

## Research



# Lifestyle modification practice and associated factors among diagnosed hypertensive patients in Mizan Tepi University Teaching Hospital South west Ethiopia, 2019: cross-sectional study



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Received: 25 Feb 2020 - Accepted: 10 Apr 2020 - Published: 23 Apr 2020

Domain: Cardiology

Keywords: Hypertension, life style modifications, Mizan Tepi university teaching hospital, southern Ethiopia

### Abstract

**Introduction:** hypertension; which is silent killer is leading cause mortality and disability in industrialized and non-industrialized countries. It is one of overwhelming chronic illness because of its risk factor for other chronic illness including ischemic heart disease and kidney failure. Control of hypertension to accepted limit is challenging and it requires both pharmacological and none pharmacological methods. Lifestyle modifications as non-pharmacological management remained as one of effective hypertension control method. The present study assessed the practice of lifestyle modification and its associated factors in Mizan Tepi University teaching hospital, 2019. **Methods:** a facility-based cross-sectional study design was conducted among hypertensive patients from April to June, 2019. Data were collected by a pretested, interviewer administered, and structured questionnaire. A systematic sampling technique was used. Bivariate and multivariate logistics regressions were used to identify factors. The adjusted odds ratio with 95% CI was used to identify the independent factors at  $P < 0.05$ . **Results:** in present study the response rate was 98.8%. Fifty seven (33.3%) of patients practiced recommended life style modifications. Age greater than 65 years old, having no source of information, duration of diagnosis of hypertensions, having no formal educations, poor knowledge and negative attitudes were independent predictors of lifestyle modifications. **Conclusion:** practices of lifestyle modification were found to be low. Age, education status, duration of disease since diagnosis, knowledge, and attitude were identified factors. Health care providers should design and implement lifestyle modification practices as interventions in patients.

Research | Volume 2, Article 156, 23 Apr 2020 | 10.11604/pamj-cm.2020.2.156.22010

Available online at: <https://www.clinical-medicine.panafrican-med-journal.com/content/article/2/156/full>

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## Introduction

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Hypertension now a day is a global challenge in both developed and developing countries. It is common prevalent none communicable diseases and in every three adults, one having the hypertension. It can be viewed as important risk factor for other none communicable diseases such as stroke and cardiovascular diseases. Worlds´ 4.5 % diseases burden is attributed by hypertension [1-4]. Finding indicated that in 2000, more than 25 % of adult had hypertension and it is estimated to reach 29% by 2025. In Africa about 15 % of population has hypertension [5]. The magnitude of the problem expected to be in Ethiopia is 27.9% [6]. The control rate of hypertension is varied through geographical regions with 29% in USA, 17 % for Canada, 38% in Barbados and in European countries ranged from 5-10% [7, 8]. There is no well documented data for control rate of hypertension in Ethiopia. Factors that contribute for development of hypertension include tobacco use, alcohol consumption, obesity, high cholesterol and diabetes mellitus. According to WHO estimate worldwide obesity has doubled in many countries since 1980. In recent decades worldwide alcohol consumption has increased and become causes for many problems [9, 10]. Being physically inactive plays a major role in development of hypertension, as well as worsening the condition. Decreasing inactivity by 25% can save the death of more than 1.3 million victims [11, 12].

Lifestyle modification with pharmacologic management is effective for control of hypertension and is recommended. It is considered as the initial choices over the drug treatment in those with pre-hypertension stage [13,14].Recommended life styles to be modified include; weight reduction, salt restriction, and physical activity, smoking cessation and abstaining from alcohol [15]. Hypertension can lead to numerous fatal conditions including ischemic heart diseases, renal failure and stroke. Finding depicted that hypertension is responsible for

62% of cases of stroke and 49% of cases of ischemic heart disease [4,16]. Several factors contributed for not practicing recommended lifestyle modifications. These includes lack of social support, food culture, lack of time, marital status, income, source of information, knowledge on hypertension and gap between patients and health care providers [17-20]. Despite of effective control of hypertension by modification of lifestyle together with pharmacological treatment; cases with stroke, ischemic heart diseases and renal failure from hypertension are emerging to setup. Moreover, little is known about the practice of life style modifications and associated factors in hypertensive patients in Ethiopia, particularly to study area. Therefore; the study is aimed to assess the practice of life style modifications and associated factors in adult hypertensive patients receiving treatment at Mizan Tepi university teaching hospital south west Ethiopia.

