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ANALYSIS OF WORK ACCIDENTS IN MARKET CHAIN ACTIVITIES*

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Abstract

This study aims to identify the factors affecting work accidents in the market chains, present protective recommendations and create a public opinion about work accidents in this sector. The study first included data on 321 work accident victims from 109 different branches of a market chain in Istanbul in 2019, 2020 and 2021, and the study was completed with the data of 290 victims after the necessary data extraction. Statistical Package for the Social Sciences 25 (SPSS) trial version is used for data analysis. Frequency and Cross Tabulation (Chi-Square) Analyses were also used in the study. Frequency analyses provided a better understanding of the data set under study. Chi-Square Analyses were used to investigate the relationships between the variables of task and damaged organs and equipment resulting in injury. According to the analysis results, it is found that the work accident and injury types are affected by the occupation of the employees as well as the used tools and equipment. The results of this study provide recommendations to employers, occupational safety experts, employees, public institutions with audit-control authorities and liabilities in the occupational safety field in the market chains and academicians and researchers studying the occupational safety area to be protected from work accidents and negative consequences.

Keywords: Occupational Health and Safety, Work Accident, Statistical Analysis and Practices, Market Chain Activities

JEL Classification: J28, J81, Z22

ZİNCİR MARKET FAALİYETLERİNDE MEYDANA GELEN İŞ KAZALARININ İNCELENMESİ

Öz

Bu çalışmada zincir marketlerde meydana gelen iş kazalarını etkileyen faktörlerin belirlenmesi, koruyucu tavsiyelerin sunulması ve bu sektördeki iş kazaları hakkında kamuoyu oluşmasına katkı sağlanması amaçlanmıştır. Araştırmaya İstanbul'daki bir zincir marketin 109 farklı şubesinde 2019, 2020 ve 2021 yıllarında meydana gelmiş iş kazalarından etkilenen 321 kazazede verisi ile başlanmış, gerekli veri ayıklamaları sonunda 290 kazazedeye ait verilerle çalışma tamamlanmıştır. Verilerin analizinde, Statistical Package for the Social Sciences 25 (SPSS)'in deneme sürümünden faydalanılmıştır. Çalışmada Sıklık ve Çapraz Tablolama (Ki-Kare) Analizleri kullanılmıştır. Yapılan Sıklık Analizleri sayesinde, üzerinde çalışılan veri setinin daha iyi anlaşılması sağlanmıştır. Ki-Kare Analizleriyle; görev ve zarar gören organ, görev ve yaralanmaya neden olan araç gereç, zarar gören organ ve yaralanmaya neden olan araç gereç değişkenlerin birbirleri ile olan ilişkileri sorgulanmıştır. Bu analizlerin sonuçlarına göre; iş kazaları ve yaralanma çeşitlerini; çalışanların mesleklerinin, kullanılan araç ve gereçlerin etkilediği bulgusuna ulaşılmıştır. Çalışma sonunda, iş kazaları ve zararlı sonuçlarından korunmak için; işverenlere, iş güvenlik uzmanlarına, çalışanlara, iş güvenliği alanında denetim - kontrol yetkisi ve sorumluluğu bulunan kamu kurumlarına, zincir market ve iş güvenliği alanında araştırma yapan araştırmacılara önerilerde bulunulmuştur.

Anahtar Kelimeler: İşçi Sağlığı ve İş Güvenliği, İş Kazası, İstatistiksel Analiz ve Uygulamalar, Zincir Market Faaliyetleri

