



NWSA-Vocational Sciences
ISSN: 1306-3111/1308-7355
NWSA ID: 2014.9.1.2C0047

Status : Original Study
Received: September 2013
Accepted: January 2014

E-Journal of New World Sciences Academy

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<http://dx.doi.org/10.12739/NWSA.2014.9.1.2C0047>

**A STUDY INTO THE VIEWS OF PLAIN WEFT-KNITTING SECTOR REPRESENTATIVES
MANUFACTURING WOMEN'S TOPWEAR OVER DEMOGRAPHIC FEATURES, THE STRUCTURE
OF THE BUSINESS QUALITY CONTROL PROCESS**

ABSTRACT

In the current study, it was aimed to obtain and analyze the views of plain (V-bed) weft-knitting sector representatives manufacturing women's top wear in the cities of Ankara and Istanbul over demographic features, the institutional and personal staff of factories, and quality perceptions and applications. In this purpose, 8 businesses acting in the sector of women's top wear in the city of Ankara and 24 in Istanbul were applied the questionnaire form of interview prepared by the researcher. Depending on the data, it was found that the businesses were working with a double shift system (8 hours x 2) having a production annual capacity of 200.000 pcs. It was also determined that authorities thought that the employees working in the knitting department were adequate in terms of quantity and quality, expected them to enjoy their work and be willing. It was found that they organized an in-service training for the employees on how to use the machinery as well.

Keywords: Knitting Wear, Plain Weft-Knitting,
Women's Top Wear, Quality, Quality Control

**BAYAN ÜST GİYİM ÜRETİMİ GERÇEKLEŞTİREN ATKILI DÜZ ÖRME SEKTÖRÜ
TEMSİLCİLERİNİN DEMOGRAFİK ÖZELLİKLERİ, İŞLETME YAPISI VE KALİTE
KONTROL SÜRECİNE İLİŞKİN GÖRÜŞLERİNİN DEĞERLENDİRİLMESİ**

ÖZET

Bu araştırmada Ankara ve İstanbul illerinde bayan üst giyim üretimi gerçekleştiren küçük ölçekli işletmelerde atkılı düz (V yatak) örme sektör temsilcilerinin; demografik özellikleri, fabrikaların kurum ve personel özellikleri, kalite anlayışları ve uygulamaları ile ilgili görüşlerinin elde edilmesi ve değerlendirilmesi amaçlanmıştır. Bu amaçla Ankara ilinde 8, İstanbul ilinde 24 örme bayan üst giyim alanında faaliyet gösteren işletmeye araştırmacı tarafından geliştirilen anket formu uygulanmıştır. Elde edilen verilere göre, Araştırma kapsamındaki işletmelerin limitet şirket statüsünde, küçük ölçekli, yıllık 200.000 adet üretim kapasitesine sahip çift vardiya sistemi (8 saat x 2) ile çalıştıkları belirlenmiştir. Yetkililerin örme bölümünde görev alan çalışanların, nicelik ve nitelik bakımından yeterli buldukları, işini sevmesi ve istekli olmasını bekledikleri anlaşılmıştır. Çalışana makine kullanımı konusunda hizmet içi eğitimi verdikleri belirlenmiştir.

Anahtar Kelimeler: Örme Giyim, Atkılı Düz Örme, Bayan Üst Giyim,
Kalite, Kalite Kontrol.



1. INTRODUCTION (GİRİŞ)

Knitting is a method of making the successive loops of yarn into a stitch through knitting equipment and then obtaining a textile surface by making a connection of these stitches with the other stitches in the latitudinal and longitudinal direction.

The fact that knitted products is widely used in such areas as under and outer wear, upholstery, medical wear and medical tools and so on has an increasing effect on the demand for knitted products in the market in Turkey. In particular, the texture of the knitted outdoor products, the warmth they give, their characteristic of embracing the body, their usability and aesthetics are the major factors that increase the demand for them. As a result, knitting sectors perform their productions benefitting from the current developed technology in order to meet the demands in different terms depending on the individual's comfort, aesthetic value, fashion movement, and economic and social status.

The machinery knitting production in Turkey started in 1920s and there became a big increase in the knitting plants in parallel with the importance of the industrial and manufacturing sectors in 1950s. With the improvement of electronic industry and the introduction of it to the knitting area in 1960s, electronic control unit and control systems were started to use. When it comes to 1980s, the capacity of color, design and technical formation at knitting machines increased with the introduction of computer age [1].

With the industrial revolution, machinery usage decreased the cost and it has been the only determiner of sales for the product for many years. In the following years, modern management systems were developed and the quality came to the forefront with the creation of conscious customers [2].

It is necessary for a country aiming at export in textile to be more careful in terms of quality. Among the most important factors for the businesses in order to stand on their own feet, to provide customer satisfaction and to become a preferable choice, the qualitative production comes to the fore [3].

