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PREFACE

Dear readers of the Journal of Middle East and North Africa Sciences,

It is a great pleasure to publish this issue of the Journal of Middle East and North Africa Sciences for our readers. The issue is composed of 2 different papers having an acceptance rate of 83% in various disciplines of science. We would like to thank all authors, referees, our editorial board members and content editor that show efforts for the publication of the issue.

I would like to invite you to submit your manuscripts to the next issue of the Journal of Middle East and North Africa Sciences.

Ahmad Saleh, PhD
Editor-in-Chief



Knowledge, Attitudes, and Beliefs toward Contraceptive Use among Women and Men in the Ho Municipality in the Volta Region, Ghana



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ABSTRACT

Background: Acceptance of contraceptive use by men and women in developing countries is believed to be influenced by people's awareness, attitudes, and beliefs about contraceptive.

Objective: The study investigated the knowledge, attitudes, and beliefs about contraceptive use among women and men among residents of the Ho Municipality in the Volta Region, Ghana.

Materials and Methods: This study was a cross-sectional survey. A total of 340 respondents, men and women were randomly selected from the sub-municipalities in Ho for the study. The tool for data collection included structured questionnaires and an interview guide. Quantitative data was analyzed at the univariate and bivariate level using SPSS version 15.0 software, while qualitative data was analyzed thematically.

Findings: The average age of the men was 28.06 years (SD=7.28) while that of the women was 30.41 years (SD=8.12). Knowledge of contraceptive methods was high: (151/161) 96.3% of men and (153/169) 90.5% of women were aware of contraceptive; however, this did not translate into high usage. Only 67 (41.6%) of men and 59 (34.9%) of women were current users of modern contraceptive. The major perceptions and beliefs regarding family planning contraceptive use from the perspectives of men and women in this study included contraceptives were harmful to the womb, contraceptives use will make you increase in weight, contraceptives use can make you infertile, contraceptives are meant for only married people, and contraceptives should only be used by women because they become pregnant

Conclusion: In conclusion, the findings of this study showed that the awareness of contraceptives use among community members were high, however, the high level of awareness of contraceptives use did not translate into high usage among men and women in the study area as there was still low contraceptive use.

To cite this article

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Keywords: Knowledge, Beliefs, Attitudes and Family Planning, Contraceptive Use.

1. Background of the Study:

In recent years, there have been tremendous advances in the development of modern contraceptive services, and yet millions of individuals and couples around the world are unable to plan their families as they wish. According to the World Health Organisation (WHO) globally each year, close to 350,000 women die from pregnancy and childbirth complications (WHO, 2014). Reports from Ghana Health Service (GHS) indicate that in 2014, approximately 376,657 pregnancies registered in 2013 were registered to young women aged 10-24 years. This represents 39% of a total of 971,268

registered pregnancies countrywide (GHS, 2014). There were 23,130 cases of spontaneous and induced abortions among young women (10-24 years) reported within the same period (Robinson et al., 2016).

Empirical evidence suggest that effective contraceptive uptake prevents an estimated 2.7 million infant deaths and the loss of 60 million of healthy life in a year (Apanga & Adam, 2015; Nsubuga et al., 2016) while promotion of family planning could reduce poverty and hunger and avert 32% of all maternal deaths and nearly 10% of childhood deaths (Higgins & Smith, 2016).

Furthermore, investing in family planning as a component of good reproductive health has benefits that go beyond the obvious prevention of pregnancy and reduction of disease burden, the social and economic benefits for global development goals should not be overlooked. However, despite persistent advocacy urging the use of modern contraceptive methods for family planning, the fertility rates in most sub-Saharan African countries still remains unacceptably high, mostly due to poor uptake of contraception because of cultural, economic and political barriers (White et al., 2013).

Research studies (Agyei-Baffour et al., 2015; Mboane et al., 2015) show that women and men contraceptives use methods largely depend on the knowledge, beliefs, and attitudes of women and men towards reproductive health, especially, contraceptive use. Making a choice to use contraceptive presupposes that couples have ample knowledge about suitable contraceptive methods which is also a pre-requisite of access and use. Cultural beliefs, values, and practices shape an individual's knowledge and perception of health care seeking practices and behaviours especially in reproductive health decisions among couples (Asekun-Olarinmoye et al., 2013).

In Sub-Saharan Africa, traditional religious beliefs and practices are embedded in lineage systems that impact the structure of society, which influence women and men decisions regarding contraceptive use (Yakong et al., 2010). The marriage customs, the societal value of having many children, and strong extended family ties regulate reproduction (Godfrey et al., 2011). Studies have revealed that in most West African countries, births are spaced by use of prolonged "postpartum abstinence" although this method tends to be unreliable (Yakong et al., 2010; Robinson et al., 2016). Husbands and wives face difficulties in maintaining the prolonged abstinence, especially when the marriage is monogamous.

Despite difficulties women encounter in maintaining post-partum abstinence, and the desire to have fewer children, acceptance of family planning in most African cultures including Ghana is low and fertility rates are high (GHS,2014). This is because women have limited choices regarding fertility regulation as a result of the traditional beliefs, values, and practices around childbearing (Yakong et al., 2010). The high fertility rates endanger women's health status in general and reproductive health in particular.

In Ghana, the majority of the cultural beliefs and practices place a high value on large families and especially male children, and therefore, there is a lack of support for women's use of birth control (Agyei-Baffour et al., 2015; Apanga & Adam, 2015; Yakong et al., 2010). In some cases, there are usually tensions

in some marriages where the woman is interested in using birth control, and these tensions may even lead to separation or divorce. Women, due to cultural practices in some Ghanaian societies, exercise little control over their reproduction and experience multiple pregnancies in a context of limited health services (Yakong et al., 2010). This has a direct impact on the women's overall health status. As well, some studies have demonstrated that women's autonomy over their reproductive health can bring tensions in some families both for their husbands and the extended family members (Agyei-Baffour et al., 2015; Apanga & Adam, 2015; Yakong et al., 2010).

According to GHS (2014), although diverse efforts are being made to ensure an increase in uptake of family planning services, these efforts have only contributed in increasing family planning acceptor rate marginally from 24.7% in 2013 to 29.1% in 2014. In spite of the low uptake of family planning contraceptives in Ghana, a search through literature reveals that there is a paucity of information regarding men's and women's knowledge, attitudes and beliefs regarding contraceptive use in the Volta Region of Ghana. The aim of this study is to explore the knowledge, attitudes, and beliefs towards contraceptive use among women and men in the Ho Municipality, Ghana.

2. Materials and Methods:

A cross-sectional survey was conducted among women and men in the Ho municipality of Ghana. Women and men who met the inclusion criteria were selected to participate in the study. The study outcomes included knowledge, attitudes, and beliefs towards contraceptive use among women and men. Knowledge was defined as the state of awareness of contraceptive methods, any specific types and the sources of contraceptives. Attitude or perception was defined as a respondent's opinion review, whether positive or negative towards a practice or behaviour such as contraceptive use.

