

## Nursing diagnosis “Deficient Knowledge” in users of combined oral contraceptive

### Diagnóstico de enfermagem Conhecimento Deficiente em usuárias de anticoncepcional oral combinado

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#### ABSTRACT

Our objective was to analyze the accuracy of defining characteristics of the nursing diagnosis “Deficient Knowledge” in users of COC. A cross-sectional study conducted with 97 women in fertile age at a family health center in the Northeast Region of Brazil. The data collection was between September to October of 2011, through interviews to identify defining characteristics and factors related to Taxonomy II of NANDA-I 2012. The nursing diagnosis in question presented prevalence of 58.8%; the defining characteristic “inadequate following of instructions” (57.7%) and the related factor “wrong interpretation of information” were the most prevalent. “Inadequate following of instructions” presented higher sensitivity, 96.21 (88.46 – 99.07), high positive predictive value (PPV = 98.28) and elevated negative predictive value (NPV= 95.35). All defining characteristics presented the same specificity, 97.62 (87.68 – 99.58). It is concluded that studied defining characteristics presented high sensitivity, specificity, positive predictive values, and negative predictive values for the analyzed nursing diagnosis.

**Descriptors:** Nursing Diagnosis; Knowledge; Contraceptives, Oral, Combined.

#### RESUMO

Objetivou-se analisar a acurácia das características definidoras do diagnóstico de enfermagem “Conhecimento Deficiente” em usuárias de AOC. Estudo transversal realizado com 97 mulheres em idade fértil em centro de saúde da família do nordeste brasileiro. A coleta de dados ocorreu de setembro a outubro de 2011, por meio de entrevista para identificação das características definidoras e dos fatores relacionados da Taxonomia II da NANDA-I 2012. O diagnóstico de enfermagem em questão apresentou prevalência de 58,8%; a característica definidora “seguimento inadequado de instruções” (57,7%) e o fator relacionado “interpretação errônea de informações” (58,8%) foram os mais prevalentes. “Seguimento inadequado de instruções” apresentou maior sensibilidade, 96,61(88.46 - 99.07), elevado valor preditivo positivo (VPP=98,28) e elevado valor preditivo negativo (VPN=95,35). Todas as características definidoras apresentaram a mesma especificidade, 97,62(87.68 - 99.58). Conclui-se que as características definidoras estudadas apresentaram sensibilidade, especificidade, valores preditivos positivos e negativos altos para o diagnóstico de enfermagem analisado.

**Descritores:** Diagnóstico de Enfermagem; Conhecimento; Anticoncepcionais Oraís Combinados.

## INTRODUCTION

In contemporaneity, there are diverse available contraceptive methods (CMs), hormone contraceptives are noticed among the most used by the world population. In the past years, the use of Combined Oral Contraceptives (COC) has been growing in Brazil<sup>(1)</sup>.

A National Demography and Health Research (PNDS) conducted in six Brazilian capitals with 15,575 women found that within participants with a fixed partner (82.4%), 80.5% were using some method, from those 25.9% were lacquered, 27.4% were using oral contraceptive, 13% used male preservative, 2.1% practiced withdraw method, 5.1% had a vasectomized partner and 7.0% used other methods, as the Intra Uterine Device (IUD), diaphragm, injections, within others<sup>(2)</sup>.

Low dose combined contraceptive pills are constituted of up to 30µg of ethinyl estradiol in its two presentation forms: one of 21 pills, with a pause of seven days between one card and the subsequent; and another of 28 pills, of continuous use<sup>(3)</sup>.

Besides providing safe, the COC is an effective protection and reversible against pregnancy, it propitiates non-contraceptive benefits, as control of the menstrual cycle, alleviation of menstrual symptoms, bone health improvement, prevention of ovary and endometrial and colorectal cancer and, reduction of maternal and infant mortality. The presence of risks and adverse events associated with this method are noted<sup>(4)</sup>. In this sense, the contraceptive decision should be based on risks and benefits.

The correct and consistent use of contraceptive method is the main determinant of its efficacy. Adoption of women's safe sexual behaviors is a challenge for health professionals, as the individualized approach during the Family Planning (FP) consultation is not contemplated by all involved in this process<sup>(5)</sup>.

The rate of failure is estimated as eight pregnancies for 100 users per year. Yet, if there are no use failures, less than one pregnancy might occur for 100 women per year.

The failure rate is directly related to incorrect method use, as well as the presence of adverse events, an important factor for abandonment<sup>(3)</sup>.

