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## of Medical Research: E

# Gynecology and Obstetrics

Antenatal Care Services

Utilization of Antenatal Care

**Highlights**

Inflammatory Breast Cancer

Clinical Features and Outcome

Discovering Thoughts, Inventing Future

VOLUME 15 ISSUE 2 VERSION 1.0

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# Clinical Features and Outcome of Inflammatory Breast Cancer in Moroccan Population: Experience of Oncology Department of National Institute of Rabat

By Ouziane I MD, Bensouda Y MD, HM'rabti MD, Elomrani F MD, Elismaili N MD, Laanaz S MD, Elyacoubi H MD, Berrada N MD, Boutayeb S MD & Errihani H

*National Institute of Oncology, Morocco*

*Abstract-* *Background:* Inflammatory breast cancer (IBC) is a clinical condition characterized by varied incidence, geographical distribution, and poor prognosis. We conducted this study to trace his epidemiological and immunihistochemical, evolution.

*Methods:* Case files were collected from the archives of the National Institute of Oncology. Inclusion criteria included:

– Aproven histological diagnosis of breast cancer
– Skin erythema over at least one third of breast
– Symptoms appearing over a period of under six months

*Results:* We collected 172 cases, incidence was 5%.Erythema in more than one third of the breast, orange peel skin and edema was present in all patients.126 patients had a localized disease ,46 patients were metastatic.

*Keywords:* *inflammatory breast cancer, neoadjuvant chemotherapy, pathological complete response, moroccan, hormonal receptor, her2neu.*

*GJMR-E Classification :* *NLMC Code: WP 840*

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64% of patients with localized disease showed axillary lymph node activity, and 9,.3% supraclavicular adenopathy . The most common histological type was invasive ductal carcinoma, 95.6%. In 42.4%( n=59) of the cases, hormonal receptors were negative. Human epidermal growth factor 2 (HER2) status was positive in 59 %( n=52) of the cases. In 88% of the cases (n=109), anthracyclines were administered. Anthracyclines and taxane was delivered to 15 patients (12%).

Among 124 patients with local disease, 77.4% (n=96) were operated on. pCR (pathological complete response) was 4,8% (n=6).

Median overall survival (OS) in non metastatic patients was 16.5 months, three and five year's OS were respectively 11 % and 3%.

***Conclusions:*** Our study confirms the higher incidence of IBC in Moroccan population comparatively to American and European populations. Positivity of HER2 was higher. Treatment used was insufficient, with poor survival. We have started a prospective registry of IBC in our institute.

*Keywords: inflammatory breast cancer, neoadjuvant chemotherapy, pathological complete response, moroccan, hormonal receptor, her2neu.*

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## I. Background

Inflammatory breast cancer (IBC) is an uncommon form of breast cancer which represents the most aggressive manifestation of breast cancer, with a very poor prognosis. It has a particular geographical distribution with a higher incidence in North Africa-about 5-7% of all breast cancer cases [1].

At the National Institute of Oncology in Rabat, the first recruitment center in Morocco, we realized a retrospective study aimed at evaluating the incidence of this rare type of breast cancer in the country, tracing its immunhistochemical profile, and evaluating patient treatment and survival.

## II. Methods

This is a retrospective study covering the period of January 2005 to December 2008, performed at the National institute of Oncology of Rabat.

We conducted our study based on clinical, histological and therapeutic data collected from the files of patients with inflammatory breast cancer available in the archives of the institute. Incomplete files were excluded.

Inclusion criteria of our study were: histological evidence of breast cancer and onset of inflammatory signs in less than 6 months. Twelve hundred sixty cases met our inclusion criteria.

Inclusion criteria of primary inflammatory breast carcinoma (IBC) include: a proven histological diagnosis of breast cancer, skin erythema in over one third of the breast, symptoms appearing over a period of less than six months.

All patients underwent chest radiography, abdominal ultrasound, and bone scans. The data collected from the patient's medical file included: age, time of onset of symptoms, clinical diagnosis, nodal involvement, stage, treatment received (chemotherapy, surgery, radiotherapy) and date of death or last visit.

Pathological complete response (pCR) was evaluated by Chevalier classification, which studied the response in both breast and lymph nodes: Grade 1 and

2 correspond to obtaining a complete response; Grade 3 includes invasive carcinoma with tumor alterations; Grade 4 is defined by few alterations or absence of alterations of tumor cells.

*a) Statistical methods*

Data was analysed using SPSS 13 software. Overall survival and progression-free survival were estimated by the Kaplan-Meier method. A log-rank test was used to compare survival rates. The test was conducted at a 5% significance level. Descriptive statics with 95% confidence interval (CI) were calculated according to standard procedure.

## III. Results

*a) Patient characteristics*

Between January 2005 and December 2008, out of the three thousand four hundred cases of cancer identified, one hundred seventy-two patients were identified as having inflammatory breast cancer; the incidence was 5%.

Patient age included in the study was 27 to 75 years (Figure 1), with a median of 46 years. The occurrence of inflammatory breast cancer was higher in patients between 40 and 49 years (n=68), 39, 5%. Non-menopausal women constituted 58% of the patients.

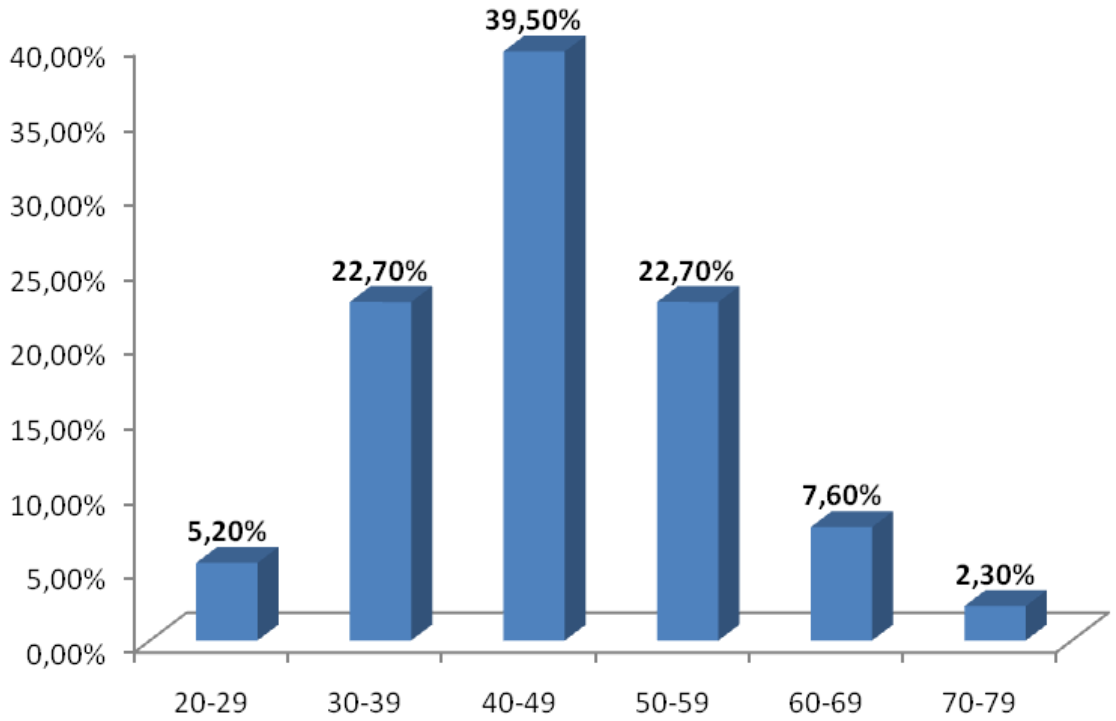


*Figure 1 :* Distribution of patients according to age

The time of the appearance of symptoms was less than six months in all patients, as defined in the inclusion criteria, to differentiate between a true inflammatory and locally advanced breast cancer. In half of the patients, the signs of inflammation appeared within three months.

*b) Clinical features*

Signs found in all patients upon clinical examination were: Erythema over more than one third of the breast, or orange peel skin, and edema. However, in 26.7% of the cases, no palpable mass was found.

Axillary lymphadenopathy was found in 64% (n=110), and the supraclavicular lymph node in 9.3% (n=16).

After staging, 27% (46) of the patients (n=46) had metastases at the onset. The metastasis site was: bone (n=32), liver (n=16), lung (n=17), and brain tissue (n=7). However, 39% (n=18) of the patients had multiple synchronous metastases (Table 1)

*Table 1:* The different metastasis site

| Metastasis site | Number of patients |
|---|---|
| Bone | 32 (69,5%) |
| Lung | 17 (36,9%) |
| Liver | 16 (34,7%) |
| Brain | 7 (15,2%) |
| Multiple sites | 18 (39%) |

*c) Histological and immunohistochemical features*

The dominant histological type found was invasive ductal carcinoma (95.6%). Invasive lobular carcinoma was second, at only (3.4%), other histological types were found in 1% of cases.

94% of patients' tumors showed an aggressive profile, with grade SBR 2 and 3. Only 6 % of tumors were grade 1.

Hormonal receptor status couldn't be determined in 19%. The criterion of hormonal receptor negativity was ER and PR negative, the rate of negative receptors was 42.4% (n=59).

Human epidermal growth factor 2 (HER2) status was positive in 59% of cases, but research of HER2 status was done on only 51% of all patients (n=88) (Table 2)

*Table 2 :* Clinicopathological characteristics of patients

| Median age | 46 years |
|---|---|
| Histological type | |
| Infiltrating ductal carcinoma | 95,6% (n=161) |
| Invasive lobular carcinoma | 3,4% (n=9) |
| Other | 1% (n=2) |

| SBR grade | |
|---|---|
| I | 6% (10) |
| II | 54% (92) |
| III | 40% (68) |
| **Hormone receptors** | |
| Negative | 42,4% (59) |
| Positive | 57,6% (80) |
| **HER2** | |
| Negative | 41% (36) |
| Positive | 59% (52) |

*d) Treatment*

Among 126 patients with no metastatic disease, 2 patients couldn't receive chemotherapy because of an ECOG performans staus higher than 2.

Anthracyclines were administered in 88% of cases (n=109). The most commonly used protocol was the AC60 regimen (Anthracycline:60mg/m$^2$, cyclophosphamide:600mg/m$^2$) followed by the FEC 100 (5Fu:500 mg/m$^2$, Epirubicine:100mg/m$^2$, Cyclophosphamide: 500 mg/m). An association of sequential anthracyclines and taxane was administered to only 15 patients (12%). Patients received an average of 4 neoadjuvant cycles, with a minimum of 3 cycles and a maximum of 9.

Among 124 patients with localized disease we obtained 77.4% (n=96) of clinical response, a Patey was realized in all these patients. Some patients were inoperable, mainly due to the lack of response to neoadjuvant chemotherapy or clinical progression.

After surgery, an evaluation was made to the histological response in the breast based on the CHEVALIER classification, 8,8% (n=11) of our patients had a pathological complete response (pCR) in the breast. A lymphnodes complete histological response was found in 15,3% (n=19) of cases. pCR in both breast and nodes was obtained in 4,8% of cases (n=6).

Treatment of metastatic patients consisted on palliative chemotherapy .Protocols were heterogeneous, mainly anthracyclines in 80,6% of cases,10,8% (n=5) of cases received auther regimens (FUN,CMF)

8,6%(n=4) patients did not receive chemotherapy due to performans status higher than 2.