JEL Sınıflaması: J28, J81, Z22

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1. Introduction

An analysis of the Social Security Institution (SSI) data reveals that the number of people who had work accidents in Turkey is between 359.000 and 430.000, and the number of victims who lost their lives is between 1.147 and 1.633 (SGK, 2023). Work accidents occur predominantly in the metal and construction industries, consecutively while the ones with the fatality rates are primarily seen in the construction, transportation, and mining industries (Taylan, 2008; Yardım et al., 2007). Most academic studies in Occupational Health and Safety notably relate to these sectors. In this context, according to literature, Güllüoğlu and Güllüoğlu (2019) compare the data on the frequency of work accidents in Turkish construction sites with that of European Union countries and make some suggestions to prevent work accidents in Turkey accordingly. Gözüak and Ceylan (2021) studied work accidents in Turkish construction sites and suggested a series of measures. Ayanoğlu and Kurt (2019) designed an accident probability model using the work accident data from 165 workplaces in the metal industry. Dündar, Bilim and Bilim (2018) also analysed work accidents in Turkish mining activities and made some suggestions. Gökçe and Zorluer (2022) performed a fault tree analysis with the data on deaths and injuries resulting from construction work accidents in Turkey and showed that this method could be used in the construction industry. Demir et al. (2021) investigated the relationship between job satisfaction and job safety perception of construction workers and recommended increasing job satisfaction and job safety perception at the end of the study. Öztürk and Heperkan (2021) studied the effects of overall and seasonal factors affecting the severity of construction work accidents and suggested ways to reduce the severity. İlknur and Ürünveren (2021) analysed mining accidents in their study and recommended ways to prevent possible accidents in underground coal mines. Koçali (2022) analysed work accidents in the mining sector in terms of lost working days and gender and suggested ways to reduce these work accidents. The most substantial commonality of these sectors is that they are classified as very dangerous regarding occupational health and safety. The latest statistics show that it is of utmost importance to carry out studies required to ensure the health and safety of employees. Apart from these sectors, work accidents also occur in workplaces classified as less dangerous. However, the literature review indicates that the number of academic studies on work accidents in these sectors is insufficient.

It is ubiquitous to see less dangerous workplaces have dangerous operations in Turkey. Since these workplaces are classified as less dangerous and occupational safety violations are

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unnoticed, serious work accidents might occur. A lack of proper health and safety conditions is assumed to be a crucial reason for these work accidents.

In order to ensure and improve occupational health and safety conditions at workplaces in Turkey, the Occupational Health and Safety Law No. 6331 was put into effect in 2012. According to this law, workplaces are divided into three groups: very dangerous, dangerous and less dangerous. Occupational health and safety services are compulsory in very dangerous, dangerous and less dangerous sectors (Official Gazette, 2012). However, Article 6 of this code being put into effect is on hold for the less dangerous workplaces due to amendments at different times. Finally, with code no 7252 dated 23.07.2020, the effective date is postponed again until 31.12.2023 (Official Gazette, 2022). This postponement of Article 6 does not require the employment of occupational safety experts in workplaces with less than 50 employees and less dangerous workplaces, which may lead to a false perception that occupational health and safety practices are not mandatory in less dangerous workplaces with less than 50 employees. Due to this misperception, it is difficult to ensure occupational health and safety conditions in less dangerous workplaces with less than 50 employees. However, this law obliges the provision of health and safety conditions in less dangerous workplaces with less than 50 employees. Although some workplaces have less than 50 employees and are classified as less dangerous, their activities may include dangerous operations.

Market chains are a fine example. Although market chains are classified as less dangerous, their operations include several dangerous activities varying from product supply, storage, and processing to display, sales, and recycling. An analysis of the Statistical Chart on Work Accidents and Occupational Diseases published by Social Security Institution (SSI) reveals that there are 16.397 casualties, including 32 death cases, in similar operations – though there is no clear indication of the market operations. Of all industries, the casualty rate is 4.27%, and the death rate is 2.6% (SGK, 2023). Work accidents from such dangerous operations go unnoticed since the industry is flagged as less dangerous. The literature study does not point to any research solely focusing on work accidents in Turkish market chains. The latest statistics and literature study shows a growing need for studies on work accidents in this sector to form a basis of descriptive analysis and measures.

