

*Full Length Research Paper*

# Safety research on community pharmacies in Kocaeli

Ozlem Nazan Erdogan\* and Safiye Kaya

College of Hereke Ömer Ismet Uzunyol, Kocaeli University, Marshall Campus, Korfez, 41800- Kocaeli, Turkey.

Accepted 25 February, 2010

The aim of this research was to understand the precautionary measures of pharmacies in terms of safety issues of service. There are 322 community pharmacies in Kocaeli. Cluster sampling was used to select the community pharmacies included into the study. Four of eight regions were selected to this end. Throughout December 2005, face-to-face questionnaires were administered in 156 of 247 community pharmacists in four regions. Two thirds of community pharmacists (33.3%) have described the service area as unsafe. Eighty-eight (88) pharmacists who had inadequate safety measures in their pharmacy indicated 122 reasons. Cost accounted for 64% of these reasons, lack of necessary regulations for 31%, lack of managerial direction for 21%. Pharmacists who had not experienced any threat to security of life and property (n = 47, 40.2%) used a higher ratio of new technology methods (safety measures alarm systems to inform the police and private security firms, sensors on windows and doors, digital video recording systems). Traditional safety measures taken by pharmacists were cameras, window-guards, guns and other objects used as weapons (such as metal bars) and never being alone on night duty. 64% of pharmacists explained their safety measures against earthquake as fixing shelves to the wall. It is understood that in 56% of community pharmacies, there was no provision made for drugs which need to be kept cold during power outages. Thus, In-services needs have to be made and provided for pharmacist regarding safety issues.

**Key words:** Safety, management, security system, community pharmacy, drug.

## INTRODUCTION

Attractive and sophisticated appearance of city-life, increased employment ratio related to extension of job area, intensive usage of technology, and differences of socio-economic situations in different districts, require security measures in all areas. According to the Maslow's Need Pyramid, safety measures have become an essential need. In urbanization phenomenon where industry community of norms are dominant, individuals of better planned and organized city development must have met some of their essential security needs but these needs are divergent according to location and have environmental expectations or anxiety (Çimen, 1992). Increases in crime regarding to commodities is a social reality in developed cities. Causes of increasing crime such as unemployment, drugs and homeless children are elements of a simple but serious topic. However it is

stated that in rural areas there was less rigour but more person-oriented attention (Patrick, 2002). Naturally, violent events create fear and disturb people who experience them causing "lack of confidence". Data from the Turkish Statistical Institute has indicated that security has become a necessity today. According to the Turkish Statistical Institute (2007) regional crime statistics; after Sakarya, Kocaeli was the province having the second highest crime ratio 1598/4856 32.9%). As a type of crime distribution, theft is primary (142/1598), violence is secondary and fraud is third (83/1598) (Turkish Statistical Institute, 2007). As to another report called "crime economics" published by the Turkish Association of Young Businessman in 1998; the rapid increase in population and urbanization were marked among the reasons of crime economics (Özsoylu, 1998). Considering the 2006 Security General Directorate data for all Turkey; ratio of pilfering goods from work place was 12.07% (55967/463834) and shop-lifting from work place was 9.23% (42800/463834) (Security General Directorate, 2008).

\*Corresponding author. E-mail : [nerdogan@kocaeli.edu.tr](mailto:nerdogan@kocaeli.edu.tr). Tel: 90 537 2542556. Fax: 90 262. 5115676

The conditions under which pharmaceutical services were maintained are important, when the pharmaceutical profession has been explicated from the social and behavioural science perspective (Dolinsky, 1982). Today, pharmacists meet the expectations of patients and attempt to solve their problems but they still have the social and commercial anxiety of the profession. Pharmacists face a lot of problematic cases not only during working hours but also on the night duty they provide. Besides this, there are several toxic and harmful narcotics, and other chemicals. Passing over this kind of goods without limits it could cause a serious danger and possibly even death (Meriçli, 2004).

When the theft reports published in the first six months in USA were examined, 907 cases were determined for controlled substances. These cases accounted for 78% of all burglary events, in other words, every day theft occurred in 11 pharmacies (Young, 1974). According to the reports, it happened on night shifts and armed burglaries were remarkably increased. This report showed that the same pharmacy was targeted more than once because the burglar was encouraged by past success to pilfer again. That is, to say it was clear that locking doors alone was not enough to combat theft.

