OROMIA HEALTH BUREAU
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Adverse Events Following Immunization of COVID-19 Vaccination among Health Care Professionals in Ethiopia: An online E-Survey

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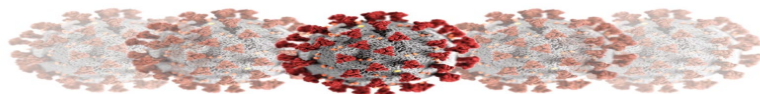Lecturer of Health Economics,
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Building a resilient health system to ensure the quality of health care during a public health emergency

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1

Presentation Outlines

◉ Introduction

◉ Objectives

◉ Methods and materials

◉ Results and Discussion

◉ Conclusion and Recommendation

◉ References

◉ Acknowledgement

Introduction

Coronavirus disease 2019 is an infectious disease caused by coronavirus, (SARS-CoV-2)(Zhu *et al.*, 2020).

- Initially reported from Wuhan, China, on Dec 2019 (Sim, 2020).

- WHO made an assessment & declared the outbreak **as a *PHEIC***, (Eurosurveillance ET, 2020).

- On March 12,2020, due to its rapid global spread WHO declared as a *global pandemic* (Ndwandwe &Wiysonge, 2021,WHO,2020).

- On March 13,2020, the 1st confirmed COVID-19 case was reported by the FMOH of Ethiopia (FMOH ,2021).

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Nowadays, we are living in a pandemic situation given its rapid spread & the occurrence of new variants (Adhikari *et al.,* 2020).

- **As of 28 January 2022;**
  - **Globally:** 366.6millions & 5.63 million confirmed *cases & deaths*
  - **In Ethiopia,** 465,792 & 7,346 confirmed cases & deaths were reported respectively (WHO, 2022a).

The pandemic has been *exerting* high negative impacts on the *health, social, economic wellbeing* of people & resulted in interruption of HS which *brought* both DB & EB (Tequare *et al.,* 2021).

Cont'd…Introduction

To prevent this pandemic & related consequence: various social & PH risk mitigation measures were proposed & being implemented (WHO, 2020).

- *These measures include; travel bans, wearing of nose masks, lockdowns, social distance, & frequent washing of hands with soap and water, were among others* (WHO, 2020; Konu et al., 2021).

In addition to these measures, researchers & pharmaceutical companies are collaborating to develop safe & effective vaccines of d/t types.

- **Vaccination** is an **effective way of combating the conditions** &particularly an essential pillar for controlling it(Manning et al., 2021).
- **Currently**, *hundreds* of candidate vaccines have been on *trial, some* of which have passed the acceptable efficacy & safety standards & been deployed for use (Onyeaka et al., 2021; Solomon et al., 2021).
- **Based on this**, **FMOH of Ethiopian** has launched the vaccine at d/t level on 13th of March 2021 (FMOH,2021).

Cont'd...Introduction

As of Jan 27, 2022, **61.1%** of the world population has *received at least one dose of the vaccine.*

As a result of : **inadequate supply of the vaccines** globally, gov'ts have **prioritized high-risk groups** (HCWs, elderly & chronic co-morbidity) *to receive the initial supply of vaccines* (WHO, 2021; Solomon *et al.*, 2021).

Globally; **10.12 billion doses** have been administered, & 21.27 million/day.

In LMIC ; **Only 10%** of people have received at least one dose (WHO, 2022).

In Ethiopia, **over 10 million doses of** vaccine have been administered

- Of 3.7m who took their 1st jab, **2.7m** have been **fully vaccinated** (WHO, 2022b).

Cont'd ...Introduction

Vaccines are not free from SE, or "AE," but most are very rare or mild.

- **Importantly,** some adverse health problems following a vaccine *may be due to coincidence* & are not caused by the vaccine (NAS, 2011).
- **Also,** false information & miss trusts of these vaccines has *contributed* to anxiety & hesitancy associated with a fear of occurrence of long-term AEFI (Scheel., 2020).

Manufacturers of vaccines include a list of potential post-vaccination SE with their products;

- Of these reactions, according to CDC: Symptoms at the injection site (swelling, pain, & redness) as well as systemic effects (back pain, tiredness, headache, muscle pain, joint pain, chills, fever, & nausea) (Klugar *et al.*, 2021; Riad *et al.*, 2021).