Quality is a significant concept in human's life. There are various definitions for quality. Quality is the combination of the features exhibiting the skill to meet certain needs [4]. It is a desired and expected standard [5]. It is the case of a product or a service which fulfils the expected performance at the highest level [6]. It is all the conditions and features desired by the buyer [7]. It is the indispensable factor of customer satisfaction and a criterion comprising the whole business [8]. It is the judgment given by its customer or user about a product or service [9]. It is the suitability with the purpose of usage and wishes of customers [10].

Quality starts with control. Quality control is the control carried out not only for the finished product but also for each stage. The statistical quality control for textile business must be carried out in three stages as introduction control (the control of the suitability of raw material, semi-product and other materials) and outcome control (the suitability of the product obtained at the end of the production with the desired features and standards)[11].

The purpose of obtaining the standard quality is to produce good quality products for a long period at the same level of quality. Only the interlude and final controls are not enough in obtaining this purpose. Therefore, it is essential to develop a well-organized quality system. The responsibility of the production quality belongs to the production management made up of various stages such as the group chief for training (the trainer), group chief (band chief), main group chief, production chief and business manager and so on [12].



The knitting sector, which is considered within the textile sector having a significant share in Turkish economy should necessarily be in a position of being able to export, make its businesses develop at a competitive level in foreign and domestic fields, highlight the concept of quality in the fields of production and service in order that it is accepted and finally pay attention to the issues of total quality and quality control. Quality control plays a significant role for the businesses to be successful in both foreign and domestic markets. Each business aims at setting up quality units, decreasing the defect to the zero level and find the ways to produce in low costs in order to achieve the success and maintain it [13].

2. RESEARCH SIGNIFICANCE (ÇALIŞMANIN ÖNEMİ)

Thinking that economic development is multi-directional, the determination of the views regarding the quality perceptions and applications of the plain (V-bed) weft-knitting sector manufacturing women's top wear within the textile industry today is of great importance in terms of supplying those who would like to make a research with a source in this field.

3. MATERIAL AND METHOD (MATERYAL VE YÖNTEM)

The research was carried out in the plain (V-bed) weft-knitting businesses acting in the field of small scaled women's knitted top wear registered in the sector of Ankara and Istanbul Chamber of Industry and Knitted Outwear Industry. A total 32 businesses, 8 in Ankara and 24 in Istanbul, were determined through a random sampling out of 160 businesses that comprise the population of the research (Table 1.) The average annual capacities of the businesses were 200.000 pcs. The questionnaire prepared by the researcher was used as the data collection instrument. The questionnaire was applied by face-to-face interviews with the authorities in the businesses, and the material of the research was gathered.

Table 1. The Distribution of The Study Population and Sampling
(Tablo 1. Araştırmanın Evren ve Örneklem Dağılımı)

Cities	Population	Sample	%
Ankara	40	8	25
Istanbul	120	24	75
TOTAL	160	32	100

The interview form was prepared to collect data about the demographic features of the authorities in the knitting businesses; (gender, age, educational status, the field and the period of working), the institutional and staff features of the business (the structure of the business, shift work systems of the businesses, the number of the employees and the departments they work, the quantitative and qualitative competence of the employees, the attitudes and behaviors expected from the employees, in-service training activities), quality perception and applications (quality documents, quality purposes, quality control application stages, instruments related to quality control, applications aiming at improving the product quality, units related to quality control, views over the rate of separating the products as the second quality, and presented to the individuals with the dialogue technique. It was applied to the authorities in the businesses by face-to-face interviews. In the statistical analysis of the data the frequency and percentage values were calculated and the findings were tabulated. In



the tables where more than one answer was marked in the questionnaire, totality was not taken and "n" numbers were given.

4. FINDINGS AND DISCUSSION (ARASTIRMA BULGULARI VE TARTISMA)

4.1. The historical Development of Knitting and its Current Position (Örmenin Tarihsel Gelişimi ve Bugünkü Durumu)

Even though such techniques as the production of thread, weaving and sewing have been applied since the antiquity, the beginning of knitting is not completely known to us. It is made clear through the archaeological excavations that some Central Asian Turks and Egyptians were dealing with knitting work in 6th and 5th centuries B.C.[1]

Hand knitting depending on forming knots with such tools as different kinds of needles or without tools constituted the basis of the first knitting machine produced by William Lee in England in 1589. Working with the system of single bearing, this machine looked like a loom. In 1758, Jedediah Strutt developed a double bearing knitting machine and in 1789 Decroix Wise produced a round knitting machine, contributing to the knitting sector significantly [14].

While the knitted products were produced as a handmade knitting, electronic and computer assisted machines that are able make a mass production very fast in order to meet the knitting products replaced the traditional ones currently. In that way, there became an opportunity to make an easy and very fast production in a great variety in many knitting businesses.