Security in pharmacies, which are the smallest units in the health sector, is an important issue with its different dimension. Besides, community pharmacists, who are the most accessible healthcare members, are faced with a host of difficulties. Safety is described as intelligent provision against all degrees of harmful and destructive events such as fire, sabotage and assault of all kinds and acting for both personnel and buildings in order to provide peaceful and efficient work environments in firms. Safety is determined under three main groups (Meriçli, 2004):

- a) Safety as to applied system and precautions.
- b) Safety as to place in which safety precautions are applied.
- c) Safety as to applying way of precautionary measures.

All community pharmacies are not located in busy provincial centres. Some of them have been serving in underserved areas where means of access has been a problem especially during the night. Accordingly, if pharmacists don't take any security measures, they might pay a penalty with their life (Güncel Eczacılık, 2004). Besides, community pharmacies could be more motivated by improving the safety of structure, process, and outcome criteria of the service.

## Purpose

The aim of this study was to investigate security measures taken by the community pharmacists in their pharmacies and to compare these measures with those which have to be taken as minimum security and safety measures according to the scientific literature.

## MATERIALS AND METHODS

### Participants and procedures

This study is a descriptive one including an analytical approach. There are 322 community pharmacies serving in Kocaeli. Cluster sampling was used to select the community pharmacies included in the study. Four of eight regions were selected to this end. Throughout December 2005, a face-to-face questionnaire was administered to 156 of 247 community pharmacists in four regions; 58 of Gebze, 8 of Körfez, 24 of Derince, and 66 of İzmit districts.

### Instrument

The questionnaire was designed to gather information from six major sections consisting of 18 items; a) demographic data of participants (k = 3 items), b) drugs storage and drug safety (k = 4 items), c) taken measures in pharmacy during service and night duty (k = 3 items), d) personal safety (k = 2 items) e) knowledge of pharmacy location (k = 3 items) f) in-service training (k = 3 items). Questionnaire was developed according to the scientific literature (Pegg, 1973; Young, 1974; Patrick, 2002; Meriçli, 2004). First, a pilot study was carried out in 10 pharmacies to improve the questionnaire. The participants were asked if any of the questions in the survey were confusing. Some modifications were made using feedback from this pilot study.

### Procedures for gathering data

Before starting the survey, senior chief of the Pharmacist Chamber of Kocaeli was called, and the aim of the study was explained. He informed all community pharmacists about this survey to be done, by e-mail. Participation was voluntary. Applying questionnaire procedure was performed by 10 undergraduate students registering at the Private Security Programme at the College of Hereke Ömer İsmet Uzunoğlu, University of Kocaeli. They were trained about the questionnaire techniques before starting the survey. Pharmacy addresses list was obtained from the Kocaeli Chamber of Pharmacist. Students went to same pharmacy three times, if the pharmacist did not present in pharmacy at the moment of the visit. Students worked in couple.

### Statistical analysis

Both age and service duration were considered to be numeric variables, while gender, pharmacy location, night duty, safety measure of pharmacy, life and property security, drug safety, glass cabinet, pharmaceuticals that are to be kept in refrigerator, earthquake and in service education were considered to be categorical variables. The numerical variables were shown as an arithmetical mean and standard deviation, whereas, the categorical variables were shown as frequencies and percentages. The numerical variables were tested with Student's t-test if the variables were distributed normally. The categorical variables were tested with the Pearson chi-square, and with Mc Nemar, if the variables were dependent. The significance level was set at 0.05. Statistical analysis was carried out with the SPSS Ver. 15.0.

