	%	Number	%	Number	%
Sex						
Male	175	59.5	177	49.6	352	54.1
Female	119	40.5	180	50.4	299	45.9
Total	294	100.0	357 *	100.0	651	100.0
Age groups						
0-14	44	15.1	73	20.9	117	18.2
15-24	65	22.2	90	25.8	155	24.2
25-44	91	31.2	116	33.2	207	32.3
44<	92	31.5	70	20.1	162	25.3
Total	292 **	100.0	349 **	100.0	641	100.0

* In temporary settlement B, the sex of 6 persons could not be recorded.

** In temporary settlement A, the age of 2 persons could not be identified and in temporary settlement B, the age of 14 persons could not be identified.

the temporary settlement A, the number of females in the population (40.5 percent), was quite low (Table 2).

According to the interviewer's statements, 161 chronic conditions were identified: there were 50 cases of hypertension (31.1 percent), 29 of heart disease (18.0 percent), 28 of rheumatism (17.4 percent), 14 of chronic obstructive pulmonary disease (COPD) (8.7 percent), 13 of diabetes mellitus (8.1 percent) and 27 other cases of other chronic conditions (16.8 percent) (Table 3). According to this survey, all chronic conditions were identified as being more prevalent among females and they seemed to increase with age.

As shown in Table 4, 14.3-61.5 percent of the patients with chronic conditions in these settlements had had a check-up before the earthquake occurred. While more than half of them preferred to go to hospitals for follow-up after the earthquake, only 20.0-50.5 percent of the patients with chronic conditions were examined by the mobile teams at the settlements (Table 5).

Discussion

Earthquakes can create important public health problems in the world as they result in tremendous loss of human life, cause injuries, diseases and nutrition problems which are beyond the capacity of health care services resulting in an increase in mortality and morbidity rates. They also deeply affect the supply of emergency services, routine and preventive health care services, and the quality of life in the future, as well as affecting the psychological and social behavior in the society[3,4].

The proportion of males in the two settlements was 54.1 percent and of females 45.9 percent (Table 2). However, according to the figures for the 1990 population census carried out by the State Institute of Statistics (SIS), in the province of Sakarya these rates were 50.5 percent and 49.5 percent respectively. These figures are very close to the general ratio in Turkey where it is 50.7% males to 49.3% females. Thus, the male ratio in the temporary settlements where the research was conducted is higher than the average for Sakarya province in particular and for Turkey in general[12]. When age groups are examined, the number of those in the 0-14 age group in these temporary settlements is lower than the average for Sakarya province or of that for Turkey. For the 20-24 and 40-54 age groups, this ratio is higher than the average for Sakarya province or of that for Turkey. The figures of SIS used for Sakarya province and Turkey were those for 10 years before the survey was carried out and these figures represented the populations of both urban and rural areas. This research data on the settlements were collected through interviews, not through official documents on the families. In addition, the lower ratio of women and the lower number in the 0-14 age group can be explained in

Table 3. The distribution of persons[1] declaring chronic conditions in two temporary settlements (Sakarya, November, 1999)

	n[2]	Hypertension (n=50) (%)	Heart diseases (n=29) (%)	COPD[3] (n=14) (%)	Diabetes (n=13) (%)	Rheumatism (n=28) (%)	Others[4] (n=29) (%)
Gender							
Male	239	4.2	5.0	1.3	0.8	2.5	2.9
Female	213	18.8	8.0	5.2	5.2	10.3	8.5
Age Group							
20-39	227	2.2	0.4	-	1.8	2.6	5.3
40-59	181	16.0	12.2	5.5	2.8	7.7	7.7
60+	44	36.4	13.6	9.1	9.1	18.2	4.5

1 Among persons older than 20 years

2 Number

3 Chronic bronchitis, chronic asthma

4 Ulcer, paralysis, migraine

that the members of these had been sent to live with their relatives in other cities.. For the other age groups, it is apparent that men and aged people stayed in order to continue their jobs or to protect their property.

In Survey on the Use of Health Services in Turkey, it is stated that the rate of chronic conditions for all age groups is 6.8 percent, for males 6.1 percent and for females 7.4 percent. It is also observed that this rate rises to 14 percent with the increase in age[13]. In this study, the data gathered are based upon the statements of the persons interviewed. Within this context, there are likely to be undeclared, neglected, unknown or wrongly-stated chronic conditions. Even under this wide definition, the number of people with chronic conditions was reported to be 161 out of 657 persons. The high number of people with chronic conditions indicates that chronic illnesses are important public health problems, which should not be neglected after such disasters. Chronic diseases and patients with chronic conditions emerge as a priority in the planning of health services for the aftermath of disasters.

In the temporary settlements in which the survey was carried out, "hypertension" was the most common chronic condition (31.1 percent), while "heart disease" came the second (18 percent) (Table 3). The chronic conditions declared were observed mostly among women and increased with age. In different surveys, hypertension prevalence in the age group of 40 years or over was between 10.2 and 52.0 percent[14-25]. The surveys carried out on different age groups also found that hypertension was more common among women[14-16, 19, 24, 26, 27].

