COLLEGE OF MEDICINE AND HEALTH SCIENCE DEPARTMENT OF NURSING

TREATMENT OUT COMES AND ASSOCIATED FACTORS AMONG TUBERCULOSIS PATIENT ATTENDING IN GURAGA ZONE PUBLIC HOSPITAL IN SOUTH WEST ETHIOPIA

Investigators

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A RESEARCH THESIS SUMMITED TO WOLKITE UNIVERSTIY COLLEGE OF MEDICINE AND HEALTH SCIENCE DEPARTMENT OF NURSING ON IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE BACHULOR OF DEGREE IN NURSING

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WOLIKITE, ETHIOPIA

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ABRIVATION AND ACRONUMS

AFB =Acid Fast Baillie

ANC = Ante Natal Care

ART = Anti-Retroviral Therapy

CD4=HIV Helper Cell Count

DOTS= Direct Observed Therapy

EPTB = Extra Pulmonary Tuberculosis

ETB=Ethiopian Birr

FMOH=Federal Ministry of Health

FP= Family Planning

HIV/AIDS = Human Immune Virus / Acquired Immune Deficiency Syndrome

MDR TB= Multi Drug Resistance Tb

PT. = Patient

PTB = Pulmonary Tuberculosis

REHZ =Rifampicin, Ethambutol, Isoniazid, Pyrazinamide

RR-TB = Rifampicin Resistance

Rx =Treatment

TB= Tuberculosis

TSRS =Treatment Successful Rates

WHO=World Health Organization

XDR TB =Extensive Drug Resistan

ABSTRACT

Back ground: WHO estimates that Tuberculosis annually causes to 3 million deaths and till 2020 the global burden of Tuberculosis infection will reach to more than one billion. Tuberculosis remains top killer in 2016, 90% disease burden comes from poor resourced countries where the rate of re-emergence is faster due to poor Tuberculosis control and spreading extremely inadequate.

Objectives: To determine treatment out come and associated factors among tuberculosis patient attending in Guraga Zone public hospitals, south west Ethiopia, 2021

Methodology: Facility based Retrospective cross-sectional study design was used and the study was conducted from three hospitals from July 20, 2021-July 30, 2021. To assess Tuberculosis treatment out come and associated factors among Tuberculosis patient who were treated in Guraga Zone public hospitals and who were registered from July 8, 2016-July 8, 2021. Data was retrieving from record of patient registration book .data were analyzed using SPSS version 25 and binary and multivariate logistic regression methods were used

Results: Out of 440 samples 396 were completed data. Out of 396 TB patients (204 were male in sex, 191 patients between 21-40 years in age) including all type of TB, 77% had successful outcome and 23% had unsuccessful outcome. In final multivariate logistic model :- TB with HIV positive patients more likely to have unsuccessful treatment outcome compared to TB with HIV negative patients with (AOR=2.85,95%CL:1.17-6.96), female (AOR=2.08,95CL:1.23-3.52) times more likely to achieve successful outcome, patients with malnutrition, smear positive PTB, living in urban area age 40 and above, patients not having supporter(widowed, divorce), having sputum result positive at second months, patients were less likely to achieve treatment successful outcome.,

Conclusion and recommendations: in this study 77% of successful outcome this is less than WHO target. Therefore:-in order to improve successful treatment outcome it is necessary to make a strategically plan for modifying in patients with TB with HIV co-infection and other risk factors (predictors) and we suggest that TB patients on treatment it need strictly follow up

Key words: MDR, TB, Treatment Outcome Guraga Zone, Ethiopia

1. Introduction

1.1. Back ground

Tuberculosis is air born communicable disease caused by bacteria from mycobacterium tuberculosis complex. TB is an important global health problem and estimated by WHO to be among the leading cause of death and disability among the economically active segments of the population[1].The use for the development of reliable outpatient TB treatment strategies is big importance, especially in resource limited setting, DOT is support strategies it may be not feasible related to a lack of medical personnel or patient access[2]. In 2016 TB remain top killer, 90 % disease burden comes from poor resourced countries where the rate of re-emergence is faster due to poor TB control and the spreading are globally in 2016 about 490,000 people were estimated to have MDR-TB which about 4.1% of new TB case and 19% of previously treated cases were estimated rifampicin or MDR-TB [3].According to WHO 2019 TB report there are an estimated 10 million people infected with TB and 1.2 million TB deaths among lining with HIV/ AIDS. Globally of the case the highest report was from Asia (44%) and next Africa (24%).the FMOH hospital statics data have shown that TB is leading cause of morbidity , the third cause of hospital admission and the second cause of death in Ethiopia, after malaria[4]. WHO estimates that TB annually cause to 3 million death and till 2020 the global burden of infection will be reach to more than one billion [1]. Ethiopia in 1992 as pilot and since then Ethiopia has been implementing DOTS [5]. The WHO new strategies The END TB and "TB action plan for the WHO European region 2016-2020 " propose the development of integrated, patient-centered National programs for the treatment and prophylaxis of TB, together with creation of incentives for the use of innovative approaches toward prevention, diagnostics, and treatment of TB[2]. Ethiopia has 2.3% new TB case and 17. 8% of previously treated TB cases were estimated to have MDR-TB in 2017 around 10 million people became sick with TB disease and 1.3 million TB related death worldwide excluding the global number of HIV/AIDS death[3].