## RESULTS

### Sociodemographic results

According to the study findings; 97 pharmacists were

**Table 1.** Description of the pharmacy location where service provided.

Pharmacy location	Declared as safe N (%)	Declared as unsafe N (%)	Total N (%)
Gebze	35 (61.4)	22 (38.6)	57 (100.0)
Körfez	4 (50.0)	4 (50.0)	8 (100.0)
Derince	13 (54.2)	11 (45.8)	24 (100.0)
Izmit	47 (75.8)	15 (24.2)	62 (100.0)
Total	99 (65.6)	52 (34.4)	151 (100.0)

**Table 2.** New technology and traditional security methods used during day time working hours and night duties.

		Safety measures on night duty		Total N (%)
		New technology N (%)	Traditional method N (%)	
Safety measures used during (day time) working hours	New technology	53 (67.1)	26 (32.9)	79 (100.00)
	Traditional method	5 (7.4)	63 (92.6)	68 (100.00)
Total		58 (39.5)	89 (60.5)	147(100.00)

Mc Nemar  $p < 0,01$ .

women, 59 were men. Distribution of community pharmacies in four regions is as follow: 58 in Gebze, 8 in Körfez, 24 in Derince, and 66 in Izmit. The mean age and duration of service of community pharmacists are  $42,70 \pm 11,02$  (25 - 11.02 - 68),  $15,55 \pm 10,37$  (0.33 - 13 -43), respectively.

## Relating to structural elements of service

### Pharmacy location

Community pharmacies were asked to describe whether the location of the pharmacy where services were provided, was safe or not. One third of community pharmacists (52/151) described the region as unsafe. When the regional distribution of pharmacies is examined (Table 1), 50% of the pharmacists in Körfez stated that the region was unsafe. But it should be mentioned that there are only eight pharmacies in this region. The second most unsafe region was Derince (45.8%), the third was Gebze (38.6%).

### Night duty

Twenty three percent of pharmacies had a night duty shift once every 15 days, 41% once a month and 5% once a week).

### Safety measure of pharmacies

Safety measures taken by pharmacists for their pharmacies can be divided into two main groups; new

technology and traditional methods. Some pharmacists marked more than one of the safety measure options at the same time. But once the new technology option was marked they were included into the new technology group. New technology included alarm systems to inform the police and private security firms, sensors on windows and doors, digital video recording systems; traditional methods included cameras, window-guards, guns and other objects used as weapons (such as metal bars) and never being alone on night duty.

The difference between security measures used on night duty and during the day was statistically significant (Mc Nemar,  $p < 0,01$ ) (Table 2). Although pharmacists use new technologies on day shifts they prefer traditional methods on night duties ( $n = 26$ ).

The difference between security measures used on day shifts in declared safe and unsafe regions was statistically significant (Pearson  $\chi^2 = 0,041$ ,  $p < 0,05$ ) (Table 3). Pharmacists who declared the region safe preferred traditional methods for day time working hours ( $n=52$ ).

More than one answer would be marked for the question regarding description of knowledge of safe and unsafe regions. Approximately 90 (89.7%) of pharmacists described it according to personal knowledge, 31.4% of pharmacists to hearsay, 18.6% of pharmacists to media, 16% of pharmacists police data.

Eighty-eight (88) pharmacists who had inadequate safety measures in their pharmacy indicated 122 reasons. Cost accounted for 64% of these reasons, lack of necessary regulations for 31%, lack of managerial direction for 21% , difficulties of accessing services 3%, and lack of reference resources 3%. The reasons dealing with inadequate pharmacy safety measures are 73% because of the cost, 35% due to lack of necessary regulations and 24% due to lack of managerial direction.

**Table 3.** Distribution of security measurements taken during working hours according to pharmacy region.

		Pharmacy region		Total N (%)
		Safe N (%)	Unsafe N (%)	
Safety measures used during (day time) working hours	New technology	46 (60.5)	30 (39.5)	76 (100.0)
	Traditional method	52 (76.5)	16 (23.5)	68 (100.0)
Total		98 (98.0)	46 (31.9)	144 (100.0)

Pearson  $\chi^2 = 0.041$ ,  $p < 0.05$ .

**Table 4.** Distribution of new technology and traditional safety measures for pharmacists who had experienced and for those who had not experienced threats to security of life and property during working hours.

		Safety measure on night duty		Total N (%)
		New technology	Traditional method	
		N (%)	N (%)	
Threats to security of life and property during working hours	Yes	11 (33.3)	22 (66.7)	33 (100.00)
	No	47 (40.2)	70 (59.8)	117 (100.00)
Total		58 (39.5)	92 (61.3)	150 (100.00)

Pearson  $\chi^2 = 0.507$ ,  $p > 0.05$ .