It is known that health education is one of the nursing care. Thus, its importance is found in health promotion actions, especially during the preconception period, when promoting pregnancy planning<sup>(6)</sup>.

The Adequate COC promotion should follow the World Health Organization (WHO) recommendations, so the voluntary and clear decision about existing contraceptive methods occurs. Thus, women seeking PF services should be knowledgeable about the method efficacy, its use, how it works, adverse events, risks, and benefits to health, signals and symptoms indicative of return to service, return to fertility after interruption of use and prevention of Sexually Transmitted Diseases (STDs)<sup>(7)</sup>. All this information should be offered to COC users in nursing consultations.

The nursing consultation presupposes application of the Systematization of Nursing Care (SNC) and allows the nurse to collect data, establish the Nursing Diagnosis (ND), prescribe and implement interventions and, assess results<sup>(8)</sup>. It is defined by the International NANDA, as a "clinical judgement of the answers of individuals, family, or community for the vital processes or for the actual or potential health problems. It provides the case to select nursing interventions"<sup>(9)</sup>.

The International NANDA defines the ND Deficient Knowledge, as "the absence or deficiency of cognitive information related to a specific topic". It has the defining characteristics: exaggerated behaviors, inappropriate behaviors, inadequate performance in a test, inadequate following of instructions and problem verbalization. Its related factors are: lack of ability to remember, lack of exposition, lack of familiarity with information resources, lack of interest to learn, wrong interpretation and cognitive limitation<sup>(9)</sup>.

Considering what was exposed, the study objective was to analyze the accuracy of defining characteristics from the ND "Deficient Knowledge" in COC users.

**METHODS**

A cross-sectional study conducted in a Health Family Center (“*Centro Saúde da Família*” - CSF) in a city located at the Northeast Region of Brazil. The referred CSF has seven teams (“*Equipes Saúde da Família*” - ESF) to attend an average population of 28,000 people.

The study population corresponded to women at fertile age (10 to 49 years) enrolled on the CSF, and the sample size (n=97) was calculated based on the formula for infinite populations:

$$n = \frac{Z_{\alpha}^2 \cdot P \cdot (1 - P)}{e^2}$$

Where, n: is the sample size; Z<sub>α</sub>: significance level at standard deviation (95%); P: phenomenon prevalence (50%); E: sample error (10%). We adopted the maximum

value of P by the lack of information about the exact proportion of women in fertile age seeking service.

The inclusion criteria were to be in childbearing age and to be accompanied in the referred CSF. Women accompanied in other CSFs or in private healthcare services were excluded.

Data collection was in September to October of 2011, through structured interviews aimed to identify related factors, signs, and symptoms composing the defining characteristics of the study diagnosis according to Taxonomy II of NANDA-I<sup>(9)</sup>. The participants were approached in diverse attention sectors, and the data collection instrument contemplated: (1) sociodemographic data; (2) information related to habitual use of COC; (3) test regarding the knowledge of women about the correct use of the method (Chart 1).

**Chart 1:** Definition of defining characteristics and factors related to the ND – COC Deficient Knowledge

Defining characteristics	Definitions
Exaggerated behaviors	Takes COC excessively. For example: take it more than once a day.
Inappropriate behaviors	Uses the COC incorrectly, although not exaggerated. Represents an improper conduct that, although not excessively intense, can lead to pregnancy. For example: Does not take the pill every day; takes the pill only when having sex; after forgetting to take it, throw the rest of the card away.
Inadequate performance in a test	Performance in a knowledge assessment inferior than expected or desired. It was considered inadequate when the woman answered incorrectly the four questions about the correct use of COC.
Inadequate following of instructions	Non-compliance or not realizing activities or norms judged as needed. Included any incompatible attitude with the recommendations offered by the professional. For example: Does not start to take COC on the first five days of the menstrual cycle.
Problem verbalization	Recognizes to have a problem through saying. Characterized by the verbal report of the difficulty to use the COC correctly (constant forgetfulness, presence of adverse events, not adapted to the method).
<b>Related factors</b>	
Lack of remembering ability	Incapacity to search in the memory information stored before that is related to the received guidance. Difficulty to remember instructions of COC use and/or presents episodes of frequent forgetfulness.
Lack of exposition	Reports that have never used COC before.
Lack of familiarity with information resources	Inadequate interpretation of guidance on the card, label and/or offered by the professional.
Lack of learning interest	Absence of questions about the conduct to adopt and directing of attention to facts or circumstances not related to the adequate use of COC.
Wrong interpretation of information	Divergence between what was oriented by the professional and what is executed by the client.
Cognitive limitation	Difficulty to read and/or reasoning demonstrated by the difficulty to comprehend the offered instructions.

