



## **Ego-Identity of Women in the Reproductive Age with Pcos and Their Socio-Demographic Determinants**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Introduction:** The purpose of the research is to identify the ego-identity nature of women of reproductive age with PCOS and socio-demographic factors determining this pattern.

**Methods:** The methods, used in the study, are as follows: "SEI-test" by EL Soldatova, Life-Line test by A.A. Kronik, «Twenty statements test» (TST) by M. Kuhn and T. McPartland; the total sample included 140 women (70 women with PCOS, 70 without PCOS).

**Results:** In women of reproductive age, diagnosed with PCOS, the status of Ego-identity Achievement prevails compared to women without this diagnosis. Patients with PCOS also show much less complete representation of their past and future life. Finally, women PCOS describe themselves in categories related to identity social component (career, self-development, etc.), rather than the interpersonal component (family sphere). Influence analysis of socio-demographic factors on the identity of women with PCOS showed that a greater number of external factors determine their identity compared to women without this diagnosis. The ego-identity of such women depends on their marital status and place of residence.

**Conclusion:** Women of reproductive age with PCOS, the status of Ego-identity Achievement prevails, compared to women without PCOS, similar by marital, age, and social status. It means they are responsible for their choice and control over their emotions.

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## 1. INTRODUCTION

The problem of polycystic ovary syndrome (PCOS) is a multiple-aspect problem, actively studied in Russian and foreign science [1,2]. Being one of the endocrine infertility reasons [3] associated with various metabolic disorders and socially significant reproductive medicine problems [3,4,19], PCOS is a determining factor of a woman's mental state. Along with depression [5], anxiety [6], etc., PCOS can determine a gender and family components of women's identity, as well as an ego-identity. Amenorrhea, hirsutism, and infertility determine women's self-perception and social roles, which they are most likely to play. However, the modern research results are contradictory. If in the work of N. Amiri et al. [7], in women with PCOS, destructive changes in identity are manifested with a negative perception of their body and a decrease in their femininity level, etc. According to E. Morotti et. al. [8], on the contrary, women with PCOS do not experience a gender identity crisis and do not have a decreased satisfaction by their sexuality. Besides, H. Manlove, C. Guillermo & P. Gray, based on the retrospective self-reports, specify that various authors' approaches differ, whether women with PCOS predominate in the male type of behaviour or, on the contrary, they suffer from the loss of their femininity [9].

Ego identity is the sense of identity that provides individuals with the ability to experience their sense of who they are, and also act on that sense, in a way that has continuity and sameness. The most influential theorist in this area, Erikson (1968) described ego identity as a means for continuity of the person. Erik Erikson (1963), a neo-Freudian, postulated a psychosocial theory of ego development which paralleled and extended Freud's psychosexual stage theory into the adult years [10,11]. Erikson linked Freud's biological emphasis in psychosexual development with the social attitudes and behavior patterns acquired by the individual. Erikson believes that the individual must be viewed in the context of his or her "changing community. The psychosocial task resolution of one stage is influenced by the resolution of the previous stages' crises and this, in turn, contributes to the resolution of the following stages. There are three domains of the individual which are involved in ego epigenesis:

physical growth, cognitive maturation, and social demands [10,11].

Studies showed that the women with PCOS has reduced quality of life, anxiety, depression, body dissatisfaction, eating disorder, and sexual dysfunction, but the etiology of these disturbs remains still debated. Psychological aspects, such as depression, and/or anxiety, have been emphasized in PCOS, but only few articles analyzed women's personality structure. Again, the interaction of psychosocial stressors and personality characteristics leads to the expression of psychological symptoms [12,13,14]. Since no studies used Rorschach test or Millon Clinical Multiaxial Inventory to analyze the personality structure of subjects with PCOS, we believe it is useful to carefully study and develop the personality aspects related to this hyperandrogenic syndrome, as well as the psychopathological ones. Moreover, to minimize the influence of diagnostic and therapeutic pathways, young women, with comparable social conditions, undergoing for the first time to the endocrine evaluation for clinical features of hyperandrogenism and/or disorders of menstrual cycle should be studied [12-14].

