



A study to evaluate willingness to pay using Van Westendorp's method on the example of contraceptives

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ABSTRACT

Family planning remains one of the key areas of healthcare that needs significant support regardless of country. The preservation of a woman's health through the use of contraceptives until she is fully ready for childbirth prevents a number of social and economic cataclysms: demographic, labor, and other kinds of crises. However, in modern conditions of limited healthcare resources, as well as economic difficulties faced by women, there is a need to improve the provision of contraceptives to women in family planning. The purpose of that is primarily to reduce the economic burden on the state and women, as well as patient orientation. Therefore, the determination of willingness to pay for contraceptives is critical in the improvement of family planning systems. The study's aim was to develop and test Van Westendorp's method for establishing willingness to pay in Ukraine followed by the sharing of the economic burden between women and the state in family planning programs. A cross-sectional study involved a hall test with an anonymous questionnaire survey. Descriptive statistics and regression modeling were used. It was established that for women with an income of up to 88 EUR the acceptable price range made up from 26% to 38% of the price values; for women with an income of 88–129 EUR, from 30% to 48%; and for women with an income of more than 129 EUR, from 32% to 51%. Similarly, willingness to pay was calculated for all contraceptives in age groups. These findings suggest that the willingness to pay for contraceptives is relatively low in Ukraine. This information can be used to construct a payment model for contraceptives and to attain higher contraceptive coverage, especially for those who are less wealthy.

INTRODUCTION

The international community recognizes that the state must guarantee the protection and empowerment of married couples in family planning services. Reproductive management is considered as the main means of maintaining health and belongs to the category of fundamental human rights, according to key international documents (World Health Organization, 2015a).

Today, the improvement of reproductive management is based on the "patient-centered" principle and includes the study

of the consumer and their desires, possibilities, and adherence to a particular type of contraception (compliance). However, modern scientists argue that the price factor of contraceptives is the main obstacle when using reproductive management (Braun and Grever, 2020). To sum up, it is clear that the consumer price research, namely, the psychological price (the price that a person is willing to pay for a specific product which depends on the personality of the consumer, their position in life, the need for a product, etc.), remains a fundamental step in improving family planning services (World Health Organization, 2018).

The classical methods of studying psychological prices and willingness to pay are divided into three groups. The first two groups (historical analysis of data about consumer behavior and the discrete choice experiment) are economic. They tend to become outdated and require a significant amount of information about the market and financial resources. This is the main barrier

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to their widespread practical application. The third group includes marketing direct surveys. These marketing studies make it possible to interpret and integrate the basic provisions of economic theory into the process of making price decisions (Monroe, 1973). They form the main knowledge base about consumer pricing: interrelation between price and quality, price, and utility (value), the perception of prices depending on brands, the influence of factors on pricing, studying psychological prices, buyer segmentation based on the external or internal reference prices, and others (Dickson and Sawyer, 1973; Manoj and Menon, 2007; Shapiro, 1968, 1973; Yin and Paswan, 2007; Zeithaml, 1987).

Focusing on the above problems (increasing compliance and overcoming the price barrier for women), the key remains to determine the subjective willingness to pay by women, which can be done using methods of setting psychological prices from scientific marketing methods. Determination of the psychological price, and hence the willingness to pay, is based on the postulate formed by marketing scientists about the existence of a “standard price” (Gabor and Granger, 1986; Mazumdar *et al.*, 2005; Stoetzel, 1986). According to market studies, the “standard price” (optimal price) is a point on the consumer’s subjective scale, below which the price of a product is extremely cheap and above which it is extremely expensive (Winer, 1986).

The theoretical substantiation of this hypothesis is borrowed from the field of psychology and some other theories. In the adaptation theory of Helson (1964), individual processes of generating judgments are forms of adaptation to external and internal stimuli (Helson, 1964). Helson (1964) experimentally confirmed the existence of a “personal scale,” “standard (optimal) and neutral (indifferent) points” in humans. Against these points, the consumer makes the assessment. At the same time, as Emery (1970) showed, around the optimal price an area of tolerance or indifference is formed (Herrmann *et al.*, 2004). This zone has been interpreted as an area of price fluctuations relative to the reference (optimal price), and these do not have a sharp impact on the level of compliance (Sinha and Prasad, 2004). We can call this high point of consumer’s indifference the indifference price.