### Life and property security

On night duties, there is no statistically difference between usage of new technology and traditional safety measure of pharmacists who had never experienced any threat to security of life and property (Table 4). Pharmacists who had not experienced any threat to security of life and property ( $n=47\%$ , 40,2) used a higher ratio of new technology safety measures.

### Distribution of safety measures and demographic result

In terms of average age, there is no statistically difference between usage of new technology and traditional safety measures of pharmacists who had and had not experience any threat to security of life and property on night duty (Student-T Test for independent groups  $t=1,471$ ,  $p>0.05$ ). But in terms of average age, there is a statistically difference between those who did not experience any threat during working hours (Student-T Test for independent groups  $t=2,260$   $p<0.05$ ). Pharmacists using new technology were younger (average age  $41\pm 10,97$ ).

In terms of average service year, there is no statistically difference between usage new technology and traditional safety measure of pharmacist who did not experience any threat to life and property security on night duties (Student-T Test for independent groups  $t=1,826$ ,  $p>0.05$ ). It is understood that pharmacists having higher number of service years preferred traditional safe measures. In terms of average service year, there is statistically

significant difference between usage of new technology and traditional safety measures of pharmacists who did not experience any security threat to life and property during working hours (Student-T Test for independent groups  $t=2,449$ ,  $p<0.05$ ). Pharmacists using traditional safety measures had more years of service (average service year  $216\text{ months}\pm 132,10$ ).

### Drug safety

#### Glass cabinet

It is necessary that drugs requiring red and green prescriptions can be confidently kept in the pharmacy. Pharmacists stated that these kinds of drugs were kept in locked opaque cabinets, 62%, in the back of the pharmacy, 22%, in locked glass cabinets, 12%, under lock and key, 11%. One-hundred and thirty-nine pharmacists (89.1%) reported that all drugs were kept in glass cabinets, 6% of pharmacist reported in opaque cabinets.

#### Pharmaceuticals that are to be kept in the refrigerator

The ratio of pharmacists using a refrigerator for drugs needing to be kept cold is 85%, those using uninterruptible power supply (UPS) is 3%, pharmacists using both is 12%. In answer to the question about measures against long blackouts: 30% of pharmacists said that they have not yet faced this kind of long blackout problem, 31% of them put a generator in circuit, 19% have taken no measures, 9% of them kept drugs in

ice, 7% of them carried drugs to the refrigerator at home.

### **Earthquake**

Pharmacists were asked about earthquake measures. 64% of pharmacists explained their safety measures against earthquake as fixing shelves to the wall, 44% of them reorganized the pharmacy, 31% of them got insurance.

### **In-service education**

Approximately one third of pharmacists (48/152, 31.6%) have stated that they had not been informed about in-service education related to safety, more than half of them (84/152%, 55.3) did not participate in it. The participation ratio of pharmacists on courses was 13.2 % (20/152).

## **DISCUSSION**

### **Discussion on safety/unsafety of the region**

Nearly all pharmacists (90%) declared pharmacy region as safe or unsafe based on their own-information, 31.4% on hearsay, 18.6% on media, and 16% on the police. It draws attention to the fact that the police should have been ranked as primary sources of confidential information but were in fact last. This is pointing out an intersectorial lack of communication.

City life can be divided into fields where intensity and speed are geometrically increased and others that are not increased (Çimen, 1987). So it is not necessary to protect a pharmacy in Kocaeli to the same degree as a pharmacy in a province where crime ratios are low. Safekeeping ratio of a pharmacy is directly related to crime ratio on service area of the pharmacy. Accordingly pharmacists must benefit from scientific data when they describe their pharmacy location is safe or unsafe. We have seen assault such as physical assault, threat, harassment, snatch-and-run theft involving violence to pharmacists and pharmacy personnel as a social problem. Whether or not an area is safe could be ascertained by crime ratio statistics belonging to the area. Rational information resources for describing pharmacy area must be emphasized during in-service courses of pharmacies.

Adequate level of education on safety topics is one of the basic conditions of preventive security system (Meriçli, 2004). In the USA (Scott et al., 2001) one of the topics in pharmacy in-service courses is application of security systems. But it is seen from this study that 55% of pharmacists did not participate in security courses and one third of them were unaware of the courses. This

situation can underline a lack of communication between pharmacists and The Chamber of Pharmacists or it might be a consequent of pharmacists' disinterested in in-service education or lack of knowledge about security topics.