Post-market AEs, & safety-related studies has been conducted across d/t countries on AEFI by d/t angles(Tequare et al., 2021).

- **Of these**, AEFI was reported in;
  - **Afghanistan,** 93.5% (Azimi et al., 2021) ,
  - **korea,** 90% (Jeon et al., 2021),
  - **Togo,** 71.5% (Konu et al., 2021);
  - **South India,** 58%% (Basavaraja et al., 2021) &
  - **Indonesia,** 38 % (M.Kes., 2021).
  - **In Ethiopia's** two region, Amhara &Tigray, studies , on AstraZeneca has been reported (Solomon et al., 2021; Tequare et al., 2021).
- Additionally, *sign & symptoms* & *degree of severities* reported d/tly according to their findings.

To the level of the authors no prior studies has been conducted on AEFI of COVID-19 vaccination among HCPs in Ethiopia.

Also, studies conducted elsewhere mostly *focused on* specific vaccines, full dosage & various views or perspectives from the current study.

Therefore, to fill these gaps this study aimed to assess AEFI of COVID-19 vaccination among HCPs in Ethiopia.

Objectives

General Objective: To assess the magnitude of AEFI of COVID-19 vaccination among health care professionals & associated factors in Ethiopia from June 1st to 30, 2021.

Specific Objectives:

To determine AEFI of COVID-19 vaccination among health care professionals in Ethiopia from June 1st to 30, 2021

To identify factors associated with AEFI of COVID-19 vaccination among health care professionals in Ethiopia from June 1st to 30, 2021.

Methods & Materials

Study Setting & period	▪ Ethiopia, June 1st to 30, 2021
Study Design	▪ Cross-sectional (An online E-survey)
Source population	▪ All employed HCP working in HIs of Ethiopia
Study population	▪ All those selected/surveyed HCP working in HIs of Ethiopia
Inclusion Criteria	▪ $\geq$ 18 years, who reside in Ethiopia, who were able to read & understand English language & agreed to participate & completed the survey
Exclusion Criteria	▪ Who could not access the Internet(to use Facebook, email & telegram) & incomplete responses were excluded from the analysis.
Sample Size	▪ Not predetermined, but about 522 HCPs Participated with in the study period

Con'd...Methods & Materials

Sampling Techniques & Procedures	• Google form link to the questionnaire sent via social Medias(Facebook, email & telegram) • Convenience & snowball sampling was used
Measurement & Study Variables	• DV:AEFI of COVID-19 vaccination

	• IDV:
	   • Socio-demographic & economic
	   • Profession & work area related
	   • Health status & exposure
	   • Vaccine & AEFI related variables

	• Two major questions were asked:
	   • 1st: Have you received COVID-19 vaccine at least one dose as of today?" (Yes/No)
	   • 2nd: If Yes, have you experienced any AEFI ? (Yes/No)

Operational Definitions	• AEFI: Is any untoward medical occurrence which follows immunization, & which does not necessarily have a causal relationship with the usage of the vaccine.

Con'd…Methods & Materials

DC Instrument & Procedures	▪ An online platform was utilized (Google form.) ▪ Through the author's network ▪ Using semi-structured questionnaire ▪ Adapted by reviewing d/t literates
DQA	▪ Done Before, during & after DC ▪ Translation & retranslation ▪ Pretesting
DA	▪ Extracted from Google Forms & exported to Ms-Excel 2013 then to SPSS version 25
Ethical Approval	▪ IRB of WU, (Reference number: IRB/298/2021)

Result & Discussion

❑ A total of 522 participants were involved in the survey.

1.Socio-Demographic & economic Characteristics

    ❑ The mean age of the participants was 30.9 ± 4.75 & 406(77.8%) ranged from 25 - 34 years.

    ❑ Majority of the participants were;

- male, 471(90.2%),
- Oromo, 321(61.5%);
- protestant, 168(32.2%) &
- married, 351(67.2%).