2. Objective

This study aims to conduct a descriptive analysis of work accidents in market chain operations; contribute to public awareness of work accidents in the market chain industry; determine the

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most vulnerable occupational groups to work accidents in the industry; classify tools and devices causing limb injuries based on occupations; to determine measures to be followed and make suggestions to protect the limbs with a high probability of being injured.

3. Scope

The study covers the data of 321 work accident victims from a chain supermarket in Istanbul in 2019, 2020 and 2021, with 109 branches and 2800 employees. Data were classified as similar tasks, incidents, tools, and devices during the collection process. 31 work accidents and casualties are considered out of the study scope as they could not be classified in any group or had insufficient information.

4. Limitations

As the study subject, the market chain has various operations ranging from storage, department sales, processing, and sales of meat products and greenery and deli products. Figure 1 is designed to describe the processes.

Figure 1. Product Flow Chart in Chain Market

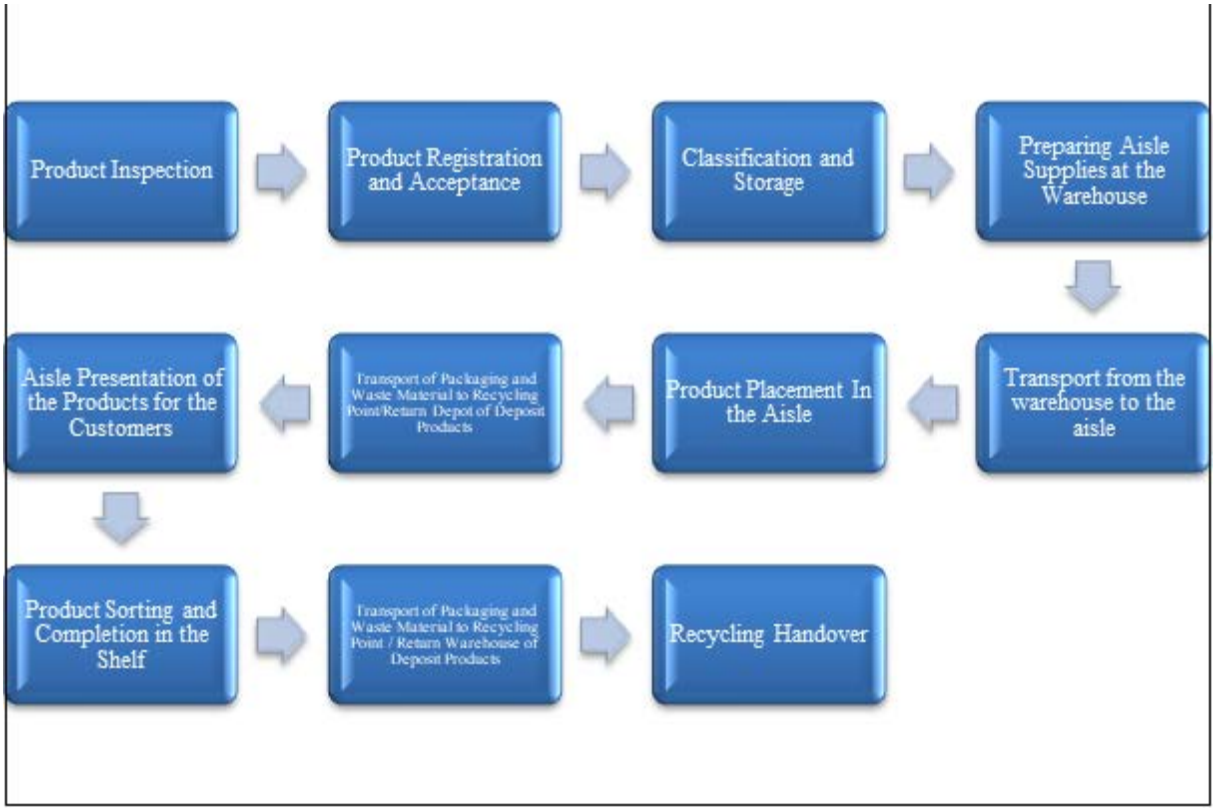

Figure 1 shows the 7-stage process from accepting a product to the warehouse and dispatch. The supplier's product is subjected to a general inspection in the product inspection phase. If the product is shipped from the central warehouse of the chain market, no separate inspection