1.2. Statement of Problem

Tuberculosis is an important health problem worldwide in morbidity and mortality [1]. The highest treatment success full rate were in western pacific region , the southeast Asia region ,and the eastern Mediterranean region . The TSR in Africa region 70% and in the Americas and Europe was 75% in 1992 Ethiopia started a standardize TB prevention and control program, incorporate in .DOTS [6] Ethiopia needs much more effort to detect the missed –one third new TB cases and effectively treat at least 90 % of notified TB cases. Treatment success rate of was observed [7]. Anti TB treatment outcomes affected by some factors those are transfer of patient a cross health service unites , lack of family support and social stigma , patient misinformation long treatment duration, low literacy , level drug side effect , insufficient health education program and distance place [8]. Ethiopia achieved 9o% TSRs was reported on 2015 but the report indicates the validity of TSR, but the report indicate the validity of treatment outcomes data remains in question and may not be the reflection of the reality .[3] WHO reports show that the considerable number of TB cases failed after several treatment :- many relapsed after completion of treatment , many was under go retreatment after completion of treatment and many was developed MDR-TB among retreatment case[9]. A grate issue about unsuccessful rate of TB treatment out comes is related to MDR-TB and XDR, which was a huge problem causes increase the burden of Tuberculosis. in different study the unsuccessful rate of TB treatment out comes reported; India 14%, central Africa 27.65% , west Ethiopia 17.5%, afar 18.2 % [10]. Ethiopia is one of among the 30 high burdens MDR TB burden countries with average of 2700 MDR /RR-TB cases among annually notified TB cases [11].The national TB control program was established in 1994. It is implementing the new stop TB strategy of WHO to achieve the 2015 TB related millennium target. Remarkable progress has been made in the TB treatment success rate that has increased from 54% in 1995 to 86% in 2008, TB mortality remain high at 8% [12]. Global TB reported new TB cases, 2.7%, and in Ethiopia 14% was retreated TB case was MDR /RR-TB in 2017[11]. Treatment non adherent and loss of follow up is the main responsible for high treatment failure. Non adherence to anti TB treatment many resulted in the emergence of MDR-TB, prolonged infectious ness and poor treatment out comes. high rate of loss to follow up of TB patient reported in sub Saharan Africa was 11.3% up to 29% and in our country reported was 84% of treatment success rate it is one of the seven country

of lower rates of treatment success[9]. In developing country the defaulter rate and treatment frailer rate were high including Ethiopia [10]

1.3. Significance of Research

our study will help hospitals should provide training for health profession to deliver better and more appropriate quality of care to their patients and also qualified there staff specially who work in TB clinic to provide the patient with adequate care to protect the patient from MDR-TB. Our research helps the health care provider to get the training and to see the gap in care and provide better care to patients. It also helps the patients getting quality of care and work closely with the care giver about his/ her health to prevent hospitalization and prolonged use of medication. For future researchers working on this idea my research result will serve as a base line. In our country setting where resource is limited, conducting this type of research our study will help health policy to reduce the number of patients dying from TB, MDR-TB developing and XDR TB by adequate studying the problem in our research and highlighting the gap it will be the basis for reducing the above outcome.

2. Literature Review

2.1. TB Treatment Outcome

Important indicator of the performance of tuberculosis control programs and regardless of the number reported TB cases in a setting is treatment outcome, key treatment outcome are expected to improve in line with WHO treatment outcome benchmarks [12]. In 22 high burden countries the highest treatment coverage was reported in Brazil, Philippines, and Russia federation other countries including Ethiopia, treatment gap remains high specifically in MDR-TB cases [13]. In Baluchistan province of Pakistan a cohort study from January 1,2012-April 30,2016 shows that treatment success full rate was 71.6%,from this 69.4% was cured and 2.2% completed ,from unsuccessful treatment outcome(28.4%)19.9% died, 1.1% were treatment failure and 7.4%were lost to follow up [14].Total treatment success rate in Ethiopia was 91 % it was encuregable [15]. At Jimma university specialized hospital and omonada training health center a retrospective study was done from the first September 2008 up to august 31, 2012 reported that 85% were successful rate and unsuccessful rate was 14.1 % [16]. The successful rate was varies in kola Diba health center in northwest Ethiopia successful rate was 88.5 % [17].88.1% in woldia and Dessie town health institution [18]. In Dabat 86.6 % [19]. In Mizan Aman general hospital, 21.9% and 66.4% in Gedio zone of snnpr [20, 21]. In Benshangumgumz 8.61% rate was defaulter [22]. In Woldia and Dessie town health institution, North West Ethiopia in 2012 was 1% and in 2015 was 1.9% [17, 18]. In Addis Ababa the death rate was 3.7 % , 1.22% in mizan aman general hospital , gambella regional hospital 3.5% , 4.33% in gedio [21,18, 20, 23,]. In Ethiopia retrospective stud was done from 31 selected hospital from 2001-2015 was showed treatment successful rate was 55.8 % and unsuccessful rate was 44.2% [24]. Improving treatment outcome and plan effective intervention necessitate understanding of the factor that prevent people from adhering to treatment and those that help in treatment completion[12].In Mogadishu 2016-1017 the study shows that treatment outcome 61.6% cured, 20.3% completed,6.8% treatment failed, defaulter 6.2%, transferred 2.9%and died 2.35%[25].TB treatment aims at curing the patient, limiting transmission of Tuberculosis to other person and preventing bacilli

from becoming drug resistant. Unluckily these aim are not accomplished in many region of the world even anti tuberculosis drugs are available .Rating of treatment outcome is cardinal to assessment of strength of tuberculosis control program [12].