Divergence of the obtained results can be explained by the research method and cultural differences, as well as by differences in the mental state during the research. In our pilot study [15], we determined that women of reproductive age with PCOS have a more formed ego-identity and show fewer signs of identity crisis; however, they are less likely to use family-related categories and pay more attention to the social identity spheres (career, self-development, etc.). At the same time, we did not consider ethnic background of these women, their age characteristics, place of residence, education, etc.

The purpose of this research was to study the ego-identity of women of reproductive age with PCOS in correlation with socio-demographic factors, including ethnic background, place of residence, educational level, and marital status.

## 2. MATERIALS AND METHODS

The research sample consisted of premenopausal women who came to annual routine medical examination based on the Scientific Centre for Family Health and Human

Reproduction Problems (Irkutsk, Russia) from March 2017 to May 2018.

**Inclusion Criteria:-** The main group consisted of 70 women with PCOS, confirmed in compliance with the Rotterdam Consensus [16,17]. The control group consisted of 70 women without PCOS. The controls were selected by their equivalence in age, ethnic background, and social status to women of the main group. The socio-demographic characteristics of the main and control groups are presented in Table 1.

**Exclusion criteria:** Patients with systemic complications has been excluded from the study.

We used "Ego-identity structure test" (Self Report Emotional intelligence - SEI test) by E.L. Soldatova [12]. This method was developed based on J. Marcia's [18] methodology and used to measure the following ego-identity statuses: Identity Achievement, Identity Diffusion and Identity Foreclosure using a 50-point questionnaire.

Besides, we used "Life-Line" methodology, adapted by A.A. Kronik [19]. This method is used to represent a personal story (for example, in works of L.F. Gramling & R.L. Carr [20], the person is proposed to line up the most important events of her past and assumed future, and to date them. Based on the analysis of this method results we considered how much time the tested person marks on the timeline for subjective representation of the past and future life (in centimetres), as well as the number of life events, indicated in each period.

Finally, we used the "Twenty statements test" by M. Kuhn and T. MacPartland [21]. There are several ways to process this method (e.g., Z. [22]. Based on the analysis of this method results we considered the share of self-descriptions related to a particular identity component, based on the processing method of Abdukeram et al. and the author's processing method [20].

## 2.1 Statistical Analysis

For statistical analysis, IBM SPSS Statistics 23 software was used. To describe quantitative data with a normal distribution, we used the arithmetic mean and standard deviation in M (SD) format. For others, the median and Q1 and Q3 quartiles in Me (Q1; Q3) format were used. SEI test method results, considering its standardization, were analysed as quantitative parameters. Kolmogorov-Smirnov D-statistics was not

significant for this method scale. Accordingly, when comparing results obtained by SEI test method for women with and without PCOS, a Student's t-test was used. To study differences in the women's identity with and without PCOS based on ethnic background, place of residence, educational level, and marital status, multivariate analysis of variance (ANOVA) was applied. At the same time, due to non-equivalent subgroup size, we used Pillai's trace criterion. The data obtained using the "Life-Line" method, were considered as conditionally quantitative. Accordingly, to compare results obtained by this method in women with and without PCOS, the Mann-Whitney U-test was used (normalized z-values were specified since the sample group exceeded 60 members). To compare the share occupied by an identity component in women with and without PCOS,  $\chi^2$  criterion was used. The critical value of the significance level was  $p = 0.01$ , the trend level significance:  $p = 0.05$ .

## 2.2 Design of the Study and Estimation of Sample Size

The design of the study was a randomized, prospective, double-blinded, and controlled clinical study. The level of confidence in this study was taken 95% and by assuming that 30% of the population is exposed to a risk factor and assuming an equal number of cases and controls in matched study design hypothesized odds ratio of 2.0. Level of significance = 5%, Power = 80%, Type of test = two-sided.

**Level of Significance:** This is typically assumed as 5%. Type I error is inversely proportional to sample size. Power: Power was taken as 80% and Type II error is directly proportional to sample size.