4.2. The Evaluation of the Interview Forms Applied to the Sector Representatives (Sektör Temsilcilerine Uygulanan Görüşme Formlarının Değerlendirilmesi)

4.2.1. Knowledge Regarding the Demographic Features of Individuals (Bireylerin Demografik Özelliklerine İlişkin Bilgiler)

Knowledge on gender, age, educational status, the field and working period regarding the demographic features of the authorities acting in the sector was evaluated and given in Table 2.

Table 2. Knowledge Regarding The Demographic Features of Individuals (Tablo 2. Bireylerin Demografik Özelliklerine İlişkin Bilgiler)

Choices	Cities		Ankara		Istanbul		Total	
	n	%	n	%	n	%	n	%
1. Genders								
Man	6	75.0	21	87.5	27	84.3		
Woman	2	25.0	3	12.5	5	15.7		
Total	8	100.0	24	100.0	32	100.0		
2. Ages								
26-30	-	-	3	12.5	3	9.4		
31-35	1	12.5	3	12.5	4	12.5		
36-40	2	25.0	8	33.3	10	31.2		
41-45	1	12.5	2	8.3	3	9.3		
46-50	3	37.5	2	8.3	5	15.7		
51 and over	1	12.5	6	25.0	7	21.9		
Total	8	100.0	24	100.0	32	100.0		

As given in Table 2, 84.32% of the authorities in the plain knitting plants were men, while 15.7% of them were women. It is likely to say that the authorities were mostly men in the knitting facilities. Depending on the Table 2, it is likely to say that 31.2% were in the age group of 36-40, 21.9% were 51 and over, 15.7% were 46-50, 12.5% were 31-35, 9.4% were 26-30 and 9.3% were in the age group



of 41-45. According to WHO, people under 35 years of age are regarded as young, those in the age group of 36-69 are middle aged, and the ones in their 70 and over are considered in the elderly group [15]. It is possible to say that the majority of the ones dealing with this profession are in the middle age group.

Table 3. Knowledge regarding the educational status, the field and working period
(Tablo 3. Bireylerin eğitim durumu, alanı ve çalışma süresine ilişkin bilgiler)

Choices	Ankara		Istanbul		Total	
	n	%	n	%	n	%
1. Educational Status - Graduate of						
Primary School	1	12.5	7	29.1	8	25.0
Secondary School	1	12.5	1	4.1	2	6.2
High School	3	37.5	11	45.9	14	43.7
College	1	12.5	-	-	1	3.1
University	2	25.0	5	20.8	7	21.9
Total	8	100.0	24	100.0	32	100.0
2. Fields of Education						
Textile	-	-	3	12.5	3	9.4
Business	1	12.5	2	8.3	3	9.4
Economy	-	-	3	12.5	3	9.4
Engineer of Chemistry	1	12.5	1	4.2	2	6.2
Engineer of Physics	1	12.5	-	-	1	3.1
Stylist/Designer	-	-	1	4.2	1	3.1
None	5	62.5	14	58.3	19	59.4
Total	8	100.0	24	100.0	32	100.0
3. Working Period						
6-10 years	1	12.5	9	37.5	10	31.2
11 years and over	7	87.5	15	62.5	22	68.8
Total	8	100.0	24	100.0	32	100.0

As for the educational status of the authorities in Table 3, it is clear that 43.7% of the participants were a graduate of a high school, 25% were a graduate of a primary school, 21.9% were graduated from a university, 6.2% were a graduate of a secondary school and 3.1% were a graduate of a college. It was found that they started their profession after they graduated from a high school and they were raised in the profession with a relation of master and apprentice up to the current time. Therefore, the level of a university graduation was lower.

In terms of the educational fields of the participants, 59.4% did not have training in the field, while 9.4% had an education in the field of textile, business and economy, 6.2% were chemical engineers, 3.1% were a stylist/designer and engineer of physics. As shown in the Table presenting the educational status of those dealing with this profession, the authorities did not have an education in their fields since they completed their education at a high school in both of the cities and they had their experience with the ones they were working in relation with a master and an apprentice and they started their own business later on.

Depending on Table 3, it is likely to say that the working period of the participants was 11 years and over at the rate of 68.8%, 31.2% of them were at the age group of 6-10 years. When we think the majority of the participants comprised the middle age group and those graduating a high school started their professional life at the age of



25-26 after completing their military service, it is clear that their working period is parallel with the age group of 36-40 working 11 years and over.

4.2.2 Knowledge Regarding the Institutional and Staff Features of the Businesses (İşletmelerin Kurum ve Çalışan Özelliklerine İlişkin Bilgiler)

The knowledge regarding the structure of the businesses related to the institutional and staff features of those acting in the sector, the shift-work systems, the numbers of the workers and the departments they work, the qualitative and quantitative competence of the workers, the attitudes and behaviors expected from the workers and in-service training activities were evaluated and given in Tables.

The data showing the structure and shift-work systems of the plain knitting businesses were evaluated and given in Table 4.