2.1. Description of Study Site:

Ho is one of the fifteen-political/administrative districts in the Volta Region of Ghana. It is located in the middle zone of the Region. The municipality, formerly a district, which was made up of six sub-districts had two of its sub-districts_ Adaklu and Kpetoe-Ziope carved out to make the new Adaklu-Anyigbe District. The municipality has since then been made of four sub-municipalities namely Ho Shia, Kpedze Vane, Abutia and Tsito sub-municipalities. Ho Municipality is bordered on the north by the Hohoe District, west by Asuogyaman District, east and south-east by Adaklu-Anyigbe District, north-west by South Dayi District and north-



east by the Republic of Togo. Although the land area covered by the municipality has not yet been clearly demarcated, together with Adaklu-Anyigbe, it covers an area of about 2,564 square kilometers with Ho Municipality operating with an estimated population of 160,493 with an annual growth rate of 1.9 percent. Ho town doubles as the Municipal Capital and the Regional Capital of the Volta Region.

There have been Adolescent Health Services going on in the municipality, precisely, Tsito Health Centre and Ho Reproductive and Child Health (RCH) Unit. Patronage is no more encouraging. In an effort to revamp the Adolescent Health Service in the municipality, Community Health Nurses (CHNs) were taken through the health policy, so as to make their facilities more adolescent friendly and report on activities carried out in their various catchment areas. The Municipal Health Directorate (MHD) in collaboration with a Non-Governmental Organization (NGO) has set up a center known as Health Outreach and Peer Education (HOPE) Centre at VORADEP Village in Ho. In addition to the above, the MHD has outlined a series of activities to reach out to the adolescents in the municipality and sensitize them on the Adolescent Health Policy. Pathfinder International has earmarked Tsito Health Centre (H/C) and Council Hall RCH Unit for upgrading to adolescent health facilities and budget proposals have been forwarded to them awaiting their response.

2.2. Study Population

The survey population comprised adolescents, young adults, and adults of both sexes. Women in their reproductive age (15-49 years) and men aged 15-65 who were sexually active and were willing to participate in this present study were selected from the Ho municipality.

2.3. Data Collection Techniques and Tools

Primary data was collected for the study. Both qualitative and quantitative methods were used for the data collection. The qualitative data were gathered through interviewing key informants and conducting focus group discussions with adults, both male, and female, in the Ho municipality. A structured questionnaire was used to collect quantitative data on respondents' demographic characteristics; respondents either self-administered the questionnaire or had interviewers administer the questionnaire to them depending on a respondent's ability to read English. The tools used for qualitative data collection were Key Informant Interview (KII) schedule and focus group discussion guide. Three hundred and forty (340) women aged 15-49 years, and men aged 15-65+ years were interviewed using a structured questionnaire designed to elicit information on

respondents' background and knowledge, attitudes and beliefs about contraceptive use among women and men. Background characteristics of the respondents recorded included the age, residence, and ethnicity of the respondents. The instrument used in determining the potential barriers to contraceptive use consisted of 18 items, each of which was worded in a short statement and was structured on awareness of contraceptive, preference for a method, the number of children living, contraceptive use, the attitude at service units and misconception of contraceptive use.

2.4. Sampling Techniques and Sample Size

Probability sampling techniques were adopted for the quantitative component of the study while non-random sampling was used for the qualitative component. The study covered all the four sub-municipalities in the Ho municipality. Multistage sampling was used in selecting the respondents for the quantitative data. The Municipality is composed of four sub-municipalities and each has between 7-12 towns and villages.

The sampling covered the four sub-municipalities: Tsito, Abutia, K/Vane and Ho/Shia. Systematic sampling was used in selecting the communities in the four sub-municipalities. On the main road through a sub-municipality, every other community was selected on the basis of fair systematic sampling. In each community, every other household was then selected, starting from the one nearest to the interviewer and all men 15-65 years and women 15-49 years in their reproductive years were interviewed.

2.5. Sample Size

A sample size of 340 was used for the quantitative data. The sample size was calculated as follows: The size was arrived at by using the Magnani Robert formula, $n = z^2 pq/d^2$, where n = sample size, Z^2 = reliability coefficient, P = population proportion (parameter), $q = 1-p$, and d = width (CI) / margin of error. Given $p = 0.3$, $q = 1-0.3 = 0.7$, $z = 1.96$ and $d = 0.05$, $n = z^2 pq / d^2 = 1.962^2 (0.3) (0.7) / 0.05^2$

$$n = 3.8416 * 0.21 / 0.0025$$

$$n = 322.7$$

$$n \sim 323$$

Adding 5% (n) as non-response rate makes $n = 339 \sim 340$.

The above formula is from Magnani Robert's sampling guide (1997). Four research assistants were trained to assist in the data collection. Topics discussed during the training included how to conduct an interview and how to obtain valid answers from the respondents since contraception is a sensitive issue.

2.6. Pre- testing

In order to ensure the validity and reliability of the study instruments and to identify potential problems in the proposed study as well as to give the research assistants some practice, pre-testing of research instruments was conducted in Dzodze which was not part of the study area. This was useful in testing the suitability of the questionnaires, and corrections were made where necessary.

2.7. Data Handling and Analysis

Completed questionnaires were checked for errors in the field immediately after collection to ensure completeness. Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 15.0 software. The quantitative data were presented graphically by the use of tables and graphs. Individual variables were described using frequency distribution tables and bar charts and relationships and associations established by using the chi-square test. Gender was the basis of comparison. The chi-square test for trend was used to measure the relationship between study variables and the corresponding p-values were reported.

2.8. Ethical consideration

Ethical clearance was obtained from Ethics Committee Board (Committee on Human Research Publication and Ethics) of Kwame Nkrumah University of Science and Technology. Administrative clearance was obtained from the Ho Municipal Assembly and the Ghana Health Service (Ho). The respondents were not required to state their names. Participants were informed about the study and about their right to refuse to participate in the survey. Strict privacy was ensured and respondents reassured that their views and identity would remain confidential. The respondents gave their verbal consent before they were enrolled in the study.

3. Results:

3.1. Description of the Sample

The average age of the men was 28.06 years (SD=7.28) while that of the women was 30.41 years (SD=8.12). The difference between the ages of the groups was statistically significant ($p=0.04$). Whereas 52.2% of the men lived in an urban area, 46.7% of the women lived in the same area, however, there was no statistical difference ($p=0.77$) as far as the residence of the groups was concerned. The dominant ethnic group was Ewe; 73.3% and 69.2% of men and women respectively. The religious background of the respondent showed that 88.2% and 85.2% of men and women respectively were Christians. The variation in religious affiliation between the men and women was not statistically significant ($p=0.62$). Nearly seven

percent (6.8%) of the men and 9.5% of the women had had no education. The level of education attained by the groups did not differ significantly ($p=0.60$).

Among the men and women, 52.8% and 52.7% respectively were married. Eighty percent (80.7%) of the men and 81.7% of the women said they earned a regular income. The type of occupation engaged in by the respondents included the civil service, trading, farming, and artisanship. Eighteen percent (18.0%) and 19.5% of men and women respectively were students. There was no difference between the occupational status of the men and women ($p=0.54$).

On the rating of the economic status, 63.4% of the men were ranked in the middle class as against 58.6% of the women. However, 4.3% of the men and 6.5% of the women were rated core poor on the socio-economic scale; they earned little and were not able to provide for 2 meals a day for their families. There was no statistically significant difference ($p=0.54$) in the ranking of economic classes between the socio-economic groups.