These theories, as well as the theory of assimilation and contrasts, the theory of range, and the theory of cognitive dissonance, underlie and confirm the validity of using marketing methods based on the optimal and indifference prices for estimating willingness to pay (Festinger, 1964; Volkman, 1951).

One such method is Van Westendorp’s method. Another name for this method is price sensitivity measurement (PSM) (Van Westendorp, 1976).

The simplicity of calculations and interpretation of results and relative cheapness of this method’s implementation distinguish it (Kunter, 2016; Wildner, 2003). In addition, Van Westendorp (1976) refers to several more psychophysical theories: the Weber-Fechner theory and the theory of reasonable prices (Kamen and Toman, 1970). However, they all describe a similar mechanism for estimating and setting an optimal price to which the consumer subconsciously agrees.

Despite its widespread use in many countries, PSM is rarely used in Ukrainian marketing practice and is absent in the pharmaceutical sector (Podolchak and Gavrylyuk, 2013; Salamandic *et al.*, 2014). These facts, along with the importance of the family planning process for the state as a whole and the

woman’s compliance, including in economic terms, to the chosen method of contraception, determine the relevance and expediency of using this method in pharmaceutical practice.

MATERIALS AND METHODS

Sample design

We conducted a cross-sectional study based on a quota sample, which consisted of 420 women of reproductive age (World Health Organization, 2021) from the Zaporizhzhia region, Ukraine. The size of the quota sample was justified by the requirements for the PSM study, sociological research on the possibility of using a quota sample that corresponds to or exceeds the calculated random sample for the general population ($N = 384,369$; $n = 384$) (Dobrenkov and Kravchenko, 2003; Zhurko and Zenkova, 2016). The main social and economic criteria for inclusion in the sample were age, per capita income, and women’s education. Data on quota volumes by indicators were obtained from the State Statistics Service of Ukraine (Appendix Table A1).

According to the age indicator, seven quotas were formed: 16–19 years ($n = 29$), 20–24 years ($n = 42$), 25–29 years ($n = 60$), 30–34 years ($n = 78$), 35–39 years ($n = 73$), 40–44 years ($n = 70$), and 45–49 years ($n = 68$). Based on age quotas, quotas were formed according to the level of per capita income: income up to 88 EUR, 20.7% of the age quota; from 88 to 129 EUR, 34.3%; and more than 129 EUR, 45% of the age quota.

Further, the quotas were divided into the smallest shares by the level of education: the quota of respondents with higher education/planning to obtain higher education was 47.1% and without higher education (school, college, or technical school)/do not plan to receive higher education 52.9%. This approach to age gradation and the distribution of per capita income quotas was based on methodological frameworks for conducting sociological research, ethical and legal norms in Ukraine, and assumptions about the mandatory existence of the middle sociological class in any society (Myagkov, 1996).

Experiment design

To establish the psychological prices of women and willingness to pay for contraceptives, women were asked four questions regarding each contraceptive (Van Westendorp, 1976):

1. At which price on this scale you are beginning to experience (test-product) as too cheap—so that you say at this price the quality cannot be good?
2. At which price on this scale are you beginning to experience (test-product) as cheap?
3. At which price on this scale are you beginning to experience (test-product) as expensive?
4. At which price on this scale you are beginning to experience (test-product) as too expensive—so that you would never consider buying it yourself?

The anonymous questionnaire survey was conducted as a hall test (a special method of field marketing research, both qualitative and quantitative, involving interviews with a relatively large number of respondents using a special questionnaire in a designated closed room for the purpose of testing, including comparative, certain properties of the product). Such face-to-

face contact helps to increase the reliability of the results of the psychological survey method, according to sociological studies.