## Methods

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**Study area and period:** study was conducted from April to June, 2019 at Mizan Tepi university teaching hospital, Bench Sheko zone, southern Ethiopia. It is located at about 561 km from Addis Ababa, capital city of Ethiopia. It is serving for 3 million people. The hospital has a total of 100 beds and 313 health professionals. The hospital has clinical departments including, internal medicine, surgery, pediatric, gynecology/obstetric, dentistry, psychiatry and anesthesia. The setting has also one chronic follow up setting in which; hypertensive, diabetic and epileptic patients are attending. Currently there are 293 hypertensive patients receiving treatment and are study participants.

**Study design:** facility based cross-sectional study design was carried out to assess the life style modification practice and associated factors among patients.

**Population:** all hypertensive patients on treatment follow up at chronic follow up in Mizan Tepi University Teaching Hospital were source population. All randomly sampled patients from total hypertensive following treatments at chronic follow up in Mizan Tepi University Teaching Hospital were study population.

**Inclusion and exclusion criteria:** all Patients with a clinical diagnosis of hypertension on follow up with an age greater than or equal to 18 years were included in study. Patients who were severely ill and not able to communicate were excluded from the study.

**Sample size determination:** the sample size was determined by using single population proportion formula. The following assumptions were made, marginal error (d) that was tolerated in either sides of the true proportion to be 5%, and using 95% confidence level,  $\alpha=0.05$  and adding 5% to compensate for non-responses and the proportion of lifestyle modification practice 50%.

$$n = \frac{(z \alpha/2)^2 p(1 - p)}{d^2}$$

$$= (1.96)^2 (0.5) (0.5) / (0.05)^2 = 384$$

Finally, finite population correction formula was considered since the source population (293) is less than 10,000 and the final sample size was 173.

**Sampling technique:** systematic sampling method was employed to get desired samples. Sampling interval (K) was 2. Through 1 to 2, 1 was randomly selected and first comer patient in the beginning day of data collection was taken as a first sample and then taking every 2<sup>nd</sup> patients was carried out until getting the desired sample size. Variables of the study; dependent variable; lifestyles modifications practices; independent variables. Socio-demographic variables: age,

income, ethnicity, sex, marital status, educational status, religion, occupation, residence and living status. Clinical related variables: family history of hypertension, comorbidity, BMI and duration since diagnosis. Individual related factors: Hearing information about lifestyle modification, knowledge and attitude towards life style modification.

**Data collection instrument:** the tool was initially developed in English language then translated to local language, Amharic version for more understanding by every respondent. The questionnaire had five essential components related to life style modification practices, participants' socio-demographic characteristics, knowledge related questions, and attitude related questions and clinical related questions. Tools for assessing dependent and independent variables were adapted similar studies [15,21].

**Measurements:** the dependent, variable lifestyle modification practice was assessed by adapting tool from similar study. In this study component of life style modifications were measured on 5 likert scale (all the time, most of the time, some of the time, already doing for other reason and never did so). Each of component (limit of salt consumption, exercising of regular exercise, dietary approach to stop hypertension (DASH) diet, Control of body weight, quitting smoking and limiting of alcohol consumptions) was asked with specific questions for participants to respond from alternatives of all the time, most of the time, some of the time, already doing for other reason and never did so [21].

**Data collection procedures:** data were collected by interview using a semi-structured and pretested. Four diploma nurses and one BSC nurse were involved in data collection and supervision respectively. One day orientation regarding the tool and how to collect the data was given for data collectors and supervisor.

**Data quality control:** on each days of the data collection the supervisors checked the data for completion, accuracy and clarity. Again the principal investigators checked the data for missing values during data entry.