In our survey, the prevalence of heart disease is 5.0 percent among men and 8.0 percent among women. Similar results were also obtained in other surveys, namely, 5.0 percent among men and 8.0 percent among women[18,27]. In various studies, prevalence of heart diseases for the same age group has been reported as between 11.0 percent and 17.1 percent[20,24].

Based on their declarations, the prevalence of diabetes among persons aged 20 or over in both of the settlements was 2.9 percent. Different surveys on the subject confirmed that the prevalence of diabetes was between 4.5 percent and 17.1 percent[20,24,28], and that it was also more common among women[18,28].

This survey was carried out in order to identify the efficiency of the health-services after the earthquake and to come up with suggestions for solving the problems. One of the findings was that there is a tendency for the symptoms of chronic illnesses to increase after disasters. In some surveys, it is observed that cases of high blood pressure rise right after disasters[29], decreasing to normal limits within 4-6 weeks[30,31]. Moreover, an increase in deaths due to acute myocardial infarct was an important finding of the surveys. Another troublesome area is difficulty in the regulation of diabetes mellitus[7,32]. All these

Table 4. Percent distribution by time of the last follow-up of persons with chronic conditions (Sakarya, November, 1999)

Follow-up time	Hypertension (n=50) (%)	Heart diseases (n=29) (%)	COPD[1] (n=14) (%)	Diabetes (n=13) (%)	Rheumatism (n=28) (%)	Others[2] (n=27) (%)
Within 0-15 days	32.0	20.8	50.0	-	30.0	33.3
16 days-3 months	28.0	20.8	35.7	38.5	15.0	9.6
Before the earthquake	40.0	58.4	14.3	61.5	55.0	57.1

1 Chronic bronchitis, chronic asthma

2 Ulcer, paralysis, migraine

findings indicate that treatment and monitoring of chronic conditions should be more strongly emphasized in the health care services provided after disasters. Although the symptoms of chronic conditions rose after the disaster, 40.0 percent of the hypertension patients, 58.4% of the heart disease patients, and 61.5% of diabetes mellitus patients were examined in the settlements after the Marmara earthquake. This study, which was conducted in Turkey, revealed the fact that patients with chronic illnesses do not regularly use the health care system. It has been observed that patients with chronic illnesses (71.1% of those with hypertension, 47.8% with diabetes mellitus, 58.8% with heart disease, and 74.3% with rheumatism) do not benefit from health care services[33]. It might be expected that the number of people using health services would be greater after disasters than under normal conditions. But, in this case, the number of applicants to health institutions among the patients with chronic illnesses was significantly low.

More than half of the patients with chronic conditions preferred to use the hospitals. The second health institution preferred was mobile health services. It is significant that no patient chose to make use of health centers for a check-up. Traditionally, the priority group in health programs carried out in Turkey is mothers and children. The health programs at the health centers are mostly designed for mothers and children or for the prevention of communicable diseases. According to the report of the Ministry of Health[34] the mother- and- child health program conducted in the disaster area after the earthquake proved to be successful. This achievement stems from the integration of routine mother-child health programs into the emergency services. Physicians and nurses, particularly those working in the primary health care services, know very well the importance of mother-child health care. Patients with chronic conditions, however, mostly prefer to go to hospital[13], using health centers to obtain their regular prescriptions in normal situations. After the earthquake, therefore, patients with chronic conditions did not choose to use the health centers.

However, recent changes in age groups among the Turkish population have paved the way for an increase in the prevalence of chronic illnesses, and so for an increase in the orientation of health services

Table 5. Percent distribution by institutions of the last follow-up of chronic conditions (Sakarya, November 1999)

Institution	Hypertension (n=30) (%)	Heart diseases (n=10) (%)	COPD[1] (n=12) (%)	Diabetes (n=5) (%)	Rheumatism (n=9) (%)	Others[1] (n=9) (%)
Physician attending temp. settlement.	50.0	20.0	33.3	-	44.4	33.3
Hospital	43.3	80.0	41.7	100.0	55.6	66.7
Other[3]	6.7	-	25.0	-	-	-

1 Chronic bronchitis, chronic asthma

2 Ulcer, paralysis, migraine

3 Physicians from health institutions in the area, foreign health team

towards these chronic illnesses. On the other hand, the population pyramid of the tent area shows that the percentage of aged people is higher than the population pyramid of the region before the earthquake because of migration from the earthquake area. It is necessary to plan health-monitoring programs for chronic illnesses which will increase the sensitivity of both health staff and patients with chronic illnesses towards this issue. A health-monitoring program for chronic illnesses, previously well established, should be well implemented, too, in such cases of probable disasters. The experience of the mother-child health programs indicate that Turkey is able to achieve such a program.

Countries faced with disasters are generally helped by other countries and supported through medical equipment and human resources. However, it is necessary to consider and plan strategically what must be done in the disaster areas before disasters actually occur. For this reason, it would be beneficial if, in countries which often face disasters, special guidelines were designed for the health care services to be provided after disasters. These guidelines should include chronic-illness questioning-techniques, the establishment of laboratories and the running of diagnosis criteria and treatment protocols.

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