2.2. Factor Associated With Tb Treatment Outcomes

There are many study that showed the reason for non-adherence to TB treatment are manifested, varies from the personalities of patient to their economic and social environment [26]. In Nigeria a retrospective study was done to assess treatment out comes of DOTS for PTB assessed that the effect of HIV status and TB treatment out come with TB and without HIV status showed that, 63.8 % was cured, completed was 10.2 %, 17.3% died and treatment defaulter were 3.1 % [24,]. In Zimbabwe to assess treatment outcome of TB in relation to HIV status a

Retrospective cohort study was showed that treatment success rate of 73% regardless of HIV status [22]. A study conducted in south Africa to assess the description of recurrence of PTB reviled the risk factor for unsuccessful treatment outcomes were patient older than 46 year and unemployed person were defaulted from treatment. TB with HIV, among 41% HIV tested retreatment TB patient 98% were HIV positive. The risk factors for retreatment TB were HIV, a lower CD4 count and other opportunistic infection [26]. In Nairobi Kenya retrospective study was showed that 18.8 % cured, 15% completed without confirmation of cured. the treatment success rate were 33.8 % this was due to 64.2 % study patient were without treatment outcome information but patient who was treatment information out come the treatment success full rate was 94.5 % HIV positive TB patient had low success full rate compared to HIV negatives TB patient with p value 0.004[27]. In Zambia to asses HIV infection and treatment out comes in new and recurrent PTB in Africa patient showed that factor that resulted poor treatment outcome was low CD4 count and it is also a profound cause of death, this was explained by delayed diagnosis of TB in HIV positive individual. Other factors are low body weight, sputum smear positive and MDR TB [28]. In Haiti a prospective cohort study was done to assess the outcomes of HIV infected patient treated for recurrence TB with the standard regimen showed that 18 % died, 5 % defaulted, and 4% failed treatment. The risk of death TB with HIV compared to TB without HIV infected, TB with HIV four times is likely to die than TB without TB status during anti TB retreatment [29]. In southern region of Ethiopia by munoz-sellart study conducted was done on the factor associated with poor treatment out comes, 16.7 % were transferred to other distinct 6.9% , 1.5 % were discontinue treatment during initial phase, poor treatment outcome ; 60.9% were defaulter, 36.9 % died, and 2.2 % were treatment failure[30]. In

Tigray Region by berheet.al. in 2012 evaluated 401 patient with sputum smear positive PTB ; 10.8 % experienced unsuccessful treatment . Within 10.8 % unsuccessful l treatment; 3.7 % were treatment failure, 3.2 % defaulter and 3.9 % had died. [31].There

Are different factor that cause poor treatment out comes: older age, category of TB comorbidity such as HIV /AIDS, low income level, retreated TB [4]. There is limitation under patient with TB are unable complete the

treatment, its lead to prolonged infectious ness, drug resistance, relapse, finally death. to modify and increase TB treatment out comes it needs the appropriate understanding of the particular obstacle to and facilitate of adherence to TB treatment and patient experience of taking treatment [10].study in Mogadishu from 2016-2017 , shows married patients were high success full rate compared to unmarried patents. HIV negative patients were high success full treatment outcome compared to HIV positive patients. Newly treated TB patients were increase successful treatment outcome compared to retreatment cases [25].

Conceptual Framework

This conceptual frame work shows the relationship between dependent (treatment outcome) and the independent like socio demographic, tuberculosis type, category of patient, comorbidity, and medication related ……. As shown in the figure 1 below