**Data processing and analysis:** data consistency was checked and entered into Epidata version 3.1 and then was exported to SPSS version 21 for analysis and was summarized by using descriptive statistics. Tables were used to present the data. Bivariate logistics regression was used to identify factors associated with the practice of recommended life style modifications among hypertensive patients based on adjusted odds ratio (AOR), 95% CI and P-value <0.25. We used the enter approach in multivariate model, while Hosmer-Lemeshow statistic was used for model diagnostics. Multivariate logistic regression model was used to control the possible effect of confounders, and finally the variables that had independent association with the dependent variable were identified on the basis of AOR, with 95% CI and P-value <0.05. The variables were entered to the multivariate model using the backward logistic regression.

**Operational definitions:** practiced recommended lifestyle modifications: when patients respond the mean value above or equal to mean score of practice questions. Not practiced recommended lifestyle modifications: when patients respond the mean value below to mean score of practice questions.

**Ethical considerations** Ethical clearance was obtained from the institutional review board of Mizan Tepi University. Also, informed written consent was obtained from all participants after explaining the purpose of the study. They were also informed for their right to refuse the study and to withdraw from study at any time. All the information obtained was kept confidential.

## Results

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**Socio-demographics characteristics of participants:** out of aimed 173 participants, 171 were interviewed, two participants withdrawn because of lack of interest and allover response rate was 98.8%. As Table 1 showed, about 96(56.1%) were males; 54 participants were (31.6 %) were orthodox in religion. Out of the total respondents, 62(36.3%) were government employee, 102(59.6%) of respondents had formal education, 127(74.3%) of participants were urban dwellers and 116(67.8%) of them were married.

**Lifestyle modification practice:** the mean lifestyle modification practice score was 14(SD ± 3.43). Only 57(33.3%) of respondents practiced the recommended lifestyle modification, while the rest 114(66.7%) did not practiced. About 45(26.3%) of participants limited salt consumption some times, 64(37.4%) of respondents never did regular exercise, 67(39.2%) adopted DASH diet some times, 50 (29.2%) of respondents practiced to control weight most of the time, 107(62.6%) quitted smoking all the time and 75(43.9%) participants limited alcohol consumption all the time(**Table 2**).

**Health and individual related factors:** from the total patients, 103(60.2%) have another chronic illness, diabetic mellitus 50(73.5%) being the most common, 117(68.4%) patients have duration of illness more than three years, 106(62.0%) of respondents were have BMI between 18-24 kg/m<sup>2</sup>, 111 (64.9 %) of participants have no family history of hypertension and 134(78.4%) of patents had source of information about life style modification.

**Knowledge of lifestyle modification practices in patients, Southern Ethiopia:** the mean knowledge score of lifestyle modification practices among patients was 4(SD ± 1.94). About 102(59.6%) of participants were have good knowledge about lifestyle modification practice, while 69(40.4%) had poor knowledge. One hundred twenty six (73.7%) understood that; weight gain can worse their condition, 123(72%) patients

realized that diet and drug can control hypertension, 147(86.0) of participants did not understand that having excess salt and decreasing vegetables can worsen their condition, 112(65.5%) listed recommended lifestyle modifications, 145(84.8%) of patients did not know the effect of smoking on hypertension and 141(82.5%) of participants did not understand the effect of alcohol on their hypertension.

#### **Attitude of the patients towards life style modifications:**

ninety nine (57.9%) of the study participants agreed that dietary like fruits plays a positive role in health, 70(40.9%) patients were neutral for moderation of alcohol intake plays a positive role in hypertension, 79(46.2%) of respondents were neutral for cigarette smoking plays positive role in hypertension and 44(25.7%) strongly agreed physical activity plays a positive role in hypertension (Table 3). Overall, about 97 (56.7%) of respondents had negative attitude, while 74(43.3%) of them had positive attitude toward lifestyle modification practices.