Table 1: *Background characteristics of respondents*

Variables	Men (161) n (%)	Women (169) n (%)	Chi square (p-value)
Age (years):			
- <20	15 (9.3)	19 (11.2)	12.97 (0.04)
- 20 – 24	37 (23.0)	30 (17.8)	
- 25 – 29	51 (31.7)	32 (18.9)	
- 30 – 34	24 (14.9)	34 (20.1)	
- 35 – 39	18 (11.2)	23 (13.6)	
- 40 – 44	12 (7.5)	20 (11.8)	
- 45 +	4 (2.5)	11 (6.5)	
Residence:			
- Urban	84 (52.2)	79 (46.7)	1.13 (0.77)
- Peri-urban	23 (14.3)	27 (16.0)	
- Urban slum	12 (7.5)	16 (9.5)	
- Rural	42 (26.1)	47 (27.8)	
Ethnicity:			
- Ashanti	10 (6.2)	10 (5.9)	2.99 (0.70)
- Other Akan	8 (5.0)	15 (8.9)	
- Ewe	118 (73.3)	117 (69.2)	
- Ga/Adangme	12 (7.5)	10 (5.9)	
- Guan	9 (5.6)	10 (5.9)	
- Tribes from the three northern regions	4 (2.5)	7 (4.1)	
Religion:			
- Christianity	142 (88.2)	144 (85.2)	3.50 (0.62)
- Islam	9 (5.6)	15 (8.9)	
- Traditionalist	7 (4.3)	6 (3.6)	
- Spiritualist	3 (1.9)	4 (2.4)	
Education:			
- None	11 (6.8)	16 (9.5)	3.64 (0.60)
- Primary	15 (9.3)	18 (10.7)	
- JHS	41 (25.5)	35 (20.7)	
- SHS	24 (14.9)	32 (18.9)	
- Tertiary	70 (43.5)	68 (40.3)	
Marital status:			
- Married	85 (52.8)	89 (52.7)	9.73 (0.13)
- Cohabiting	17 (10.6)	10 (5.9)	
- Divorced/Widowed	5 (3.1)	13 (7.7)	
- Single	54 (33.5)	57 (33.7)	

Earn regular income:

Yes	130 (80.7)	138 (81.7)	1.88 (0.76)
No	31(20.3)	31(19.3)	

Occupation:

- Civil servants	39 (24.2)	42 (24.8)	8.87 (0.63)
- Traders	28 (17.4)	28 (16.6)	
- Farmers	27 (16.8)	23 (13.6)	
- Artisans	38 (23.5)	42 (24.9)	
- Student s	29 (18.0)	33 (19.5)	

Economic status:

- Core poor	7 (4.3)	11 (6.5)	4.06 (0.54)
- Poor	38 (23.6)	38 (22.5)	
- Middle class	102 (63.4)	99 (58.6)	
- Rich	11 (6.8)	12 (7.1)	
- Very rich	3 (1.9)	9 (5.3)	

3.2. Reproductive Characteristics of Respondents

When asked about having children, 28.6% of the men and 29.6% of the women said they had never had a child. Among those who had ever had a child, 4.3% of the men and 2.5% of the women said their children were not alive. However, 85.2% and 78.2% of the men and women respectively said 1 – 4 children were alive. There were no significant differences between the groups (p=0.83 for ever had a child and p=0.13 for a number of children alive). The experience of an unwanted pregnancy was indicated by 36.6% and 37.3% of the men (their wives/partners) and women respectively. The incidence of unwanted pregnancy as indicated by the respondents was not statistically different (p=0.90) between men and women.

Table 2: Reproductive characteristics of respondents by sex

Variables	Men (161) n (%)	Women (169) n (%)	Chi square (p-value)
Ever had a child:			0.04 (0.83)
Yes	115 (71.4)	119 (70.4)	
No	56(28.6)	50(29.6)	
Number of children alive:	n = 115	n = 119	4.02 (0.13)
- 0	5 (4.3)	3 (2.5)	
- 1 – 4	98 (85.2)	93 (78.2)	
- 5+	12 (10.4)	23 (19.3)	
Unwanted pregnancy:			0.01(0.90)
- Ever had	59 (36.6)	63 (37.3)	
- Never had	102 (63.4)	106 (62.7)	

3.3. Awareness of Family Planning Methods among the Respondents

The results show that about 96.3% of men and 90.5% of women have ever heard of family planning contraceptives. The difference between the men (151/161) 96.3% and women (153/169) 90.5% on the awareness of family planning methods was statistically significant (chi-square =4.37; p=0.03).

Almost four percent 3.7% of the men as compared to 9.5% of the women had never heard of family planning methods. In the focus group

discussion with the women, it was evident that majority of them had heard about and seen contraceptive, however, a few indicated that they had never seen any before. “I have never seen any contraceptive before, I just hear people talk about it...,” (said a 28-year-old woman, Tsito, FGD, Women group). Comparatively, more men were aware of contraceptives. “Yes, we know about family planning and contraceptive like a condom, yes we know, we know...,” (said a 33-year-old man, Ho-Heve, FGD, Men group).

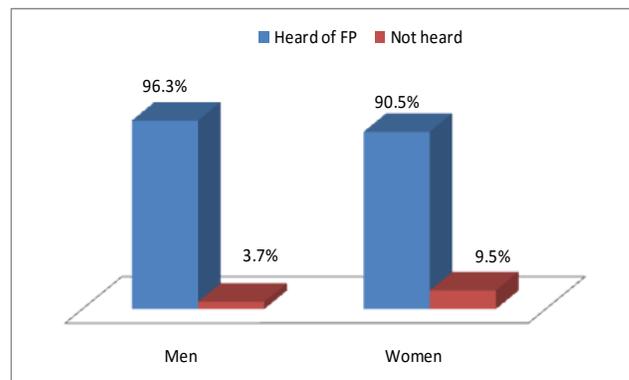


Figure 1. Awareness of family planning methods

3.4 Family Planning Methods Known by Respondents

The respondents had heard about condoms, spermicidal, oral contraceptives, and male sterilizations. There were no differences in the proportion of men and women who had heard about a particular type of family planning method or contraceptive. For instance, even though 88.4% of the men and 88.9% of the women had heard of male and female condoms, the difference in their representation was not statistically significant (p=0.89).

Table 3: FP Methods Known by Respondents

Variables	Men (155) n (%)	Women (153) n (%)	(p-value)
Type of FP method heard of			
- Condom	137 (88.4)	136 (88.9)	(0.89)
- Spermicidal	41 (26.5)	44 (28.8)	(0.65)
- Diaphragm	16 (10.3)	24 (15.7)	(0.16)
- Oral contraceptive	54 (34.8)	57 (37.3)	(0.66)
- Injection (depo)	67 (43.2)	74 (48.4)	(0.36)
- Implant	32 (20.6)	32 (20.9)	(0.95)
- IUD	32 (20.6)	36 (23.5)	(0.54)
- Female sterilization	33 (21.3)	36 (23.5)	(0.63)
- Male sterilization	32 (20.6)	38 (24.8)	(0.38)
- Lactation amenorrhea	18 (11.6)	25 (16.3)	(0.23)
- Periodic abstinence	40 (25.8)	48 (31.4)	(0.28)
- Withdrawal	66 (42.6)	67 (43.8)	(0.83)
- Traditional (herbs)	33 (21.3)	37 (24.2)	(0.55)
- Emergency contraceptive	35 (22.6)	41 (26.8)	(0.39)

*Multiple Responses

3.5. Ever Use of Contraceptive by Gender

More women (72.5%) than men (71.6%) had ever used any contraceptive. The difference between the sexes was not statistically significant ($p=0.85$).