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is performed. The product is received after being counted and registered in the branch inventory in the product registration and acceptance phase. The products are grouped according to their characteristics in the classification and storage phase and transported to the appropriate warehouses. Pallet trucks and manual transport methods are generally used in these transport operations. Products are prepared in the warehouses in line with the needs reported from the departments and transported to the front of the departments through pallet trucks. The packaging of the products is opened, and the products are placed on the shelves. The packaging and waste materials generated at this stage are transported to the warehouse by pallet trucks. The products placed on the shelves are offered to the customer. The missing products on the shelf are completed, and the products that have lost their properties are sorted. At this stage, the resulting packaging and waste materials are transported to the storage area with pallet trucks. The waste materials accumulated in the recycling warehouse are delivered to the contracted recycling company. This study is descriptive research on work accidents that occur only in the steps mentioned above of chain markets. Therefore, one must remember that study results might solely represent the features of work accidents in market chains with similar operations.

5. Method

Frequency analysis and cross-tabulation analyses (Chi-Square) were used in the study. Frequency analyses are widely used to understand and summarise the studied data set. Cross-tabulation analysis is a non-parametric method to determine the relationships of categorical data. This method compares the two variables' change states in the subcategories via cross-tabulation (Scheffe, 1947; Sims, 2000; Baradan et al., 2016; Akşehir et al., 2019; Öztürk, 2020). For this comparison, the table in Figure 2 has been initially designed.

Figure 2. Observed Sample Table

Observed		Variable (1)		
		Category (1.1)	Category (1.2)	Row Sum
Varible (2)	Category (2.1)	a	b	a+b
	Category (2.1)	c	d	c+d
	Column Total	a+c	b+d	a+b+c+d

Source: Sümbüloğlu and Sümbüloğlu, 2017; Öztürk, 2020

The category cells in Figure 2 present the data set's frequency values. By summing these frequency values, row and column, totals of the table are obtained. Based on this table's row and column totals, Figure 3 presents the expectations (Öztürk, 2020).

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Figure 3. Expected Sample Table

Expected		Variable (1)		
		Category (1.1)	Categori (1.2)	Row Sum
Varible (2)	Category (2.1)	((a+c).(a+b))/(a+b+c+d)	((b+d).(a+b))/(a+b+c+d)	a+b
	Category (2.1)	((a+c).(c+d))/(a+b+c+d)	((b+d).(c+d))/(a+b+c+d)	c+d
	Column Sum	a+c	b+d	a+b+c+d

Source: Sümbüloğlu and Sümbüloğlu, 2017; Öztürk, 2020

While creating the table of expectations in Figure 3, firstly, the row and column totals from the observed table are transferred to this table exactly. Then, each category cell's row totals and column totals are multiplied by each other and divided by the total. With this calculation method, each cell of the expectations table is filled (Öztürk, 2020). After this stage, the Pearson Chi-Square χ^2 calculation value is obtained through Equation 1 using the data in the observed and expected table (McHugh, 2013; Sümbüloğlu and Sümbüloğlu, 2017).

$$\chi^2 = \sum_{i=1}^{n} \frac{(G_i - B_i)^2}{B_i} \quad (1)$$

G_i : Observed Frequency

B_i : Expected Frequency

After obtaining this calculation value, the degrees of freedom (df) are calculated by using the number of rows and columns of categories in the table of expectations through Equation 2.