Formula of calculating sample size is

$$n = [(Z\alpha/2 + Z\beta)^2 \times \{(p1 (1-p1) + (p2 (1-p2)))\} / (p1 - p2)^2]$$

Where,

n = sample size required in each group,  
 $p1$  = proportion of subject treated by Group I = 0.50,  
 $p2$  = proportion of subject treated by Group II = 0.34,  
 $p1-p2$  = clinically significant difference = 0.16  
 $Z\alpha/2$ : This depends on level of significance, for 5% this is 1.96  
 $Z\beta$ : This depends on power, for 80% this is 0.84

Based on above formula the sample size required per group will be 70. Hence total sample size required shall be 140.

### 3. RESULTS AND DISCUSSION

Socio-demographic characteristics of the main and control groups are presented in Table 1.

Thus, women with PCOS (the main group) and without PCOS (the control group), nearly equivalent in gender, family status, ethnic background, place of residence, and educational level participated in the study (all  $p > 0.05$ ).

At the first stage, we analysed differences in identity, present in women of reproductive age with and without PCOS. Kolmogorov-Smirnov D-statistics was not significant for SEI test method scale. Thus, the Student's t-test was used to compare the obtained data.

According to obtained data, premenopausal women of the main group, compared with women

of the control group, have a higher indicator of Identity Achievement ( $t = 2.32, p < 0.02$ ). Moreover, by Identity Diffusion scale, they show significantly lower results ( $t = -2.15, p < 0.03$ ). Further analysis showed that the main contribution to results was made by differences in such method subscales as Responsibility for the choice ( $t = 3.11, p < 0.01$  for Identity Achievement scale,  $t = -2.51, p < 0.01$  for Identity Diffusion scale), Ego Strength ( $t = 2.43, p < 0.02$ ) and Emotional Maturity ( $t = 2.88, p < 0.01$  for Identity Achievement scale,  $t = -2.62, p < 0.01$  for Identity Diffusion scale).

Thus, the pilot study results were confirmed. Although PCOS, according to some authors, appears to distort woman's perception of herself, nevertheless, in our main group, women with PCOS, by taking responsibility for their choices and emotions control, demonstrate a higher level of ego-identity maturity and a lower level of its diffusion, compared to women of the control group.

**Table 1. Socio-demographic characteristics of groups**

Socio-demographic characteristics	Women with PCOS (main group) n=70	Women without PCOS (control group) n=70
<b>Age</b>	31.2±6.7	31.1±6.5
<b>Marital status (persons)</b>		
Unmarried	18	18
Married	33	35
Civil marriage	13	11
Divorced	6	6
Widows	0	0
<b>Ethnic background (persons)</b>		
Caucasian (Russians)	42	42
Asian (Buryats)	18	18
Mixed-race	10	10
<b>Place of residence (persons)</b>		
City	40	35
Countryside	30	35
<b>Educational level (persons)</b>		
Secondary education	5	6
Complete secondary education	13	9
Vocational secondary education	5	6
Higher education	40	40
Postgraduate education	5	5

**Table 2. Results of women of the main and control groups according to SEI test method\***

Scale	Main group		Control group		t	p-value
	M	σ	M	σ		
Identity Achievement	26.89	7.37	24.13	5.72	2.32	<b>0.025</b>
Identity Diffusion	11.79	6.75	15.40	6.29	-2.152	<b>0.037</b>
Identity Foreclosure	12.11	3.42	12.42	3.9	-0.288	0.775

\* - a comparison using Student's t-test

A comparison of the structure of women's responses of the main and control groups to the "Twenty statements test", the following results were obtained. Women with PCOS demonstrate less expressed identity components, such as: social component (11% and 15.8%,  $\chi^2 = 13.82$ ,  $p = 0.001$ ), interpersonal (19.7% and 25.2%,  $\chi^2 = 11.87$ ,  $p = 0.001$ ) and distinct manifestation of personal component (69.3% and 59.0%,  $\chi^2 = 32.2$ ,  $p = 0.001$ ). Further analysis showed that differences- associated with such components as sex-role (4.2% and 6.5%,  $\chi^2 = 7.21$ ,  $p = 0.008$ ), and family (8.4% and 15.3%,  $\chi^2 = 32.23$ ,  $p = 0.01$ ) in women with PCOS are less expressed. Moreover, in patients with PCOS personal (48.5% and 42.7%,  $\chi^2 = 9.44$ ,  $p = 0.003$ ) and existential (14.9% and 11.4%,  $\chi^2 = 7.52$ ,  $p = 0.007$ ) components of identity are more expressed.