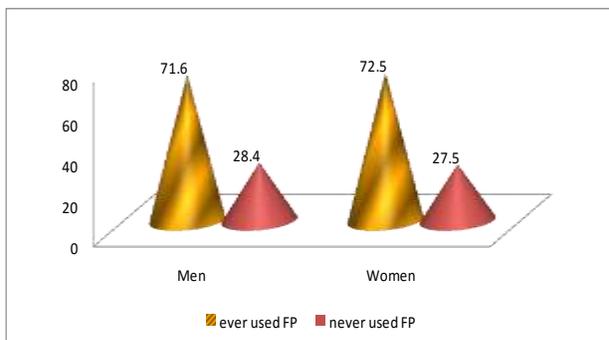


Figure 2. Ever used an FP method,

3.6. The Level of Current Use of Contraceptives by Gender in the Study Area

Out of the 155 men who had heard about family planning, 50.3% said they were currently using contraceptives. A similar proportion of women 50.3% who had heard of family planning were current users of contraceptives. The difference between men and women current users was not statistically significant ($p=0.99$). Among the 78 men who claimed they were currently using contraceptives, 67 representing 85.8% were using modern contraceptive as against 76.7% (59/77) of the women. There was no significant difference ($p=0.14$) between the modern contraceptive user proportions among male and female current users of contraceptives. The modern contraceptive user rate for the men was 41.6% (67/161) and that of the females 34.9% (59/169).

Table 4: Current Use of Contraceptives by Gender

Variables	Men (155) n (%)	Women (153) n (%)	Chi-square (p-value)
Current use of contraceptive:			0.00 (0.99)
- Yes	78 (50.3)	77 (50.3)	
- No	77 (49.7)	76 (49.7)	
Current use of modern contraceptive	n = 78	n = 77	2.18 (0.14)
- Yes	67 (85.8)	59 (76.7)	
- No	11 (14.2)	18 (23.3)	

The most common contraceptive used by the study population was the male condom; 53.8% of men and 49.3% of women reported current use of the condom. In the FGD with the women, mention was made of contraceptives such as ‘injectable (depo) and ‘jabelle’ normally known as Norplant. The choice of these contraceptives by the women was confirmed by a health worker. “The preferred method was the

injectable (Depo) and the Jadelle. Other methods are the male condoms and occasionally the pills,” (said a 27-year-old Midwife, Ho Municipal Hospital). In the men group, mention was made of condoms. However, the group asserted that it was better for women rather than men to use contraceptives. “We use condoms often, but it is best for the women to go for the contraceptives and not men,” (said a 27-year-old, Ho-Heve, FGD, Men Group).

3.7 Perceptions and Beliefs of Participants Regarding Contraceptives Use

Men and women have several beliefs and practices regarding contraceptives use. About 70(45.2%) of men and 55 (40.0%) of women perceived that contraceptives were harmful to the womb, while 55 (35.5%) of men and 70(46.0%) of women perceived that contraceptives use will make them increase in weight. Also, 50(32.3%) of men and 60(39.2%) of women believed that Contraceptives use can make them infertile, while 47 (30.3%) of men and 50(33.0%) of women believed contraceptives use is against the will of God. About 42 (27.1%) of men and only 20 (13.1%) of women perceived that contraceptives are meant for only married people while 30 (19.4%) of men and only 10 (6.5%) of women believed that contraceptives should only be used by women because they become pregnant.

Table 5: Perceptions and beliefs of men and women regarding contraceptives use

Belief	Men (155) n (%)	Women (153) n (%)
Perceived that contraceptives were harmful to the womb	70 (45.2%)	55 (40.0%)
Contraceptives use will make you increase in weight	55 (35.5%)	70 (46.0%)
Contraceptives use can make you infertile	50 (32.3%)	60 (39.2%)
Contraceptives use is against the will of God	47 (30.3%)	50 (33.0%)
Contraceptives are meant for married people only	42(27.1%)	20(13.1%)
Contraceptives should only be used by women because they become pregnant	30 (19.4%)	10 (6.5%)

Multiple responses

4. Discussion:

The study investigated the knowledge, attitudes, and beliefs of women and men about contraceptives use in the Ho municipality of the Volta Region of Ghana. Adequate information about family planning contraception is a pre-requisite for contraceptive use decision making. Borrero et al. (2013) opined that contraceptive knowledge or



awareness logically precedes contraceptives use, and it is, therefore, important to know whether women have proper knowledge of contraceptives or family planning methods.

The findings of this study suggest that majority of women and men were generally aware of contraceptives use, more men were aware of contraceptives than women. The difference between the men and women on the awareness of family planning methods was statistically significant ($p=0.03$). Similarly, in the focus group discussion, it was observed that more men were aware of contraceptives than women. The identified differences in knowledge about the family planning contraceptives by men and women may also contribute to differences in family planning methods use among men and women in this study. The findings of this study confirm a study by Craig et al. (2014) in Ethiopia, which showed that although the overall awareness of most contraceptive methods was high, specific areas of disparities in contraceptives knowledge existed among women and men.

Further, the findings of the present study show that the attitudes of men and women towards the use of contraceptives in the Ho Municipality are not encouraging. Although the majority of the women were generally aware of family planning services in the district in this study, current contraceptives usage among men and women were still low as about half of men and women were currently not using contraceptives. These findings of this study were consistent with studies reported by Nsubuga et al. (2016) and Apanga & Adam (2015) in Ghana, who found in their studies that although the majority of respondents were generally aware of family planning contraceptives, usage of these services was still low.

This trend may indicate that, although the awareness level of family planning contraceptives is becoming more popular overall, misconceptions about the contraceptives among men and women in the Ho municipality may be hampering use. Further, the high level of awareness of family planning contraceptives in this study is not surprising because the Ghana Health Service as part of its policy of increasing the utilization of reproductive health services has created an appreciable level of awareness about family planning services through its educational campaign programmes in all communities, districts, and regions in Ghana. Also, the high awareness of family planning services in this study may be attributed to the community-based health planning and services (CHPS) concept that were introduced to make health care more accessible to the rural communities as well as empowering them to have knowledge on the reproductive health and have greater control of their own health. A number of

forums have been held in most communities in Ghana with the aim to increase acceptance and uptake of family planning services nationwide (Apanga & Adam, 2015).

Moreover, the findings of this present study showed that in spite of the fact that government's and other stakeholders' campaigns and efforts to disabuse people's minds about the misconceptions regarding family planning contraceptives use, men and women still have several perceptions and beliefs regarding family planning contraceptives use. The major perceptions and beliefs regarding family planning contraceptives use from the perspectives of men and women in this study included contraceptives were harmful to the womb, contraceptives use will make you increase in weight, contraceptives use can make you infertile, contraceptives are meant for only married people and contraceptives should only be used by women because they become pregnant.

There was a popular belief by the respondents that, by using male or female condoms one will not enjoy sex. The male discussants say they preferred their female counterpart to use any method other than the condom. One of them put it this way; 'Condoms make sex uncomfortable and unenjoyable'. Another also said; 'I want bone to bone and flesh to flesh'. These perceptions and beliefs about the contraceptives among men and women negatively affect the utilization of family contraceptives use by men and women as it is revealed in this study. The finding of this study is in line with findings reported by Nsubuga et al. (2016) in their study in Ethiopia. They found out that women and men perceived that family planning contraceptives were for the poor or their use being wrong.

