*Original Article*

# General home hygiene practices and infectious disease transmission in Malatya, Turkey

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**ABSTRACT**

*Objective:* To determine the general home hygiene practices of housewives and to examine the relationship between hygienic practices in the home and the transmission of infectious diseases symptoms among housewifes.

*Methodology:* This is a cross-sectional study conducted on 339 housewifes. The questionnaire included questions about home hygiene practices: general cleaning, laundry, kitchen hygiene and sociodemographic characteristics and about illness information including whether or not some symptoms had been present within the previous 30 days. The dependent variable, infectious disease transmission was defined as the presence in two or more individuals within the same household of one or more of the same symptoms.

*Results:* In more than one-third of households (122 of 339, 36%), had symptoms during the previous 30 days. Transmission was 16.0% among women who used self-disinfecting sponge, 42.6% among women who used only sponge or clothe (p=0.001). Transmission was found higher among those who used detergent or soap for floor cleaning than women who used bleach. Duration of sponge/clothe use in kitchen and frequency of using bleach was found significant.

*Conclusion:* Home hygiene practices was found relevant to transmission of infectious disease symptoms among household members. Use of disinfectants in home cleaning can have an effective role in home hygiene and healthcare situations.

**KEY WORDS:** Home Hygiene, Infection, Transmission, Infection Risk.

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## INTRODUCTION

Despite the advances made over the past two centuries, infectious disease remains a serious problem, most particularly in developing countries where it is major factor undermining health status and economic progress.[1]

There is now growing recognition that the home plays an important role in several public health and hygiene issues. The home environment has been implicated as one important source of spread of infectious diseases, and hygienic interventions in reducing incidence, particularly in less-developed countries.[2-5]

In many developing countries infectious diseases are the major cause of death particularly of children and incidences of microbial and parasitic infections are many times that in the developed world.[6]

"Hygiene" refers to conditions or practices by which people maintain or promote good health by keeping themselves and their surroundings clean. The home environment, in ways that set it significantly apart from the clinical setting, is an integral part of the broader community.

Although there are specific programs against infectious diseases such as Acut Respiratory Diseases Control Program and Diarrheal Diseases Control programs, infectious diseases are still important public health problem in Turkey.[7] Hygiene practice in the domestic environments is largely a question of an individual's habits and knowledge about the risks.[8] However, only one study examined the relationship between hygienic practices in the home and the transmission of infectious disease symptoms among household members.[9] To our knowledge, there is no study about home hygiene practices in Turkey.

The purpose of this study was therefore, to determine the general home hygiene practices of housewife's and to examine the relationship between hygienic practices in the home and the transmission of infectious diseases symptoms among housewifes living in Malatya province in Turkey.

## METHODOLOGY

*Setting:* This is a cross-sectional study conducted on household women at Adafi Health Center area, in Malatya.

*Study population:* In Turkey, every individual is followed-up according to age, sex characteristics at their homes for the health promotion, counselling and health education.

All of the household determining forms were screened in order to detect all the household women, then names and adresses of these women were listed. There were 3504 household determining forms. As the aim of this study was to examine the relationship between hygienic practices in the home and the transmission of infectious diseases symptoms, the sample was calculated as minimum 320 women regarding a study on the ratio of transmission of infection at home.[2] After choosing the first name randomly from the list of women, 1/10 systematic sampling method was used and, therefore, the representativeness of the study population for the target population was provided. The number of the women in the sample was 350, but four women did not answer all the questions, two women living alone were not included in study, five women were not reached. Hence, the final sample consisted 339 housewives.

*Instrument and Definitions:* The questionnaire consisted of three sections. Section I included questions about sociodemographics characteristics. Section II included questions about home hygiene practices: general cleaning, laundry, kitchen hygiene and personel hygiene. Section III included questions about illness information including whether or not the following symptoms had been present within the previous 30 days: vomiting, diarrhea, fever, runny nose, cough, sore throat, skin infection, any other infections.

The dependent variable, infectious disease transmission in the household was defined as the presence in two or more individuals within the same household of one or more of the same symptoms.

Verbal informed consent was obtained fron the housewifes. The authors declare that they have no conflict of interests.

*Analysis:* Data entry and statistical analysis was performed using the SPSS program. Chi-square test was performed to detect any association between hygiene practices and transmission of infection (two or more persons with same symptoms).