*e) Follow-up*

Patients were followed up for five years. Patients who were not reviewed in the last consultation were subsequently contacted by telephone. Monitoring was organized over several visits: every three months for two years, every 6 months for a year, then once a year.

*f) Survival*

Median overall survival (OS) for patients with localized disease was 16,5 months. Three and five year OS were respectively 11% and 3% (Figure 2).

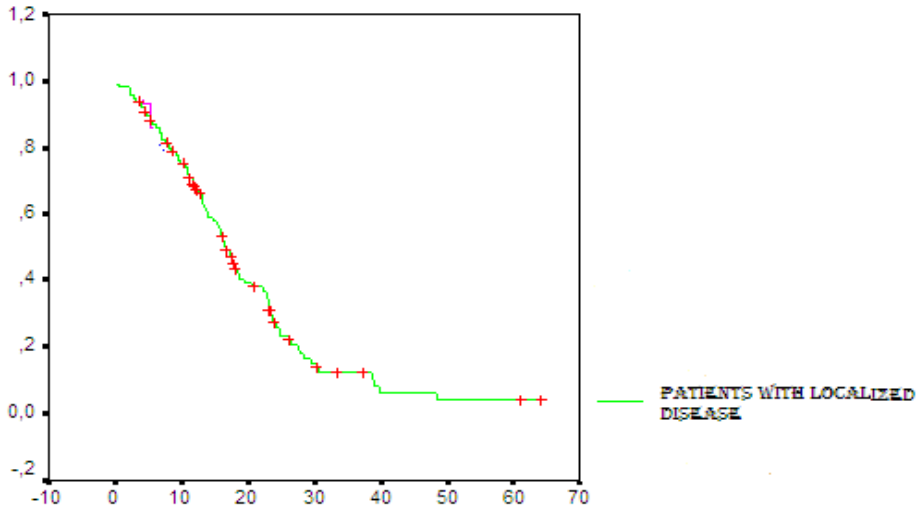


*Figure 2 :* OS in patients with localized disease

During the follow-up, the evolution has been characterized by local recurrence in seventeen cases (27,5% of all patients). Metastasis occurred in 48 cases. The site of metastasis was lung in fourteen cases; the bone in eleven cases, liver in eight cases; lymph node and brain in eight and four patients respectively.

Metastatic patient survival was poor, with a median overall survival of 11.6 months. OS at 2 and three years was 1.5% and 0% respectively (Figure 3).

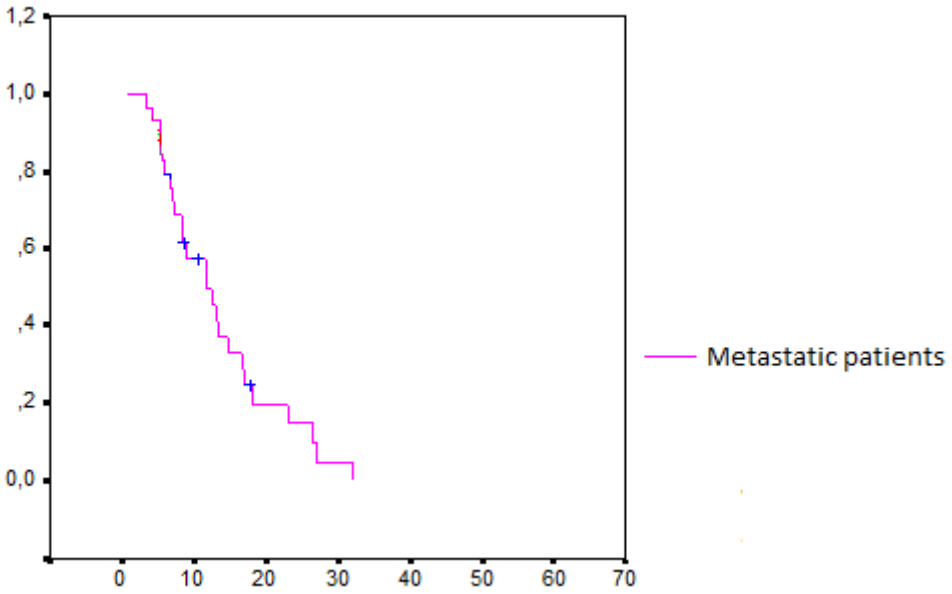


*Figure 3 :* OS in metastatic patients

Patient survival was influenced by the presence or not of metastases (p<0,0001) and hormonal status, patients with positive hormonal receptors had a better survival (p<0,002).

The difference in survival between patients with HER2 positive status and those with a negative HER2 was not statistically significant (p = 0.08), this is explained by the large number of patients (n=84) who have not benefited from the study of HER2 status.

## IV. Discussion

Inflammatory breast cancer is now distinguished from other forms of locally advanced breast cancer. It is characterized by its clinical presentation and its severity. It accounts for about 1-7% of breast cancers with a frequency depending on the country (higher in the Maghreb countries including Tunisia). The current study represents a large retrospective review of 172 patients with a diagnosis of inflammatory breast cancer treated at our institute over four years (2005-2008). In our study, the incidence found was 5%. In the Tunisian study, Mourali, the incidence rises to 5.6% [2], which confirms the elevated frequency of this type of cancer in North African countries.. In the United States and Europe, IBC is particularly rare, its frequency not exceeding 3% in a wide study by the American SEER program (Surveillance Epidemiology and End Results), and 1% in Japan (Table 3) [3]

*Table 3 :* Incidence of IBC by country

| OUR STUDY | 5% |
|---|---|
| Japan | 1% |
| USA(SEER) | 1,9% |
| Spain | 3% |
| ITALIE | 3% |
| TUNIS | 5,6% |

Several medical teams have tried to identify risk factors related to this type of cancer; Tunisian studies have confirmed that the young age is a risk factor. Data from the SEER (Surveillance Epidemiology and end results program) show a higher incidence in the African-American race; this has been confirmed also by studying Chang-Shine (USA). Others factors are involved, such as the young age of first pregnancy, obesity. Mouse mammary tumor virus (MMTV) sequences have been reported to be present in some human breast cancers, recently, it has been shown that in addition to activation of cellular proto-oncogenes, MMTV can contribute to mammary tumorigenesis by direct transformation of normal human epithelial cells by expression of signaling proteins [4] [5].

Clinically, the diagnosis of inflammatory carcinoma is essentially based on an onset of

symptoms within six months: Erythema over at least one third of the breast, edema, and warm breast, with or without an underlying palpable mass. Histological evidence of the presence of cancer is imperative [6]. All our patients saw their symptoms appear in less than 6 months.

The particularity of these neoplastic entities results not only in its clinical presentation, but also in terms of its bio molecular profile. Inflammatory carcinoma histology shows no specificity compared to other forms of cancer .The largely predominant histological type in the entire study is invasive ductal carcinoma, representing between 87% and 95%, the same result was found in our study with 89.5% (n=154) of invasive ductal carcinoma. But we must remember that there is no histological type specific to inflammatory breast cancer [7] .The real hallmark is the presence of dermal lymphatic invasion by lymphatic emboli. These emboli are responsible for the characteristics and clinical symptoms (color, edema), as well as high metastatic potential of breast cancer [6]. Skin biopsy remains important for the demonstration of emboli but not essential for confirmation of the diagnosis [8]

The molecular alterations usually reported in IBC include: Low expression levels of the hormone receptor, Paradiso and al, Boussen and al. Studies show more frequent negative estrogen and progesterone status in patients with inflammatory carcinoma than others [1][9]. Negativity of receptors is associated with poor survival rate [10]. In our study, we find 42.4 % of negative receptors, however, 19% of our patients have not benefited from the research of RH status.

Human epidermal growth factor receptor 2(HER2) is a proto-oncogene located in the long arm of chromosome 17 (17q21) and encodes a trans membrane receptor, tyrosine kinase. Its appearance is generally amplified in breast cancer. Furthermore, IBC has a higher percentage, thus reflecting its aggressive potential. Paradiso and al have used the results of 49 biopsies taken in patients with inflammatory breast cancer, 42% of these samples tested positive for HER2neu [9].The Tunisian Ben Hamida study supports these findings, objectifying the rate of HER2 amplification of 33.3% versus 14.5% in non-inflammatory cancers [11]. Our results are consistent with those findings, with 59 % of HER2 positivity detected (Table 4).

*Table 4 :* HER2 expression in the different series

| study | Rate of expression of HER2 |
|---|---|
| Chaher [12] | 20% |
| Paradiso [9] | 49% |
| Ben hamida [11] | 33,3% |
| Our study | 59% |

Other characteristics of IBC tumors include a high expression of human epidermal growth factor receptor (EGFR), thus promoting increased transcription of cellular DNA [12][13]. There is also an over expression of a proto-oncogene p53-with a high mutation rate [14] E-cadherin is also over expressed, this molecule promote intercellular adhesion tumor, and the formation of tumor emboli infiltrating the lymphatic dermis [15][16].

Van Golen have identified the lack of a specific molecule IBC: WISP3 or LIBC (lost in inflammatory breast cancer), data indicate that LIBC/WISP3 acts as a tumor suppressor gene in breast [17]. Comparison of gene expression between human IBC and non-IBC tumor samples revealed overexpression of RhoC, which gives to IBC an invasive phenotype with a high metastatic potential [18].

In the MD Anderson study, 178 patients with inflammatory carcinoma were treated with primary chemotherapy centered on doxorubicin; patients subsequently received local treatment with radiotherapy or mastectomy followed by adjuvant chemotherapy. Overall survival rate within 5 years was 40%, with a median overall survival of 37 months. Histological responses to chemotherapy were obtained in 71% of cases, with 12% of pathological complete responses. 88% of our patients received only anthracyclines (AC60, FEC100), we obtained 66% of histological responses [19].

Nevertheless, integration of taxanes into combination chemotherapy has shown efficacy in neoadjuvant treatment. In retrospective analysis of M.Cristofanilli and al, with 240 patients included in 6 studies between 1973 and 2000, the addition of paclitaxel to anthracycline (FAC) increased the pCR rate by 15% (25% for FAC and paclitaxel versus 10% for FAC alone), progression-free survival and overall survival rate [20].

The largest study of patients with IBC who received Trastuzumab was reported from NOAH (neoadjuvant Trastuzumab) phase 3 trials. it included 343 HER2 positive patients, and it evaluated the benefits of adding Trastuzumab to neoadjuvant chemotherapy. Amongst the76 patients with HER2-positive IBC, a significantly higher pathological complete response rate (54.8%) was noted in women who received standard doxorubicin, paclitaxel, and cyclophosphamide chemotherapy with Trastuzumab than in women who received standard therapy without Trastuzumab (19.3%) [21]. In our study, no patient received Trastuzumab because it was unavailable until 2009.

Clinical complete response in the breast is defined by the absence of inflammation and clinical mass, with or without clinical complete response at the nodes [22].

Data from collected works reported a poor correlation between complete clinical response and histology. In a recent study on a group of 89 patients preoperatively treated with anthracyclines, 15 (17%) had a complete clinical response with only 3

histopathological complete responses [23]. In our study, 77.4% of patients obtained clinical complete response, but complete histological response is noted in only 6 patients (4.8%). The study of Belembaogo and colleagues lead to similar gaps [24].