The defining characteristics and related factors were conceptualized by the authors based in clinical and

operational criteria, established based on the specific literature<sup>(3)</sup> and experience of those regarding the theme

in question. Thus, the definitions were determined by absolute agreement among authors.

The presence of the ND “Deficient Knowledge” was determined in accordance with the presence of one or more defining characteristics presented on Chart 1<sup>(10)</sup>.

The data was organized on the Excel for Windows software and analyzed on SPSS version 19.0. To assess the association between the defining characteristics and the ND presence, the Pearson’ Chi-Square Test was used for expected frequencies higher than five; and the Fisher Test for exact probability, for frequencies lower than five. When tables presented more than two categories and expected frequencies lower than five, the Fisher-Freeman-Halton test was applied. The association magnitude between categorical variables was measured by the prevalence ratio. To verify the normality of data, the Shapiro-Wilk test or Kolmogorov-Smirnov test was used. To verify the homogeneity of variances, the Levene test was applied. Based on the results of those tests, T test or Mann-Whitney test was applied, to verify the mean difference/median between groups.

At last, accuracy analysis was conducted based on sensitivity, specificity and probability measures post-test

(positive and negative) of defining characteristics and related factors brought up in the study. Sensitivity represents the probability to correctly identify the presence of clinical indicator in patients without the ND. The predictive value of a clinical characteristic when positive (PPV), represents the probability to find the ND in patients presenting such defining characteristic. When negative (NPV), represents the absence probability of the ND in patients without such defining characteristic<sup>(11)</sup>.

The research project was submitted and approved by the Ethics in Research Committee of Universidade Federal do Ceará, according to the protocol nº 160/11. All participants signed the Free and Informed Consent. The study followed all Brazilian norms for research with human beings.

**RESULTS**

Regarding education, complete high school was predominant, referred by 61 women (62.9%). The occupation “stay home” was referred by 30 women (30.9%) e 27 (27.8%) cited “student”. Marital status “married” was cited by 51 women (52.6%) (Table 1).

**Table 1:** Distribution of the number of participants in accordance with sociodemographic data and time of COC use. Fortaleza, CE, Brazil, 2011.

Variables (n=97)	No.			%	
Education					
Middle school	10			10,3	
High school	84			86,5	
College or higher	3			3,2	
Occupation					
Work outside home	31			31,9	
Stay at home	30			30,9	
Student	27			27,8	
Others	9			9,1	
Marital status					
Married or in a stable relationship	51			52,6	
Single	45			46,4	
Divorced	1			1	
	<b>Mean</b>	<b>SD</b>	<b>Median</b>	<b>IQ</b>	<b>P value</b>
Age (completed years)	24,08	5,082	24	7	0,021
Family income (minimum wage*)	1,97	770	2	1	<0,001
Time of COC use (in months)	61,22	46,707	48	72	<0,001

\* SD: standard deviation

\* IQ: *inter*-quartiles

\* p value: Kolmogorov-Smirnov test

\* Minimum wage at the time of the study—R\$ 545,00

When assessing normality of socioeconomic variables using the Kolmogorov-Smirnov test, heterogeneity was obtained related to age, family income and time of COC use, therefore, median was adopted.

Interviewed women presented median age of 24 years (IQ = 7), family income of two salaries (IQ=1) and four as the number of people in the family (IQ=1). The median time of oral contraceptive use was 48 months (IQ = 72).

The presence of method flaw was mentioned by 18 women (18.6%), being this attributed to forgetfulness to take it daily. Referring to the indication of the method, 79

(81.4%) mentioned to receive indication of a health professional. From those, 56 (70.9%) mentioned the physician and 23 (29.1%) mentioned the nurse. Yet, 13 (13.4%) admitted to start the method per se and five (5.2%) referred indication by friends.

In accordance with Table 2, it is verified that the defining characteristic “inadequate following of instructions” was more prevalent 56 (57.7%), and the related factor “wrong interpretation of information” 57 (58.8%). In relation to the nursing diagnosis “deficient knowledge”, 57 (58.8%) presented it.

**Table 2:** Prevalence of defining characteristics and factors related to the nursing diagnosis deficient knowledge. Fortaleza, CE, Brazil, 2011.