Previously, the women were provided with information (name, image, frequency and duration of use, and level of protection) on the main means of contraception for their detailed acquaintance (Appendix Table A2). The list of tested contraceptives was formed based on regulatory legal documents in the field of women's health and included the following (World Health Organization, 2015b):

- a) Hormonal contraceptives: pills, injections, subcutaneous implants, skin patches, vaginal rings, and intrauterine therapeutic systems (IUSs).
- b) Nonhormonal medicinal contraceptives: vaginal suppositories, vaginal creams/ointments, vaginal aerosols, and sponges with contraceptive.
- c) Contraceptive medical devices: intrauterine devices (IUDs) with silver/gold/copper, male and female condoms, cervical caps, and diaphragms.

For each of the four questions, a set of prices was proposed that ranged from 0% of the maximum market price to 100% in 20% increments in monetary terms in UAH (Ukrainian currency in the ISO 4217 standard) for each contraceptive (prices have been converted to euros for clarity) (Appendix Table A3). The definition of the maximum market price as the upper limit value of the price is associated with the peculiarities of the implementation of the programs of assistance to the population "Affordable Medicines" and the accompanying marketing research on this topic. Information on market prices was obtained from the online drug reference service "Tabletki.ua" and "Compendium.com.ua".

This price division allows using the obtained data about willingness to pay in the process of price modeling in special social family planning programs and in the pharmaceutical market of Ukraine.

Statistical analysis

Data were entered and analyzed using the MS Excel 2010 software.

The prices according to questions 1–4 were considered as random variables $X_j, j = \overline{1, 4}$ with the corresponding distribution functions $F_j(x) = P(X_j < x)$. The results of the questionnaire were presented as a four-dimensional sample $(X_{q1}, X_{q2}, X_{q3}, X_{q4})$, where $q = 1, 2, \dots, N$ (number of women interviewed separately to independent sample elements).

For each vector of the sample $\{X_{1j}, X_{2j}, \dots, X_{Nj}\}$ of random variable $X_j, j = \overline{1, 4}$, empirical cumulative distribution functions were constructed:

$${}^*F_j(x) = \frac{1}{N} \sum_{q=1}^N I_{[0,x)}(X_{qj}),$$

where $I_{[0,x)}$ — indicator function.

Empirical cumulative survival functions were also constructed for the price distribution functions (1, 2 questions):

$${}^*S_j(x) = 1 - {}^*F_j(x),$$

where

*F_1 are empirical cumulative distribution functions for question 1,

*F_2 are empirical cumulative distribution functions for question 2,

*F_3 are empirical cumulative distribution functions for question 3,

*F_4 are empirical cumulative distribution functions for question 4,

*S_1 are empirical cumulative survival functions for question 1,

*S_2 are empirical cumulative survival functions for question 2.

The results of the calculation of the empirical distribution and survival functions are reflected on a graph.

To calculate the values of the point of indifference (IDPP) and optimal price point (OPP), the method of piecewise linear approximation was used, where for all distribution curves the following was observed:

$${}^*F_j(x) = a + b_x + \varepsilon; 0 \leq x \leq x_{max}$$

$${}^*S_j(x) = a + b_x + \varepsilon; 0 \leq x \leq x_{max},$$

where

a is a constant or intercept term,

ε is the standard error.

For the obtained regression models, the coefficient of determination R^2 and F -test were calculated. The regression equations were considered valid when $R^2 > 0.90$ and $F_{est.} > F_{tab.}, p < 0.05$.

The IDPP and OPP values at the point of intersection of the regression curves were found from the following equality:

$${}^*F_j(x) = {}^*S_j(x)$$

$$x = \frac{a_{S_j} - a_{F_j}}{b_{F_j} - b_{S_j}}.$$

The value of the point of intersection of the regression curves *S_2 and *F_3 is the IDPP and *S_1 and *F_4 OPP. The recommended range of willingness to pay is the interval between the points of the optimal price (reference price) and the point of indifference price.

At the first stage of the study, willingness to pay for contraceptives was determined in per capita income quotas. Two graphs of the cumulative distribution of respondents were constructed for each contraceptive (15 items/90 graphs), in accordance with three income quotas (up to 88 EUR, from 88 to 129 EUR, and more than 129 EUR) (Fig. 1 shows, as an example, the graphs of the cumulative distribution of women for injectable contraceptives in the income group up to 88 EUR). Point values of the OPP and IDPP were calculated (Table 1).