The study of Kuerer showed that pathological complete response obtained at the mammary gland or axillary lymph nodes is indicative of improved survival rate [25].

The prognosis of inflammatory breast cancer is unfavorable due to early metastatic spread and local recurrence. But a combination of chemotherapy, surgery, and radiotherapy has been a major breakthrough over the last three decades, As a result, survival rates have improved significantly, with 15-year survival rates of 20% to 30% reported [2][26] . In the Tunisian study of Boussen [1], the survival rate within 5 years was 8.52%, in our study it was 20%.

This is can be due to a suboptimal treatment neoadjuvant: only 12% of our patients received taxanes, and trastuzumab was not administered although 59% of patients were HER2 positive.

But it can also be due to the aggressive profile of inflammatory carcinoma in the Maghreb. SEER data support this hypothesis: a higher incidence of this type of cancer was observed in the African-American race [3]. Only an international multicenter observational study can answer to this probable difference in incidence and prognosis.

Two other features are added to the biological profile of inflammatory carcinoma: the angiogenesis and lymphogenesis. Mc Carthy and al. reported a significant increase in intratumoral microvessel density [27]. Indeed, Colpaert and al, showed intense angiogenesis by the percentage of high endothelial cells [16]. Based on this data BEVERLY sudy has evaluated efficacy and safety of neoadjuvant bevacizumab combined with trastuzumab and chemotherapy in patients with primary HER2-positive inflammatory breast cancer, 63,5% had a pathological complete response [28].

Recent data showed that the ALK gene is amplified in the IBC cell lines, in nine of the 12 patient tumors analyzed; However without detection of any activating mutations in the ALK gene, which are common in non–small-cell lung cancer [29].

## V. Conclusion

Through our retrospective study, we have once again affirm that inflammatory breast cancer is a very aggressive tumor, with markers of poor prognosis, 59% of our patients expressing HER2, with a high rate of hormone receptor negativity whose mechanisms of action are still poorly understood, explaining his mediocre survival , 3% survival at 5 years.

A prospective study is underway the institute, to determine the contribution of targeted therapies in inflammatory carcinoma.

## Abbreviations

*IBC:* inflammatory breast cancer

*HER2:* Human epidermal growth factor receptor 2

*OS:* overall survival

*AC:* adriamycine, cyclophosphamide

*FEC:* 5fluoro uracile, eprubicine, cyclophosphamide

*FAC:* 5fluoro uracile, adriamycine, cyclophosphamide

*FUN:* 5 fluoro uracile, navelbine

*CMF:* cyclophosphamide, metotrexate, 5 fluoruracile

*SEER:* Surveillance Epidemiology and End Results

*pCR:* pathological complete response

*Competing interests*

The authors declare that they have no competing interests.

*Authors' contributions*

*i.Ouziane:* conceived of the study, participated in its design and coordination, contributed to the acquisition, analysis and interpretation of data and drafted the manuscript.

*y.Bensouda:* conceived of the study, participated in its design and coordination, contributed to the acquisition, analysis and interpretation of data and drafted the manuscript.

*h.M'rabti:* participated in the design and coordination of manuscript.

*f.Elomrani:* contributed to the acquisition and analysis of data.

n.Elismaili: conceived of the study, participated in its design and contributed to the acquisition of data.

*S.Laanaz:* contributed to the acquisition and analysis of data.

h. Elyacoubi: contributed to the acquisition and analysis of data.

*N.Berrada:* contributed to the acquisition and analysis of data.

*S.Boutayeb:* contributed to the interpretation of data.

*h.Errihani:* conceived of the study, participated in its design.

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# Utilization of Antenatal Care Services and Influencing Factors among Women of Child Bearing Age in Assosa District, Benishangul Gumuz Regional State, West Ethiopia

By Muluwas Amentie, Muluemebet Abera & Misra Abdulahi
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*Abstract-* *Background:* Every minute, somewhere in the world and most often in a developing country, a woman of reproductive age dies from complications related to pregnancy. The major reason for this huge magnitude of the problem is failure to use antenatal care services in developing countries. Little is known about the utilization and factors influencing the use of Antenatal care services.

*Objective:* To assess utilization of ANC services and influencing factors among women in Assosa District.

*Methods:* A community based cross sectional study design was conducted from May 17 – 31, 2012 on randomly selected samples of 536 women who had at least one delivery in the five years prior to the study. Structured questionnaire, FGD and in-depth interview guide were used to collect data. Data were analysed by using SPSS version 16.0. Binary logistic regression was used to determine the association between dependent and independent variables.

*Keywords:* *antenatal care, health service utilization, factors, assosa, benishangul gumuz.*

*GJMR-E Classification :* *NLMC Code: WS 360*


*Strictly as per the compliance and regulations of:*

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Muluwas Amentie [α], Muluemebet Abera [σ] & Misra Abdulahi [ρ]

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*Results:* Out of the 525 study subjects 430(81.9%) had at least one ANC visit. Factors influencing ANC service use were being able to read and write [AOR= 3.18, 95%CI: 1.15, 6.45], attending grade 7 and above [AOR= 7.6, 95%CI: 1.69, 34.34], availability of TTBA [AOR= 2.21, 95% CI: 1.19, 4.12], and distance of more than 30 minutes on foot [AOR= 0.25, 95% CI: 0.11, 0.58].

*Conclusion and Recommendation:* This study revealed that utilization of ANC services were relatively better, they are still low as compared to national HSDP IV target. . Educational status, availability of TTBA in the Kebeles, knowledge on ANC and distance of the services were identified as factors affecting ANC service utilization. Providing IEC and house-hold level discussion on the important of ANC service utilization in the district is recommended.

*Keywords: antenatal care, health service utilization, factors, assosa, benishangul gumuz.*

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## I. Introduction

Antenatal care is one of the most effective health interventions for preventing maternal morbidity and mortality particularly in places where the general health status of the women is poor. The antenatal period presents an important opportunity for identifying threats to the mother and unborn baby's health, as well as for counselling on nutrition, birth preparedness, delivery care and family planning options after the birth (1, 2, 3).

A women's health is critical to her own life, and to the well-being of her family, and the economy of her community and her country (4, 5). But the mothers' health is closely tied to women's over all status. Where women lack education, economic opportunities and power over the decision that governs their lives, the health of the mother is poor. That is why world leaders gave a central place to maternal health and gender equality in the Millennium Development Goals. MDG 5, Improving Maternal Health, is often called "The heart of the MDGs," because if it fails, the other MDGs will fail as well (4, 5).

The health care that a mother receives during pregnancy is important for the survival and well-being of both the mother and the child. The importance areas to maternal health care service: antenatal care service; problems in accessing health care and awareness and attitudes concerning maternal health care service are also essential for the survival and well-being of both the mother and the child (4-7).

The World Health Organization (WHO) estimates that, every minute of every day, somewhere in the world and most often in a developing country, a woman of reproductive age dies from complications related to pregnancy (10, 11).

Now a day, the importance of Antenatal care services in reducing maternal mortality and morbidity has received a significant recognition. Implementing and assuring utilization of effective maternity care for women in the developing world is not an easy task. In Ethiopia, as in other developing countries, most childbearing women are poor and live under harsh conditions. For

them, while adequate care during pregnancy is essential, health care service utilization is extremely low (7).

Ethiopia demographic health survey 2011results show that 34 percent of women received antenatal care from a trained health professional at least once for their last birth. This low utilization of health care services may give some indication of service coverage in the country. As a result, each year large number of women in the child bearing ages (15-49 years) were die from complications associated with pregnancy and childbirth (7, 8). In Benishagul Gumuz regional state, utilization of ANC was 35.1%. This figure indicates there was low utilization of antenatal care services. Even though, utilization of ANC services is affected by a multiple factors (7-9).

Therefore, an attempt was made in this study to assess the status of ANC service utilization and important factors that affect women's utilization of maternal health care services.

## II. Methods and Materials

Community based cross sectional study design was conducted employing both quantitative and qualitative methods of data collections to assess the status of ANC services utilization and influencing factors among women in child bearing age in Assosa District, Assosa Zone, Benishangul Gumuz Regional state, North-west Ethiopia. The source populations were all women living in Assosa District and had at least one delivery in the five years period preceding the survey. For quantitative method: the study population were women selected from source population. For qualitative methods: the study population was the part of community members in the study area especially study kebeles site such as women in child bearing age group, community leaders, religious leader, husbands, health workers and health extension workers.

Sample size was calculated for the cross sectional quantitative study. However, the sample size was calculated for each factors and magnitude each component of maternal health services utilization and the optimum sample size was taken. The sample size was calculated using EPI table of EPI 6 computer software which used two population proportion formulas. Therefore, the highest sample size calculated place of resident factors on the institutional delivery and this research is the continuation of institutional delivery service utilization. So that the calculated sample sizes was 134 for urban and 402 for rural women to be selected considering a design effect of two for the variation due to clustering and non-response rate of 10%. The total calculated sample size was536 women. However, this sample size was calculated for the study done for institutional delivery service utilization which has highest sample size. For qualitative data, the sample size was purposively determined which result 29 key informative for in-depth interview and 10 FGD were selected to supplement the quantitative data.

Sampling technique for the quantitative data, multi-stage sampling technique was employed. First, the four urban and seventy four rural kebeles were listed from which a total of ten kebeles (1 urban and 9 rural) were selected using simple random sampling technique. Secondly, the numbers of households living in the area were recorded; the probability of being included in the sample was proportional to the total number of household residing in each kebele. Assuming every household was to host at least one woman who gave birth in the last five years, households were taken as a final sampling unit. Out of the one sampled urban kebeles, a total of 134 households were selected. Also from the nine sampled rural kebeles, a total of 402households were selected using simple random sampling techniques. For households that had more than one eligible woman, interview was done by selecting one of them using lottery method. Revisit of three times was made in case where eligible respondents were not available at the time of the survey before considering as non-respondent. Regarding a woman having two and more under five children the most recent birth was taken. For qualitative data, focus group discussions were conducted after selecting FGD participant purposively. A total of ten FGDs were conducted at each selected kebele (one FGD having 8 –12 individuals) and: 3FGD for women in child bearing age, 3FGD for husbands, 3FGD for religious and community leaders, and 1FGD for health workers. For in-depth interview purposively selected 29 key informants were interviewed from the ten selected kebeles. Ten health workers (one from each kebele), 9 HEWs (one from each of the rural kebeles having HEW) and 10 community leaders (one from each kebele) were interviewed. In order to minimize bias, those who participated in FGDs and in-depth interviews were excluded from participating in quantitative study.

Data collection instrument for Quantitative method: Structured questionnaire was prepared in English and translated to Amharic language and then back translated to English by different people and used in the data collection of quantitative survey. Amharic (the Official working language) was preferred. Whereas for Qualitative method: discussion guide was prepared in English and discussions were made in local languages. Tape record was used at the same time. Interview guide was prepared in English and used for in-depth interview of key informants. Both discussion guide and interview guide were not translated in to Amharic because they are moderated and collected by principal investigator and experienced nurse.