#### **Factors associated with lifestyle modification practices in hypertensive patients in MTUTH, southern Ethiopia, 2019:**

in the bivariate logistic regression analysis, lifestyle modification practice was significantly associated with, having source information, educational status, duration since diagnosis, age of the respondents; attitude and knowledge of the participants by using enter method to identify the independent predictors of lifestyle modification practices (Table 4). The result of multivariable logistic regression analysis showed that hypertensive patients age greater or equals to 65 years old were 61% times less likely to practice recommended lifestyle modifications than those who had age less than 65 years old (AOR: .39, 95% CI: .184, .848). Statistical association also depicted that patients' duration of hypertension since diagnosis had a significant association with lifestyle modifications, where patients who had duration of hypertension less than three years were 80% times less likely to practice recommended lifestyle modifications than who had

duration more or equals to 3 years (AOR: 0.20, 95% CI : .080, .514). Having source of information is significantly associated with lifestyle modification practices, where hypertensive who had source of information about lifestyle modifications were 2.77 times more likely to practice recommended lifestyle modifications than who had not source of information (AOR: 2.77, 95% CI: 1.16, 6.63). Statistical association pointed that hypertensive who had formal education were 3.153 times more likely to practice recommended lifestyle modifications than patients with no formal education (AOR: 3.153, 95% CI:1.47, 6.75). Patients knowledge is significantly associated, where hypertensive who had good knowledge were 2.25 times more likely to practice recommended lifestyle modifications than who had good knowledge (AOR: 2.25, 95% CI:1.076, 4.74). Attitude of participants is also significantly associated, where patients who had positive attitude were 3.156 times more likely to practice recommended lifestyle modifications than who had negative attitude (AOR: 3.156, 95 CI: 1.443, 6.9).

## **Discussion**

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The present study assessed the practice of lifestyle modification practices and its determinants in hypertensive patients. The study revealed that only 57(33.3%) of hypertensive patients in MTUTH practiced recommended lifestyle modifications. Hypertension control requires applications of both pharmacological and non pharmacological managements. This finding was consistent with in Durame (27.3%) [22]. This finding is not interesting when it is compared with study from Canada where 57% to 89% patients initiated to practice recommended lifestyle modifications [21]. The discrepancy might be due to the fact that patients were from developed country with good access to adequate counseling from care providers. As well as good setup can encourage patients to adopt good lifestyle modification practices. In current study only 53(31%) limits salt consumptions all the time. This finding is lower than studies

conducted in USA [23], Canada [21] and Jimma (80%) [24]. This might be due to socio cultural difference as well as having poor knowledge about the effect of salt on hypertension. Only (37.4%) implemented the physical activity recommendations all the time and 23 (13.5) never did these recommendations. This showed poor practice and not interesting compared with studies from India [18], USA [23]. This variation could be due to difference in individual's level of awareness because of socio-economic status. The study revealed that 102(59.6%) of participants were have good knowledge about lifestyle modification practices. This finding is higher than study from Durame, Ethiopia (44.9%) [22], but lower than study from Dares Salaam (66.8%) [25]. However; the study is supported by study from Jimma (59.2%) [24] .The finding depicted that 97 (56.7%) of respondents had negative attitude towards life style modifications. Seventy nine (46.2%) patients were neutral for effect of cigarette smoking in hypertension. This is lower than study in Ghana (60%) [26].

The current study identified that, age greater or equals to 65 years old were 61% times less likely to practice recommended lifestyle modifications than those who had age less than 65 years old (AOR: .39, 95% CI: .184, .848). This finding is in line with studies from Durame, Ethiopia [22], China [27] and Nigeria [20]. The possible explanations for this are; older may have less access for information, having other chronic illness decreased capacities to do the recommended. The multivariate analysis showed that patients who had duration of hypertension less than three years were 80% times less likely to practice recommended lifestyle modifications than who had duration more or equals to 3 years (AOR: 0.20, 95% CI: .080, .514).This is consistent with finding from Durame, Ethiopia [22] and Nigeria [20].This could be due to increased realization about recommended lifestyle modifications after counseling from continual follow up. Educational status is another statistically significant variable. Hypertensive who had formal education were 3.153 times more likely to practice recommended lifestyle modifications than patients with no

formal education (AOR: 3.153, 95% CI: 1.47, 6.75). This is in line with study from Durame [22]. This is due to the fact that; cognitive variations between patients with no formal educations and formal education. The current study also revealed that hypertensive who had source of information about lifestyle modifications were 2.77 times more likely to practice recommended lifestyle modifications than who had not source of information (AOR: 2.77, 95% CI: 1.16, 6.63). The study also showed that; hypertensive who had good knowledge were 2.25 times more likely to practice recommended lifestyle modifications than who had good knowledge (AOR: 2.25, 95% CI: 1.076, 4.74). This is inconsistent with study from the Durame, Ethiopia [22]. The study also depicted that; attitude is significantly associated with lifestyle modifications. Patients who had positive attitude were 3.156 times more likely to practice recommended lifestyle modifications than who had negative attitude (AOR: 3.156, 95 CI: 1.443, 6.9).