Similarly, Haddad et al. (2013) report that women often rejected using the contraceptives because of their poor attitudes towards their perceived side effects. Respondents expressed fears that using contraceptives would make them barren. Others complained of side effects such as excessive bleeding, contraceptive failure, causing of cancer, deforming children and causing deaths in women. A focus group discussion with women showed that misconception leads to low patronage of contraceptives use. One of the discussants said that she knows a woman who died because she was using contraceptives (IUD). Another discussant said; 'Ever since I started using contraceptives I have not seen menses' (FGD, female 34-year-old, Tsito). Focus Group Discussions for this study suggest that there is a high perception among the discussants that condom use causes a reduction in sexual satisfaction, and an individual's decision to use a condom can be influenced by the extent to which he thinks condom use influences his sexual satisfaction.

In Sub-Saharan Africa, traditional religious beliefs and practices are embedded in lineage systems that impact the structure of society, which in turn influences health decisions (Bulto et al., 2014). These beliefs and values consequently influence the level of acceptance of contraception in most African cultures, including Ghana, creating higher fertility rates) and negative health implications for women (Yakong et al., 2010). In large part, the low acceptance of contraception can be attributed to women's lack of autonomy over their fertility regulation as a result of traditional beliefs, values, and practices around childbearing.

5. Limitations of the Study:

The limitation of the study design, in terms of lack of verification of responses by observation, could affect the strength of the predictions. However, this effect was reduced by piloting the study instruments and standardization of the use of the question items. In addition, it would have been ideal to have taken a sample each of the sub-populations of contraceptive users and non-users; however, this could not be done due to lack of data on the two sub-populations. The use of the prevalence rate of contraceptive users in the estimation of the sample size limits the effects of the not knowing the exact sub population of the two groups.

6. Conclusion:

In conclusion, we found that the knowledge and awareness of modern family planning contraceptive use among community members are high in the study area. However, despite the fact that knowledge of modern family planning methods is high and that these methods are readily available in the study area, a good number of women and men reported not using any of these methods. This implies that knowledge and availability of the modern family planning methods alone do not determine the use of these services and other factors influence decisions on whether or not to adopt a modern family planning method. It is, therefore, important for health workers, especially midwives and public health nurses, to organize educational campaigns on the awareness of family planning services by emphasizing the benefits of the services as it will help reduce misconceptions, and increase access and utilization of contraceptives use among community members.

7. Recommendation:

Based on the conclusions drawn, the following recommendations were made, with the view to improving contraceptives use among men and women in Ho.

First, the Municipal Assembly should facilitate the initiation and formulation of locally appropriate

development and health policies as well as programmes that address the reproductive health concerns of the people, in conformity with national and international policies and programmes. Secondly, there should be a policy to make the individual aware that, the cost of providing contraceptives and counseling services to women and men in their reproductive years is far less than the health and social costs of unplanned pregnancies, STIs, and HIV/AIDS. This can be done through giving out of free pamphlets and handouts on types of contraceptive methods available. The policy again should empower women to know that, it is important they know that pregnancy by choice is their reproductive right and not by chance. In addition, as it has been discovered in this study, some of the reasons for low uptake of contraceptives are the misconceptions and perceived side effects.

It is also recommended to the Municipal Health Directorate to see it as a matter of urgency to intensify their counseling and education on family planning by including it in their outreach programmes, so as to address the needs of those who do not visit the clinics. Programmes are needed to inform women and men in their reproductive years to prevent misconceptions about contraceptives use. This can be achieved through such useful strategies as reproductive health week celebrations, the giving out of pamphlets and handouts, and staging of role plays on contraceptive use at market places among others.

Further, nurses and midwives should be made to locate and target women and men in their reproductive years at places where they naturally congregate such as work places, concerts, schools, sports clubs, dance halls, churches, hotels, hostels and other locations that provide social or recreational services. This provides excellent opportunities to reach users and non-users of contraceptives to clear misconceptions and to encourage the use of contraceptives.

8. Competing Interests

The authors declare no competing interests.

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Psychotropic Drugs and Skin: An Association

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ABSTRACT

Background: Psychodermatology is an established branch of psychosomatics. The vast knowledge in the field of psychosomatics has also opened the door for the discussion of the dermatological side effects of psychotropic drugs. Various psychotropic drugs are found associated with skin side effects. In this review article, we highlighted some common psychotropic drugs that lead to skin damage.

Method: Literature search in various databases and journals were conducted.

Result: Drugs like Haloperidol, Clozapine, Asenapine, Quetiapine, Lithium, Risperidone, Cyamemazine are practically responsible for skin eruptions and lesions like, rash, alopecia areata, angioneurotic edema, pityriasis-rosea like drug reaction, acute generalized exanthematous pustulosis, acne, giant urticaria, rash and desquamation, symmetrical drug-related intertriginous and flexural exanthema, photoallergic reactions.

Conclusion: Almost all of these side-effects were reversible when the drug was discontinued or replaced. By studying the association of the side-effects of different psychotropic medications with the human skin, we concluded that more significance should be given to the patch- tests before prescribing any anti-psychotic drug so, that allergic reaction can be avoided. We suggest more study and searches on this subject to spread awareness among healthcare professionals and patients to produce even better-working antipsychotics medications in the coming future.

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Keywords: Psychodermatology; psychotropic drugs; antipsychotics and skins; anti-depressants skin; dermatology; psychiatry.

1. Introduction:

Since the universal acceptance of psychiatry as an important branch of medical sciences, it has been found to be associated with different specialties as a comorbidity. It is also not uncommon to see psychiatric patients in the wards specifically dedicated to other medical disciplines (Tohid, 2015;

Tohid & Ashraf, 2016). Multiple drugs have been introduced to treat psychiatric patients that are classified as Antidepressants, Stimulants, Antipsychotics, Mood stabilizers, Anxiolytics, Depressants and, Psychedelic drugs. All of these drugs have their own effects along with their side effects.



Psychiatric medications are among the most widely prescribed medications in the United States. Patients prescribed with psychiatric medications (psychotropic medications) are often affected by adverse cutaneous drug reactions (Lange-Asschenfeldt et al., 2009; Lamer et al., 2010; Mitkov et al., 2014).

Because brain and the integumentary system have an association (Tohid et al., 2016), it is quite logical to understand that skin disorders and brain disorders have an association. Similarly, psychotropic drugs leading to cutaneous reactions is not a surprise either. Usually, 2% to 3% patients on psychiatric drugs show adverse skin reactions. Most adverse cutaneous drug reactions associated with psychotropic medications are benign and easily treated, however, some can be severe and life-threatening. These adverse cutaneous drug reactions are commonly associated with antidepressants, antipsychotics, and mood stabilizers (Bliss & Warnock, 2013).

These adverse drug reactions (ADRs) also account for 3-6% of all hospitalizations, accounting for 5% to 9% of hospital admission costs. Skin is often involved in ADRs and although most cutaneous ADRs have good prognosis, they may present as Severe Adverse Cutaneous Drug Reactions (SCARs), such as Toxic Epidermal Necrolysis (TEN), Stevens-Johnson syndrome (SJS), drug-induced hypersensitivity syndrome (drug reactions with eosinophilia), and acute generalized exanthematous pustulosis (Borroni, 2014). Most of the cutaneous ADRs are not life-threatening, however, they can cause poor quality of life especially among the elderly (Carneiro et al., 2011). Serious consequences of SJS and TEN are a high mortality rate of 20%–25%, and long-lasting sequelae including corneal ulcerations (Rzany et al., 1996). Additionally, the mortality in SJS and TEN patients increased with age (Fouchard et al., 2000). Moreover, in-hospital mortality and after-discharge deaths were associated with older age in patients with SCARs (Sekula et al., 2013). A couple of cases of bullous skin lesions and paresis the following coma due to the ingestion of many antipsychotic drugs have been reported. Histological examination showed an intraepidermal blister in SJS and degeneration of sweat glands in both SJS and TEN. An immunofluorescence study showed massive deposits of IgM and C3 in the dermal vessels (Taniguchi et al., 1990).