Ten female data collectors, who were health extension workers and could speak local languages like Bertegna, Afan-oromo and Amharic, were used. For

supervision four nurses having Diploma were selected from Assosa District Health Office, Selga 22 Health Center and Abramo Health Centre. Both the interviewers and supervisors were given two days training before the actual work about the study. Practical exercise was made through peer interviewer. Pre-test was carried out on 27(5%) of the sample size in two of the kebele in Assosa district which were outside of the selected kebeles that has similar socio-demographics characteristic with the people in both urban and rural kebeles. After completing pre-test, discussion was made with supervisors and data collectors, and care was taken not to include the kebele where the pre-test was made. Then, the data were collected using house-to-house interview questions, which consist of seven parts. During the actual data collection, supervisors were assigned for the data collector. The supervisors checked the activities of each data collectors by walking with them in each kebele and sometimes-random spot-checking of the households were made to ensure reliability of the data collected. Each night the supervisors checked all the filled questionnaires for completion, clarity and proper identification of the respondents. Then, the principal investigator randomly checked 10% of the supervisors' work each day for completeness and relevance. Incomplete and unclear questionnaires were returned back to the interviewers to the next morning to get it corrected. For qualitative data: the principal investigator moderated the discussion of the male groups while the female groups were moderated by an experienced female nurse with diploma holder. Two senior nurses with diploma holder were took a note during the discussion. Each discussion had a tape recorded and finally the conversation was transcribed verbatim after each session and then analyze. Although, divers' opinions were expressed within each group, preliminary coding of transcript was done and themes that were directly related to the objective of this study were identified.

Data processing and analysis for quantitative method: the collected data were coded, entered and cleaned and analyzed by using SPSS Window version 16.0. Descriptive statistics was calculated for all variables. In bi-variate analysis crude odds ratio and confidence interval were determined to select candidate variables for multivariate analysis at the level significance ($p<0.05$). Binary and multivariate logistic regressions were used to determine the adjusted odds ratio and corresponding 95% confidence interval. A maximum likelihood estimate of the independent effect of the predictor variables was used to see the level of significance. The strength of association was interpreted using the adjusted odds ratio and 95% CI. The criterion for statistical significance was set at $p <0.05$. For qualitative method: Data of qualitative method were translated in to English, organized in narrative forms in congruent with the respondents' own words on the same day and analyzed by thematic frame work analysis.

Data quality was controlled by designing structured questionnaire. Interviewers were recruited and trained for two days. Pre-test was carried out for both tools. Two day training was given for data collectors, supervisors, and FGD moderators. The collected data was examined for completeness and internal consistency each day by supervisors. Strict supervision and tape recording of FGD process were also additional quality control methods

The study was conducted after approval of the proposal by ethical review committee of Jimma University. The survey was commenced after written consent obtained from Benishangul Gumuz Regional State Health Bureau to the respective offices. In turn the Assosa district Administration Office and Assosa Town Administrative Office wrote a letter to study kebeles to get permission and collaboration. Oral consent and written consent were obtained from each interviewee for their agreement to participate in the study. Interviews were conducted in private place. However, the women were assured that neither a 3rd party nor their husband will have access to their responses. Privacy, anonymity and confidentiality were maintained throughout the process of the study by avoiding identifiers such as name.

## III. Results

*a) Obstetric characteristics of respondents*

Nearly two third (74.1%) of the respondents were married before the age of 20 years old; 79(60.3%) for urban and 310(78.7%) for the rural. Most 333(63.4%) women had their first pregnancy below twenty; 62(47.3%) were in urban and 271(68.8%) were in rural. Half (50.1%) of women were between gravidity two and five; 72 (55.0%) were in urban and 191 (48.5%) were in rural.

Half (50.3%) of the respondents whose birth order of the last delivery between two and five (72(55%) for urban and 192(48.7%) for rural). In contrast 166(31.6%) of respondents (8(6.1%) for urban and 158(40.1%) for rural) had their birth order of the last delivery greater than five. Regarding number of delivery within last five years 237(45.1%) women (85(64.9%) for urban and 152 (38.6%) for rural) had only one delivery while 236(45%) women (35(26.7%) for urban and 201(51%) for rural) had two deliveries. Majority of the women in rural area had two and more than two deliveries but most of the urban women had only one delivery within last five years.

Fifty nine (11.2%) women had history of abortion among these 47(79.7%) had one time. Ninety seven (18.5%) of the respondent had history of still birth. History of abortion and still birth were much higher in rural area than urban area. About one fifth (19%) of the

respondents encountered at least one health problem during pregnancy of their last delivery. (Table – 1)

*Table 1 :* Obstetric characteristics of respondents in Assosa District, Assosa Zone, Benishangul Gumuz Region, Western Ethiopia, May 2012

| Variables | | Place of residence | | Total (N=525) |
|---|---|---|---|---|
| | | Urban (n=131) | Rural (n=131) | |
| | | No (%) | No (%) | No (%) |
| Age at first marriage | <15 | 8(6.1%) | 34(8.6%) | 42(8%) |
| | 15-19 | 79(60.3%) | 310(78.7%) | 389(74.1%) |
| | 20-29 | 43(32.8%) | 50(12.7%) | 93(17.7%) |
| | >=30 | 1(0.8%) | 0(0.0%) | 1(0.2%) |
| Age at first pregnancy | <20 | 62(47.3%) | 271(68.8%) | 333(63.4%) |
| | >= 20 | 69(52.7%) | 123(31.2%) | 192(36.6%) |
| Gravidity | 1 | 50(38.2%) | 43(10.9%) | 93(17.7%) |
| | 2-5 | 72(55.0%) | 191(48.5%) | 263(50.1%) |
| | >5 | 9(6.9%) | 160(40.6%) | 169(32.2%) |
| Birth order of the last delivery | 1 | 51(38.9%) | 44(11.2%) | 95(18.1%) |
| | 2-5 | 72(55.0%) | 192(48.7%) | 264(50.3%) |
| | >5 | 8(6.1%) | 158(40.1%) | 166(31.6%) |
| No. of delivery in last 5 years | 1 | 85(64.9%) | 152(38.6%) | 237(45.1% |
| | 2 | 35(26.7%) | 201(51.0%) | 236(45.0%) |
| | >2 | 11(8.4%) | 41(10.4%) | 52(9.9%) |
| Ever had abortion | Yes | 8(6.1%) | 51(12.9%) | 59(11.2%) |
| | No | 123(93.9%) | 343(87.1%) | 468(88.8%) |
| Number of abortions ever encountered ($n_1$=8, $n_2$=51) | One time | 8 (100.0%) | 39 (76.5%) | 47 (79.7%) |
| | >= two times | 0 (0.0%) | 12 (23.5%) | 12 (20.4%) |
| Number of still birth (n1=9, n2=88) | 1 | 9 (100.0%) | 60 (68.2%) | 69 (71.1%) |
| | 2 | 0 (0.0%) | 23 (26.1%) | 23 (23.7%) |
| | >=3 | 0 (0.0%) | 5 (5.6%) | 5 (5.1%) |
| Any health related problems during last pregnancy | No | 109 (83.2%) | 316 (80.2%) | 425 (81.0%) |
| | Yes | 22 (16.8%) | 78 (19.8%) | 100 (19.0%) |

Among women who encountered at least one health related problem during last pregnancy about 17(17%) encountered APH, 32(32%) severe headache, 37(37%) severe abdominal pain, 31(31%) drowsiness, 14(14%) persistent vomiting. These pregnancy related problems occurred more in rural than urban residents of the respondents. (Fig -1)

*In the FGD of women in child bearing age; "The major cause of mortality and morbidity in the study areas were obstructed labour, prolonged labour, eclampsia (hypertension during pregnancy) and uterine rupture whereas the cause of morbidity were anaemia, malaria, persistent vomiting, bleeding during pregnant and after delivery".*

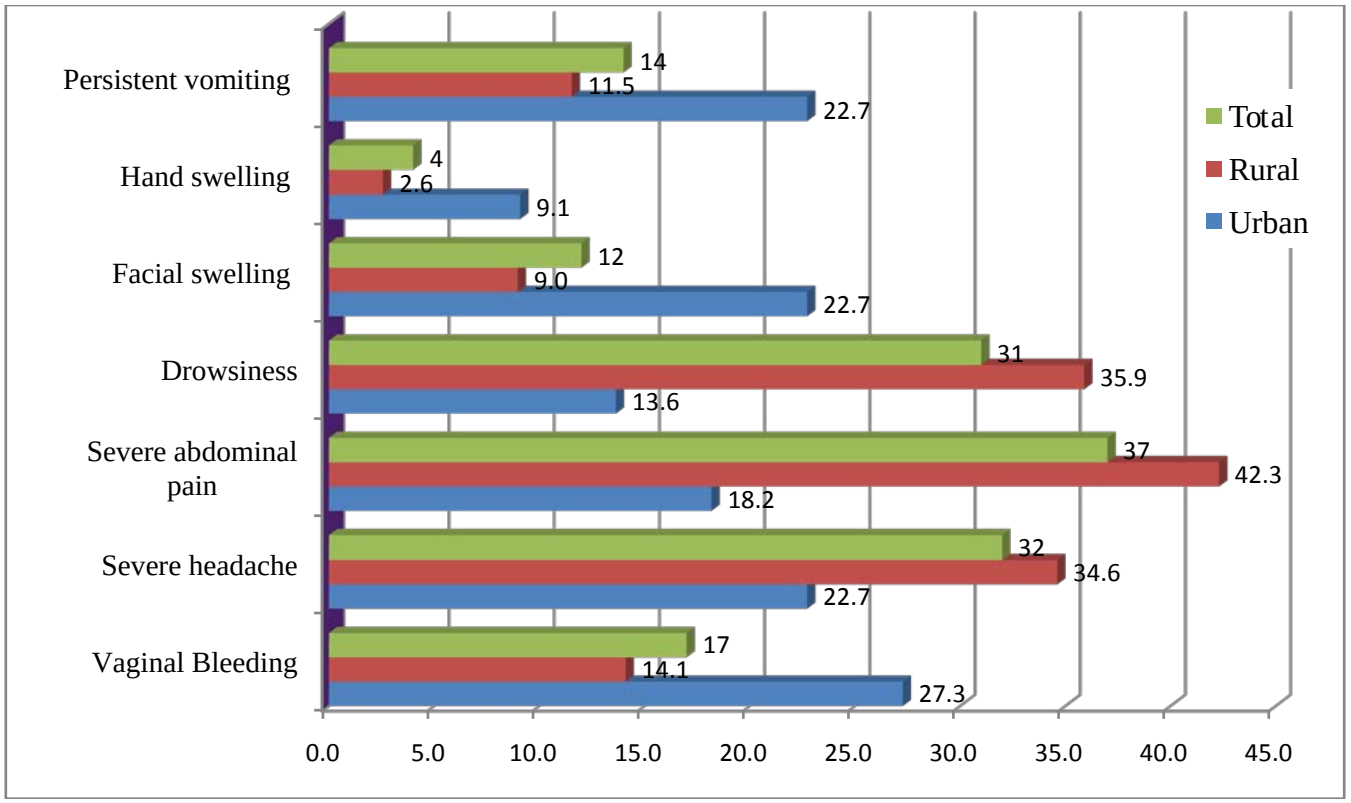


*Figure 1 :* Health related problems during last pregnancies in Assosa District, Assosa Zone, Benishangul Gumuz Region, Western Ethiopia, May 2012($n_1$=22, $n_2$=78)

*b) Utilization of Antenatal Care Service (ANC)*

Four hundred thirty (81.9%) women who had birth within five year preceding the data collection period received ANC from health professionals during the last pregnancy (121(92.4%) for urban and 309(78.4%) for rural).