Variables	No.	%
<b>Defining Characteristics</b>		
Inadequate following of instructions	56	57,7
Problem verbalization	4	4,1
Inappropriate behaviors	2	2,1
Inadequate performance in a test	1	1
<b>Related factors</b>		
Wrong interpretation of information	57	58,8
Lack of remembering ability	7	7,2
Lack of exposition	4	4,1
Lack of learning interest	2	2,1
<b>Nursing Diagnosis Deficient Knowledge</b>	57	58,8

In the bivariate analysis among defining characteristics of the nursing diagnosis and the clinical and demographic variables, there was no association statistically significant found.

The defining characteristic “inadequate following of instructions” presented a positive association with the ND Deficient Knowledge ( $p < 0,001$ ). Regarding factors related to “wrong interpretation of information”, these presented statistical significance ( $p < 0,001$ ).

On Table 3, the defining characteristic “inadequate following of instructions” had the highest sensitivity, thus, this presented higher probability to identify correctly the ND presence in a study with COC users. Such characteristic also presented a high positive predictive value (PPV = 98.28), indicating a higher probability to confirm the deficient knowledge ND. All defining characteristics obtained the same specificity.

The characteristics inadequate following of instructions and problem verbalization presented high positive and negative predictive value, indicating an elevated likelihood of the deficient knowledge ND to occur in the presence of these characteristics and the absence of the referred diagnosis when the COC users do not present such characteristics. Higher values of area under the ROC curve were obtained in the characteristics inadequate following of instructions (0.971) and problem verbalization (0.530) (Table 3).

The diagnostic odds ratio (DOR) analysis verify the probability of the diagnosis occurrence in accordance with the presence of the defining characteristic, thus the inadequate following of instructions was the clinical sign with higher chances of occurrence (Table 3).

**Table 3:** Accuracy measures of the defining characteristics for the nursing diagnosis deficient knowledge. Fortaleza, CE, Brazil, 2011.

Characteristics	Variables	Se	Sp	PPV	NPV	+LR CI (95%)	-LR CI (95%)	DOR CI (95%)	ROC	p
Inappropriate behavior		5,08	97,6	75	42,2	2,14 (0,30-15,05)	0,97 (0,90-1,05)	2,01 (0,22-59,5)	0,513	0,51
Inadequate performance in a test		3,3	97,6	66,6	41,8	1,42 (0,20-10,04)	0,99 (0,93-1,06)	1,35 (0,11-43,41)	0,505	0,4
Inadequate following of instructions		96,6	97,6	98,2	95,3	40,58 (0,30-15,05)	0,03 (0,01-0,14)	778,06 (107,77-16384)	0,971	<0,001
Problem verbalization		8,47	97,6	83,3	43,1	3,56 (0,51-25,07)	0,94 (0,86-1,03)	3,4 (0,50-92,38)	0,53	0,14

\* Sensitivity (Se), Specificity (Sp), Positive Predictive Value (PPV), Negative Predicted Value (NPV), Positive Likelihood Ratio (+LR), Negative Likelihood Ratio (-LR), Diagnostic Odds Ratio (DOR) e Area under the ROC curve (ROC)

\* CI confidence interval

\* p Person Chi-Squared test

## DISCUSSION

The total of people between 18 and 20 years with complete high school more than tripled on the past two decades, with the indicator passing from 13% to 41%<sup>(12)</sup>. In discordance with this study, where more than half of participants concluded high school, a condition that could influence knowledge regarding COC.

This correlation was found, for example, in a study conducted in Fortaleza-CE with 264 COC users, where authors identified an association between the correct COC use and education variables and family income, both having a positive correlation, suggesting that the more educated ( $r=0.164$ ;  $p=0.008$ ) and/or the family income ( $r=0.135$ ;  $p=0.029$ ), the more knowledgeable participants were about the correct COC use<sup>(13)</sup>.

Regarding occupation, the percentage of women working outside the house was practically the same compared to women doing home-related activities. It confirms the inclusion of women in the job market awakening interest due to their social upward, with consequent reduction of fertility, emphasizing the need to assist family planning<sup>(14)</sup>.

With concern of marital status, married women or in a stable relationship was prevalent. It agrees with a study conducted in health centers from Fortaleza-CE where 84.1% of participants referred to be in a stable relationship<sup>(13)</sup>.

There was predominance of young women in the study, a consonant factor in the study that can infer on

the knowledge about general contraceptive methods, considering that it is expected that older people should have a higher sense of responsibility, what can conduct to a higher search for information and health services in order to limit pregnancies<sup>(15)</sup>.

The average family income identified in the study characterize participants as social class "poor, but not extremely poor"<sup>(16)</sup>. This result was expected at the ESF studied, once the priority of the implementation team is places with less favorable socioeconomic indicators. This condition lead the authors to affirm that unfavorable socioeconomic factors should be emphasized in the process of family planning advice, in a sense to alert women, men and/or couples regarding the decision to have or not children and when, considering the family' financial infrastructure<sup>(17)</sup>.