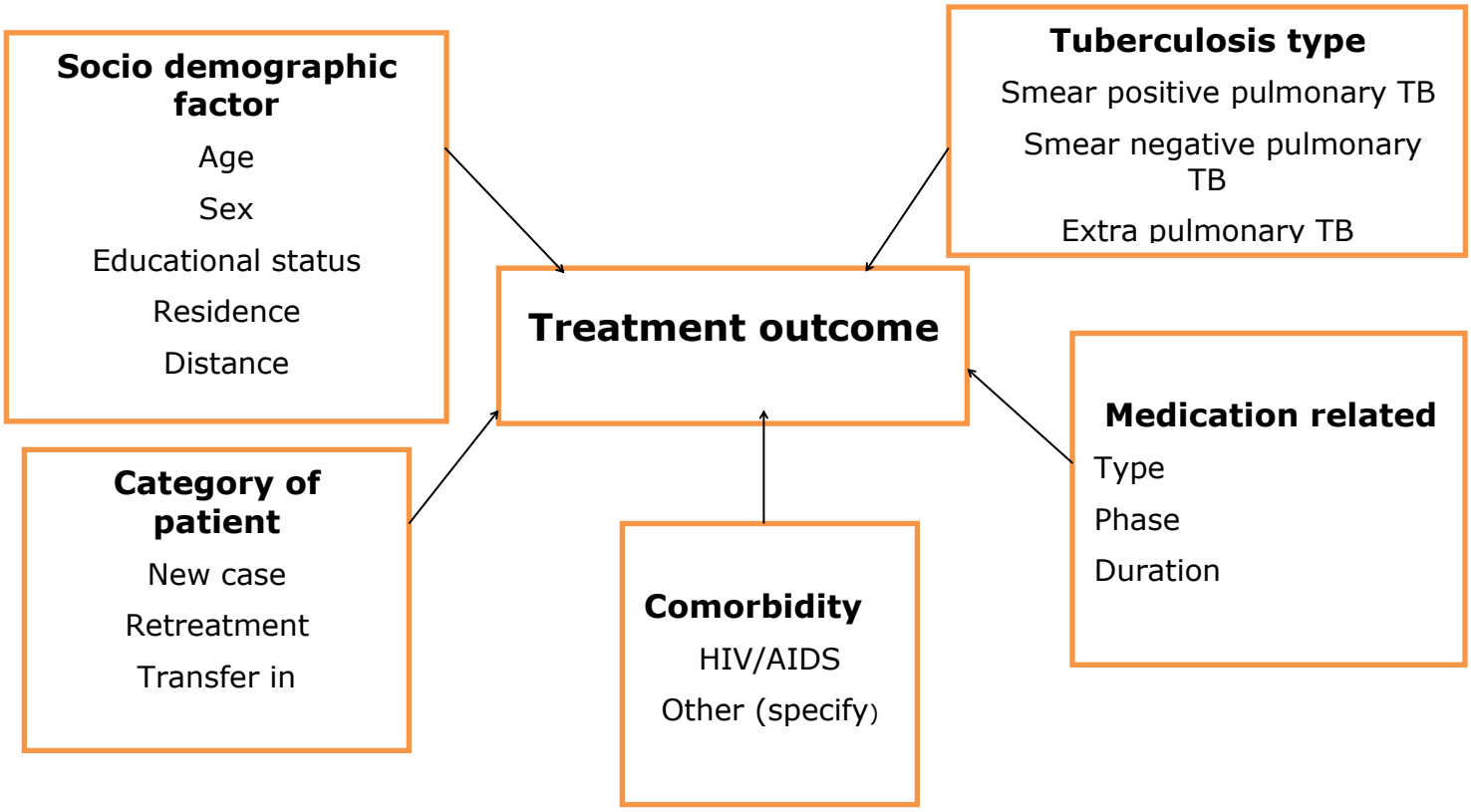

Figure 1: Tuberculosis treatment out comes and associated factors among TB patients in Gurage zone public hospitals, southwest, Ethiopia, 2021. (Adapted from searching of different literature)

3. Objective

3.1. General Objective

- ❖ TO Determine treatment out come and Associated factors among Tuberculosis patient Attending in Guraga Zone public hospitals, South west Ethiopia,2021

3.2. Specific Objective

- ➢ To determine treatment outcome of TB patient registered for Anti TB treatment in selected hospitals
- ➢ To identify factors associated with treatment out comes of TB patients in selected hospitals

4. Methodology

4.1. Study Area

The study was conducted in Butajira, Buei, and Gunchire Hospital

Butajira is town and separated woreda in central Ethiopia. Located at the base of the Zebidar massif in the guraga zone of the south nation nationalities and peoples region, this town has an elevation of 2131M above sea level .it is surrounded by Meskan woreda .The coordinates: 8˚7'15"N38˚22'45'E this town has a total population of 33,406 Of whom 16,923 are male and 16,483 women .It's at distance of 135Km from Addis Ababa and 1 58 Km from Hawassa the regional capital and 223Km from Wolkite the guraga zone capital.

Butajira hospital provides clinical service for the town Butajira and its surrounding parts community ,service approximately ,1300,00.people .the health service include :- Emergency ,gynecology /obstetrics , surgery , ANC , FP, pediatrics ,ART ,Dental Care

Soddo is one of the woredas in the southern nations, nationalities, and peoples' region of Ethiopia The administrative center of the Soddo Is Buei. It is bordered on the south by Meskane and on the west, north and east by the Oromia Region. Latitude: 8.˚19'60.00"N, Longitude: 38˚39'59.99"E and an elevation of 2045M or 6709.32 feet above sea level. This town a total population of 134,683, of whom 67,130 are men and 67,553 women

Gunchre is located in the region of southern nation nationalities and peoples region. The distance from Gunchira to Addis Ababa is 151Km from Hawassa 139Km and 3 Km from Wolkite. Its geographical coordinates are 8˚5'0" N, 37˚45'0"E.