At the second stage of the study, willingness to pay for contraceptives was determined in age quotas.

Two graphs of the cumulative distribution of respondents were constructed for each contraceptive (15 items/630 graphs), in accordance with three income quotas (up to 88 EUR, from 88 to 129 EUR, and more than 129 EUR) and seven ages quotas (Fig. 2 shows, as an example, the graphs of the cumulative distribution of women for injectable contraceptives in the income quota up to 88 EUR of 16–19-year-olds). Point values of the OPP and IDPP were calculated (Table 2).

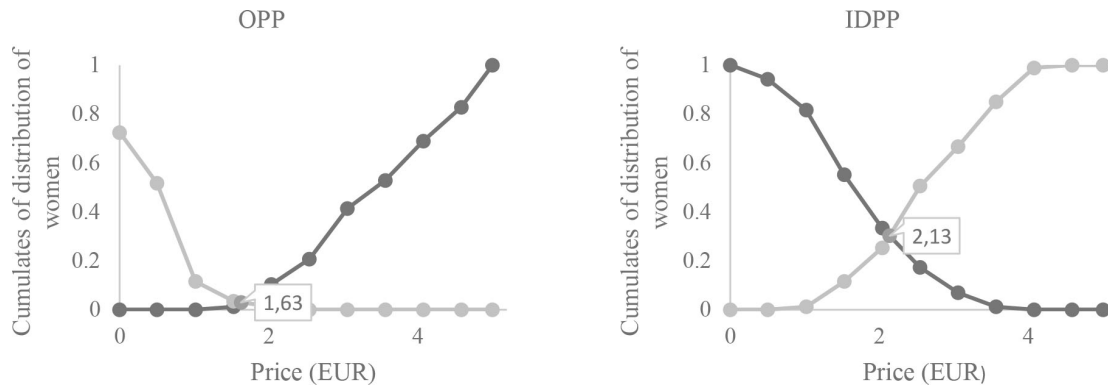


Figure 1. Graphs of cumulative distribution functions of women for injectable contraceptives in the income quota up to 88 EUR.

Table 1. Ranges of willingness to pay by per capita income quotas.

Contraceptive	Injection		Skin patch		Vaginal ring		Pills		Intrauterine therapeutic system		
Full cost (EUR)	5.0		14.4		16.0		28.5		71.2		
	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Average percent, hormonal
	Income up to 88 EUR										
	1.6–2.2	32.0–42.0	3.9–4.9	27.0–34.0	4.4–5.9	28.0–37.0	7.3–9.3	26.0–33.0	17.4–21.0	24.0–29.0	26.5–33.0
	Income from 88 to 129 EUR										
	2.2–2.7	43.0–54.0	4.8–5.6	34.0–39.0	4.8–6.7	30.0–42.0	9.6–11.9	34.0–41.0	19.1–24.4	27.0–34.0	31.8–40.0
	Income more 129 EUR										
	2.4–2.7	48.0–53.0	5.8–7.2	40.0–50.0	6.0–7.6	38.0–48.0	11.8–13.1	41.0–46.0	20.8–28.6	29.0–40.0	36.8–44.5
Contraceptive	Subcutaneous implant		Aerosol		Suppositories		Ointment/Cream		Sponge with contraceptive		
Full cost (EUR)	122.4		0.97		4.3		5.5		11.2		
	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Average percent, non hormonal
	Income up to 88 EUR										
	26.8–28.3	22.0–23.0	0.6–0.61	59.0–63.0	1.6–2.0	38.0–48.0	2.1–2.3	38.0–42.0	2.4–2.8	22.0–25.0	32.7–38.0
	Income from 88 to 129 EUR										
	28.7–34.0	23.0–28.0	0.6–0.64	62.0–66.0	1.9–2.6	45.0–60.0	2.3–2.8	42.0–52.0	2.7–3.7	25.0–33.0	37.0–48.3
	Income more 129 EUR										
	31.2–37.2	25.0–30.0	0.6–0.65	61.0–67.0	2.1–2.6	49.0–61.0	2.5–3.0	45.0–56.0	2.9–4.2	26.0–38.0	40.0–51.7
Contraceptive	Male condoms		IUC with silver/gold/copper		Female condoms		Diaphragm		Cervical cap		
Full cost (EUR)	2.9		7.7		10.0		45.3		56.9		
	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Range (EUR)	%	Average percent, medical devices
	Income up to 88 EUR										
	2.1–2.3	59.0–61.0	2.7–3.0	35.0–39.0	3.0–3.2	30.0–32.0	10.9–11.4	24.0–25.0	11.4–11.8	20.0–21.0	27.3–29.2
	Income from 88 to 129 EUR										
	2.3–2.8	60.0–64.0	2.7–3.9	39.0–51.0	3.6–4.2	36.0–43.0	11.5–13.8	25.0–31.0	12.4–14.6	22.0–26.0	30.5–37.7
	Income more 129 EUR										
	2.5–3.0	63.0–66.0	3.6–4.4	47.0–57.0	3.5–4.6	35.0–46.0	11.4–15.1	25.0–33.0	13.4–14.5	24.0–26.0	32.8–40.5