❑ Educational status: BSc/MSc=80.8%

❑ Residence: urban= 85.8%

❑ Family Size: $\geq 5/HH=72(13.8\%)$

Cont'd…Result & Discussion

Variables	Categories	Frequency (%)
Age	18-24	20(3.8%)
	25-34	406(**77.8%**)
	35-44	71(13.6%)
	45+	25(4.8%)
Sex	Male	471(**90.2%**)
	Female	51(9.8%)
Religion	Orthodox	135(25.9%)
	Protestant	168(**32.2%**)
	Muslim	160(30.7%)
	Catholic	21(4.0%)
	Wakefata	17(3.3%)
	Others [a]	21(4.0%)
Ethnicity	Oromo	321(**61.5%**)
	Amhara	94(18.0%)
	Tigre	21(4.0%)

| Variables	Categories	Frequency (%)
Resident	Urban	448(**85.8%**)
	Rural	74(14.2%)
Marital status	Never married/divorced/ Widowed	171(32.8%)
	Married	351(**67.2%**)
Edu. status	College Diploma	28(5.4)
	BA/BSc Degree	225(**43.1**)
	MA/MSc Degree	197(37.7)
	PHD and above	72(13.8)
Family size	<5	450(**86.2%**)
	≥5	72(13.8%)
Monthly income	1651-3200	13(2.5%)
	3201-5250	44(8.4%)
	5251-7800	172(**33.0%**)
	7801-10900	171(32.8%)
	>10900	122(23.4%)

2.COVID-19 Vaccine and Its AEFI

☐ Of all survey ,522,about 324 (*62.1%*) were vaccinated with any of COVID-19 vaccines at least once.

☐ **AEFI**: Of those respondents 243 (**75%**) of them had experienced AEFI of COVID-19 vaccination.

☐ This finding was ***higher than*** study done;

- **Indonesia**,38% (M.Kes., 2021);**Togo**,71.5% (Konu *et al.*, 2021); **South India** ,58% % (Basavaraja *et al.*, 2021), & Ayder CSP Hospital, **Ethiopia**, **63.8%** (Tequare *et al.*, 2021).

- The discrepancy *might be due to*;
  - Difference in socio-cultural env't, time period considered for DC & types of vaccines considered.

Cont'd…COVID-19 Vaccine and Its AEFI

☐ This finding was ***lower than*** study done;

- **Afghanistan**,93.5% (Azimi *et al.*, 2021) & **korea**,90% (Jeon *et al.*, 2021)

- The probable reason for these difference *might be* :

  - Difference in study population as medical students might experienced an AE than HCP staffs due to medical student syndrome.

☐ This finding was ***in line*** with study done in;

- **UK**, 71.9% (NAS, 2011) & **LMIC** (Solomon *et al.*, 2021), 75.8%.