## RESULTS

*General characteristics of the study population:* A total 339 women responsible for home hygiene were included in the study. The mean age of women was 33.96 ± 9.87 years. (Table-I). Transmission of

Table-I: Characteristics of Household women.

| *Age* | *n* | *%* |
|---|---|---|
| ≥24 | 65 | 19.2 |
| 25-34 | 120 | 35.4 |
| 35-44 | 94 | 27.7 |
| 45+ | 60 | 17.7 |
| *Educational Level* | | |
| Primary incomplete | 35 | 10.3 |
| Primary school | 109 | 32.2 |
| Secondary school | 57 | 16.8 |
| High school | 83 | 24.5 |
| College | 55 | 16.2 |
| *Marital Status* | | |
| Married | 263 | 77.6 |
| Never married | 52 | 15.3 |
| Divorced,widowed | 24 | 7.0 |
| *Number of bedroom in the home* | | |
| ≥2 | 39 | 11.5 |
| 3 | 182 | 53.7 |
| 4+ | 118 | 34.8 |
| *Number of person in the home* | | |
| ≥3 | 115 | 33.9 |
| 4-5 | 153 | 45.1 |
| 6+ | 71 | 20.9 |

Table-II: The number of room and the number of person at home and Transmission of Respiratory and Gastrointestinal Illness

| | *Respiratory Illness Transmission* | | | | | | *Gastro-Intestinal Illness Transmission* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Yes | | No | | | | Yes | | No | | | |
| *No. of Room (n:122)* | *n* | *%* | *n* | *%* | $x^2$ | *p* | *n* | *%* | *n* | *%* | $x^2$ | *p* |
| ≤2 | 3 | 21.4 | 11 | 78.6 | | | 1 | 7.1 | 13 | 92.9 | | |
| 3 | 9 | 14.3 | 54 | 85.7 | 5.02 | 0.08 | 6 | 9.5 | 57 | 90.5 | 4.60 | 0.10 |
| 4+* | 14 | 32.6 | 29 | 67.4 | | | 10 | 23.3 | 33 | 76.7 | | |
| *No. of Person (n:122)* | | | | | | | | | | | | |
| ≤ 3 | 6 | 15.4 | 33 | 84.6 | | | 5 | 12.8 | 34 | 87.2 | | |
| 4-5 | 8 | 16.0 | 42 | 84.0 | 7.15 | 0.02 | 4 | 8.0 | 46 | 92.0 | 5.07 | 0.07 |
| 6+* | 12 | 38.7 | 19 | 61.3 | | | 8 | 25.8 | 23 | 74.2 | | |

* p<0.05

respiratory symptoms was higher in homes living 6 or more people (38.7%) (Table-II).

*Home Hygiene Equipments and Transmission of Infection:* Transmission was 16.0% among women who used self-disinfecting sponge, 42.6% among women who used only sponge or cloth (p<0.05). No significant difference was found between the equipments used for cleaning bathroom and transmission. Transmission was found higher among women who used detergent or soap for floor cleaning (41.9%) than women used bleach or water (Table-III).

*Home Hygiene Practices and Transmission of Infection:* While transmission was 18.8% among women who changed sponge/cloth in 1-14 days in the kitchen, it was 42.1% among women who changed in 30 days or more (p=0.03). Transmission was 15.8% among women who used daily bleach on home cleaning, it was 53.3% among women who used in 7 days or more. (Table-IV).

## DISCUSSION

The demographic predictor of transmission risk in this study a higher percentage of number of people living at home (it means crowding) is not surprising.[10] Crowding may sensibly increase the risk of transmission of respiratory infection among the family. The agents of such infections are easily transmitted, usually through air by droplets.[11] A number of epidemiological studies, using different measures of crowding such as total number of residents in the home, number of people sharing the bed, room occupancy, and population density, have reported an association between crowding and respiratory infections.[12-14] Transmission of respiratory symptoms was higher in homes living six or more people in our study.

Two studies have reported an association between household crowding and increased infection in young children.[12,13] One such study noted that infants

Table-III: Used Home Hygiene Equipments and Transmission of Respiratory and Gastrointestinal Illness

| | *Respiratory Illness Transmission* | | | | | | *Gastro-Intestinal Illness Transmission* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Yes | | No | | | | Yes | | No | | | |
| *Kitchen (n:122)* | *n* | *%* | *n* | *%* | $x^2$ | *p* | *n* | *%* | *n* | *%* | $x^2$ | *p* |
| Self-disinfecting sponge | 10 | 13.3 | 65 | 86.7 | | | 6 | 8.0 | 69 | 92.0 | | |
| Only sponge or clothe | 16 | 35.6 | 29 | 64.4 | 8.18 | 0.01 | 11 | 24.4 | 34 | 75.6 | 6.25 | 0.01 |
| *Bathroom (n: 115)* | | | | | | | | | | | | |
| sponge | 9 | 29.0 | 22 | 71.0 | | | 3 | 9.7 | 28 | 90.3 | | |
| brush | 11 | 16.2 | 57 | 83.8 | 4.89 | 0.08 | 10 | 14.7 | 58 | 85.3 | 2.30 | 0.31 |
| clothe | 6 | 40.0 | 9 | 60.0 | | | 4 | 26.7 | 11 | 73.3 | | |
| *Floor cleaning (n:122)* | | | | | | | | | | | | |
| Only water | 1 | 9.1 | 10 | 90.9 | | | 2 | 18.2 | 9 | 81.8 | | |
| bleach | 9 | 13.6 | 57 | 86.4 | 9.65 | 0.01 | 7 | 10.6 | 59 | 89.4 | 1.53 | 0.46 |
| Detergent or soap* | 16 | 37.2 | 27 | 62.8 | | | 8 | 18.6 | 35 | 81.4 | | |