4.2. Study Design and Period

Facility based Retrospective cross-sectional study design was used and the study was conducted from three hospitals from July 20, 2021-July 30, 2021

4.3. Source of Population

All TB patients who were registered in three hospitals from July 8, 2016- July 8, 2021 was source of population

4.4. Study population

Sampled patients who were registered during the data collection period and who fulfill inclusion criteria

4.5. Inclusion and Exclusion Criteria

Inclusion: - All TB patient who was been on treatment at least 2months

Exclusion: - All data with incomplete chart were excluded

4.6. Sample Size

To calculate sample size, single population proportion formula

$$\frac{(Za/2)^2 p(1-p)}{d^2}$$

Where n=sample size

Using CL 95%, margin of error 5%

P Value of 0.54 (Treatment out comes and associated factors among TB patient will be used from a study done in from September 1st 2008 to August 31st 2012, in Jimma University Specialized Hospital and Omonada Training Health Center)

n=(1.96)20.54(1-0.54)/(0.05)2= 400

By considering non respondent rate of10% n =400=40

The total sample size 400+40=440

4.7. Sampling Procedure

We used stratified sampling procedure from each hospitals and systemic sampling

$nj = n/N) \times NJ$

n=sample of population

N=total population

NJ = specific population

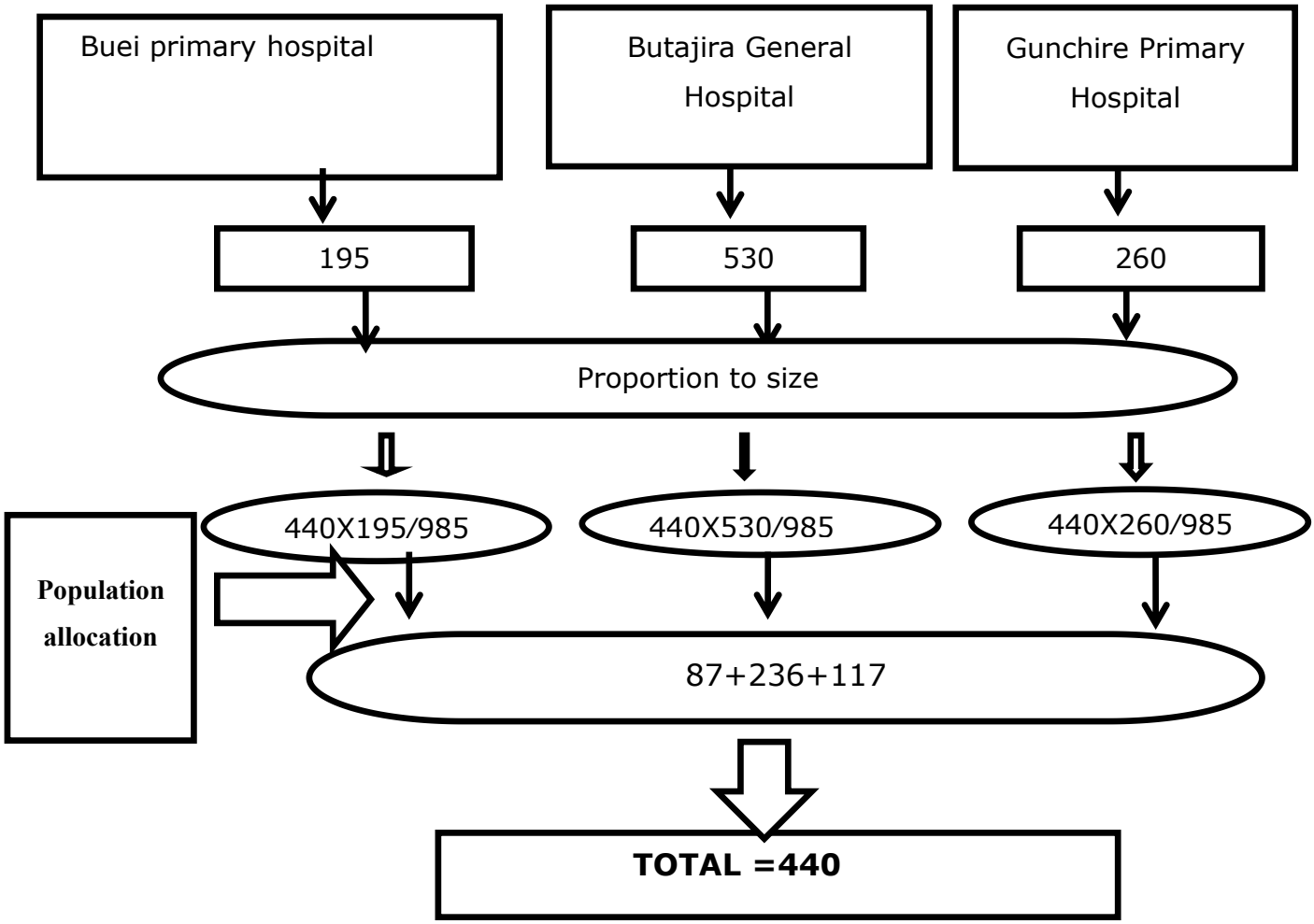

Figure:-2 Schematic presentation of TB outcome treatment and associated factors among TB patients at Gurage Zone Public hospitals, southwest Ethiopia, 2021.