$$\mathrm{df} = (\text{number of rows} - 1).(\text{number of columns} - 1) \quad (2)$$

The Chi-Square (χ^2) table value is obtained by comparing the degrees of freedom obtained in Equation 2 and the acceptable margin of error of the research. Pearson Chi-Square calculation and table values obtained by these calculations are compared. In this comparison, if the calculated value is greater than the table value, it is concluded that there is a statistically significant relationship between the variables. In cases where the calculation value is less than the table value, it is decided that there is no statistically significant relationship between the variables. If a significant relationship is determined between the variables, the strength of this relationship is calculated through Equation 3.

$$\Phi = \sqrt{\frac{x^2}{N}} \quad (3)$$

χ^2 : Pearson chi-square value

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N : Number of Samples

The Phi (Φ) value obtained with Equation 3 is considered to be weak if the relationship is between 0.00 - 0.10, moderate if the relationship is between 0.11 - 0.30, and strong if the relationship is greater than 0.30 (Healey, 2014; Öztürk, 2020). If the analyses are performed with the help of SPSS, as in this study, the observed and expected tables, Pearson Chi-Square (χ^2) calculation value, degrees of freedom (df), and Φ values can be easily accessed without any other calculation.

6. Findings

Table 1 shows the task frequency distribution of the casualties from the data.

Table 1. Task Frequency Distribution

Task	Frequency	Percentage (%)
Butchery	126	43,4
Aisle	48	16,6
Storage	42	14,5
Deli	38	13,1
Grocery	36	12,4
Total	290	100

Source: The chart is modelled by the author using SPSS.

Table 1 shows the frequency distribution of 290 accident victims based on their duties. According to this frequency distribution, 43,4% of the victims were butcher workers, 16,6% were aisle workers, 14,5% were warehouse workers, 13,1% were deli workers, and 12,4% were greengrocer workers. According to these results, butcher employees have the most frequent work accidents in chain supermarkets, followed by department, warehouse, deli and greengrocer employees in terms of the frequency of work accidents. The frequency distribution of the organ injury in subjects whose data were used in the study is given in Table 2.

Table 2. Frequency Distribution of the Organ Injury

Organ Injury in Work Accident	Frequency	Percentage (%)
Finger	152	52,4
Arm	66	22,8
Waist	48	16,6
Foot	24	8,3
Total	290	100

Source: The chart is modelled by the author using SPSS.

Table 2 shows the frequency distribution of 290 accident victims according to the type of injured organ. According to this frequency distribution, 52,4% of the injured organs are fingers, 22,8% arms, 16,6% waist and 8,3% feet. According to these results, finger injury is the most

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common injury in chain supermarkets. Finger injuries are followed by arm, waist and foot injuries, respectively. Table 3 shows the Frequency Distribution of the Incident, Tool, and Devices resulting in injury.

Table 3. The Frequency Distribution of the Incident, Tools, and Devices Resulting in Injury

The Incident, Tool and Devices Resulting in Injury	Frequency	Percentage (%)
Knife and Utility knife	168	57,9
Handling Heavy Load, Dropping Materials or Falling from a Height	60	20,7
Pallet Trucks, Gates, and Doors	48	16,6
Knocker, Cutting Board, Grinder for Meat, Salami and Cheese Cutting Machines, Stretching Machine, Tin Containers for Olives and Cheese	14	4,8
Total	290	100

Source: The chart is modelled by the author using SPSS.

Table 3 shows the frequency distribution of the events, tools and equipment that caused injuries to 290 victims. According to this frequency distribution, 57,9% of the incidents, tools and equipment causing injuries were knives and box cutters, 20,7% were heavy load carrying, material fall or fall from height, 16,6% were pallet trucks, gates and doors, 4,8% were meat mallet, meat cutting board, meat grinder, salami and cheese cutting machine, stretching machine, olive and cheese can. According to these results, knives and box cutters are the tools that cause the most injuries in work accidents in chain supermarkets. In terms of the frequency of incidents, tools and equipment causing injuries, knives and box cutters are followed by heavy load carrying, material falling, falling from a height, pallet trucks, gates and doors, meat mallet, meat cutting board, meat grinder, salami and cheese cutting machine, salami and cheese cutting machine, stretching machine, olive and cheese tin. Table 4 shows the analysis results for Chi-Square between the task and the injured organ variables.