Cont'd...Result & Discussion

☐ **Major AEFI**: to lesser or greater extent comparable with d/t studies across the globe & to the vaccine safety surveillance manuals(VSSM) prepared by WHO(Ndwandwe & Wiysonge, 2021; Tequare *et al.*, 2021).
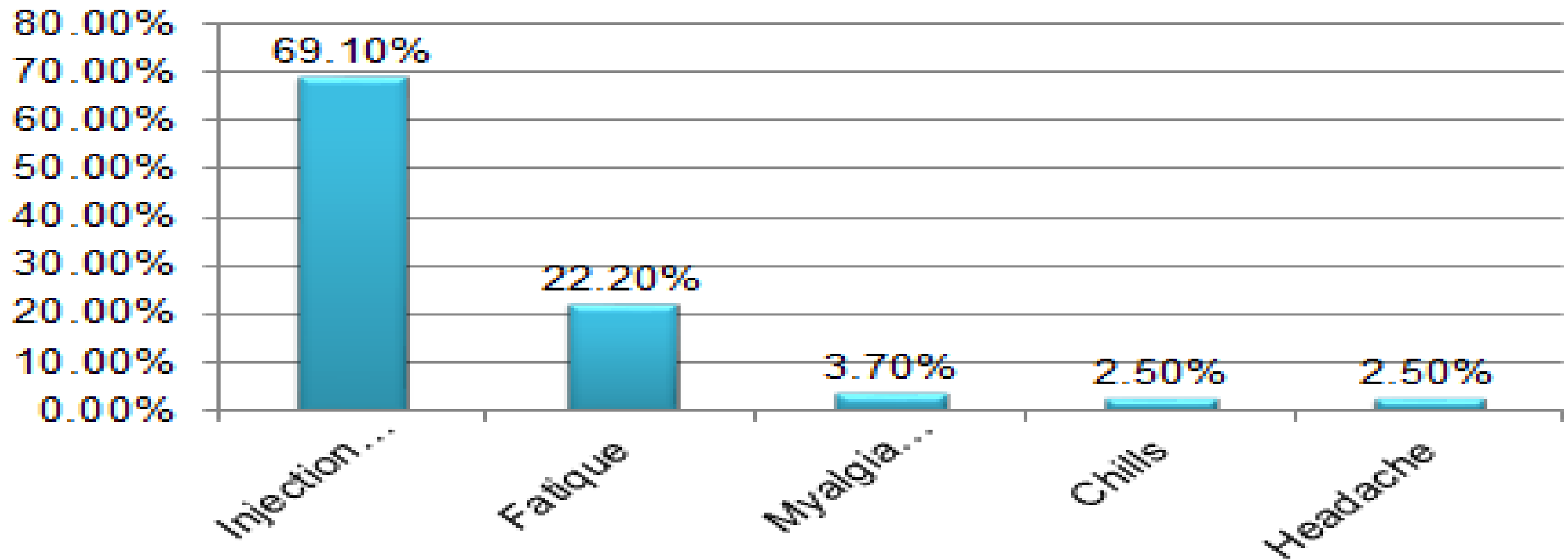
Cont'd...Result & Discussion

☐ Some of the common AE reported was **higher than** from;

- **Nova Scotia**, where pain/redness/swelling at injection site ,60% (ˊAEFI ,2021) &

- **Indonesia**, where localized pain during 1ˢᵗ first dose ,45 % (M.Kes., 2021).

- The discrepancy **might be due** to d/ce in study population.

☐ But, **lower than** study done in;

- **Korea** (Jeon et al., 2021) where
  - ✓ tenderness at the injection site (94.5%),
  - ✓ fatigue (92.9%),
  - ✓ pain at the injection site (88.0%), &
  - ✓ malaise (83.8%) &
- **Togo** (Konu et al., 2021) were
  - ✓ injection site pain (91.0%),
  - ✓ asthenia (74.3%),
  - ✓ headache (68.7%),
  - ✓ soreness (55.0%), &
  - ✓ fever (47.5%) were the most commonly reported AEFI
- This **might be due to the fact that** ;
  - • The current study focused on any of the vaccines than specific vaccine.

Cont'd...Result & Discussion

❑ Also, **in line** with the study conducted in;

- **Afghanistan**, where local *pain at the site of injection* ,68.3% (Azimi *et al.*, 2021) &

- **LIC**, where SE after 1st Dose of the Oxford AstraZeneca Vaccine among HCP ,75.8% (Solomon *et al.*, 2021).

❑ **Perceived severity:** of those AEFI;

- about 144(59.3%), 84(34.6%) & 15(6.2%) were mild, moderate & severe infections respectively.

- This indicates *most of severity* of the reported adverse events was mild to moderate.

- This is **comparable** with the study conducted in **Afghanistan**(Azimi *et al.*, 2021), **Korea**(Jeon *et al.*, 2021) & **Southern Ethiopia**(Zewude *et al.*, 2021).

Cont'd…Result & Discussion

❑ *However, severity* of AEFI reported in this study was **higher than**

- **Minas Gerais**, 3% (da Silva *et al.*, 2021) &
- **Korea, South India & Ethiopia** (Basavaraja *et al.*, 2021; Jeon *et al.*, 2021; Tequare *et al.*, 2021), where none categorized as serious .
- This **might be due to** heterogeneity in the population these studies have considered & some of the studies were institution based.

❑ *Whereas* severity of AEFI indicated was **lower than**;

- **Nova Scotia** (AEFI,2021) & **Togo** (Koru *et al.*, 2021) where severity was reported as 17.7% and 23.8% respectively.
- This discrepancy **might be due to** d/ce in the type of vaccine over which the severity was assessed.