### **Discussion on drugs security**

#### ***Glass cabinet***

One-hundred-thirty-nine pharmacists (89.1%) reported that all drugs were kept in glass cabinets. It is reported that open-display and self-selection techniques encourage shopping impetus and increases sales. But this technique also increases pilfering. Pharmaceuticals that are openly displayed may be a crime triggering element. Consequently both crime triggering components must be eliminated and appropriate security systems adopted in pharmacies (Pegg, 1973).

#### **Pharmaceuticals that need to be kept cold**

As to results of the questionnaire administered to 500 people 18 years of age and over, living within the Istanbul Municipality city border by Actual Pharmacist Journal and Macro Research Firm in 1994, two thirds of participants described pharmacists as "reliable" (Aktüel Eczaci Dergisi, 1974). This consequence is highly praiseworthy for a profession working in a critical field such as drug and health. Because "reliable" is not a easily acquired image. Once it has been gained by a pharmacist he/she must behave in a professionally appropriate way in order to maintain the image. Being in a pharmacy, giving advise, providing proper storage conditions are the risky subjects that influence pharmacy image.

Thirty percent of pharmacists have stated that there have not been any long power shortages in their pharmacies to date. But it made an impression that there were not any measures against the possibility of long power shortages. Besides this 19% of pharmacists said that they have not taken any measures and 7% of them carried drugs to the refrigerator at home. So, it is thought that more than half of pharmacists (56%) were not aware of serious risk in terms of drug stability or were not prepared for risk management. However preserving drug stability is a professional responsibility and drug stability constitutes a subtitle of drug safety. Consequently each pharmacist must take measures against the possibility of power shortage in the pharmacy. Long-term power shortages cause problems. Therefore the probability of giving heat effected pharmaceuticals to patient can result in very serious legal problems.

Establishing and maintaining a system to ensure suitable storage conditions for unstable pharmaceuticals and provide proper security systems to protect

pharmaceuticals and other goods against pilfering were described as required fields of competency for community pharmacists (Dunn and Hamilton, 1986). These topics must be included in educational courses for pharmacists. According to a press message published in 2007, the Ministry of Education promised to educate and support personel (Hurriyet, 2007). Especially the Chamber of Pharmacists must have security items placed on pharmacy courses.

## Discussion on structure of service provided

### Life- prosperity security

Pharmacist who did not experience any security threat to life and property (n=47%, 40.2) used new technological safety measures at a higher ratio (Table 4). However there is no statistically significant difference between usage of new technology and traditional safety measures of pharmacist who had not experience any security threat to life and property to date.

### Working hours / night duty

23% of pharmacists were on night duty once every 15 days, 41% of them once a month, 5% of once a week. Problems occur more frequently on night duty. Providing night duty is obligatory for pharmacies. Night duty functions have been determined by regulations and planned by the Chamber of Pharmacists according to regional conditions, pharmacy numbers, and population. As to Pharmacists and Pharmacies Regulation number 29, pharmacists who provide night duty do not have to keep the pharmacy opened, but if there is any service request they must provide it. It is not mentioned any specific measure dealing with security for pharmacists who having a risky night duty. Locking the door and unlocking it when a patient comes is certainly not an assurance. Night duty is mostly a gainful occupation for pharmacists and means of being a health profession who can help in the "weak and hopeless" situation for patients. Thus patients can feel comfort and confident. On the other hand, it is faced by pilfering, snatch-and-run, and assault that threats society. In 1994, a pharmacist was murdered. That brought "making light of security" and "need an urgent solution" into sharf relief. When the regulation was examined, attention was drawn to the fact that currently safety measures were in adequate.

### Cost

Seventy-three percent of pharmacists marked the cost as a cause for inadequacy of pharmacy safety measures. One probability of risk happening, evaluations related cost for organization must be calculated and investment

must made to decrease risks becoming true. Danger and risk analysis research must be taken into account when deciding on pharmacy location. Geophysical features of surroundings such as earthquake, close vicinity of stadium or meeting area, number and opportunities of public service vehicles, special social problems belonging to the region such as street children must be taken into consideration.