When a severe cutaneous reaction develops, the suspected causal agent should be immediately withdrawn. Hypersensitivity reactions like lichenoid drug eruptions are usually symmetrical on the trunk, extremities, and trunk. These kinds of reactions are commonly seen after using various psychotropic

including phenothiazine antipsychotics. However, most of these reactions are relatively benign and easily treated (Kimyai-Asadi et al., 1999). The onset is within a few days of ingestion, affects any part of the body, and may involve the mucosal membranes (Valeyrie-Allanore et al., 2007). Severe cutaneous eruptions, such as Erythema Multiforme, have been reported much less frequently with several atypical and some typical antipsychotics (Warnock & Morris, 2002a). This may lead to more serious reactions such as Stevens-Johnson Syndrome (SJS) or Toxic Epidermal Necrolysis (TEN) (Warnock & Morris, 2002b). The onset is slower, typically 1–3 weeks after initiation (Svensson et al., 2001).

Several psychotropic and neurotropic agents are useful in treating patients with skin diseases such as obsessive compulsive skin manipulation, delusions of parasitosis, generalized pruritus, and post-herpetic neuralgia. The mechanism of action of these agents is based on their interaction with central and peripheral neuronal receptors (Tennyson & Levine, 2001). TEN is an acute life-threatening disease characterized by involvement of the skin, multiple mucous membranes and internal organs. It is most commonly precipitated by the administration of drugs like anticonvulsants. Neuroleptic Malignant Syndrome (NMS) is a rare complication of neuroleptic therapy characterized by catatonic behavior, generalized muscular rigidity, hyperthermia and autonomic dysfunction (Muhammed & Raman, 2005).

Lipid-soluble psychotropic drugs are often used to treat skin diseases with psychosomatic indications. Although these drugs are known to exert their effects through the central nervous system, relatively little is known about their mechanism of action on the skin. In this regard, several lipid-soluble psychotropic drugs have been examined for their ability to inhibit protein kinase C (PKC)-catalyzed phosphorylation of exogenous substrates and endogenous skin proteins. Phosphorylation of three discrete skin protein substrates at 64, 42 and 28 kDa and a group crowded together at 15-18 kDa was inhibited by the antidepressants and antipsychotics. Inhibition was more pronounced in a phospholipid (PL) dependent system, but both drug-PL and drug-PKC interactions seem to be important in the mechanism of action of these drugs. In addition to the tricyclic nucleus, the propanamine side chain or its N-methyl form may influence the interaction of these drugs with PKC and its substrate(s). Chlorpromazine, imipramine, fluoxetine, doxepin, amitriptyline and hydroxyzine used in the practice of dermatology may exert their therapeutic effects by modulating skin PKC activity (Vaitla et al., 1997).

In this article, we will highlight those side-effects of psychiatric drugs which can affect the



physiology of the human skin, and can produce serious dermatological hazards if neglected at early stages or not treated at all.

2. Dermatological Side-Effects of Anti-Psychotic Medications:

2.1. Typical Anti-Psychotic:

2.1.1. Haloperidol:

Schizophrenia and other mental problems which affect the way a person thinks, feels or behaves impact the lives of millions of people in the world. These conditions can make a person hear, see or sense things that are not there, believe things that are not true or have an irrational distrust of others. The antipsychotic medicine Haloperidol is used to treat the symptoms of these mental disorders. Studies suggest that Haloperidol can increase the skin's sensitivity towards sunlight causing photosensitive dermatitis (Thami et al., 2002). It may also cause a skin rash that might become severe, in which case requires immediate discussion with a physician (Allen, 2013).

Kubota et al. presented a case in 1994, in which a patient was prescribed Amoxapine 150mg/day and Haloperidol 5mg/day as a treatment of his suicidal thoughts and depression. One month after this treatment it was found out that the patient started to suffer from alopecia on the back of his head which remained unchanged on dermatological treatment. But this hair loss stopped only a week after Haloperidol was discontinued and later the hair started to regrow. In this case, it was suggested that the antipsychotic medication Haloperidol is associated with alopecia areata (Kubota et al., 1994).

Almirall et al. studied the effect of D-limonene, alpha-pinene and Cineole on in vitro transdermal human skin penetration of chlorpromazine and haloperidol and found that Cineole and D-limonene increased the permeation profile of Haloperidol, giving enhancement index (EI) values of 1.95 and 4.21 (Almirall et al., 1996). These kinds of studies, we believe, can provide a better understanding to improve the dermal side effects of haloperidol and other antipsychotic medications.

2.1.2. Chlorpromazine:

Chlorpromazine, a non-tetracycline photo toxin, has been shown to cause skin problems. (Monteagudo-Paz et al., 2011).

Niczyporuk et al. conducted a study. The goal of the study was to make a selection of the calmodulin blockers, which could be useful in the topical treatment of psoriasis. They assessed four drugs: chlorpromazine, trifluoperazine, miconazole and ketoconazole. These drugs were applied on the skin of guinea pigs, twice a day for a period of two weeks.

Biopsy samples were then taken for light microscopy, histo- enzymatic examination and for evaluation of the proliferation activity of the epidermis. A decrease in reaction activities for lactate dehydrogenase and succinic dehydrogenase as well as in the proliferation activity of the epidermis was seen (Niczyporuk et al., 1995).

It could suggest an inhibitory effect of chlorpromazine and miconazole on the cell cycle and keratinization process (Niczyporuk et al., 1995). Moreover, chlorpromazine can also cause pustular eruptions (Burrows et al., 1994). In the study conducted by Kammeyer et al. Chlorpromazine, an inhibitor of the complement (C) system, was found to inhibit the cellular infiltration at the site of Arthus reaction (AR) as assessed by a newly developed computerized area integration technique (CAIT). This inhibition was strong (mean value 92%) and statistically significant according to the classical quotient estimator. This could explain the protection of vessel wall destruction by chlorpromazine in AR. CAIT estimated cellular infiltration in H & E stained skin biopsy sections quantitatively and reliably (Kammeyer et al., 1990).

Furthermore, Mischer et al. tested 150 patients with a light sensitivity of unknown etiology with photo patch. 22 patients showed photoallergy. The identified photo allergens were mostly halogenated salicylanilides and other phenolic compounds. These substances are used as antimicrobials in soaps and cosmetics and as antimycotics in dermatological preparations. Four of the patients showed allergic contact photosensitivity to chlorpromazine. In two patients a new photo allergen has perhaps been discovered, namely a derivative of phthalic acid which is employed as a fungicidal pesticide. The problems and consequences of photoallergy are discussed (Mischer et al., 1977).