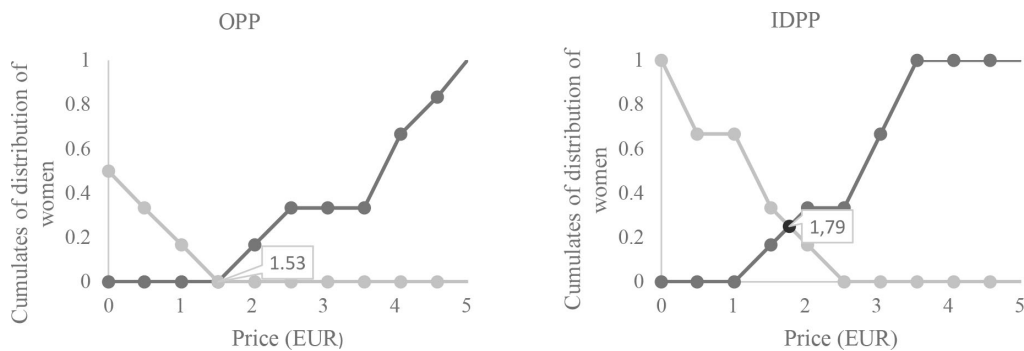


Figure 2. Graphs of cumulative distribution functions of women for injectable contraceptives in the income quota up to 88 EUR of 16–19 years old.

RESULTS

It was determined that the range of willingness to pay with an income of up to 88 EUR ranged from 26.0% (OPP) to 38.0% (IDPP); for women with an income of 88–129 EUR, from 30.0% (OPP) to 48.0% (IDPP); and for women with an income of more than 129 EUR, from 32.0% (OPP) to 51.0% (IDPP) (Table 1).

Women with an income of up to 88 EUR per capita had willingness to pay from 26.5% to 33.0% for a hormonal contraceptive, from 32.7% to 38.0% for a nonhormonal contraceptive, and from 27.3% to 29.3% for a medical device.

Women with an income from 88 EUR to 128 EUR had willingness to pay from 31.8% to 40.0% for a hormonal contraceptive, from 37.0% to 48.3% for a nonhormonal contraceptive, and from 30.5% to 37.7% for a medical device.

Women with an income of more than 128 EUR had willingness to pay from 36.8% to 44.5% for a hormonal contraceptive, from 40.0% to 51.7% for a nonhormonal contraceptive, and from 32.8% to 40.5% for a medical device.

Separately, the highest prices were set for women from all income levels for aerosols (willingness to pay from 59.0% to 67.0%) and male condoms (willingness to pay from 59.0% to 66.0%).

Women of all income levels were willing to pay the lowest amount for cervical caps (the price ranged from 20.0% to 26.0%), which is the lowest intragroup rate.