From those mothers who visited health institution for ANC, 94(77.7%) urban women and 122 (39.5%) rural women attended the care for at least four times during pregnancy. Out of 430 women who attended antenatal care 21(4.9%) women visited the care for one occasion only (1(1.7%) for urban and 19(6.1%) for rural). More than half (57.9%) women attended ANC at the time of second trimester (83(68.6%) for urban and 166(53.7%) for rural).

Among urban women who had ANC visit at least once, more than half 65(53.7%) of them visited hospital followed by 52(43%) health centre while among rural 68(22%) of them visited health center followed by 4(1.3%) hospital. More than half 183(59.2%) of rural women who had ANC visit at least once visited health post while 2(1.7%) urban women visited health post. Most ANC attendants 293(68.1%) were nurses followed by 108(25.1%) health extension workers. Among women who had ANC visit: 110(90.9%) urban respondents and 197(63.8%) rural respondents had information to deliver in the health facility. Majority 386(89.8%) of the respondents received TT vaccine and 91(21.2%) paid for ANC service (26(21.5%) for urban and 65(21%) for rural). Among respondents who paid for ANC service 14(15.4%), 58(63.7%) and 29(20.9%) rated paid Birr for the ANC service as expensive, fair and cheap, respectively. (Table 2)

*Table 2 :* Information related to ANC visit of last pregnancy among respondents in Assosa District, Assosa Zone, Benishangul Gumuz Region, Western Ethiopia, May 2012

| Variables | | Place of residence | | Total (N=525) |
|---|---|---|---|---|
| | | Urban (n=131) No (%) | Rural (394) No (%) | No (%) |
| Received ANC service | Yes | 121(92.4%) | 309(78.4%) | 430(81.9%) |
| | No | 10(7.6%) | 85(21.6%) | 95(8.1%) |
| Number of ANC visit | First visit | 2(1.7%) | 19(6.1%) | 21(4.9%) |
| | Second visit | 2(1.7%) | 82(26.5%) | 84(19.5%) |
| | Third visit | 23(10.0%) | 86(27.8%) | 109(25.3%) |
| | Fourth visit | 94(77.7%) | 122(39.5%) | 216(50.2%) |
| Time of first visit | First trimester | 27(22.3%) | 18(5.8%) | 45(10.4%) |
| | Second trimester | 83(68.6%) | 166(53.7%) | 249(57.9%) |
| | Third trimester | 11(9.1%) | 125(40.5%) | 136(31.6%) |
| Place of ANC visit | Health Centre | 52(43.0%) | 68(22.0) | 120(29.9%) |
| | Health post | 2(1.7%) | 183(59.2%) | 185(43%) |
| | Clinic | 2(1.7%) | 54(17.5%) | 56(13%) |
| | Hospital | 65(53.7%) | 4(1.3%) | 69(16%) |
| ANC attendants | Doctors | 17(14.0%) | 9(2.9%) | 26(6.0%) |
| | Nurse | 102(84.3% | 191(61.8%) | 293(68.1%) |
| | Health extension | 0(0.0%) | 108(35%) | 108(25.1%) |
| | TTBA | 2(1.7%) | 1(0.3%) | 3(0.7%) |
| Information to deliver in health facility | Yes | 110(90.9%) | 197(63.8%) | 307(71.4%) |
| | No | 11(9.1%) | 112(36.2%) | 123(28.6%) |
| TT vaccine | Yes | 106(87.6%) | 280(90.6%) | 386(89.8%) |
| | No | 15(12.4%) | 29(9.4%) | 44(10.2%) |
| Did you pay for ANC service? | Yes | 26(21.5%) | 65(21%) | 91(21.2%) |
| | No | 95((78.5%) | 244(79%) | 339(78.8%) |
| How do you rate the payment?($n_1$=26, $n_2$=65) | Expensive | 2(3.8%) | 12(18.5%) | 14(15.4%) |
| | Fair | 14(53.8%) | 44(67.7%) | 58(63.7) |
| | Cheap | 10(38.4%) | 9(13.8%) | 19(20.9%) |

*c) Factors influencing utilization of ANC services*

Bi-variate analyses involving all variables were performed to identify candidate variables for multivariate analysis with the utilization of ANC service. Consequently, place of residence, ethnicity, maternal education, religion, availability of TTBA, availability of health professional providing delivery service, knowledge on (ANC and delivery service), Attitude towards (ANC, delivery service, PNC and maternal health service),availability of delivery service, available of transportation service and distance of health facility showed significant association ($p<0.05$) with the utilization of ANC service.

A multivariate analysis was performed for identified candidate variables for utilization of ANC service in bi-variate analysis which showed significant association. So that ethnicity, educational status, availability of TTBA, knowledge on ANC and distance of health facility showed significant association on multivariate analysis. The odds of utilizing ANC among women who attended secondary school and above were 7.6 times more than women who were illiterate [AOR = 7.6, 95% CI: 1.69, 34.34] whereas women who were able to read and write were 3.18 times more likely to utilize ANC service than women who were illiterate [AOR = 3.18, 95% CI: 1.57, 6.45]. Similarly women for whom distance between home and facility took greater or equal to 30 minutes on foot were 75 percent less likely to use the ANC service than their counterparts [AOR = 0.25, 95% CI: 0.11, 0.58]. Regarding the availability of Traditional Trained Birth Attendant in the kebeles, women who reported existence of TTBAs in their kebele were 2.21 times more likely to utilize ANC

services than women who reported absence of TTBAs [AOR = 2.21, 95% CI: 1.19, 4.12]. Women who were knowledgeable on ANC service were 1.96 times more likely to utilize ANC service than women who were not knowledgeable on ANC services [AOR = 1.96, 95%; CI:1.04-3.68]. **(Table-3)**

*Table 3 :* Factors influencing ANC service utilization in Assosa District, Assosa Zone, Benishangul Gumuz Region, Western- Ethiopia, May 2012

| Variables | | ANC service utilization | | Crude OR (95%CI) | Adjusted OR(95%CI) * |
|---|---|---|---|---|---|
| | | No | Yes | | |
| Place of residence | Urban | 10(7.6%) | 121(92.4%) | 1 | |
| | Rural | 85(21.6%) | 309(78.4%) | **0.3(0.15-0.59** | 0.27(0.06-1.18) |
| Religion | Orthodox | 35(29.2%) | 85(70.8%) | 1 | |
| | Muslim | 58(14.9%) | 330(85.1%) | **2.34(1.45-3.79)** | 1.46(0.69-3.07) |
| | Others | 2(11.8%) | 15(88.2%) | 3.09(0.67-14.22) | 0.53(0.07-4.22) |
| Ethnicity | Berta | 43(14.2%) | 260(85.8%) | 1 | |
| | Amhara | 44(27.8%) | 114(72.2%) | **0.43(0.27-0.69)** | **0.28(0.13-0.62)** |
| | Oromo | 2(5.1%) | 37(94.9%) | 3.06(0.19-1.37) | 1.13(0.13-9.63) |
| | Others | 6(24%) | 19(76%) | 0.52(0.19-1.37) | **0.08(0.02-0.39)** |
| Educational status | Illiterate | 73(25.6%) | 212(74.4%) | 1 | |
| | Able to read and write | 14(11%) | 113(89%) | **2.78(1.5-5.14)** | **3.18(1.57-6.45)** |
| | 1-6th Grade | 5(20.8%) | 19(79.2%) | 1.31(0.47-3.62) | 1.92(0.55-6.71) |
| | >=7 Grade | 3(3.4%) | 86(96.6%) | **9.87(3.03-32.17)** | **7.6(1.69-34.34)** |
| Availability of TTBAs in kebele | No | 36(20.9%) | 136(79.1%) | 1 | |
| | Yes | 59(16.7%) | 294(83.3%) | **1.32(1.02-2.09)** | **2.21(1.19-4.12)** |
| Health professional provide delivery care | No | 27(31%) | 60(69%) | 1 | |
| | Yes | 68(15.5%) | 370(84.5%) | **2.45(1.45-4.13)** | 1.29(0.71-2.38) |
| Knowledge on ANC service | Not-Knowledgeable | 68(24.6%) | 205(75.1%) | 1 | |
| | Knowledgeable | 27(10.7%) | 225(89.3%) | **2.71(1.7-4.49)** | **1.96(1.04-3.68)** |
| Knowledge on delivery service | Not-Knowledgeable | 55(26.2%) | 155(73.8%) | 1 | |
| | Knowledgeable | 40(12.7%) | 275(87.3%) | **2.44(1.55-3.83)** | 1.55(0.8-3.0) |
| Attitude towards ANC service | Unfavourable attitude | 17(33.3%) | 34(66.7%) | 1 | |
| | Favourable attitude | 78(16.5) | 396(83.5%) | **2.54(1.35-4.77)** | 1.95(0.79-4.78) |
| Attitude towards delivery service | Unfavourable attitude | 34(26.2%) | 96(73.6%) | 1 | |
| | Favourable attitude | 61(15.4%) | 334(84.6%) | **1.94(1.2-3.12)** | 1.08(0.54-2.16) |
| Availability delivery service | Not available | 27(31%) | 60(69%) | 1 | |
| | Available | 68(15.5%) | 370(84.5%) | **2.45(1.45-2.09)** | 0.93(0.45-1.91) |
| Transportation service | No | 83(21.8%) | 298(78.2%) | 1 | |
| | Yes | 12(8.3%) | 132(91.7%) | **3.06(1.62-5.8)** | 1.8(0.58-5.62) |
| Time taken by the foot from home to health facility | < 30 minutes | 81(16.8%) | 401(83.2%) | 1 | |
| | >= 30 minutes | 14(32.6%) | 29(67.4%) | **0.42(0.21-0.83)** | **0.25(0.11-0.58)** |

**** Adjusted for*** *place of residence, religion, ethnicity, educational status, available of TTBA, knowledge, attitude, availability of service, transportation service, availability of health profession providing delivery service and distance from home to health facility.*

***Bold*** *indicates statistical significant at p. value = 0.05.*

## IV. Discussion

Antenatal care is one of the most effective health interventions for preventing maternal morbidity and mortality particularly in places where the general health status of women is poor. This study revealed that utilization of ANC services was (81.9%) in the district. This result is almost consistent with most studies conducted in other parts of the country such as the result of study conducted in Harari region in 2006/7 (79.8%) and study done in Afar region in 2005 (80%) (14,16). However, this result is higher than the results of

EDHS 2011 in Benishangul gumuz region (35.1%), study conducted in Yem Special woreda in 2008 (28.5%), in Harari region in 2009 (75%), EDHS 2011 in Somali region (21.5%), in Metekel zone in 2008 (49.8%) (8,15,17,18).This coverage could be due to the fact that ANC service is strongly given at the newly expanded growing health centres and health post through strong linkage with health extension and community health workers. Strong community mobilization is being done to avert complication during pregnancy and child birth and creating awareness of the community on importance of ANC services.

Utilization of ANC service in urban (92.4%) was higher than as compared to rural (78.4%). This is because of urban women had high awareness and knowledge on the important of ANC services.