Since the discovery of chlorpromazine in 1953, the dermatological side effects have been studied in depth. GRE et al studied that Ocular and dermatologic complications of prolonged chlorpromazine therapy had been noted in 70 patients of a series of many thousands receiving similar therapy. All affected patients were women who had been receiving high doses of chlorpromazine, averaging 500 to 1500 mg. daily for at least three to five years before the complications were seen. Skin manifestations consisted of a peculiar purplish pigmentation of the skin of exposed areas of the face, neck and hands characterized histologically by deposition of material with the staining properties of melanin in the superficial layers of the dermis, particularly in a perivascular distribution. Ocular complications consisted of granular opacity of the cornea and often of the lens as well, the latter producing a central



stellate type of cataract (Greiner et al., 1964). Later, Blue-gray pigmentation of the skin as well as corneal and lens opacities has been seen in patients who were treated with chlorpromazine for a period of years by several other researchers (Huff et al., 2014).

2.1.3. Cyamemazine: Photoallergic Reaction:

According to the Dermatology Online Journal, a case was reported in which a 50-year-old man with a history of chronic alcohol abuse who has been treated with Cyamemazine, Risperidone, Alprazolam, complained of severe pruritus with marked erythema of the face, neck, and upper chest. These side-effects were later relieved upon discontinuation of the Cyamemazine medication. The patient showed positive patch tests to Cyamemazine, a biopsy was performed and based on the clinical and histological findings it was diagnosed as a photoallergic reaction to Cyamemazine (Fernandes et al., 2013).

The mechanisms of the phototoxic response induced by cyamemazine in cultured fibroblasts and keratinocytes were also described by Morlière et al. who found that keratinocytes were an order of magnitude less sensitive to the photosensitized lipid peroxidation than fibroblasts. Microspectrofluorometry revealed that lysosomal membranes were major sites of Cyamemazine incorporation into the two cell lines because a Förster-type resonance energy transfer process occurs from Cyamemazine to LysoTracker Red DND99 (LTR), a specific fluorescent probe of lysosomal membranes. The Cyamemazine-photosensitized destruction of LTR demonstrated that the drug retained its photosensitizing capacity after its lysosomal uptake (Morlière et al., 2004).

2.2. Atypical Anti-Psychotic:

2.2.1. Olanzapine

Olanzapine also affects the skin as it is found to be associated with skin rash in many patients (Solfanelli et al., 2013). Pustular eruption is also witnessed with olanzapine use (Adams & Mutasim, 1999). Olanzapine-induced eccrine squamous syringometaplasia is a rare but a possible skin problem associated with olanzapine use. (Molina-Ruiz et al., 2012) Moreover, olanzapine is also associated with occupational allergic contact dermatitis (Lowney et al., 2010)

Photo-onycholysis associated with drugs is an uncommon disorder. A case of a woman who developed photo-onycholysis on multiple nails after uptake of olanzapine has been reported by Gregoriou et al. They observed that substitution of olanzapine with aripiprazole further exacerbated the problem (Gregoriou et al., 2008).

2.2.2. Aripiprazole

Lichenoid drug reaction to aripiprazole, a severe and potentially life-threatening adverse cutaneous reaction that required medical and surgical intervention was observed by Parker (Parker, 2012). Shen et al. reported three severe adverse cutaneous reactions in people using aripiprazole with lamotrigine. This combination therapy increases the risk of Stevens-Johnson syndrome (Shen et al., 2007).

2.2.3. Clozapine

Prescribed anti-psychotics can cause cutaneous rashes, lesions, and eruptions which may vary in the severity and forms. Most of these reactions caused are mild; however, some may become very complicated if not treated on time. Some of the most severe cases reported are of Angioneurotic edema, exanthematous reactions, Stevens-Johnson syndrome and toxic epidermal necrolysis.

According to Mishra et al. two cases have been reported in which patients taking Clozapine developed Classical Angioneurotic Edema and the symptoms were rapidly improved when the clozapine therapy was discontinued. (Osman et al., 2014; Mishra et al., 2007).

Another case was published on 20th April 2012 in General Hospital Psychiatry Journal, which reported that a 54-year-old man with chronic schizophrenia was being treated with Clozapine for 28 days after which he developed serious skin rashes, fever, and abnormal LFTs. In this case, Clozapine was immediately discontinued and symptoms were relieved with treatment with anti-histamines and steroids (Lai et al., 2012).

Moreover, toxic hepatitis with dermatological rash and cutaneous vasoconstriction have also been seen by the use of clozapine (Fong et al., 2005; Blessing, 2004).

2.2.4. Asenapine: Pityriasis Rosea-Like Drug Reaction

A study was conducted by Makdisi et al. in which it was reported that a 30-year-old woman who was prescribed with 5 mg of Asenapine twice a day, developed Pityriasis rosea like drug reaction which was initially treated by methylprednisolone and topical steroids but the eruptions persisted for more than a week due to which Asenapine was discontinued. In this case, the first biopsy revealed spongiosis and parakeratosis (Features consistent with PR), and the second biopsy exhibited more characteristics of a drug reaction. It was concluded that the eruptions arose shortly after the initiation of Asenapine and this was the first reported case of Asenapine-induced reaction (Makdisi et al 2013).

2.2.5. Risperidone Oral

A case was presented in which a 37-year-old person with Bipolar Disorder I was initially treated with 2mg of Risperidone oral solution at bedtime along with calculated doses of Lithium, Diazepam, Zolpidem, and procyclidine.

On the 3rd day of treatment the patient complained of facial flushing, rash and desquamation which were progressively increasing to the face and neck with time, to avoid the adverse reaction Risperidone oral solution was replaced with 150mg/day of Quetiapine and it was observed that the skin lesions completely disappeared just after one day of the drug replacement. Lithium was maintained throughout the treatment. The study suggested that Quetiapine was a good alternative to Risperidone oral solution in order to avoid any adverse skin reactions in psychotic patients. (Chae et al., 2008).

Akay and Sanli published an article in Pediatric Dermatology Journal, 2009. The article reported the case of an 8-year-old boy who was on treatment with Risperidone oral solution for Attention Deficiency with Hyperactivity, developed skin eruption, the clinical findings were compatible with symmetrical drug-related intertriginous and flexural exanthema, also called Baboon syndrome. This case was said to be the first case associated with the Risperidone oral solution (Akay & Sanli., 2009). Moreover, self-limiting erythema multiforme has been observed in some patients due to the use of risperidone (Burke et al., 2009).

In October 2007, British Journal of Clinical Pharmacology reported a case of a 46-year-old male patient diagnosed with schizophrenia, prescribed Risperidone. The patient had a history of poor response to the other antipsychotic drugs except for Risperidone. Within 3 days of treatment with Risperidone the patient developed erythematous pruritic and painful rash, diagnosed as giant urticaria. Risperidone was stopped, resolving the symptoms. A re-challenge with Risperidone was done due to patient's poor response to the other drugs but the patient again started showing symptoms of giant urticaria that lead to discontinuation of the drug. This study highlighted the potential complication of the allergic form of urticaria due to Risperidone (Mishra et al., 2007).

2.2.6. Quetiapine

A case was presented in the journal, Psychiatria Danubina in 2013, where a 53-year-old female was admitted to the hospital for the treatment of generalized skin erythematous and pruritic papulopustular. The patient had mild mental retardation for the past 15 years and has been in psychiatric treatment. She had been treated with

clozapine for the past one week after which clozapine was substituted with quetiapine. A week after the treatment with quetiapine, erythematous macules with partial conflation and exfoliated areas appeared throughout the body. The patient had no history of somatic disorders. Histopathological findings reported this case as the first known case of clinically-consistent and histologically proven acute generalized exanthematous pustulosis overlap induced by quetiapine (Lasić et al., 2013).