Table 4. The Institutional Features of Businesses
(Tablo 4. İşletmelerin Kurum Özellikleri)

Choices	Cities		Ankara		Istanbul		Total	
	n	%	n	%	n	%	n	%
1. Structures of Businesses								
Limited Company	8	100.0	23	95.8	31	96.9		
Corporation	-	-	1	4.2	1	3.1		
Total	8	100.0	24	100.0	32	100.0		
2. Shift-work Systems								
One shift (10-11 hours)	2	25.0	2	8.3	4	12.5		
Double shift (8 hour x 2)	6	75.0	15	62.5	21	65.6		
Three shift (8 hour x 3)	-	-	7	29.2	7	21.9		
Total	8	100.0	24	100.0	32	100.0		

Depending on the structures of the businesses included in the research, 96.9% were limited company and 3.1% were a corporation. It is likely to say that founded with at least two real or legal entity, a limited company is preferred, as corporations are expensive, time consuming to establish and they have long formalities in this process.

Shift-work system is a system aiming at making some of the workers work in certain hours during the day and making the others work in different hours in order to increase the activity and the opening hours of a business. It is used to make the production constant [16]. It is applied as one, double and triple shift-work in the businesses.

As for the shift-work of the businesses included in the research, it was found that 65.6% of the worked as double shift-work, 21.9% worked as three shift and 12.5% worked as one shift. The owners of the businesses in Istanbul pointed out that they worked as three shifts in order to make more production and provide employment depending on the balance of supply and demand. Double shift hours varied as 08.00-16.00 and 16.00-24.00.

The data regarding the number of the workers and the departments they worked regarding their quantitative and qualitative competence were evaluated and given in Table 5.



Table 5. The Features of The Employees Working in The Businesses
(Tablo 5. İşletmelerde Çalışanları Nözellikleri)

Choices	Ankara		Istanbul		Total	
	n	%	n	%	n	%
1. The number of the workers and the departments they work						
Knitting	68	17.6	253	24.9	321	22.9
Looping machine	31	8.0	153	15.0	184	13.1
Ironing	28	7.2	71	7.0	99	7.0
Quality control	23	5.9	87	8.6	110	7.8
Plain stitch	39	10.1	55	5.4	94	6.7
Packaging	9	2.3	76	7.5	85	6.0
Overlock stitch	42	10.8	48	4.7	90	6.4
Cutting	41	10.6	48	4.7	89	6.3
Marketing	40	10.3	49	4.8	89	6.3
Design	12	3.1	56	5.5	68	4.8
Accountancy	14	3.6	32	3.2	46	3.2
Decorating	13	3.3	26	2.6	39	2.7
Store/ distribution	8	2.0	18	1.8	26	1.8
Purchasing	5	1.2	15	1.5	20	1.4
Washing	6	1.5	7	0.7	13	0.9
Modelling	5	1.2	5	0.5	10	0.7
Hemming	2	0.5	4	0.4	6	0.4
Stop-stitching (bartacking)	-	-	5	0.5	5	0.3
Office boy	-	-	4	0.4	4	0.2
Label / Button and button hole	-	-	3	0.2	3	0.1
Total	386	100.0	1015	100.0	1401	100.0
2.Quantitative competence of workers						
Yes	7	87.5	22	91.7	29	90.6
No	1	12.5	2	8.3	3	9.4
Total	8	100.0	24	100.0	32	100.0
3.Qualitative competence of workers						
Yes	4	50.0	17	70.8	21	65.6
No	4	50.0	7	29.2	11	34.4
Total	8	100.0	24	100.0	32	100.0

As given in Table 5 regarding the number of workers in the businesses and the departments they worked, it was found that knitting department had the highest value with a rate of 22.9%, while button-button hole and label department had the lowest at the rate of 0.1%. The nearest one to this value was the looping machine with a rate of 13.1%. Collar is an essential machine for knitting businesses and it is used for the band lacing. Also, the number of employees in the departments of ironing, quality control, plain stitch, packaging, overlock, cutting, marketing, design, accountancy, decoration, store/distribution, purchasing, washing, modelling, hemming, stop-stitching or bartacking and office boy tasks were found low.

As a result of the interviews with the authorities, it was found that the parts of a product were knitted at the machine first then they were transferred to the ready-made department in order to turn into a finished product in a process depending on the model feature. It was also found that since the process of button hole in this department was not applied to every product, few workers were employed in this department and that those working in the department of labelling were also working in other departments, the labels were added during the process of combining the parts.

It was determined through the interviews with the authorities that they closed down most of the ready-made departments (plain stitch, hemming, stop-stitching, button-button hole, decoration, over lock, looping machine etc.) and they provided them as sub-production from other companies, so reducing the production costs.

As given in Table 5 regarding whether the number of workers was sufficient in the businesses included in the research, 90.6% said yes and 9.4% said no. It was found that the businesses did not have any problem at the number of workers. It is likely to say that the number of workers were sufficient due to the fact that each new worker becomes a burden for the business in terms of insurance, transportation, food etc.