Table 4. Chi-Square Analysis Chart for Task and Injured Organ Variables

	Value	Degree of Freedom	Significance (p)
Pearson Chi-Square	298,335a	12	0,000
Likelihood Ratio	288,399	12	0,000
Linear-by-Linear Association	0,060	1	0,807
Number of Observations	290		
a. 4 cells (20.0%) have expected values less than 5.			

Source: The chart is modelled by the author using SPSS.

An analysis of Table 4 points to a statistically significant correlation between the task and injured organ variables ($p<0,05$). Table 5 points to the Phi Test result pointing to the correlation degree.

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Table 5. Phi Analysis Table for Task and Injured Organ Variables

	Value	Significance (p)
Phi	1,014	0,000
Cramer's V	0,586	0,000
Number of Observation	290	

Source: The chart is modelled by the author using SPSS.

When Table 5 is analysed, it is seen that Phi (1,014) value is greater than 0.30, and this relationship is accepted to be at a strong level (Healey, 2014). A cross table has been prepared for the task and injured organ variables to interpret this correlation for the subcategories, as shown in Table 6.

Table 6. Cross Table for the Task and Injured Organ Variables

			Butchery	Storage	Grocery	Aisle	Deli	Total
Injured Organ	Arm	Observed Value	36	0	12	18	0	66
		Expected Value	28,7	9,6	8,2	10,9	8,6	66,0
	Foot	Observed Value	0	6	0	18	0	24
		Expected Value	10,4	3,5	3,0	4,0	3,1	24,0
	Waist	Observed Value	6	36	0	6	0	48
		Expected Value	20,9	7,0	6,0	7,9	6,3	48,0
	Finger	Observed Value	84	0	24	6	38	152
		Expected Value	66,0	22,0	18,9	25,2	19,9	152,0
Total		Observed Value	126	42	36	48	38	290
		Expected Value	126,0	42,0	36,0	48,0	38,0	290,0

Source: The chart is modelled by the author using SPSS.

Table 6 shows that the observed value for the arm is greater than the expected value in cross-table analysis for butchery, grocery, and aisle employees. The observed value for the foot is greater than the expected value in cross-table analysis for storage and aisle employees. The observed value for the waist is greater than the expected value in cross-table analysis for storage employees. Table 7 shows the results of the Chi-Square analysis between tasks and tools, and devices resulting in injury.

Table 7. Chi-Square Analysis Table for Task and Tools and Devices Resulting in Injury

	Value	Degree of Freedom	Significance (p)
Pearson Chi-Square	495,855a	12	0,000
Likelihood Ratio	442,265	12	0,000
Linear-by-Linear Association	5,132	1	0,023
Number of Observation	290		
a. 4 cells (20.0%) have expected values less than 5.			

Source: The chart is modelled by the author using SPSS.

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Table 7 points to a statistically significant correlation between the task and the tools and devices resulting in injuries (p<0,05). Table 8 shows the Phi Test outcome for the correlation degree.

Table 8. Phi Analysis Table for the Task and Tools and Devices Resulting in Injury

	Value	Significance (p)
Phi	1,308	0,000
Cramer's V	0,755	0,000
Number of Observation	290	

Source: The chart is modelled by the author using SPSS.

Analysis of Table 8 reveals that the value of Phi (1,308) is greater than 0,30, and this relationship is accepted to be at a strong level (Healey, 2014). A cross table has been prepared for the task and tools and devices causing injury to interpret this correlation for the subcategories, as shown in Table 9.