Subcutaneous implants (22.0% OPP; 30.0% IDPP), sponges with spermicide (22.0% OPP; 38.0% IDPP), and vaginal diaphragms (24.0% OPP; 33.0% IDPP) also received low values of the price range.

The lowest point values in the age groups were obtained by vaginal diaphragms (20.0% OPP; 30.0% IDPP) and cervical caps (24.0% OPP; 30.0% IDPP). The exception is the age group 45–49 years, where cervical caps received the average price group values of OPP (36.0%) and IDPP (42.0%). Average price ranges for other contraceptives were from 25.0% to 55.0%. The highest prices were set for women in all age groups for aerosols (willingness to pay from 61.0% to 66.0%) and male condoms (willingness to pay from 61.0% to 65.0%).

DISCUSSION

Our marketing research to determine the willingness to pay for contraceptives by the PSM method is the first for the pharmacy field of Ukraine.

We noted that women of all income groups were sensitive to price increases, which manifested in a wide range from OPP to IDPP. According to Van Westendorp's method, the gap between these two values should be as small as possible. This fact indicates the presence of "stress" in the perception of prices by consumers and when they increase. This result is observed in a market where prices tend to increase rapidly (Van Westendorp, 1976), which is observed in Ukraine.

We can also hypothesize that there is a relationship between the willingness to pay and the socioeconomic characteristics of the respondents, since women with higher incomes expect higher costs than women with lower incomes. Similar findings were made in another contraceptive price study (Onwujekwe *et al.*, 2013; Prata *et al.*, 2013).

Separately, it should be noted that contraceptives that received the highest prices of willingness to pay as in the age group and in income groups had the lowest maximum market price (male condoms and aerosols) or are widely known in Ukraine and have a significant assortment in Ukrainian pharmacies (male condoms). At the same time, contraceptives with the lowest willingness to pay either have a small assortment (sponges with spermicide, subcutaneous implants) or are completely absent from the market, and therefore the woman is not aware of the existence of similar contraceptives (cervical caps, vaginal diaphragms). We hypothesize that there is a relationship between willingness to pay and not only the price of contraceptives but also the low awareness of women and the lack of clear and accessible information about these contraceptives.

We also focus on the remark (Onwujekwe *et al.*, 2013) that lower willingness to pay for contraceptives is associated with the perception of these contraceptives as more harmful and therefore of less utility and value. This hypothesis is supported by our other studies conducted for contraceptives using a regular conjoint analysis.

Comparing with our research on the determination of willingness to pay, it should be noted that some of them did not cover the entire range of contraceptives which does not give us the possibility of a full comparison (Harvey, 1994; Thomas, 1978).

Regarding the limitations of the method, some researchers consider the method untenable, since its results are based on consumer feelings, which do not have a direct connection with the expected profit goal of the manufacturing company, and also they cannot treat the data as clearly perceived

Table 2. Ranges of willingness to pay by age quotas.