Thus, women with PCOS are less likely to use categories related to gender and family for self-description. It is compensated by more frequent use of their personal qualities ("confident," "kind", "active") and abstract self-description ("man", "resident of the Earth") for self-description.

Finally, the A.A. Kronik's "Life-Line" results analysis revealed the following results (Table 4).

It was determined that the main group members focus more on their past: compared to the control group, they represent it as a larger segment of their life (Me = 5.4 (4;6.7) cm. vs. Me = 3.1 (2.5;6) cm.,  $Z = 2.3$ ,  $p = 0.02$ ), and also indicate a larger number of events (Me = 4 (3;6) vs. Me = 2 (1; 4),  $Z = 3.51$ ,  $p = 0.01$ ). At the same time, the main group members represent the future as a shorter period of their life (Me = 5.3 (2.5; 8.5) cm. vs. Me = 7.5 (4.6;10.1) cm.,  $Z = 2.7$ ,  $p = 0.01$ ) and indicate earlier end of event-related period of their life - the moment with no further plans afterwards (Me = 56.5 (37.5; 62.5) years vs. Me = 68 (40; 75) years,  $Z = 2.3$ ,  $p = 0.02$ ). Thus, representation of their "past" as being more eventful, and the "future" as being more uncertain is higher among women with PCOS.

At the second stage, we analysed the influence of various socio-demographic factors on the identity of premenopausal PCOS patients, compared to results of women without PCOS. We used multivariate analysis of variance to determine whether ethnic background, place of residence, educational level and family status influence women's identity. At the same time, due to non-equivalent subgroup size, we used Pillai's trace criterion.

**Table 3. Results of women of main and control groups according to the "Twenty statements test" method (the total number of answers for each group is 1400)**

Component (% of total responses)	Main group		Control group		$\chi^2$	p-value
	Quantity	%	Quantity	%		
Social	154	11.00%	221	15.80%	13.82	0.01
Interpersonal	276	19.70%	352	25.20%	11.87	0.01
Personal	970	69.30%	826	59.00%	32.2	0.01

\* - a comparison using  $\chi^2$  criterion

**Table 4. Performance indicators of the "Life-Line" test results of main and control group members\***

Indicators			Main group	Control group	Z	p-value
Subjective representation of the past	Distance	Me	5.4	3.1	2.3	0.02
		Q1;Q3	4;6.7	2.5;6		
	Number of events	Me	4	2	3.51	0.01
Q1;Q3	3;6	1;4				
Subjective representation of the future	Distance	Me	5.3	7.5	2.7	0.01
		Q1;Q3	2.5;8.5	4.6;10.1		
	Number of events	Me	5	6	-	-
Q1;Q3	2;7	3;8				
End of event-related period	Me	56.5	68	2.3	0.02	
	Q1;Q3	37.5;62.5	40;75			

\* - a comparison using Mann-Whitney U-test (normalized z-values were specified since the sample group exceeded 60 members)

**Table 5. A posteriori analysis of the results among women with PCOS according to their marital status by SEI test results\***