Utilization of ANC service was more than 7.6 times higher among those who attended secondary school and above and among those literate were more than 3.18 times respectively compared to those who were illiterate. Furthermore, utilization of ANC services was 1.96 times higher among those who were knowledgeable on ANC service than mothers who were not knowledgeable on ANC services. This result in the line with other study done Sheka zone in 2008, study conducted in Special Yem woreda in2008 and in developing countries in including Ethiopia most women lack of knowledge on the risk of pregnancy and child birth, which influence the use of ANC service. Knowledge of women was also associated with their educational status which affects utilization of ANC service (17,20,21).Due to the possible explanation for why education is a key determinant could be that as a woman go up through the ladder of education, the more knowledgeable mothers will be use of ANC service.

Similarly women for whom distance between home and health facility took greater or equal to 30 minutes on foot were 75 percent times less likely to use the ANC service than their counterparts. This result was consistent with the study conducted in India, Pakistan, Kenya and Nigeria were find distance from health facility directly affected the attendance of women for ANC services (19,23,24,25). The possible explanation is that accessibility of health services have been shown to be an important determinant of utilization of maternal health care services in developing countries including Ethiopia (22). However, the result was lower than the study done in Yem special woreda women live in less than 60 minute walk from the health facility was 6.73 times more likely use ANC compare with live in far distance from the health facility (17).

Availability of traditional Trained Birth Attendant in the kebeles increase the odd of utilization of ANC service by 2.44 times higher among women with presence of TTBA in kebeles than with the absence of TTBA in the kebeles. This result consistent with WHO reports that is the trends have had serious implications on awareness, access and acceptability of maternal and newborn health services (13).This might be due to the TBAs have been trained by several development partners in modern methods of maternal health and childbirth to complement the existing maternal health services and improve their ability to refer.

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# Knowledge and Practice of Mothers towards Exclusive Breastfeeding and its Associated Factors in Ambo Woreda West Shoa Zone Oromia Region, Ethiopia

By Zenebu Begna Bayissa, Belayneh Kefale Gelaw, Alayou Geletaw, Ahimed Abdella, Bereket chinasho, Abreham Alemayehu, Amanuel Yosef & Keno Tadele

*Ambo University College of Medicine and Health Science, Ethiopia*

*Abstract-* *Back ground:* Breastfeeding is an important public health strategy for improving infant and child morbidity and mortality, improving maternal morbidity, and helping to control health care costs. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend that every infant should be exclusively breastfed for the first six months of life, with breastfeeding continuing for up to two years of age or longer. The aim of this study to assess knowledge and practice of mothers and identify associated factors towards exclusive breastfeeding.

*Methods:* A community based cross-sectional study was employed. Sample size was determined by using single population proportion formula and four hundred three lactating mothers who have breastfed for 6 months and up to two years was selected by Simple random sampling technique. All explanatory variables that were associated with the outcome variable during bivariate analysis were included in the final logistic model. A multivariate logistic regression analysis was made to identify the predictors of maternal knowledge about exclusive breastfeeding practices.

*Keywords:* *exclusive breastfeeding, knowledge, practice.*

*GJMR-E Classification :* *NLMC Code: WS 125*


*Strictly as per the compliance and regulations of:*

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*Result:* The mean duration of exclusive breast feeding among woman in the study subjects was 5.87 months with standard error of 0.025. The prevalence of exclusive breast feeding is 305(82.2%). Three hundred thirty seven (90.8%) of mothers were Knowledgeable. The actual practice of exclusive breast feeding was 305(82.2%). Among the total variables which were included in the analysis only three variables shows positive association with mothers EBF status. These are knowledge of EBF, ANC follow up and women occupation. House wife women were two times more likely exclusively breast feed their child comp aired to those employed (OR=2.42 CI=1.36, 4.33 P value = 0.022).

*Conclusion and Recommendations:* The study finding implies there is a gap between the current knowledge and actual practice of exclusive breast feeding in line with the WHO recommendations. Therefore, collaborative efforts have to be exerted at different levels, relevant stake holders, health providers together with the community to improve the situation.

*Keywords:* *exclusive breastfeeding, knowledge, practice.*

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## I. Introduction

### a) Back ground

Breastfeeding is the process of milk transference from mother to baby that is needed for the survival and health (1, 2). Breastfeeding Creates an inimitable psycho social bond between the mothers enhances modest cognitive development and it is the underpinning of the infant's well-being in the first year of life even into the second year of life with appropriate complementary foods from 6 months (3, 4).

Breastfeeding is an important public health strategy for improving infant and child morbidity and mortality, improving maternal morbidity, and helping to control health care costs. Breastfeeding is associated with a reduced risk of otitis media, gastroenteritis, respiratory illness, sudden infant death syndrome, necrotizing enter colitis, obesity, and hypertension (5). Nutrition deficiencies and infectious diseases are the leading causes of child mortality in developing countries. Breastfed infants have a reduced risk of malnutrition and common childhood infectious diseases. Maternal health benefits from breastfeeding have also been documented. To maximize the health effect of breastfeeding, optimum breastfeeding is recommended. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend that every infant should be exclusively breastfed for the first six months of life, with breastfeeding continuing for up to two years of age or longer (6,7,8). Exclusive breastfeeding (EBF) is defined as feeding the infant only breast milk, with no supplemental liquids or solids except for liquid medicine and vitamin/mineral supplements (8).

For the first six months of life, infants should be exclusively breast fed to achieve optimal growth, development and health. Thereafter, infants should receive nutritionally adequate and safe complementary foods, while continuing to breast feed for up to two years or more. The single most effective Intervention to reduce child mortality in developed and developing countries is promotion of breast feeding practices.

Despite this recommendation of worldwide only 39 % of infants 6 months of age are exclusive breast feed. In 2008 more than million children under the age of five die each year, 41 % of this death occur in sub-Saharan Africa and another 34% in south Asia and the major contributors to their death is poor breast feeding practice (9, 10).

Globally,60% of infant and young child deaths occur due to in appropriate infant feeding practices and infectious disease from which two third of these deaths are attributable to sub optimal breast feeding practices. Inappropriate infant feeding practice could have negative effect on child growth and development, especially in developing countries, where accessibility of basic health serves is not sufficient. (11)

In Ethiopia 57% of all under-five deaths is highly associated with abrupt cessation of breastfeeding and infectious diseases, but it is closely linked to gap of knowledge how to feed appropriately and food insecurity. A recent report showed that 27% of mothers early provide water, butter and various types of food to feed their children, thereby reducing the percentage of exclusively breastfeed and increasing the percentage of receiving complementary food at very young age. Generally, infant and young child feeding is a complex issue that has implications not only for an infant's nutritional and health status, but also affects infant's psychological development and the development of proper eating habits (11, 12,13).

*b) Objectives*

General objectives

- To assess knowledge and practice of mothers and identify associated factors towards exclusive breastfeeding.

Specific objectives

- To assess knowledge and practice of mothers towards exclusive breast feeding.
- To identify predictors of exclusive breast feeding.

## II. Materials and Methods

*a) Study setting and period*

The study was carried out in Ambo woreda which is one of the eighteen woredas of West Shoa Zone. It is located 114 km from Addis Ababa. Based on the 2007 housing and census, population projection, it has an estimated total population of 129,094 of which about 65,094 are women. There are thirty two kebeles in the woreda. The weather condition of Ambo woreda is 35.3% high land, 50% woyna dega, 14.7% lowland. Data was collected from May to June 2014.

*b) Study design and populations*

A community based cross-sectional study design was employed. The study included lactating mothers who had Breastfed for not less than six months and up to two years and permanent resident of selected kebeles. Sample of mothers randomly selected from the source population was included in the study. The study included mothers who had children under 2 years and permanent resident of selected kebeles.

*c) Sample size and sampling*

First ten kebeles were selected randomly from total of 32 kebeles and complete census was conducted within the selected kebeles to identify the study subjects. Sampling technique was used to take the mothers-child pairs from each selected kebeles. The sample size was calculated using a formula for estimation of a single proportion as follows:

$n = (Z\alpha/2)^2 p (1-p) /d^2$

Where Z= Standard normal variable at 95% confidence level (1.96),

P= Estimated proportion of optimal breastfeeding, 50%, d= 0.05 (5% margin of error) and considering 5% possible non response rate.

The total sample size was 403.

*d) Data Collection Procedure and Statistical Analysis*

Interviewer administered questionnaire adapted from different literatures and modified according to the local context by the investigators was used to collect data concerning socio-demographics, maternal and child characteristics, child feeding practices. Furthermore, women's knowledge of optimal child feeding practices and socio-cultural influences of child feeding were also included in the questionnaire. Their knowledge and practice of breastfeeding were assessed from their responses. Questionnaire was prepared in English and translated to Oromiffa by language experts and then back translated to English language by a third person to check the consistency. Also to ensure the data quality it was collected by collectors who can speak the local language and training was given to them. The questionnaires were pre-tested. Based on a pretest result additional adjustment was made.

On site supervision was carried out during the whole period of data collection on daily basis. At the end of each day questionnaires were reviewed and cross checked for completeness, accuracy and consistency by the principal investigator and corrective measures were under taken.

The data was entered, coded, and analyzed using SPSS for windows version 21.0. Descriptive statistics such as mean was computed. The findings were presented with graphs and tables. Bivariate analysis was performed to identify the association of dependent and independent variables. Odds ratio was computed to see the strength of association between independent variables and exclusive breast feeding. To identify independent predictors, first a bivariate logistic regression was performed (at $p<0.25$) for each

independents and outcome of interest. Finally a multivariate logistic regression analysis was made to identify the predictors of exclusive breast feeding practices. Variables which were significant on p-values of less than (0.05) were reported as predictors of exclusive breast feeding.

*e) Ethical Consideration*

The study was conducted after getting official permission from an ethical clearance committee of Ambo University, College of Medicine and Health Sciences. Data were collected after getting official permission from Ambo Woreda Administration. Letter of cooperation from kebeles administrators was also secured. Informed verbal consent was obtained from each study Participant before data was collected and each respondent was informed about the objective of the study and their right to with draw from the study. Confidentiality was secured.

## III. Result

The total size of the study units who were actual respondents during the data collection period in this study was 371. Therefore, response rate for the interviews conducted was 92.05%. The mean age (+/-SE) of mothers in the study is found to be 26.5 years with standard error of 0.29. Most of the respondents, 345(93%), are married. Among the total respondents, 180(48.5%) are Orthodox. Oromo 293(79%) is the dominant ethnic group followed by Amhara 53(14.3%). The socio-demographic characteristics of the study population are listed in the Table 1.