## Conclusion

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The practice of lifestyle modifications in study area was found to be low. Educational statuses, age, durations of hypertension since diagnosis, lack of source of information were factors associated with life style modifications. Beside this lack of good knowledge and having negative attitude were the influencing reasons not to practice recommended life style modifications.

### What is known about the topic

- Life style modification is recommended for prevention to those with family history of hypertension and prehypertension and control of hypertension;

- Effective lifestyle modification can lower blood pressure by at least as much as a single hypertensive medication;
- Effective lifestyle modification can lower diastolic blood pressure by 2 mmhg.

#### What this study adds

- The study is the first study to the area and identified the proportion of practice of recommended lifestyle style modifications;
- The study identified the extent of practice of lifestyle modification practice and factors contributing for not practicing. Considerations can be taken based on the factors identified for effective control of hypertension in study participants.

#### Competing interests

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The authors declare no competing interests.

#### Authors' contributions

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Abiy Tadesse Angelo initiated the research project, wrote the research proposal, conducted the research, did data entry and analysis, and wrote the manuscript. Teketel Ermias Geltore was involved in the write-up of the proposal and manuscript. Both of authors contributed to data analysis and drafting. All the authors read and approved to the final version of this manuscript.

#### Acknowledgements

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We would like to extend our gratitude to data collectors, supervisors and study participants.

#### Tables

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**Table 1:** socio-demographic characteristics of participants in Mizan Tepi University teaching hospital, Southern Ethiopia, April to June, 2019 (N=171)

**Table 2:** showing the distributions of recommended lifestyle modifications in participants in Mizan Tepi University teaching hospital, Southern Ethiopia, April to June, 2019 (N=171)

**Table 3:** attitude of hypertensive patients toward lifestyle modification in Mizan Tepi University teaching hospital, Southern Ethiopia, 2019 (N=171)

**Table 4:** factors associated with lifestyle modification practice among hypertensive patients in MTUTH, Southern Ethiopia, 2019

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**Table 1:** socio-demographic characteristics of participants in Mizan Tepi University teaching hospital, Southern Ethiopia, April to June, 2019 (N=171)

<b>Characteristics</b>		<b>Frequency</b>	<b>%</b>
Sex	Male	96	56.1
	Female	75	43.9
Age in years	< 65	89	52.0
	> =65	82	48.0
Ethnicity	Bench	23	13.5
	Kaffa	76	44.4
	Sheko	9	5.3
	Amhara	45	26.3
	Tigre	18	10.5
Religion	Orthodox	54	31.6
	Muslim	43	25.1
	Protestant	51	29.8
	Catholic	21	12.3
	Others*	2	1.2
Marital status	Married	116	67.8
	Single	27	15.8
	Divorced	18	10.5
	Widowed	10	5.8
Occupation	Gov't employee	62	36.3
	Merchant	32	18.7
	Farmer	33	19.3
	Student	13	7.6
	House wife	31	18.1
Monthly income in ETB	<500	59	34.5
	500-999	14	8.2
	>= 1000	98	57.3
Education status	No formal education	69	40.4
	Has formal education	102	59.6
Residence	Urban	127	74.3
	Rural	44	25.7
Living status	With family	144	84.2
	Alone	27	15.8
Religion other* have no religion			

**Table 2:** showing the distributions of recommended lifestyle modifications in participants in Mizan Tepi University teaching hospital, Southern Ethiopia, April to June, 2019 (N=171)