	45–49 years				40–44 years				35–39 years				30–34 years			
	AV OP EUR	%	AV IDP EUR	%	AV OP EUR	%	AV IDP EUR	%	AV OP EUR	%	AV IDP EUR	%	AV OP EUR	%	AV IDP EUR	%
Injection	1.4	27.7	1.9	35.5	2.7	53.3	3.0	57.4	2.5	48.9	2.8	52.4	2.0	40.0	2.7	51.1
Skin patch	5.4	37.3	5.5	37.0	5.8	40.0	6.9	46.3	5.1	35.7	6.3	42.0	5.0	34.4	6.2	41.5
Vaginal ring	5.7	35.6	7.4	44.3	5.7	35.6	8.6	51.2	3.9	24.2	4.7	28.5	6.3	39.2	8.3	49.9
Pills	7.1	25.0	6.5	22.0	11.4	40.0	13.9	46.7	10.5	36.7	13.1	44.2	11.4	40.0	13.9	46.8
IUS	15.4	21.7	20.2	27.3	19.7	27.6	27.3	36.7	18.8	26.3	26.7	36.0	16.8	23.6	25.3	34.2
Subcut. implant	33.7	26.5	37.9	29.8	27.5	22.5	28.7	22.5	27.3	22.3	34.5	27.1	26.7	21.8	34.0	26.7
Aerosol	0.58	58.9	0.7	67.4	0.58	58.5	0.65	64.8	0.6	60.6	0.6	61.8	0.6	61.1	0.7	64.4
Suppositories	40.6	28.0	1.7	38.9	2.2	51.7	2.8	63.0	1.9	46.7	2.6	59.5	2.1	50.0	2.6	58.7
Oint./Cream	2.2	40.6	2.8	48.6	2.5	46.7	3.4	59.3	1.9	34.4	23.0	40.4	2.4	45.0	2.9	51.6
Sponge	2.7	24.2	3.2	60.5	2.5	21.9	2.9	25.2	2.5	22.6	3.7	31.4	2.4	21.7	3.0	26.6
Male condom	1.7	60.6	1.9	63.2	1.8	62.1	1.9	62.4	1.5	57.2	1.8	58.7	1.7	60.0	1.9	62.6
IUD with silver/ gold/copp.	3.2	41.0	4.0	49.7	3.6	46.7	4.5	55.9	2.2	28.3	3.0	37.5	3.6	46.7	4.1	51.2
Female condom	3.9	38.8	5.2	49.8	3.1	31.4	4.0	38.7	3.2	32.2	3.4	38.3	3.6	36.1	3.4	38.3
Cervical cap	16.4	36.1	22.2	47.2	10.9	24.1	15.1	32.0	10.9	24.0	14.2	29.8	9.7	21.3	10.4	22.1
Diaphr.	13.4	23.5	15.3	25.8	11.8	20.7	13.8	23.4	12.0	21.2	12.6	21.3	12.6	22.2	15.9	26.8
	25–29 years				20–24 years				16–19 years				Average percent			
	AV OP EUR	%	AV IDP EUR	%	AV OP EUR	%	AV IDP EUR	%	AV OP EUR	%	AV IDP EUR	%				
Injection	2.0	40.0	2.9	53.5	2.0	40.0	2.5	46.9	1.5	30.0	2.3	41.3				39.9–48.3
Skin patch	4.3	30.0	5.8	38.4	3.7	25.7	4.0	26.9	5.3	37.0	6.6	43.8				31.0–39.4
Vaginal ring	6.5	40.8	7.8	47.0	4.0	25.0	5.7	34.4	3.8	23.9	5.3	31.5				32.0–40.9
Pills	10.3	36.0	13.2	44.2	8.6	30.0	10.4	35.0	6.7	23.3	10.2	34.2				33.0–39.0
IUS	21.4	30.0	23.3	31.4	20.2	28.3	22.9	30.9	23.7	33.3	30.6	41.2				27.3–33.9
Subcut. implant	31.0	25.3	35.5	27.8	26.5	21.7	29.7	23.3	36.7	30.0	45.6	35.7				24.3–27.6
Aerosol	0.63	65.6	0.7	70.0	0.61	63.3	0.7	68.5	0.6	60.0	0.7	66.2				61.2–66.2
Suppositories	2.1	50.0	2.6	58.2	1.9	46.7	2.3	51.3	1.9	46.7	2.3	52.9				45.7–54.6
Oint./Cream	2.3	42.7	2.7	48.0	2.7	50.0	2.9	51.6	2.2	40.0	2.6	46.2				42.7–49.4
Sponge	2.4	21.7	4.2	36.0	3.3	29.7	4.3	36.9	3.7	33.3	14.0	41.6				25.0–36.8
Male condom	1.6	59.2	1.9	66.2	1.7	60.0	2.0	66.9	2.0	70.0	2.3	72.5				61.3–64.6
IUD with silver/ gold/copp.	2.7	35.0	3.9	48.1	3.4	44.4	4.2	51.6	3.2	41.7	3.7	45.5				40.5–48.5
Female condoms	3.0	30.0	3.9	38.0	4.0	40.0	4.3	41.6	2.8	27.9	4.2	40.4				33.8–35.3
Cervical cap	9.8	21.7	13.4	28.3	9.4	20.8	11.2	23.6	8.7	19.2	13.1	27.8				23.9–30.1
Diaphr.	9.9	17.3	15.2	25.7	9.5	16.7	13.7	23.1	11.4	20.0	11.9	20.0				20.2–23.7

by the consumer (Hofmann and Lederle, 2006; Nagle and Holden, 1995). However, taking into account the main task of patient-oriented pharmaceutical supply, in this context, the main thing is to study the final consumer women and, consequently, to study the consumer value and willingness to pay in their own opinion.