As shown in Table 5, 65.6% of the staff had sufficient quality, while 34.4% were not competent. Depending on this result, it is likely to say that business owners did not expect much from their workers as their educational status was not so high.

The attitudes and behaviors the businesses expected from their workers and their in-service activities were evaluated and given in Table 6.

Table 6. The Attitudes and Behaviors The Businesses Expected from Their Workers and Their In-Service Activities
(Tablo 6. İşletme Çalışanından Beklenen Tutum ve Davranışlar ve Hizmetiçi Eğitim Faaliyetleri)

Choices	Cities		Ankara		Istanbul		Total	
	n	%	n	%	n	%	n	%
1. Expected attitudes and behaviors								
Loving his job and being willing	6	75.0	22	91.7	28	87.5		
Being competent in the field - work experience	8	100.0	19	79.2	27	84.4		
Fulfilling the task in time	7	87.5	19	79.2	26	81.2		
Being open to innovations and being able to produce ideas	6	75.0	19	79.2	25	78.1		
Being harmonious in human relations	5	62.5	18	75.0	23	71.9		
Having business ethics	5	62.5	20	83.3	25	71.9		
2. In-service training activities								
Machinery usage	8	100.0	14	58.3	22	68.7		
Quality control	4	50.0	14	58.3	18	56.2		
Participation to fairs	5	62.5	5	20.8	10	31.2		
Seminars and courses of sellers	1	12.5	8	33.3	9	28.1		
Efficient time using	3	37.5	4	16.7	7	21.9		
Design development	3	37.5	3	12.5	6	18.7		
Research and Development studies	1	12.5	4	16.7	5	15.6		
Seminar participation	-	-	2	8.3	2	6.2		

Ankara n: 8 İstanbul n:24 Total n:32

As given in Table 6 regarding the expectations, 87.5% of the workers preferred the attitudes and behaviors of loving his job and being willing, 84.4% expressed their ideas as being competent in the field-work experience, 81.2% did it as fulfilling his task in time, 78.1% were for being open to innovations and being able to produce ideas, 71.9% expressed their preference as being harmonious in human relations and having business ethics.

It is likely to say that a worker working willingly will be more productive and successful and due to the fact that it would have a positive effect on the business, the employers wanted their employees to have this feature the most.



As given Table 6, , the machinery usage was the highest with a rate of 68.7%, in terms of in-service training issues, while seminar participation had the lowest rate as 6.2%.

It is clear with this result that machinery usage was given more importance in terms of providing the tasks of the employees regularly and in a correct way and they did not motivate the workers to participate in seminars and so on. It is likely to say that the budget allocated to research and development studies will cause a burden on the business and also they are not aware of the fact that business is a significant way towards branding. The trust felt for the branded products is increasing day by day today and they are preferred by consumers. Therefore, it would be true to say that in the case focusing on the design in the process of branding, businesses will be in a preferred position both in domestic and international markets.

4.2.3. Knowledge Regarding the Quality Perception and Applications of Sector Representatives (Sektör Temsilcilerinin Kalite Anlayışı ve Uygulamalarına İlişkin Bilgiler)

Regarding the quality perception and applications of sector representatives, their views over quality documents, quality control application stages, tools used in quality control, application aiming at improving the product quality, units related to quality control, the separation rate of products as a second quality, the case of applying working study and its purpose were analyzed and given in Tables.

Table 7. The Quality Documents The Sector Representatives Have in The Businesses

(Tablo 7. Sektör Temsilcilerinin İşletmelerinde Sahip Oldukları Kalite Belgeleri)

Choices	Cities		Ankara		Istanbul		Total	
	n	%	n	%	n	%	n	%
The quality documents owned								
Brand registry	-	-	4	16.6	4	12.5		
Ekoteks	1	12.5	1	4.2	2	6.2		
ISO 9001	2	25.0	-	-	2	6.2		
ISO 9002	1	12.5	-	-	1	3.2		
ISO 14000	1	12.5	-	-	1	3.2		
No certificate	3	37.5	19	79.2	22	68.7		
Total	8	100.0	24	100.0	32	100.0		

As given in Table 7, businesses have no quality certificates. The highest rate for that was 68.7%. They had brand registry at the rate of 12.5%, Ekoteks and ISO 9001 at the rate of 6.2%, Woolmark blend, ISO 9002 and ISO 14000 at the rate of 3.1%. It was found as a result of the interviews with the authorities that Eko-teks and brand registry documents are the documents needed for international sales, therefore those exporting goods have to obtain these certificates. Depending on the application of the quality control by the businesses, all of the businesses pointed out that they did it. The purpose of the business for the application of quality control and the stages of quality control applications were evaluated and given in Table 8.