Table 9. Cross Table for the Task and Tools and Devices Causing Injury

			Task					Total
			Butchery	Storage	Grocery	Aisle	Deli	
Tools and Devices Resulting in Injury	Handling Heavy Load, Dropping Materials or Falling from a Height	Observed Value	6	42	12	0	0	60
		Expected Value	26,1	8,7	7,4	9,9	7,9	60,0
	Pallet Trucks, Gates, and Doors	Observed Value	0	0	0	48	0	48
		Expected Value	20,9	7,0	6,0	7,9	6,3	48,0
	Knife and Utility knife	Observed Value	108	0	24	0	36	168
		Expected Value	73,0	24,3	20,9	27,8	22,0	168,0
	Knocker, Cutting Board, Grinder for Meat, Salami and Cheese Cutting Machines, Stretching Machine, Tin Containers for Olives and Cheese	Observed Value	12	0	0	0	2	14
		Expected Value	6,1	2,0	1,7	2,3	1,8	14,0
Total		Observed Value	126	42	36	48	38	290
		Expected Value	126,0	42,0	36,0	48,0	38,0	290,0

Source: The chart is modelled by the author using SPSS.

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Table 9 reveals that the observed value in cross tables cells for Handling Heavy Loads, Dropping Materials, or Falling from a Height is greater than the expected value for storage and grocery employees. The observed value in cross tables cells for Pallet Trucks, Gates, and Doors is greater than the expected value for aisle employees. The observed value in cross tables cells for Knife and Utility knife is greater than the expected value for butchery, grocery, and deli employees. The observed value in cross tables cells for Knocker, Cutting Board, Grinder for Meat, Salami and Cheese Cutting Machines, Stretching Machine, Tin Containers for Olives and Cheese is greater than the expected value for butchery and deli employees. Table 10 shows the results of the Chi-Square analysis between the injured organ and tools and devices resulting in injury.

Table 10. Chi-Square Analysis Table for the Injured Organ and Tools and Devices Resulting in Injury

	Value	Degree of Freedom	Significance (p)
Pearson Chi-Square	279,658a	9	0,000
Likelihood Ratio	279,501	9	0,000
Linear-by-Linear Association	34,713	1	0,000
Number of Observation	290		
a. 5 cells (31,3%) have expected values less than 5.			

Source: The chart is modelled by the author using SPSS.

Table 10 points to a statistically significant correlation between the injured organ and the tools and devices resulting in injuries ($p<0,05$). However, Chi-Square analysis requires a value less than 5 in a maximum of 20% of expected value cells (Sharpe, 2015). This criterion has not been met solely in this part of the analysis. Since it might be considered a limitation, it is possible to suggest a meaningful relationship. Table 11 shows the Phi Test outcome for the correlation degree.

Table 11. Phi Analysis Table for the Injured Organ and Tools and Devices Resulting in Injury

	Value	Significance (p)
Phi	0,982	0,000
Cramer's V	0,567	0,000
Number of Observation	290	

Source: The chart is modelled by the author using SPSS.

Analysis of Table 11 reveals that the Phi (0.982) value is greater than 0.30, and this relationship is accepted to be at a strong level (Healey, 2014). A cross table has been prepared for the injured organ and tools and devices causing injury to interpret this correlation for the subcategories, as shown in Table 12.