Dependent variable	(I) Marital status	(J) Marital status	Mean difference (I-J)	Standard error	Significance	95% confidence interval	
						Lower limit	Upper limit
Identity Achievement	Unmarried	Married	-2.11*	.760	.021	-10.52	-.25
		Civil marriage	-3.95	3.052	1.000	-12.32	4.42
		Divorced	-.04	3.431	1.000	-9.45	9.38
	Married	Unmarried	2.11*	.760	.021	.25	10.52
		Civil marriage	1.63	2.868	1.000	-6.24	9.49
		Divorced	5.54	3.269	.576	-3.43	14.51
	Civil marriage	Unmarried	3.95	3.052	1.000	-4.42	12.32
		Married	-1.63	2.868	1.000	-9.49	6.24
		Divorced	3.91	3.731	1.000	-6.32	14.15
	Divorced	Unmarried	.04	3.431	1.000	-9.38	9.45
		Married	-5.54	3.269	.576	-14.51	3.43
		Civil marriage	-3.91	3.731	1.000	-14.15	6.32
Identity Diffusion	Unmarried	Married	-2.56*	.854	.011	-2.49	10.41
		Civil marriage	4.38	2.913	.835	-3.62	12.37
		Divorced	-1.84	3.275	1.000	-10.82	7.14
	Married	Unmarried	2.56*	.854	.011	-10.41	2.49
		Civil marriage	.41	2.737	1.000	-7.10	7.92
		Divorced	-5.80	3.119	.412	-14.36	2.76
	Civil marriage	Unmarried	-4.38	2.913	.835	-12.37	3.62
		Married	-.41	2.737	1.000	-7.92	7.10
		Divorced	-6.21	3.561	.521	-15.98	3.55
	Divorced	Unmarried	1.84	3.275	1.000	-7.14	10.82
		Married	5.80	3.119	.412	-2.76	14.36
		Civil marriage	6.21	3.561	.521	-3.55	15.98
Identity Foreclosure	Unmarried	Married	1.61	1.336	1.000	-2.05	5.28
		Civil marriage	-.43	1.655	1.000	-4.96	4.11
		Divorced	1.87	1.860	1.000	-3.23	6.98
	Married	Unmarried	-1.61	1.336	1.000	-5.28	2.05
		Civil marriage	-2.04	1.555	1.000	-6.30	2.23
		Divorced	.26	1.772	1.000	-4.60	5.12
	Civil marriage	Unmarried	.43	1.655	1.000	-4.11	4.96
		Married	2.04	1.555	1.000	-2.23	6.30
		Divorced	2.30	2.023	1.000	-3.25	7.85
	Divorced	Unmarried	-1.87	1.860	1.000	-6.98	3.23
		Married	-.26	1.772	1.000	-5.12	4.60
		Civil marriage	-2.30	2.023	1.000	-7.85	3.25

Based on observed mean values  
 Accuracy - Mean Square (Error) = 16.852  
 \*. Mean difference is significant at .05 level

According to obtained data, no effect of ethnic background on manifestation degree of ego-identity was observed (Pillai's trace = 0.587, p = 0.27). The educational level also did not affect ego-identity manifestation (Pillai's trace = 0.137, p = 0.47).

At the same time, it has been proven that identity status depends on women's marital status (Pillai's trace = 1.544, p = 0.01). A posteriori

analysis with Bonferroni correction showed that the main differences are between married and unmarried woman categories: unmarried women with PCOS showed greater manifestation of Identity Diffusion and less manifestation of Identity Achievement than married women.

Further analysis also showed that women with PCOS, living in the countryside, demonstrated

less expressed Identity Achievement ( $t = 2.8$ ,  $p = 0.01$ ) and a more expressed Identity Diffusion ( $t = 2.3$ ,  $p = 0.02$ ).

We also analysed the effect of socio-demographic factors on ego-identity characteristics in women of reproductive age without PCOS of the control group. The analysis showed that this difference is observed on Identity Achievement and Identity Diffusion scales ( $t = 2.3$ ,  $t = 2.5$ , respectively,  $p = 0.02$ ) between representatives of Caucasian and Asian race. In Asians, the identity diffusion level appeared to be higher, and the identity achievement level was lower. There were no differences in manifestation of ego-identity status between women of mixed-race vs. representatives of other races.

Thus, in women of reproductive age with PCOS, the ego identity level is affected by their place of residence and family status, in women without PCOS, only by their race.

Then we analysed how socio-demographic factors affect the results of patients of reproductive age with PCOS using the "Twenty statements test". It was determined that Asians are much more likely to emphasize their ethnic background (3.9% and 0.6%,  $\chi^2 = 6.11$ ,  $p = 0.01$ ) and accentuate their marital status (11.8% and 6.9%,  $\chi^2 = 4.52$ ,  $p = 0.04$ ).