4.8. Study Variables

Dependent variables

Tuberculosis treatment out come

Independent variables

- Socio demographic data (age, sex, residence, marital status ,address)
- Comorbidity (HIV/AIDS, other (specify)
- Tuberculosis type (smear positive PTB, smear negative PTB, extra PTB)
- Category of patient (new case, retreatment case, return after default, fail after treatment, transfer in)
- Medication related (phase, type, treatment started date, duration of treatment)

4.9. Data Collection Procedure

Data was extracted from the registration book of :- Butajira, Bui, Gunchira, using a structured data sheet developed specially for this study inorder to capture data from the TB registration book .the data sheet was prepare by reviewing TB registration book of those hospitals . data was extracted from all TB patient registration in the three hospitals from July 20,2021 up to July 30,2021 by group members of 4^{th} year nursing student . the registration book of Gunchira primary hospital, Buei primary, Butajira generalized hospital contain basic information such as :- age ,sex, address, category of TB , HIV status AFB result ,at the base line ,at the end of 2^{nd} , 5^{th} ,and 6^{th} month treatment regimen and treatment out comes .

4.10. Operational Definition

In our study the following operational definition was used:-

Cured: A patient who was initially smear positive and became smear negative in the last month(6 months) and on at least one previous occasion(5 month)

Treatment completed: A patient who tested smear negative at the onset of treatment, completed treatment by taking all the prescribed does and remained smear negative at the end of treatment

Treatment failure: A patient who remain smear positive at month 5 regardless of the fact that the correct doses medications were taken.

Default: a patient who interrupted treatment for two consecutive months or more after initiation of treatment.

Died: death occurring in a patient from any cause during treatment of TB.

Treatment successful outcome: completed treatment and cured.

Unsuccessful treatment: treatment failure, defaulter and died**.**

Smear positive PTB: a patient with two positive direct smear microscopy

Smear negative PTB: a patient with two negative symptom smear microscopic result, chest X-ray imaging showing lesions of active PTB and one of the respiratory TB symptoms

Extra PTB: a patient with lesion of TB confirmed by histopathological examination in extra:-pulmonary tissues however, a patient with positive extra:- pulmonary specimen by Gene Xpert MTB /RIF assay for MTB, but negative symptom smear result is reported smear positive EPTB cases

New: a patient who never had treatment for TB.

Relapse: a patient declared cured or treatment completed in the past, but whom reports back to health service **Treatment failure:** a patient who, while on treatment, is smear positive at the end of 5 month

Return after default: a patient previously recorded as defaulted from treatment and return to health facility

Comorbidity: additional to TB, diagnosis of other cases including HIV/AIDS that affect patient recovery. **[**32]

4.12. Data Collection Instrument (tools)

Data was collected through questionnaires by reviewing TB registration book. Data collection tools contain five parts that are socio demographic factors (age, sex, marital status), comorbidity (HIV/AIDS, other), patient category, medication related and tuberculosis type has13 and treatment outcome 03 the data was collected by students participate in the research and TB clinic nurses.

4.13. Data Processing Procedure and Analyzing

Data was cheeked for its completeness. Edited cleaned, and analyzed, the collected data was coded and entered to computers using SPSS version 25. Bivariate analysis was employed to

see the crude association between each exposure and outcome variable to control the effect of factors or to get independent association variables each variables that are statistically significant at P value <0.2 in bivariate analysis was entered in to back ward step wise multiple logistic regression model as the independent variable with TB treatment outcome status being a dependent variable ,p value <0.05 and CI at 95% in multivariable logistic regression was considered as statistically significant for TB treatment outcome.

4.14. Data Quality Control

To ensure the completeness, accuracy and consistency of data collection period, a plan was settled on each day of the data collection period. Data collection format was crossed match with available information on records; then the study questions was rearranged and was summited to the advisor to examined whether the number and type of item in the questioner measure concept. Prior to the actual field, a data collector was trained. The training involve familiarizing the research tool, and work schedule and supervise them and pretest was done at wolkite specialized hospital by 5 %(22) and double entry was perform

4.15. Ethical Consideration

Before beginning data collection, Ethical letter was obtained from Wolkite University College of medicine and health since department of Nursing. After that the letter was submitted to hospital administrative and after getting consent from the above bodies, TB registration book was accessed.

4.16. Dissemination of the Result

After completing this study, the result of the study was disseminated to Buei primary hospital, Butajira generalized hospital, Gunchira primary hospital, and for Wolkite University College of medicine and health science department of nursing and publication will be made on ritual journal.

5. Results

A total sample of 440 TB patients were registered from during the period of 2015-2021 at the selected hospitals(Butajira,Buie,Gunchira) out of this 396 had complete data and used in the analysis

5.1. Socio demographic characteristics of treatment outcomes of TB in Gurage zone public hospitals

90%of patient`s documents retrieved and from this 51.5% were male in sex, 48, 2% were aged between 21-40years with a few 10.4% aged >60years, 50.8% were married and with respect to place of residence during treatment 79.0% of patients were urban and 77.8% were between the range of 33-54 Kg at initial phase

Table 1: social demographic characteristics of TB treatment outcomes in Gurage zone public hospitals 2021(n=396)

S.N	VARIABLES		FREQUENCY(n)	PERCENTAGE (%)
1.	SEX	Male	204	51.5
		Female	192	48.5
2.	AGE(years)	≤ 20years	58	14.6
		21-40years	191	48.2
		41-60years	106	26.8
		>60years	41	10.4
3.	Marital status	Married	201	50.8
		Single	148	37.4
		Divorce	15	3.8
		Widowed	32	8.1
4.	Residence	Urban	313	79.0
		Rural	83	21.0
5	Weight in initial phase	<33kg	52	13.1
		33-54kg	308	77.8
		55-70kg	36	9.1