Most suitable technologies can be decided by risk assessment by use of police statistics, scientific data, and socioeconomic situation of working area. First it would bethought that it could increase cost. But in the long-term, cost would be lower than that of possibility of risk happening. the Chamber of Pharmacies must collaborate with security sector on this process. In USA, local preventive crime units have advised on security topics by informing and by comparing problem and solution of other business serving in the same area.

Pharmacy area can be taken under two headings in order to use for risk evaluation:

- a. Area where potential effects are high but possibility of crime actually happening is low; pharmacy close to the police, central or well lightened, being on main street, continously busy street or pharmacies having security system and being well lightened.
- b. Area where potential effects are low but possibility of crime actually happeningis high; place where pharmacy is in covered shopping arcade, in the dark or on streets with high vehicle traffic, not having internal security system or place where lighting is inadequate.

## Earthquake

Geographical factors are described as a variable to be considered on determining security needs (Meriçli, 2004). Kocaeli is located in a highly dangerous region. Many people died and work places were damaged by an earthquake which happened (7.4 on the scale) in August 1999 in Kocaeli. It shows that it must be considered seriously. According to study results; 64% of pharmacists explained their safety measures against earthquake as fixing shelves to the wall, 44% of them reorganized the pharmacy according to the needs of escaping earthquake, 31% of them were insured against the damages of earthquake.

## Conclusion

It is understood that safety knowledge and conscious level of community pharmacists service in Kocaeli and safety elements of pharmaceutical service were not adequate. Consequently community pharmacies must increase the precautionary measures of pharmaceutical services in their pharmacies.

## RECOMMENDATIONS

Safety of health services in hospitals, in health centers, and in pharmacies can be provided by safety measures to prevent pilfering, sensitive goods, building, equipment, and pivotal personnel (Meriçli, 2004). Pharmaceutical security standards should be determined and applied because pharmacies can not hire security men. Hereby "minimum safety standards" (MSS) are suggested in this study. Thus, basis and principal to plan and apply measures to security of physical (building, equipment), personnel, and drugs or other products having secrecy feature were determined. MSS need to be implemented regardless of region's risk grade.

There has to be a video camera and alarm system coordinated by police on a 7 days/24 h basis. This system covering working hours and night duties has a deterrent effect on persons oriented towards violence. Besides in case of event happening, it provides the information that leads to the criminals being caught.

- (i) There has to be UPS and sensor to protect drugs and other products and to control heat.
- (ii) Risk management must be done to apply standards. To do this, first of all, potential risks must be determined and pharmacy region's grade needs to be described such as less or more. Official crime statistics are to be used for these evaluations.
- (iii) Technical faults are to be fixed as soon as possible.
- (iv) Measures are to be taken against fire and flammable and chemicals.
- (v) Physical security elements are to be determined:
  - (a) Door security, wire fence, window-guard.
  - (b) Interior and exterior lighting.
  - (c) Methods of passing over important information to authorities in short-term.
  - (d) reaching police force by pressing a bottom of electronic system when pharmacist are under threat.
- (vi) Pharmacy acting order must coordinate with established security system and education dealing with this topic must be audited in certain periods. There must be a place for holding audit communication with coordinated unit or to underline behaviour regulations.
- (vii) Special regulations are to be developed according to night duty bases. For example dispensing prescription from window, lighting, window-guard, duty change bases of personnel.
- (viii) Blind spots must be fixed in pharmacy.
- (ix) After standards applied, audits must be done by government.
- (x) Pharmacy personnel who are to be responsible for security system have to be instructed.
- (xi) Technology usage of all pharmacists has to be improved according to risk categories of pharmacy area.
- (xii) Pharmacy personnel must be trained to use security equipment and understand that the process of catching thieves is a security problem (Pegg, 1973).

(xiii) Additional security measures involving upper technologies can be considered after MSS have been applied. For this purpose, pharmacy association or chamber must coordinate with the police force, security sector, pharmacy schools, decision makers.

(xiv) Legal regulations are to be made in pharmacy law and regulations in terms of security. For example some suggestions of security measures against workplace-pilfering can be taken from web-site of several police forces (Tokat Polis Office, 1995).

(xv) MSS must be operative when pharmacy is open.

## ACKNOWLEDGEMENTS

Special thanks to Kocaeli Pharmacy Chamber for providing access to the pharmacists, and Deborah Elliot for checking the English grammar of the manuscript.

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