Table 8. The Purpose of The Business For The Application of Quality Control and The Stages of Quality Control Applications
(Tablo 8. İşletmelerin Kalite Kontrol Amacı ve Kalite Kontrol Uygulama Aşamaları)

Choices	Ankara		İstanbul		Total	
	n	%	n	%	n	%
1. The purpose of quality control						
Good quality	8	100.0	23	95.8	31	96.9
Customer satisfaction	8	100.0	23	95.8	31	96.9
Reliability	5	62.5	18	75.0	23	71.9
Brand	6	75.0	17	70.8	23	71.9
Competition	2	25.0	5	20.8	7	21.9
2. Quality control application stages						
Knitting	8	100.0	21	87.5	29	90.6
Pre and post ironing	7	87.5	22	91.6	29	90.6
Raw material purchase and storing	6	75.0	17	70.8	23	71.9
Ready-made clothing	7	87.5	16	66.6	23	71.9
Washing-drying	6	75.0	10	4.2	16	50.0
Packaging - controlling of the number	5	62.5	6	25.0	11	34.3
Design	1	12.5	5	20.8	5	15.6
Dying-post printing	-	-	5	20.8	5	15.6

Ankara n: 8 İstanbul n:24 Total n:32

As was given in Table 8, the purposes of the businesses for quality control were as follows: good quality and consumer satisfaction 96.9%, reliability and branding 71.9% and competition 21.9%.

Customer satisfaction is of great importance for the maintenance of the businesses, since what is expected from the businesses is to satisfy the customer not only once, but rather constantly. Therefore, having a qualitative product would satisfy the customer and play a significant role in making them a constantly demanding one.

Depending on Table 8, the stages the businesses applied for the quality control were knitting and post ironing and pre and post ironing at the rate of 90.6%, raw material purchase and storing and ready-made clothing at the rate of 71.9%, washing and drying at the rate of 50.0%, packaging and the control of the number at the rate of 34.3%, and design and dying-post printing stages at the rate of 15.6%. These values and interviews showed that the businesses carried out their controls in order to prevent having defective products by separating the products which were not qualitative during knitting process, after the process of knitting finished, before and after the process of ironing.

The data regarding the instruments businesses used and their applications for the improvement of the product quality were given Table 9.



Table 9. The Instruments Businesses Used and Their Applications for
The Improvement of The Product Quality
(Tablo 9. İşletmelerde Kalite Kontrolde Kullanılan Araçlar ve Ürün
Kalitesini İyileştirmeye Yönelik Uygulamalar)

Choices	Ankara		Istanbul		Total	
	n	%	n	%	n	%
1.Instruments used at quality control						
Senses	8	100.0	24	100.0	32	100.0
Enlightened table	3	37.5	7	29.1	10	31.2
Enlightened model	1	12.5	1	4.2	2	6.2
2. Applications for the improvement of the product quality						
Using a suitable raw material	8	100.0	21	87.5	29	90.6
Employing specialized staff	8	100.0	19	79.2	27	84.4
Giving in-service training	6	75.0	13	54.2	19	59.4
Improving physical conditions	4	50.0	11	45.8	15	46.9
Following up the technological innovations	8	100.0	15	62.5	23	71.9
Carrying out R&D/Product Development studies	4	50.0	10	41.6	14	43.7
Making applications according to standards	4	50.0	10	41.6	14	43.7

Ankara n: 8 İstanbul n:24 Total n:32

As was given in Table 9, it is likely to say that the quality control of the businesses was made through senses. This is the highest rate with 100%. It was followed by enlightened table at the rate of 31.2% and enlightened model at the rate of 6.2. The fact that a person was allocated to quality control tools leads to an extra cost for the business. Quality control was mostly made before and after ironing by the staff working there through the sense of seeing and those working in the packaging department also made quality controls again as the final stage. With the application of quality control in the businesses through senses in a careful way by experienced people, the cost of quality control machinery decreased and that was the reason why the authorities preferred such an application.

It is clear in Table 9 that businesses mostly paid more attention to the use of qualitative raw material to improve the quality of the product at the rate of 90.6%. The rates were very near to each other as employing specialized staffs at 84.4%, following up the technological innovations at 71.9%, giving in-service training at 59.4%, improving physical conditions at 46.9%, carrying out R&D/Product Development studies and making applications according to standards at 43.7%. It is believed that the business authorities used suitable raw materials in order to have a customer satisfaction and to become a preferred business in line with it. On the other hand, it is essential that a business should pay more attention to R&D/Product Development studies in order that it can be in both domestic and international competition and be successful there.

The data regarding related units of quality control at the businesses were analyzed and given in Table 10.