<b>Life&gt;</b>		<b>Frequency</b>	<b>%</b>
How often do you limit salt consumption?	All the time	53	31.0
	Most of the time	37	21.6
	Some of the time	45	26.3
	Already doing for other reason	15	8.8
	Never did so	21	12.3
How often you did exercise for more than 30 minutes last week?	All the time	64	37.4
	Most of the time	41	24.0
	Some of the time	22	12.9
	Already doing for other reason	21	12.3
	Never did so	23	13.5
How often do you changes foods eaten (increasing fruit, vegetable, reducing high calories food, avoiding fat and cholesterol)?	All the time	19	11.1
	Most of the time	64	37.4
	Some of the time	67	39.2
	Already doing for other reason	3	1.8
	Never did so	18	10.5
How often do you controls or reduce weight?	All the time	43	25.1
	Most of the time	50	29.2
	Some of the time	55	32.2
	Already doing for other reason	5	2.9
	Never did so	18	10.5
How often do you quit smoking?	All the time	107	62.6
	Most of the time	25	14.6
	Some of the time	17	9.9
	Already doing for other reason	6	3.5
	Never did so	16	9.4
How often do you limits alcohol consumption?	All the time	75	43.9
	Most of the time	31	18.1
	Some of the time	24	14.0
	Already doing for other reason	25	14.6
	Never did so	16	9.4

**Table 3:** attitude of hypertensive patients toward lifestyle modification in Mizan Tepi University teaching hospital, Southern Ethiopia, 2019 (N=171)

Attitude questions		Frequency	%
Dietary like fruit and vegetables plays a positive role in treatment of HTN.	Strongly agree	30	17.5
	Agree	78	45.6
	Neutral	34	19.9
	Disagree	8	4.7
	Strongly disagree	21	12.3
Modified life>	Strongly agree	14	8.2
	Agree	119	69.6
	Neutral	32	18.7
	Disagree	4	2.3
	Strongly disagree	2	1.2
Limitations of alcohol intake plays appositive role in treatment of HTN.	Strongly agree	15	8.8
	Agree	56	32.7
	Neutral	70	40.9
	Disagree	23	13.5
	Strongly disagree	7	4.1
Cigarette smoking cessation plays appositive role in treatment of HTN.	Strongly agree	15	8.8
	Agree	45	26.3
	Neutral	79	46.2
	Disagree	22	12.9
	Strongly disagree	10	5.8
Sugar and sweet diets have a negative role in treatment of HTN.	Strongly agree	11	6.4
	Agree	42	24.6
	Neutral	83	48.5
	Disagree	29	17.0
	Strongly disagree	6	3.5
Physical exercises play appositive role in treatment of HTN.	Strongly agree	44	25.7
	Agree	85	49.7
	Neutral	28	16.4
	Disagree	9	5.3
	Strongly disagree	5	2.9

**Table 4:** factors associated with lifestyle modification practice among hypertensive patients in MTUTH, Southern Ethiopia, 2019

Variables		Life>				COR(95% CI)	AOR(95%CI)
		Yes	%	No	%		
Age in years	<65	38	66.7	51	44.7	1	1
	>=65	19	33.3	63	55.3	.405(.209, .785)*	.39(.184, .848)**
Duration since diagnoses in year	<3	8	14.0	46	40.3	.241(.105, .557)*	.20(.080, .514)**
	>=3	49	86.0	68	59.7	1	1
Having source of information	Yes	40	70.2	94	82.5	1	1
	No	17	29.8	20	17.5	1.997(.948, 4.21)*	2.768(1.16, 6.63)**
Educational status	No formal education	31	54.3	38	33.3	2.385(1.244, 4.57)*	3.153(1.47, 6.75)**
	Formal education	26	45.7	76	66.7	1	1
Knowledge	Poor	31	54.3	38	33.3	2.385(1.244, 4.57)*	2.25(1.076, 4.74)**
	Good	26	45.7	76	66.7	1	1
Attitude	Negative	41	71.9	56	49.1	2.654(1.338, 5.26)*	3.156(1.443, 6.9)**
	Positive	16	28.1	58	50.9	1	1

\* Statistically significant in COR: P-value <0.25. \*\*Statistically significant in AOR: P-value <0.05.