*Table 1 :* Socio demographic characteristics of the respondents in Ambo woreda, 2014

| Variables | | Frequency | Percent (%) | Remark |
|---|---|---|---|---|
| Age group | 15-19 | 27 | 7.3 | |
| | 20-24 | 122 | 32.9 | |
| | 25-29 | 152 | 41.0 | |
| | 30-34 | 26 | 7.0 | |
| | 35-39 | 30 | 8.1 | |
| | 40-44 | 12 | 3.2 | |
| | 45-49 | 2 | 0.5 | |
| Marital status | Married | 345 | 93.0% | |
| | Divorced | 22 | 5.9% | |
| | Widowed | 4 | 1.1% | |
| | **Total** | 371 | 100% | |
| Religion | Muslim | 30 | 8.1% | |
| | Orthodox | 180 | 48.5% | |
| | Protestant | 145 | 39.1% | |
| | Catholic | 12 | 3.2% | |
| | Other | 4 | 1.1% | |
| | **Total** | 371 | 100% | |
| Ethnicity | Oromo | 293 | 79.0% | |
| | Amahara | 53 | 14.3% | |
| | Tigrie | 11 | 3.0% | |
| | Others | 14 | 3.8% | |
| | **Total** | 371 | 100% | |
| Maternal education | Illiterate | 62 | 16.7% | |
| | Able to read and write | 16 | 4.3% | |
| | Elementary(1-6) | 76 | 20.5% | |
| | Junior(7-8) | 72 | 19.4% | |
| | Secondary(9-12) | 92 | 24.8% | |
| | Tertiary(+12) | 53 | 14.3% | |
| | **Total** | 371 | 100% | |
| Husband education | Illiterate | 20 | 5.4% | |
| | Able to read and write | 10 | 2.7% | |
| | Elementary(1-6) | 40 | 10.8% | |
| | Junior(7-8) | 52 | 14% | |
| | Secondary(9-12) | 99 | 26.7% | |
| | Tertiary(+12) | 150 | 40.43% | |
| | **Total** | 371 | 100.0% | |
| Occupation of the mother | Employee(GO/NGO) | 61 | 16.4% | |
| | Merchant | 68 | 18.3% | |
| | House wife | 183 | 49.3% | |
| | Student | 12 | 3.2% | |
| | Farmer | 17 | 4.6% | |

| | | | |
|---|---|---|---|
| | Daily worker | 28 | 7.5% |
| | Other | 2 | 0.5% |
| | Total | 371 | 100% |
| Occupation of husband | Employee(GO/NGO) | 168 | 45.2% |
| | Merchant | 74 | 19.9% |
| | Student | 9 | 2.4% |
| | Farmer | 31 | 8.4% |
| | Daily worker | 75 | 20.2% |
| | Other | 14 | 3.8% |
| | Total | 371 | 100.0% |

a) *Knowledge and practices of respondents towards EBF*

The actual duration and feeding style about exclusive breast feeding among the respondents has assessed based on the WHO recommendations. Similarly, majority of the respondents 337(90.8%) know that the duration of EBF was 6 months without giving any additional food except necessary medications. Whereas, 10(2.6%) of respondents know that the duration of EBF was 4 to 5 months. The mean duration of EBF is 5.87 months with a standard error of 0.025 while, the median duration of exclusive breastfeeding is six months with a standard deviation of±0.48. The main Sources of information for mothers on EBF was television 126(34%) followed by others 107(28.8%) which include health workers and neighbors. Additionally, radio 40(10.8%) and magazine 5(0.2%) were the other source of information for mothers on EBF.

Three hundred forty eight (93.8%) of the respondents knew that, EBF is important for the child; to prevent young child from infection 78(21%), to strength the baby 55(14.8%), provide ideal source of nutrient 23(6.2%). Two hundred sixty three (70.9%) of mothers knew that breast milk is nutritionally enough for the first six month while, 48(12.9%) of them responded it is not enough and 41(11.1%) of them did not know whether it is enough or not.

Concerning the breastfeeding practices of the mothers, 305 (82.2 %) of the respondents practiced exclusive breastfeeding for the first six months whereas, 66 (17.8%) were not practiced EBF, due to the assumption of insufficient breast milk 30(8.1%), bottle feeding give enough food 14(3.8%), the baby was unable to feed breast 2(0.5%), breast feeding is pain full 2(0.5%). Breastfeeding initiation within one hour after birth was 264(71.2%), 93(25.1%) did so within twenty four hours after birth. On the frequency of breastfeeding 190 (51.2%) of the mothers fed their child 8-12 times per day, while 149(40.2%) of mothers fed their child less than 8 times per day, but the rest fed more than 12 times per day. Two hundred sixty four (71.2%), of mothers initiated breastfeeding within one hour after birth and 93(25.1%) of mothers did so within twenty four hours after birth. High percentage of the mothers 335(90.3%) were not practiced to give the child prelacteal food or fluid. However, 36(9.7%) of mothers practiced to give food or fluid before the initiation of breast feeding, predominantly butter 18(4.9%), followed by water 8(2.2%), others including glucose water 7(1.9%), cow milk 3(0.8%).The main reason of mothers to give prelacteal food for the new born is culture 16(4.3%), maternal illness 9(2.4%), painful breast 4(1.1%), caesarean delivery 7(1.9%).

Most of the respondents 212(57.1%) fed their child with bottle when they are away for long period of time, 70 (18.9%) gave expressed milk, 17(4.6%) gave care giver milk but 70(18.9%) did not go away. More than half of mothers192 (51.8%) fed their baby on demand and 35(9.4%) fed when they are free to feed while 141(38.0%) fed when the baby cry.

*Table 2 :* knowledge and pattern of breast feeding in Ambo woreda 2014

| Variables | Frequency (n) | Percent (%) |
|---|---|---|
| Knowledge of EBF | | |
| Yes | 337 | 90.8% |
| No | 34 | 9.2% |
| Exclusively breast feed | | |
| Yes | 305 | 82.2% |
| No | 66 | 17.8% |
| Breastfeeding initiation | | |
| Within one hour | 264 | 71.2% |
| After one hour | 93 | 25.1% |
| Breast feeding frequency | | |
| <8 | 149 | 40.2% |
| 8-12 | 190 | 51.2% |
| >12 | 32 | 8.6% |

| | | |
|---|---|---|
| Prelactal food | | |
| Yes | 36 | 9.7% |
| No | 335 | 90.3% |
| Types of prelactal food | | |
| Butter | 18 | 4.9% |
| Water | 8 | 2.2% |
| Cow milk | 3 | 0.8% |
| Glucose water | 7 | 1.9% |

Finally those variables which show significant associations in bivariate analysis candidated to multivariate analysis. Accordingly results showed that three variables had significantly associated with mothers EBF status. Those who had knowledge on exclusive breastfeeding were 2 times more likely to breastfeed exclusively than the ones who had no knowledge on exclusive breastfeeding (Adjusted OR = 2.02, 95% CI= 1.12, 4.48 ). Also those mothers who had ANC follow up were 4.37 times more likely to exclusively breastfeed their infants than those in the referent group (Adjusted OR = 4.37 95% CI= 2.19, 10.45). The results are summarized in table 3

*Table 3 :* Determinant factors of exclusive breast feeding status in Ambo Woreda 2014

| Variables | No | COR | AOR | P-value |
|---|---|---|---|---|
| Religion | | | | |
| Muslim | 30 | 0.48 (0.53,10.44) | 0.24( 0.16, 11.44) | |
| Orthodox | 180 | 1 | 1 | |
| Protestant | 145 | 0.95(0.68,1.32) | 0.92(0.68, 3.27) | |
| Catholic | 12 | 2.68( 1.32, 22.49) | 0.39(0.20, 18.75) | 0.112 |
| Other | 4 | 0.61(0.13, 1.44) | 2.33(0.15, 5.65) | |
| Ethnicity | | | | |
| Oromo | 293 | 1 | 1 | |
| Amahara | 53 | 1.20 (0.46, 3.25) | 1.40 (0.38, 5.23) | |
| Tigrie | 11 | 0.92 (0.23, 23.93) | 1.08 (0.23, 15.14) | |
| Others | 14 | 2.31 (0.18, 32.31) | 1.18 (0.32, 21.40) | |
| Mothers education | | | | |
| Illiterate | 62 | 1 | 1 | |
| Able to read and write | 16 | 2.50(0.73, 10.42) | 3.50(0.63, 5.58) | |
| Elementary(1-6) | 76 | 1.24(0.14, 6.47) | 4.12(0.17, 17.54) | |
| Junior(7-8) | 72 | 3.53(0.06, 37.02) | 1.50(0.08, 15.16) | |
| Secondary(9-12) | 92 | 0.15(0.01, 0.63) | 4.50(0.38, 6.66) | 0.0821 |
| Tertiary(+12) | 53 | 1.10(0.14, 4.32) | 0.09(0.25, 7.03) | |
| Husband education | | | | |
| Illiterate | 20 | 1 | 1 | |
| Able to read and write | 10 | 3 (0.17, 13.32) | 0.03(0.66, 2.65) | |
| Elementary(1-6) | 40 | 0.61 (0.29, 1.28) | 1.54 (0.74, 3.22) | |
| Junior(7-8) | 52 | 0.71 (0.33, 1.13) | 1.53 (0.83, 2.81) | |
| Secondary(9-12) | 99 | 0.92 (0.42, 1.99) | 1.11 (0.52, 2.39) | |
| Tertiary(+12) | 150 | 0.53 (0.29, 0.96)* | 1.44 (0.93, 2.25) | 0.132 |
| Mother Occupation | | | | |
| Employee(GO/NGO) | 61 | 1 | 1 | |
| Merchant | 68 | 4.21(0.57, 1.44) | 0.64(0.55, 2.85) | |
| House wife | 183 | 0.53(0.46,0.82) | 2.42(1.36, 4.33) | 0.022 |
| Student | 12 | 0.92(0.67,1.27) | 0.95(0.68,1.32) | |
| Farmer | 17 | 0.10,(0.00,0.70) | 0.45(0.38,1.89) | |
| Daily worker | 28 | 0.81 (0.52,1.27) | 0.51 (0.22,1.23) | |
| Other | 2 | 0.31 (0.11,1.51) | 0.13(0.28,1.11) | |
| Husband occupation | | | | |
| Employee(GO/NGO) | 168 | 1 | 1 | |

| | | | | |
|---|---|---|---|---|
| Merchant | 74 | 0.64 (0.14, 2.42) | 0.62 (0.19, 1.98) | |
| Student | 9 | 0.95(0.68,53.32) | 0.92(0.68, 43.27) | |
| Farmer | 31 | 0.46 (0.09, 2.03) | 0.44 (0.13, 1.49) | |
| Daily worker | 75 | 0.25 (0.04, 1.47) | 0.54 (0.15, 2.03) | |
| Other | 14 | 2.06 (0.94, 14.81) | 0.69 (0.12, 15.07) | |
| ANC follow up | | | | |
| Yes | 317 | 6.16(2.33, 11.56) | 4.37( 2.19, 10.45) | 0.012 |
| No | 54 | 1 | 1 | |
| Place of delivery | | | | |
| Home | 25 | 1 | 1 | |
| Health facility | 346 | 2.68( 1.32, 22.49) | 0.39(0.20, 1.75) | 0.105 |
| Mode of delivery | | | | |
| Normal (SVD) | 340 | 1 | 1 | |
| Caesarian section | 31 | 0.61(2.13, 1.44) | 2.33(0.15, 5.65) | 0.071 |
| Knowledge on EBF | | | | |
| Yes | 337 | 2.08(1.13, 3.34) | 2.02 (1.12, 4.48) | 0.003 |
| No | 34 | 1 | 1 | |

## IV. Discussion

The median duration of exclusive breastfeeding in Ethiopia was documented with a wide range of variety from lowest (0.4 month for Afar Region) through the highest (4.3 months for Amhara region) (14,15). However in this study, the median duration of exclusive breastfeeding is six months which is in line with WHO recommendation.