5.2. Treatment related variables

Among the participants for whom disease classification 42.9%were smear positive PTB, most of the patients 82.1 %(325/396) were newly diagnosed case of TB, with regard of HIV status 88.1% were HIV negative patients and 100% of HIV positive patient starts ART, 23.5% were malnutrition, the highest number of patient 94.9% spent six months during treatment, 81.3% were new for TB treatment, most of the patient 86.6%were treated with RHZE as an intensive phase and 86.9% of the patients in continuation phase were on RH, the highest

number of patient 56.8% not done sputum tested in 2nd month, 58.1% also not done at 5th month and at 6th month 65.9% were not done from the participant, from treatment failure 94.7% were not develop MDR, 48.7% were 33-54kg with 47.0%55-70kg in continuation phase

Table 2: treatment related variables in Guraga zone public hospitals 2021

S.N	Variables	Category		Frequency (n)	Percentage (%)
1.	Type of TB	smear positive PTB		170	42.9
		smear negative PTB		92	23.2
		Extra PTB		134	33.8
2.	Category of Pt.	newly treated		325	82.1
		relapse after treatment		25	6.3
		return after default		18	4.5
		Other		24	6.1
3.	Comorbidity	HIV	No	349	88.1
			Yes	47	11.9
		Malnutrition	No	303	76.5
			Yes	93	23.5
4	Duration of treatment	6.00		376	94.9
		8.00		7	1.8
		18.00		13	3.3
6	Previous drug use	New		322	81.3
		first line		61	15.4
		second line		12	3.0
		other (specify)		1	.3
7	Type of drug in phase 1	SRHZE		40	10.1
		RHZE		343	86.6
		OTHER(specify)		13	3.3
8	Type of drug in phase 2	RHE		39	9.8
		RH		344	86.9
		Other (specify)		13	3.3
9	Weight in continuation	<33Kg		13	3.3

	phase	33-54Kg	193	48.7
		55-70kg	186	47.0
		>70kg	4	1.0
10	Treatment failure develop MDR	Yes	21	5.3
		No	375	94.7

*others in phase1 (kanamycin, moxifloxaacillin, prothionamide, clofazimine, pyrazinamide, high dose INH, Ethambutol)

*Others phase2 (moxifloxacillin, clofazimine, pyrazinamide, Ethambutol)

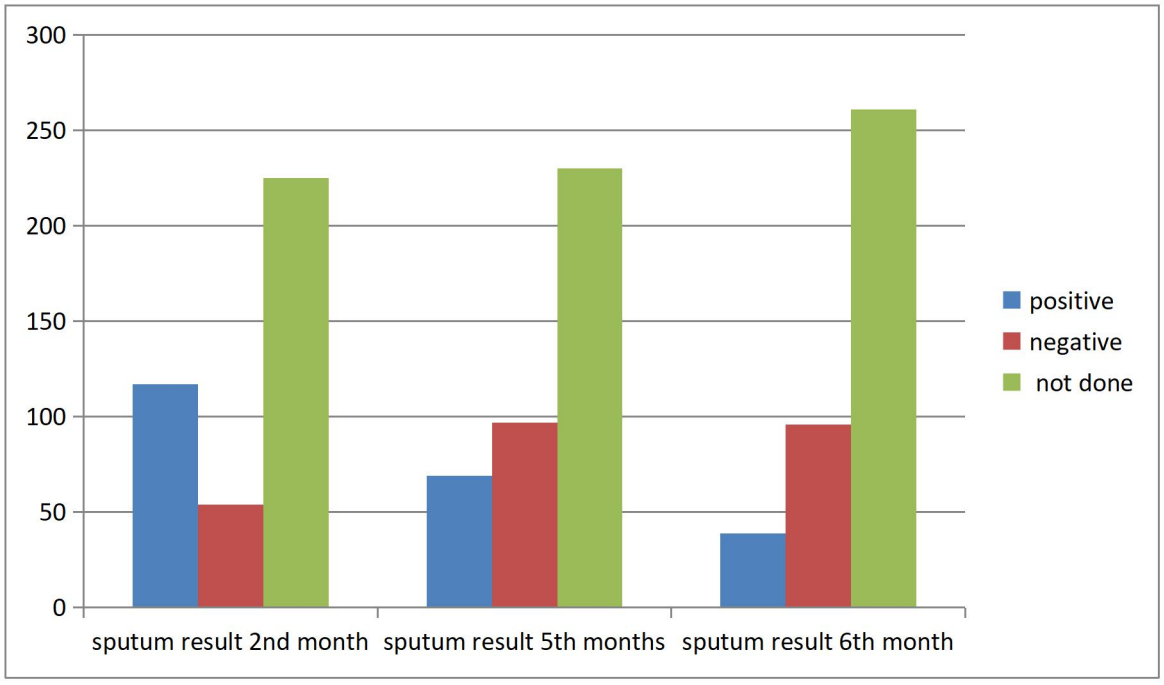

Fig 3: clinical characteristics of TB patients in Butajira Generalized hospital, Buei Primary hospital, Gunchira primary hospital Guraga zone south west Ethiopia, from July 08, 2015-July 08, 2021