CONCLUSION

The willingness to pay for contraceptives is low among Ukrainian women of reproductive age; thus, a “patient-centered” supply system of contraception is required. Women are willing

to pay less than half of the current price of contraceptives, with the exception of male condoms and aerosols. It is possible that education level, per capita income, and age are the main factors affecting the cost-sharing intention for women. According to the existing situation, further qualitative and quantitative research will be aimed at studying and confirming the existence of a connection between different characteristics of consumers and formatting of reference price ranges for contraception and dedicated to improving the PSM method and its combination with other methods of establishing willingness to pay.

CONFLICTS OF INTEREST

The authors report no financial or other conflicts of interest in this work.

AUTHOR CONTRIBUTIONS:

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work. All the authors are eligible to be an author as per the international committee of medical journal editors (ICMJE) requirements/guidelines.

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The study was conducted in accordance to the ethical and legal norms in Ukraine.

DATA AVAILABILITY

All data generated and analyzed are included within this research article.

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APPENDIX

Table a1. Socio-economic distribution of respondents by quotas.

Distribution by level of education	Distribution by per capita income (as of 01.01.2020)			Age group
	Up to 88 EUR (up to 3,000 UAH)	From 88 to 129 EUR (from 3,000 to 4,440 UAH)	More 129 EUR (more 4,440 UAH)	
	20.7%	34.3%	45%	
	6	10	13	16–19
Without higher education (school, college, technical school) / do not plan to receive higher education	3	5	7	
With higher education / planning to obtain higher education	3	5	6	
	9	14	19	20–24
Without higher education (school, college, technical school) / do not plan to receive higher education	5	7	10	
With higher education / planning to obtain higher education	4	7	9	
	12	21	27	25–29
Without higher education (school, college, technical school) / do not plan to receive higher education	6	11	14	
With higher education / planning to obtain higher education	6	10	13	
	16	27	35	30–34
Without higher education (school, college, technical school) / do not plan to receive higher education	8	14	18	
With higher education / planning to obtain higher education	8	13	17	
	15	25	33	35–39
Without higher education (school, college, technical school) / do not plan to receive higher education	8	13	17	
With higher education / planning to obtain higher education	7	12	16	
	15	24	31	40–44
Without higher education (school, college, technical school) / do not plan to receive higher education	8	12	16	
With higher education / planning to obtain higher education	7	12	15	
	14	23	31	45–49
Without higher education (school, college, technical school) / do not plan to receive higher education	7	12	16	
With higher education / planning to obtain higher education	7	11	15	

Table a2. The main characteristics of contraceptives provided for review by women.

Form of contraceptive	Frequency of application	Probability of pregnancy	The presence of hormones	Protection against infections
Pills	Every day	9%	Yes	No
Injection	Once every 1–3 months	6%	Yes	No
Subcutaneous implant	Change every 3–5 years	0.05%	Yes	No
Skin patch	Change once a week	9%	Yes	No
Vaginal ring	Change once a month	9%	Yes	No
IUS	Change once every 5 years	0.2%	Yes	No
Suppositories	At each sexual contact	28%	No	No
Ointment/Cream	At each sexual contact	28%	No	No
Aerosol	At each sexual contact	28%	No	No
Sponge with spermicide	At each sexual intercourse	28%	No	No
IUD with silver/gold/copper	Change every 3–5 years	0.8%	No	No
Male condom	At each sexual contact	18%	No	Yes
Female condom	At each sexual contact	21%	No	Yes
Cervical cap	At each sexual contact	24%	No	No
Diaphragm	At each sexual contact	12%	No	No

Table a3. The main characteristics of contraceptives provided for review by women.

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