* p<0.05

Table-IV: Home Hygiene Practices and Transmission of Infection.

| | *Transmission Yes* | | *Transmission No* | | | |
|---|---|---|---|---|---|---|
| *Duration of sponge/clothe use in Kitchen (n:121)* | *n* | *%* | *n* | *%* | $x^2$ | *p* |
| 1-14 days | 6 | 18.8 | 26 | 81.3 | | |
| 15-30 days | 10 | 19.6 | 41 | 80.4 | 6.99 | 0.03 |
| > 30 days* | 16 | 42.1 | 22 | 57.9 | | |
| *Duration of bathroom towel use (n:121)* | | | | | | |
| 2 days or fewer | 9 | 28.1 | 23 | 71.9 | | |
| 3-7 days | 14 | 25.9 | 40 | 74.1 | 0.06 | 0.96 |
| > 7 days | 9 | 25.7 | 26 | 74.3 | | |
| *Floor cleaning (n:122)* | | | | | | |
| 2 days or fewer | 16 | 34.0 | 31 | 66.0 | | |
| 3-7 days | 11 | 22.0 | 39 | 78.0 | 2.44 | 0.29 |
| >7 days | 5 | 20.0 | 20 | 80.0 | | |
| *Using bleach ( n:117)* | | | | | | |
| Every day | 3 | 15.8 | 16 | 84.2 | | |
| 2-3 days | 10 | 19.6 | 41 | 80.4 | | |
| 4-7 days | 10 | 31.3 | 22 | 68.8 | 8.27 | 0.04 |
| > 7 days* | 8 | 53.3 | 7 | 46.7 | | |

* $p<0.05$

admitted to a hospital because of lower respiratory tract infection generally lived in very crowded housing, with a mean of 6.4 occupants.[15] Similarly, among Native children in Alaska, the risk of hospital admission because of respiratory syncytial virus infection was significantly associated with living with 7 or more additional people or with 4 or more children, even after controlling for socioeconomic status.[16]

We found that transmission of respiratory and gastrointestinal infection was lower using self disinfected sponge than using only sponge or cloth on kitchen cleaning and it was lower using bleach than using detergent or soap on floor cleaning among households.

Kitchen sponges and rags have been the focus of many studies, and their potential to cause cross-contamination to surfaces is well established.[17,18] Dish cloths and sponges were recognized as a potential source for spreading microrganisms and it was observed that bacteria persisted in these vehicles.[19,20]

Scott and Bloomfield showed that cloths used with only detergent became heavily contaminated during food preparation and the post-preparation cleaning[21]. By contrast, where self disinfecting cloths impregnated with quaternary ammonium disinfectant were used throughout the food preparation and cleaning activities, there was a significant reduction in contamination of both surfaces and cloths.[21]

Only a limited number of field studies have been carried out to evaluate disinfectants under use in the domestic environment.[22] Scott et all. compared with application of a phenolic and hypochlorite disinfectant. After soap and water cleaning, the proportion of contaminated sites was increased to 68%, further indicating the ineffectiveness of soap and water without rinsing as a decontamination precedure[21].

## CONCLUSION

Home hygiene practices was found relevant to transmission of infectious disease symptoms among household members. Transmission of infection was lower using self disinfected sponge than using only sponge or cloth on kitchen cleaning and it was lower using bleach than using detergent or soap on floor cleaning among households. Use of disinfectants in home cleaning can have an effective role in home hygiene and healthcare situations.

Hygiene education may lead to a reduction in infection risk. Marketing of disinfectants could make a contribution to home hygiene and control of infection. Disinfectant manufacturers must be prepared to take a responsible part in educating the public in their correct use. Healthcare professionals can educate the women in routine visits about the link between home hygiene practices and transmission of infectious diseases.

A limitation of this study was that both the hygiene practices and infectious disease symptoms were ascertained by self-report. The presence of infections was not confirmed by physical examination or laboratory diagosis. Despite these limitations, new data on the potential role of the home hygiene in infectious disease transmission were determined. A

relationship was identified between home hygiene practices and transmission of infectious diseases. This potential risk warrants further study in clinical trials.

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