5.3. Treatment outcome

Of the 396 patients who participated in the study77% were successful outcome (23.7%cured, 53.3%treatment

Completed) and 23% unsuccessful outcome (15.4%were treatment failure, 5.6% were died and 2.0% were others)

Table 3: treatment outcome of TB patient attending in Guraga zone public hospitals 2021

S.N	VARIABLE	Category	Frequency(n)	Percentage (%)
1	Treatment out come	Cured	94	23.7
		treatment completed	211	53.3
		treatment failure	61	15.4
		Died	22	5.6
		Other	8	2.0

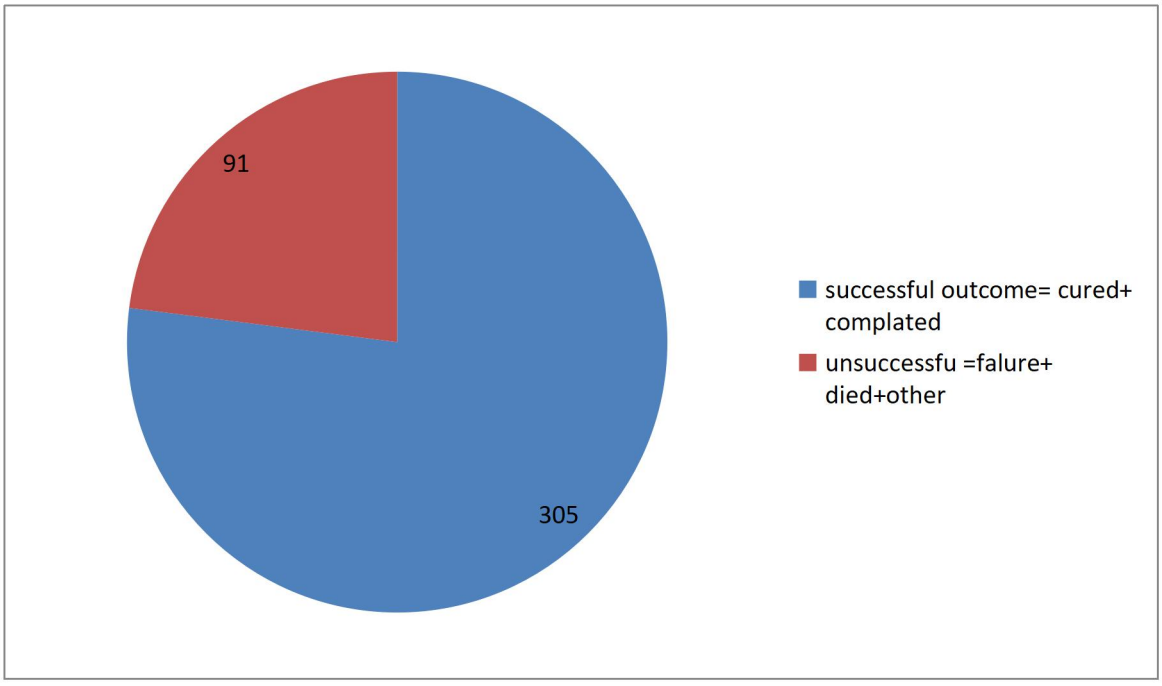

Fig 4: Over all treatment outcome of TB patients attending in Butajira Generalized hospital, Buei Primary hospital, Gunchira primary hospital Guraga zone south west Ethiopia, from July 08, 2015-July 08, 2021

Variables	Category	Treatment outcome		COR at 95% CI	p-value
		Successful	Unsuccessful		
Sex	Male	150(49.2%)	54(59.3%)	1.00	
	Female	155(50.8%)	37(40.7%)	1.50(0.93-2.42)	0.09
marital status	Married	154(50.5%)	47(51.6%)	0.54(0.30-0.95)	0.03
	Single	127(41.6%)	21(23.1%)	0.50(0.11-2.31)	0.37
	Divorce	13(4.3%)	2(2.2%)	6.25(2.81-13.9)	<0.001
	Widowed	11(3.6%)	21(23.1%)	0.16(0.72-0.35)	<0.001
Age (years)	≤20	52(17.0%)	6(6.6%)	1.30(0.50-3.35)	0.58
	21-40	166(54.4%)	25(27.5%)	3.74(1.46-9.60)	0.006
	41-60	74(24.3%)	32(35.2%)	18.6(6.39-54.4)	<0.001
	>60	13(4.3%)	28(30.8%)	0.05(0.01-0.15)	<0.001

5.4 Associated factors of TB treatment outcome

A binary logistic regression model to test the strength of association tells age group above 60 years less likely to achieve treatment success compared to those age 20 years and below. HIV co-infection, malnutrition and sputum result in second month positive were a strong evidence of association between treatment outcome ($p<0.001$). Patients with extra- pulmonary TB 20.3 times more likely to have treatment success. Variables that are significant (<0.25) and interred to multivariate logistic regression (sex, marital status, age, residence, type of TB, patient category, comorbidity, other comorbidity….. shows in (Table 4 :)

Binary Logistic Regression