The time of COC use could be related to the knowledge of users regarding the method. A research suggest women who used COC for longer time knew more about its adverse events ( $r=0.189$ ;  $p=0.002$ )<sup>(13)</sup>. A study conducted with 1.427 women between 18 and 39 years reinforce the relationship between the presence of adverse events and discontinuity of contraceptive method, in which 57.3% of participants after six months of starting to use COC, had stopped the use due to adverse events<sup>(18)</sup>. Thus, it is perceived that the low knowledge of women about a contraceptive method can increase the level of abandonment of it.

A study conducted in the city of El Paso, Texas (USA) with 108 women identified 100% of those using COC reporting to be inconvenient to take contraceptive pills daily, a fact related to the incorrect and inconsistent use, corroborating with fails when using the method<sup>(19)</sup>.

In the Nursing consultation, family planning should investigate difficulties of COC users in remembering to take it daily, helping them to find easy and accessible ways to facilitate this memorization process, as: to keep the medication in a strategic place to be seen at the correct time; relate taking it with some daily activity; involve the partner in a sense to help the user to take it; to use an available alarm clock, as the cell phone, among others.

The indication of contraceptive methods by health professionals corroborates the correct use. A study conducted with 273 adolescents reinforce this assertive, as when identifying the parents and the media as the main source of information, 75% had very scarce knowledge about the CMs<sup>(20)</sup>.

In agreement with the result of this research, the knowledge deficit about COC was identified in a study conducted in Teresina-PI, involving 278 adolescents where a questionnaire and a scale to assess objective knowledge about the correct COC use were applied. Authors found 98.2% of participants with low objective knowledge, that is, they got three or less items from the scale correct<sup>(21)</sup>.

In counterpart, a study conducted in Fortaleza-CE identified more positive results when verifying 50% of participants with substantial or extensive knowledge about COC correct use and related adverse events. In general, the knowledge was only limited regarding complications associated to COC use<sup>(13)</sup>.

There was a predominance of the defining characteristic “inadequate following of instructions”, emphasizing the difficulty that users presented to totally comprehend instructions given by health professionals. These limitations were concentrated in the correct way to start the method and in what to do in case of

forgetfulness to take COC daily. These findings corroborate with a study conducted with 357 women from Saudi Arabia, pointing high levels of inadequate knowledge about the COC use in 63.9% of users<sup>(22)</sup>. Those are worrying data, as the inconsistent and wrong use of the method can result in unplanned pregnancy.

Regarding the related factors, the one with higher prevalence in this study was “wrong interpretation of information”. This fact reflects the assimilation fragility of guidance provided by health professionals to women. It is extremely important to assess the quality of provided guidance, as other factors, for example, the comprehension of information, memory and level of education can influence the knowledge<sup>(22)</sup>.

Positive results were reached on long term in Germany when applying written material in 124 women to increase COC knowledge, it was highlighted that this strategy allowed changes in attitude and practice of users<sup>(23)</sup>.

The specificity of defining characteristics contributes with the nursing practice when helping to identify the ND during family planning consultations. It is noted that the nurse should be aware to identify users who do not feel comfortable to expose doubts or difficulties regarding the contraceptive method. This peculiarity of nursing action will contribute with early identification of defining characteristics, in particular, the problem verbalization<sup>(24)</sup>.

The accuracy analysis of the nursing diagnosis deficient knowledge reinforced evidence of many studies that identified low quality of information about the correct COC use and the comprehension difficulty from these users<sup>(13-22-25)</sup>. It is noted that the presence of the study diagnosis in COC users can influence the method efficacy and make them more susceptible to an unplanned pregnancy.

## CONCLUSION

The accuracy analysis of defining characteristics of the nursing diagnosis “Deficient Knowledge” in COC users

identified that although the elevated percentage of women with positive aspects favoring apprehension of knowledge about the method, as guidance provided by professionals (physician or nurse) regarding COC and considerable education level (complete high school), there are still difficulties of this research group in following recommendations for the correct COC use.

The defining characteristics studied presented high sensitivity, specificity, positive and negative predictive values for the analyzed nursing diagnosis.

Facing the elevated chance to occur ND “Deficient Knowledge”, through “inadequate following of instructions”, it is noted the need to revise nursing interventions to reach better results.

Intervention studies should be developed to test and/or compare health education strategies, generating resources to corroborate with the increase of knowledge about the correct COC use.

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