According to our study maternal knowledge about exclusive breast feeding, ANC follow up and women occupational status are the three variables which had significant effect to practice EBF. This study revealed high percent of women have knowledge about exclusive breast feeding 337(90.8%) and also maternal knowledge about exclusive breast feeding has significantly associated with their practice. This shows similarity with the study conducted in Arba Minch woreda zuria in which Breastfeeding is considered as a natural gift in according to their in depth interview showed some mothers perceived breastfeeding as a natural gift though they could not feed appropriately due to field and home activities. EBF practice was more common among knowledgeable mothers. This shows that basic education in the promotion of EBF should be encouraged. This is fully supported by the study conducted at Arba Minch zuria in which findings from in-depth interviews indicated mothers' knowledge of optimal breastfeeding is due to an exposure to health education given by health extension workers. This study indicated health education which is given at different occasion concerning about hygiene, complementary food and breastfeeding practices is one of the predetermining factors to promote optimal breastfeeding practices (16). The prevalence of exclusive breastfeeding practice was 305(82.2%). This is higher than the findings of Arba Minch woreda zuria (55.6%), semi urban community of Nigerian mothers (69.5%) and that of rural Papua New Guinea (17%).(16-18).

According to result of this finding women's who had ANC follow up during their pregnancy period four times more likely to practice EBF compared to those did not have follow up. This might be due to fact that counseling about EBF and its importance after the birth of the child is provided for women's during their ANC follow up.

Other major finding in this study is that women's occupation. Being house wife shows positive association with women's EBF status compared to that of employed. The likely explanation for this association could be this types of mother's have more chance to be with their child all the day so that they can provide their breast milk to their child as per needed. In other side when we observe the employed ones they are away of their child due to their job.

From our study 66(17.8%) of mothers were not practiced EBF, due to the assumption of insufficient breast milk 30(8.1%), bottle feeding give enough food 14(3.8%), the baby was unable to feed breast 2(0.5%), breast feeding is pain full 2(0.5%). The reason of those mothers is inconsistent with mothers in south west Nigeria, who were not practiced exclusive breast feeding (81%) with the perception that babies continued to be hungry after breast feeding (29%), maternal health problems (26%), fear of babies becoming addicted to breast milk (26%), and the need to return to work (24%) (19).

## V. Conclusion

In summary, even though majority, 337(90.8%) of the respondents are knowledgeable about EBF but, still there is a gap between the actual practice within the recommended duration and feeding style which is 305(82.2%). Women's knowledge about EBF, ANC follow up and occupations are the important variables which show positive association with their practice.

Based on the finding of this study, health service organizations have to critically look at the gap between the actual exclusive breast feeding and the

practice done in the area and have to orient service providers at service delivery points, particularly in clinic based settings on exclusive breast feeding practice. programs made to improve maternal and child health should consider the above modifiable factors like enhancing maternal knowledge of exclusive breast feeding and giving health education about the advantages of ANC service and then women's have utilize the service. Policy makers should consider the barriers of women's occupation for EBF during the first six months of child life.

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*Conflict of interest:* None declared

*Ethical approval:* Approval and permission was sought from Ethical Review Board of College of Medicine and Health Sciences of Ambo University

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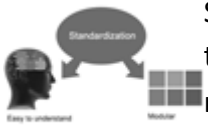


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- Left Margin: 0.65
- Right Margin: 0.65
- Top Margin: 0.75
- Bottom Margin: 0.75
- Font type of all text should be Swis 721 Lt BT.
- Paper Title should be of Font Size 24 with one Column section.
- Author Name in Font Size of 11 with one column as of Title.
- Abstract Font size of 9 Bold, "Abstract" word in Italic Bold.
- Main Text: Font size 10 with justified two columns section
- Two Column with Equal Column with of 3.38 and Gaping of .2
- First Character must be three lines Drop capped.
- Paragraph before Spacing of 1 pt and After of 0 pt.
- Line Spacing of 1 pt
- Large Images must be in One Column
- Numbering of First Main Headings (Heading 1) must be in Roman Letters, Capital Letter, and Font Size of 10.
- Numbering of Second Main Headings (Heading 2) must be in Alphabets, Italic, and Font Size of 10.

**You can use your own standard format also.**
**Author Guidelines:**

1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

**1. GENERAL**

Before submitting your research paper, one is advised to go through the details as mentioned in following heads. It will be beneficial, while peer reviewer justify your paper for publication.

**Scope**

The Global Journals Inc. (US) welcome the submission of original paper, review paper, survey article relevant to the all the streams of Philosophy and knowledge. The Global Journals Inc. (US) is parental platform for Global Journal of Computer Science and Technology, Researches in Engineering, Medical Research, Science Frontier Research, Human Social Science, Management, and Business organization. The choice of specific field can be done otherwise as following in Abstracting and Indexing Page on this Website. As the all Global

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**2. ETHICAL GUIDELINES**

Authors should follow the ethical guidelines as mentioned below for publication of research paper and research activities.

Papers are accepted on strict understanding that the material in whole or in part has not been, nor is being, considered for publication elsewhere. If the paper once accepted by Global Journals Inc. (US) and Editorial Board, will become the copyright of the Global Journals Inc. (US).

**Authorship: The authors and coauthors should have active contribution to conception design, analysis and interpretation of findings. They should critically review the contents and drafting of the paper. All should approve the final version of the paper before submission**

The Global Journals Inc. (US) follows the definition of authorship set up by the Global Academy of Research and Development. According to the Global Academy of R&D authorship, criteria must be based on:

1) Substantial contributions to conception and acquisition of data, analysis and interpretation of the findings.

2) Drafting the paper and revising it critically regarding important academic content.

3) Final approval of the version of the paper to be published.

All authors should have been credited according to their appropriate contribution in research activity and preparing paper. Contributors who do not match the criteria as authors may be mentioned under Acknowledgement.

Acknowledgements: Contributors to the research other than authors credited should be mentioned under acknowledgement. The specifications of the source of funding for the research if appropriate can be included. Suppliers of resources may be mentioned along with address.

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Approval for reproduction/modification of any information (including figures and tables) published elsewhere must be obtained by the authors/copyright holders before submission of the manuscript. Contributors (Authors) are responsible for any copyright fee involved.

**3. SUBMISSION OF MANUSCRIPTS**

Manuscripts should be uploaded via this online submission page. The online submission is most efficient method for submission of papers, as it enables rapid distribution of manuscripts and consequently speeds up the review procedure. It also enables authors to know the status of their own manuscripts by emailing us. Complete instructions for submitting a paper is available below.

Manuscript submission is a systematic procedure and little preparation is required beyond having all parts of your manuscript in a given format and a computer with an Internet connection and a Web browser. Full help and instructions are provided on-screen. As an author, you will be prompted for login and manuscript details as Field of Paper and then to upload your manuscript file(s) according to the instructions.

To avoid postal delays, all transaction is preferred by e-mail. A finished manuscript submission is confirmed by e-mail immediately and your paper enters the editorial process with no postal delays. When a conclusion is made about the publication of your paper by our Editorial Board, revisions can be submitted online with the same procedure, with an occasion to view and respond to all comments.

Complete support for both authors and co-author is provided.

**4. MANUSCRIPT'S CATEGORY**

Based on potential and nature, the manuscript can be categorized under the following heads:

Original research paper: Such papers are reports of high-level significant original research work.

Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications

Research letters: The letters are small and concise comments on previously published matters.

**5.STRUCTURE AND FORMAT OF MANUSCRIPT**

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

**Papers**: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and to make suggestions to improve briefness.

It is vital, that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

**Format**

*Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.*

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

**Structure**

All manuscripts submitted to Global Journals Inc. (US), ought to include:

Title: The title page must carry an instructive title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) wherever the work was carried out. The full postal address in addition with the e-mail address of related author must be given. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining and indexing.

*Abstract, used in Original Papers and Reviews:*

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

*Acknowledgements: Please make these as concise as possible.*

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

Tables, Figures and Figure Legends

*Tables: Tables should be few in number, cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g. Table 4, a self-explanatory caption and be on a separate sheet. Vertical lines should not be used.*

*Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.*

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution (at final image size) ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs) : >350 dpi; figures containing both halftone and line images: >650 dpi.

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*Figure Legends: Self-explanatory legends of all figures should be incorporated separately under the heading 'Legends to Figures'. In the full-text online edition of the journal, figure legends may possibly be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should notify the reader, about the key aspects of the figure.*

**6. AFTER ACCEPTANCE**

Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

**6.1 Proof Corrections**

The corresponding author will receive an e-mail alert containing a link to a website or will be attached. A working e-mail address must therefore be provided for the related author.

Acrobat Reader will be required in order to read this file. This software can be downloaded

(Free of charge) from the following website:

www.adobe.com/products/acrobat/readstep2.html. This will facilitate the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof.

Proofs must be returned to the dean at dean@globaljournals.org within three days of receipt.

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**6.4 Author Material Archive Policy**

Please note that if not specifically requested, publisher will dispose off hardcopy & electronic information submitted, after the two months of publication. If you require the return of any information submitted, please inform the Editorial Board or dean as soon as possible.

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## TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

**1. Choosing the topic:** In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

**2. Evaluators are human:** First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

**3. Think Like Evaluators:** If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

**4. Make blueprints of paper:** The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

**5. Ask your Guides:** If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

**6. Use of computer is recommended:** As you are doing research in the field of Computer Science, then this point is quite obvious.

**7. Use right software:** Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

**8. Use the Internet for help:** An excellent start for your paper can be by using the Google. It is an excellent search engine, where you can have your doubts resolved. You may also read some answers for the frequent question how to write my research paper or find model research paper. From the internet library you can download books. If you have all required books make important reading selecting and analyzing the specified information. Then put together research paper sketch out.

**9. Use and get big pictures:** Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

**10. Bookmarks are useful:** When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

**11. Revise what you wrote:** When you write anything, always read it, summarize it and then finalize it.

**12. Make all efforts:** Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

**13. Have backups:** When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

**14. Produce good diagrams of your own:** Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

**15. Use of direct quotes:** When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

**16. Use proper verb tense:** Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

**17. Never use online paper:** If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

**18. Pick a good study spot:** To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

**19. Know what you know:** Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

**20. Use good quality grammar:** Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

**21. Arrangement of information:** Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

**22. Never start in last minute:** Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

**23. Multitasking in research is not good:** Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

**24. Never copy others' work:** Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

**25. Take proper rest and food:** No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

**26. Go for seminars:** Attend seminars if the topic is relevant to your research area. Utilize all your resources.

**27. Refresh your mind after intervals:** Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

**28. Make colleagues:** Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

**29. Think technically:** Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

**30. Think and then print:** When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

**31. Adding unnecessary information:** Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

**32. Never oversimplify everything:** To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

**33. Report concluded results:** Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

**34. After conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

## Informal Guidelines of Research Paper Writing

**Key points to remember:**

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

**Final Points:**

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

**General style:**

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

**Title Page:**

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

**Abstract:**

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

**Introduction:**

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

**Procedures (Methods and Materials):**

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

**Results:**

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

**Discussion:**

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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| ***Introduction*** | Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited | Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter | Out of place depth and content, hazy format |
| ***Methods and Procedures*** | Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads | Difficult to comprehend with embarrassed text, too much explanation but completed | Incorrect and unorganized structure with hazy meaning |
| ***Result*** | Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake | Complete and embarrassed text, difficult to comprehend | Irregular format with wrong facts and figures |
| ***Discussion*** | Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited | Wordy, unclear conclusion, spurious | Conclusion is not cited, unorganized, difficult to comprehend |
| ***References*** | Complete and correct format, well organized | Beside the point, Incomplete | Wrong format and structuring |

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