2.3. Mood Stabilizers:

2.3.1. lithium Acne

Canadian Medical Association Journal reported in 2013 the case of a female patient with bipolar disorder who developed severe eruption of cysts, papules and nodules on her face during the treatment with Lithium Carbonate. She had no history of acne or dermatological diseases.

Lithium-related acne was diagnosed and lithium was replaced by an alternative drug, the Acneiform Eruption had improved within 6 months and completely resolved later (Scarfi & Arunachalam, 2013).

2.3.2. Carbamazepine and Others

Antiepileptic drugs are prescribed for the treatment of diverse conditions including migraines, mood disorders, neuropathic pain, and epilepsy (Hollingworth & Eadie, 2010). The Severe cutaneous adverse drug reactions (SCAR) risk is found to be highest in patients treated with carbamazepine as compared to other anti-epileptic drugs. However, carbamazepine is not solely an epileptic drug, it is frequently used in a psychiatric setting as a mood stabilizer.

According to one study, Carbamazepine use is associated with a nearly 10-fold increase in severe cutaneous drug reactions in Korean elderly patients. This association was consistently high with SCAR patients who received carbamazepine for neuropathic pain. Severe Cutaneous Adverse Drug Reactions (SCARs) such as Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) were also commonly seen in patients receiving carbamazepine (Yang et al., 2011).

In 2008, one study using the database from Taiwan National Health Insurance showed that the use of carbamazepine and valproate as mood stabilizers increased the risk of SCARs (carbamazepine: adjusted OR = 3.10, 95% CI: 1.51–6.35; valproate: adjusted OR = 5.17, 95% CI: 1.26–5.92). In Taiwan, Gau et al. investigated patients with bipolar disorder only, and the mean age of the subjects was 41 years (Gau et al., 2008)



According to the SCAR and EuroSCAR studies conducted in European countries, the Multivariate Relative Risk (MRR) of carbamazepine was 12 (95% CI 3.5–38) and 72 (95% CI: 23–225), respectively (Roujeau et al., 1995; Mockenhaupt et al., 2008) Besides carbamazepine, lamotrigine, topiramate, phenobarbital, phenytoin, and valproate are also associated with skin damage (Gau et al., 2008; Nanau & Neuman, 2013).

Furthermore, a meta-analysis by Grover & Kukreti, showed the presence of HLA alleles contributing toward risk of as well as protection against various CBZ-induced cADRs (Grover & Kukreti, 2014).

2.4. Tranquilizer

2.4.1. Phenothiazines and Its Derivatives

Phenothiazines can be given to a serious and sometimes irreversible dermatological and side effects. These effects can take the form of photosensitivity, grey-purple discoloration and hyperpigmentation of the skin and hyperpigmentation of the conjunctiva, cornea, lens, retina, choroidea and macula. Involvement of the retina or macula can lead to impaired vision, blurred vision, disturbed color perception and night blindness. Annual ophthalmic monitoring of patients receiving long-term treatment with Phenothiazines is suggested to avoid the dermatological side-effects of this drug (Wennersten et al., 1984).

2.5. Other Psychiatric Drugs

Perphenazine is also found to be dangerous to the skin (Gacías et al., 2013)

Thioridazine is a phenothiazine derivative that has been used as an antipsychotic; it rarely causes photosensitization. However, we noticed that this drug-induced an erythematous reaction in a photo patch test. Six volunteers were patch tested with various concentrations of Thioridazine and irradiated with a range of UVA doses, and the time courses of the color of, and blood flow to the test sites were monitored. The free-radical metabolites of Thioridazine generated under UVA irradiation and its effects on ascorbate radical formation were examined with an Electron Paramagnetic Resonance (EPR) spectrometer *in vitro*. As a result, immediate erythema developed during UVA irradiation in most subjects when 1% Thioridazine was applied for 48 h and irradiation doses were higher than 4 J cm⁻². Another peak of the erythematous reaction was observed 8-12 h after irradiation. The *in vitro* examination detected an apparent EPR signal, which appeared when 2 mM Thioridazine in air-saturated phosphate buffer was irradiated with UVA, whereas this reaction was attenuated under anaerobic

conditions. The EPR signal of the ascorbate radical was augmented under both aerobic and anaerobic conditions. Thioridazine-derived oxidants and/or Thioridazine radicals generated during UVA irradiation seem to play an important role in this unique phototoxic reaction. (Takiwaki et al., 2006).

A study was conducted by Makdisi et al. reported that a 30-year-old woman who was prescribed with 5mg of Asenapine twice a day, developed Pityriasis rosea-like drug reaction which was initially treated by methylprednisolone and topical steroids but the eruptions persisted for more than a week due to which Asenapine was discontinued. In this case, the biopsy revealed spongiosis and parakeratosis (Features consistent with PR), and the second biopsy exhibited more characteristics of a drug reaction. It was concluded that the eruptions arose shortly after the initiation of Asenapine and this was the first reported case of Asenapine-induced reaction (Makdisi et al., 2013).

A case of a pyoderma gangrenosum (PG)-like eruption due to the antipsychotic drug sulpiride, a form of risperidone, is described. The contribution of sulpiride to the etiology of the pyoderma gangrenosum -like lesion is based on the observation of the reduction and healing of the ulcer upon cessation of the drug, and the formation of a bulla following the drug's re-administration. The literature on drug-induced pyoderma gangrenosum or pyoderma gangrenosum-like eruptions is discussed. The selectivity of sulpiride for dopamine receptors and its limited effect on other neuronal pathways differentiates sulpiride from other types of antipsychotic drugs commonly used in Israel, including phenothiazine, butyrophenone, and thioxanthene. Adverse systemic and cutaneous reactions to sulpiride and to risperidone are described. To our knowledge, this is the first report of a pyoderma gangrenosum -like eruption due to the former (Srebrnik et al., 2001). Ziprasidone is another antipsychotic medication which is known to affect the human or animal skin (Kim et al., 2014).

3. Conclusion:

With the notable increase in the use of psychotropic medications, the incidence of the associated side effects has increased. We know for sure that these medications are life-savers, alleviating the symptoms of psychotics and depressed and improving their quality of life. However, we also know for a fact that it is the fate of every medication have some side-effects on the human body, psychotropic medications being no exception. Some of the side effects of psychotropic medications are non-serious and can disappear with the reduction in



dose or discontinuation of the drug, while some side-effects are serious and can cause permanent damage.

The side-effects of these medications have been widely studied and well documented. They include drowsiness, agitation, urinary hesitancy, dry mouth, increased weight, stuffy nose, emotional blunting, muscle stiffness or spasms, constipation, diabetes, effects on movement, sedation, decreased sex drive, irregular periods in women, abnormal discharge from breasts, excessive salivation, skin rashes.

All of the above-mentioned side effects can adversely affect a person's lifestyle making it difficult for a psychotic patient to adhere to the therapy, leading to incomplete treatment of his/her illness.

Dermatological side-effects play an important role in depressing an already depressed or psychotic patient, which may lead to non-compliance, making his life difficult. Our study includes articles and reports of some patients who experienced serious and non-serious dermatological side-effects which resolved after the discontinuation of the drug or replacement of the drug with an alternative. Thus, by studying the association between the side-effects of different psychotropic medications on the human skin, we concluded that more emphasis should be given to the patch- tests before prescribing any psychotropic drug, so that adverse allergic reactions can be avoided. We suggest that further study and research on this subject be conducted and awareness spread among healthcare professionals so that we can produce even better working psychotropic medications in the future.

4. Conflict of Interest

The authors declared None.

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