Table 10. Units Related to Quality Control at Businesses
(Tablo 10. İşletmelerde Kalite Kontrol ile İlgili Birimler)

Choices	Cities		Ankara		Istanbul		Total	
	n	%	n	%	n	%	n	%
Units related to quality control								
Quality control	1	12.5	6	25.0	7		21.9	
Production	-	-	3	12.5	3		9.5	
Production + management + quality control	-	-	3	12.5	3		9.5	
Management	-	-	2	8.2	2		6.2	
Management + quality control	1	12.5	1	4.2	2		6.2	
Quality control + production	2	25.0	-	-	2		6.2	
Management + production + marketing	1	12.5	1	4.2	2		6.2	
Quality control + R&D/Product Development + production	1	12.5	1	4.2	2		6.2	
R&D/Product Development	-	-	1	4.2	1		3.1	
R&D/Product Development + management	-	-	1	4.2	1		3.1	
Management + production	-	-	1	4.2	1		3.1	
Quality + R&D/Product Development + production + management	1	12.5	-	-	1		3.1	
None	1	12.5	4	16.6	5		15.7	
Total	8	100.0	24	100.0	32		100.0	

As was given in Table 10, businesses had quality control units at the rate of 21.9%. It was followed by production, production-management-quality at the rate of 9.5%. There were different units related to quality control in the businesses. It is likely to say that it had an effect on increasing the product quality. It is known that the units of R&D and Product Development have a significant role in raw material, design etc. developments of the products and in the process of branding. The fact that the scores for the unit regarding R&D and Product Development were low indicates that authorities do not pay enough attention to this unit. At the end of the interviews with the authorities, it was pointed out that this unit was not regarded as necessary due to the fact that the amount to be allocated to this department would cause economic problems. It is like to say that this case results from the fact that the educational levels of most of the business authorities were low and they were out of the textile sector. It is also possible to say that making the business owners conscious and initiating necessary legal applications would be a significant step to establish the needed units of quality in order to be in the market and prepare for the outer markets in the long term. The data regarding the separation of the products in the businesses as the second quality/defective were analyzed and given in Table 11.

Table 11. Defective Production Rate
(Tablo 11. Hatalı Üretim Oranı)

Choices	Cities		Ankara		Istanbul		Total	
	n	%	n	%	n	%	n	%
Defective production rate								
% 0-1	2	25.0	7	29.2	9		28.1	
% 1-2	5	62.5	4	16.6	9		28.1	
% 2-3	1	12.5	6	25.0	7		21.9	
% 3-4	-	-	3	12.5	3		9.4	
% 4-5	-	-	4	16.6	4		12.5	
Total	8	100.0	24	100.0	32		100.0	



As shown in Table 11, the defective products were produced as 0-1% and 1-2% at the rate of 28.1%, in 2-3% at the rate of 21.9%, in 3-4% at the rate of 12.5%, and in 3-4% at the rate of 9.4%. Depending on Table 11, it is like to say that the application of quality control in the production field was a significant factor in the lower rate of defective production.

Scientific studies into the investigation of relation between human being and working environment have developed as a result of rapid industrialization. The first study to improve the human performance was carried out by F.W.Taylor (1856-1915). Taylor designed some changes at the tools and instruments used in order to increase the human performance, carried out studies and made an emphasis on the benefits of choosing suitable workers for the work, training the workers at work and paying more for the efficient worker [17]. Working study aims at eliminating unnecessary activities by examining the work flow that occurs in the production process in different departments of the businesses, and carrying out the work in the shortest time, in lowest energy with the lowest cost. In that way, besides the increase in the efficiency of the businesses, suitable working conditions for the human structure and work flow will be obtained [18]. The data over the application of working study in the businesses and its aim were analyzed and given in Table 12.

Table 12. The Application of Working Study in The Businesses and Its Aim

(Tablo 12. İşletmelerin İş Etüdünü Uygulama Durumu ve Amacı)

Choices	Ankara		Istanbul		Total	
	n	%	n	%	n	%
1. Application of working study						
No	3	37.5	15	62.5	18	56.2
Yes	5	62.5	9	37.5	14	43.8
Total	8	100.0	24	100.0	32	100.0
2. The purpose of working study						
Educating the workforce	4	50.0	8	33.3	12	37.5
Avoiding unnecessary activities	3	37.5	8	33.3	11	34.4
Arranging the necessary activities economically	3	37.5	8	33.3	11	34.4
Determining the correct time standard related to work	4	50.0	7	29.2	11	34.4
Standardization of suitable working methods	3	37.5	6	25.0	9	28.1
Improving working conditions	2	25.0	6	25.0	8	25.0

Ankara n: 8 İstanbul n:24 Total n:32

As given in Table 12, it was found that working study was not applied in the businesses at the rate of 56.2% and it was applied at the rate of 43.8%. There was a contrast between the two cities. Businesses believed that using the machinery in full capacity meant working study. However, a great many things were carried out in order to avoid unnecessary things and increase efficiency. This means that authorities applied working study but they were not aware of it.

As given in Table 12, the aim of the working study in the businesses was; training the workforce at the rate of 37.5%, avoiding unnecessary activities and arranging necessary activities economically determining the correct time standard related to work at the rate of 34.4%, standardization of suitable working methods at the rate of 28.1%, improving the working conditions at the rate of 25.0%. So, it is likely to say that the working studies in the businesses were



applied in order to increase the efficiency and they train the workforce at work. Some personnel employed for the necessary units are able to go on with their work by learning the work from an experienced person for a certain time. It is possible to say that paying no attention to the suitability to the work or being an expert for an employed person might result from the fact that it will increase the cost for the business.