Besides, we have managed to define differences between women with PCOS depending on their educational level. Thus, women with higher educational level more often emphasize their professional identity (7.9% and 3.6%,  $\chi^2 = 6.81$ ,  $p = 0.01$ ), compared to patients with a lower level, and provide more personal characteristics (55.1% and 44.6%,  $\chi^2 = 6.22$ ,  $p = 0.01$ ).

Finally, we defined differences in the identity between women with PCOS according to their marital status: main differences were observed between women with civil marriage or unmarried and married women. The married ones more often emphasize their family identity and less often emphasize their personal component.

Besides, there were also differences in the characteristics used for self-description, depending on the women's with PCOS place of residence (city or countryside). Women, living in the countryside, more often used family-related (10.4% and 6.9%,  $\chi^2 = 5.35$ ,  $p = 0.02$ ) and less

often existential (16.5% and 12.6%,  $\chi^2 = 5.44$ ,  $p = 0.02$ ) components for self-description.

Then we analysed how socio-demographic factors affect the results of PCOS women using the "Twenty statements test". It was determined that Caucasian women of the control group, differ from Asians in terms of ethnicity component (1.6% vs. share of 4.5% among Asians,  $\chi^2 = 6.11$ ,  $p = 0.01$ ), as well as - by the personal component level (46.1% and 41.3%, respectively,  $\chi^2 = 5.88$ ,  $p = 0.02$ ). No differences were found by educational level. Finally, similarly to women of the main group, women of the control group, living in the countryside, more often use family-related characteristics for self-description (18.1% and 12.5%,  $\chi^2 = 8.82$ ,  $p = 0.01$ ).

Thus, in women of reproductive age with PCOS, self-description is characterized by a larger number of external factors compared to women without PCOS. First of all, differences affect family and personal components, characterizing, in our opinion, the most important spheres for women. In women of reproductive age without PCOS, self-categorization in terms of family identity is also determined by socio-demographic factors, but to a lesser extent.

In our view, the main determining factor for self-categorization is a place of residence. It can be assumed that in women, living in the countryside, a family sphere is the core of their identity; they are limited in their choice of other areas required for a positive identity formation. Naturally, women with PCOS feel vulnerable about this sphere, making their identity more fragile and diffused; the identity achievement level is lower compared to women living in the city.

Generally, during the study, we determined the identity of women of reproductive age with polycystic ovary syndrome. Though they describe themselves in traditional gender and family roles, compared to women without PCOS, their ego-identity often has achieved status with its structure being less controversial. These results do not coincide with conclusions made by Kh.V. Bezhina [23]. For example, we did not determine any degradation, time perspective of such women, or a decrease in the perception of their future.

In reference to other study [24], we have shown in our study that women of reproductive age with PCOS are less likely to use roles attributed to

female gender. However, we did not observe any negative emotions, experienced by women with PCOS in this respect. On the contrary, they are more inherent in the status of Identity Achievement and less in Identity Diffusion.

#### 4. CONCLUSION

Based on the research results, the following conclusions can be drawn:

- Among women of reproductive age with PCOS, the status of Ego-identity Achievement prevails, compared to women without PCOS, similar by marital, age, and social status. It means they are responsible for their choice and control over their emotions.
- Women with PCOS show the less complete representation of their past and future lives and describe themselves in categories related to identity social component (career, self-development, etc.) rather than the interpersonal component (family sphere).
- Among women of reproductive age with PCOS, self-description is characterized by a larger number of external factors compared to women without PCOS. First of all, differences affect family and personal components, characterizing, in our opinion, the most important spheres for women. In women of reproductive age without PCOS, self-categorization in terms of family identity is also determined by socio-demographic factors, but to a lesser extent.

#### CONSENT AND ETHICAL APPROVAL

This study was approved by the Local Ethics Committee of Scientific Centre for Family Health and Human Reproduction Problems. All responsible signed a voluntary informed consent to participate in the study.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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