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Table 12. Cross Table for the Injured Organ and Tools and Devices Causing Injury

			Injured Organ				Total
			Arm	Foot	Waist	Finger	
Tools and Devices Resulting in Injury	Handling Heavy Load, Dropping Materials or Falling from a Height	Observed Value	18	6	36	0	60
		Expected Value	13,7	5,0	9,9	31,4	60,0
	Pallet Trucks, Gates, and Doors	Observed Value	18	18	6	6	48
		Expected Value	10,9	4,0	7,9	25,2	48,0
	Knife and Utility knife	Observed Value	18	0	6	144	168
		Expected Value	38,2	13,9	27,8	88,1	168,0
	Knocker, Cutting Board, Grinder for Meat, Salami and Cheese Cutting Machines, Stretching Machine, Tin Containers for Olives and Cheese	Observed Value	12	0	0	2	14
		Expected Value	3,2	1,2	2,3	7,3	14,0
Total		Observed Value	66	24	48	152	290
		Expected Value	66,0	24,0	48,0	152,0	290,0

Source: The chart is modelled by the author using SPSS.

Table 12 reveals that the observed value in cross tables cells for Handling Heavy Load, Dropping Materials or Falling from a Height is greater than expected value for the injured arm, foot and waist. The observed value in cross tables cells for Pallet Trucks, Gates and Doors is greater than expected value for the injured arm and foot. The observed value in cross tables cells for Knocker, Cutting Board, Grinder for Meat, Salami and Cheese Cutting Machines, Stretching Machine, Tin Containers for Olives and Cheese is greater than expected value for the injured arm.

7. Discussion, Conclusion and Suggestions

Although the market chain industry is classified as less dangerous, it includes a series of dangerous operations from supply, storage, and processing to display, sales, and recycling. An analysis of work accidents in market chains unveils that accidents intensify in aisle, butchery, grocery, and deli. Upon analysis of accidents, study findings were compared to work accidents in similar operations from literature, and thus suggestions were put forward.

A cross-table was used to compare the tasks with the market chain employees' injured limbs due to a work accident. Employees predominantly suffer from arm, hand, and finger injuries in butchery (Akman et al., 2018; Çoktu, 2015); muscle and skeleton injuries in storage (Murat, 2016; Gönen et al., 2017; Murat and Yılmaz, 2021); finger injuries in deli, aisle, and grocery (Çoktu, 2015). A cross-table was used to compare the tasks with the tools and devices, resulting in injury in market chains. Injuries mainly occur due to knives in butchery (Biçer, 2016); heavy loads and packages in storage (Murat, 2016; Gönen et al., 2017; Murat and Yılmaz, 2021); knives and utility knives in grocery; pallet trucks and Gates in the aisle (Kurt, 2019); knives,

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salami and cheese cutting machines and frequently cheese and olive tins in the deli (Fişek, 2014). A cross-table was used to compare the injured limb and the material causing the injury. Dropping heavy and unstable loads and bumping sharp and hard surfaces damage feet (Murat and Yılmaz, 2021). Carrying heavy and unstable loads also hurts the waist (İlhan et al., 2010; Mordeniz and Sıvacı, 2010; Sedef et al., 2005); using knives and utility knives frequently leads to finger injuries (Dağlı and Serinken, 2012); opening cheese and olive tins also leads to finger cuts (Fişek, 2014). The study results align with the academic research findings on similar activities.

There are some essential and simple measures to take. It is possible to provide employees working in butchery with steel knit gloves, finger guards, and arm guards under safety monitoring; employees in storage with training on ergonomics and handling; employees in grocery with protective gloves to open packages and sort fruits; employees in transport with training on pallet trucks as well as periodical maintenance of pallet trucks; employees in the deli with tools to open cheese and olive tins and training on how to use sharp deli tools; employees in transport with steel-toed shoes under safety monitoring. These measures are assumed to mitigate the accident impact and reduce the number of accidents in market chains. The suggestions above are already required for most industries classified as very dangerous and dangerous, and both employers and employees are expected to follow them. However, during the data collection process, it has been observed that these simple and low-cost measures are not included in administrative principles but submitted to the employees' initiative in market chains. As a result, public institutions in charge of auditing and monitoring occupational safety are advised to improve the quality and quantity of supervision for dangerous or very dangerous tasks in industries not classified as very dangerous. Academicians working on occupational safety are advised to study a larger sample and create mathematical models.

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