5. CONCLUSION AND RECOMMENDATIONS (SONUÇ VE ÖNERİLER)

Plain (V-bed) weft-knitting sector making a production of women's top wear has been making their production with the help of current developing technology in order to meet the demands in different ways depending on the comfort of the individual, aesthetic value, fashion movement, economic and social status.

Of the 32 businesses included in the research, 75% were acting in Istanbul and 25% were in Ankara. The fact that a great majority of the businesses was located in the city of Istanbul results from the intensive population of the city and the industry there is highly developed.

It was found that the authorities of the plain (V-bed) weft-knitting businesses were in the age group of 36-40 (middle age) and were all men. It was pointed out that the authorities started their profession after finishing a high school and they did not have any education dealing with their profession since they were a graduate of a high school. It was also determined that due to the fact that they started their profession at a very early age, they improved their ability through the relationship of master and apprentice at work, that due to the fact that they started their profession at a very early age, and that they worked for 11 years and over in this profession.

It was found that the small scaled (having 1-50 workers) businesses with a production annual capacity of 200.000 pcs can be founded with at least two real or legal entities, so the businesses preferred it. It was found that the shift-work systems of the businesses were in the form of double shift and the working hours varied as 08.00-16.00 and 16.00-24.00.

In terms of the departments the workers worked in the businesses, it was found that the majority worked in the knitting department. It was determined that the business authorities closed down the departments of plain stitch, hemming, stop-stitching or bartacking, button hole/button, decoration, over lock, looping machine etc., which are called ready-made clothing, and they made them produced in other businesses as sub-production, so reducing the production costs. Due to the fact that authorities did not expect much from the workers in terms of quality and quantity, they thought they were sufficient in their work. The authorities pointed out that they expected the workers exhibit the attitudes and behaviors as enjoying their job and being willing. It was found that the workers doing their work willingly would be successful at work and the authorities wanted their workers to have this attitude since it had a positive impact on the business. It was determined that authorities thought that the budget allocated to R&D and Product Development studies would cause a burden on the business. They were also unaware of the fact that business is a significant step towards branding, so they gave machinery usage to the workers as an in-service training. Qualitative production is one of the leading factors in order that businesses can stay in the market, obtain customer satisfaction and become a preferred business. In order to be a country aiming at exporting in textile, we should be more careful over quality. Production in textile



sector comprises successive processes and the result of a process becomes the raw material of another. It was found that the businesses did not have a certificate, but they did the quality control of all of the businesses. It was also found that they applied quality controlling in order to have a customer satisfaction by producing a good quality product. It was determined that the quality controlling in the businesses was carried out through senses before and after ironing processes. It was found that there was a quality control unit and they put an importance on the using suitable raw material aiming at improving the quality of the product in order to obtain the consumer satisfaction and become a preferable business in line with it. The rate of defective product production occurred in 0-2%.

The products that could be eliminated with the quality control applied in the process of production were able to be corrected and could decrease the rate of the defects. It was found that since the businesses were not aware of the benefits of choosing suitable workers for the work and applying working study in order to examine the work flow and eliminate the unnecessary activities, they did not apply working study; and those applying it did this in order to give an in-service training only in the workforce. In order that textile industry maintains its competitive force, keep the market share worldwide and improve it, it is necessary to produce commercial brands recognized internationally and to produce qualitative products.

So as to obtain all these, total quality should be applied in all areas of the textile sector. It is necessary for the business to have such standards as ISO 9000, ISO 12000, CE label, and ECO label, and they should invest in order to get the certificates of compatibility/validity document, environment compatibility certificate. With an increase in the efficiency in businesses, it is likely to think that it would be at a competitive level in terms of knitting clothing export. Therefore, the production time would be decreased and the amount of production and the speed for it would be increased. In addition, with the increase in the cost obtained through the workforce, businesses would pay more attention to quality and branding and transfer their resources to new production designs and technology, so achieving success. The fact that knitted products is widely used in such areas as under and outer wear, upholstery, medical wear and medical tools and so on has an increasing effect on the demand for knitted products in the market in Turkey.

The knitting sector, which is considered within the textile sector having a significant share in Turkish economy should necessarily be in a position of being able to export, make its businesses develop at a competitive level in foreign and domestic fields, highlight the concept of quality in the fields of production and service in order that it is accepted and finally pay attention to the issues of total quality and quality control. Each business must be to aim at setting up quality units, decreasing the defect to the zero level and find the ways to produce in low costs in order to achieve the success and maintain it.

NOTICE (NOT)

The current study was prepared depending on the data of interview form prepared and applied to the authorities within the content of the doctorate thesis of "Determination of the Technical Features of the Industrial Knitting Outwear Products" completed in 2010.

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