❑ *Additionally,* studies conducted in **Ontario** (Ontario Agency ,2021), **British Columbia** (Centre, 2021) & **LIC** (Solomon *et al.*, 2021) showed **similarity** in severity

- where severity reported: 5.7%, 7.1% and 6.1% respectively.

3. Factors Associated with AEFI of COVID-19 vaccination

Variables		AEFI of COVID-19 Vaccination		OR[95% CI] And P value		
		Yes N=243(75%)	No N=81(25%)	COR P-value	AOR	P-value
Marital Status	Single	66(27.2%)	39(48.%)	1	1	
	Married	177 (72.8%)	42(51.9%)	2.49(1.48,4.18)	4.19(2.07,8.45)***	.000
Family Size	<5	207(85.2%)	75(92.6%)	1	1	
	≥5	36 (14.8%)	6(7.4%)	2.17(.88, 5.36)	5.17(1.74,15.34)**	.003
Family tested for COVID-19	Yes	60(24.7%)	9(11.1%)	1	1	
	No	183(75.3%)	72(88.9%)	0.38(.18,.80)	.39(.15,.97)*	.043
Family support to take the vaccine	Yes	117(48.1%)	57(70.4%)	1	1	
	No	126(51.9%)	24(29.6%)	2.55(1.49,4.38)	3.58(1.75,7.33)***	.000
Heard anything bad	Yes	207(85.2%)	51(63.0%)	3.38(1.90,6.00)	4.17(1.90,9.13)***	.000
	No	36(14.8%)	30(37.0%)	1	1	
Concerned about the vaccine could cause AEFI	Not at all concerned	15(6.2%)	21(25.9%)	1	1	
	A little concerned	87(35.8%)	21(25.9%)	1.46(.49, 4.31)	5.56(1.99,15.46)**	.001
	Moderately concerned	78(32.1%)	27(33.3%)	1.18(1.01,3.24)	1.85(.66,5.13)	.237
	Very concerned	63(25.9%)	12(14.8%)	2.46(1.39,4.33)	6.24(1.96,19.86)**	.002

Cont'd...Result & Discussion

□ **Marital status** : married (AOR= 4.19, 95% CI: 2.07, 8.45) Vs *Single*

- Supported by;

  - **Togo**(Konu *et al.*, 2021) , >50% prone to AEFI

  - **Ayder CSH**, Ethiopia(Tequare *et al.*, 2021) &

  - **Southern Ethiopia** (Zewude *et al.*, 2021),over 50%

    - This *might be due to*;

      − similarity in population characteristics & health system

      − also married individuals might have high risk perception

□ **Family size**: ≥5/HH (AOR=5.17, 95% CI: 1.74, 15.34) Vs < 5

- This *might be due to*;

  − Individual with higher family member have high risk perception than the counterpart.

Cont'd...Result & Discussion

□ Family tested for COVID-19: No (AOR=0.39, 95% CI: 0.15,0.97) Vs Yes

- Supported by;
    - **Ghana** (Khalis *et al.*, 2021b), 83.8% of HHm not Dxed

□ Family support to take the vaccine: No (AOR=3.58, 95% CI 1.75, 7.33) Vs Yes

- Supported by;
    - **LIC** (Solomon *et al.*, 2021; Zewude *et al.*, 2021)
    - This could **probably** be due to;
        - *fear* of Sn &Sm associated with misinformation .

Cont'd...Result & Discussion

❑ Heard anything bad: Yes (AOR=4.17, 95% CI: 1.90,9.13) Vs *No*

- Supported by:
  - **Ghana** (Khalis *et al.*, 2021b),
  - **LIC** (Solomon *et al.*, 2021; Zewude *et al.*, 2021)

❑ Concerned about the vaccine could cause AEFI:

Very concerned (AOR=6.24, 95% CI: 1.96,19.86) Vs *not at all concerned*

- This is in line with:
  - **Ghana** (Khalis *et al.*, 2021b),
  - **Togo** (Konu *et al.*, 2021),
  - **LMIC** (Machingaidze &Wiysonge, 2021) &
  - **Amhara region of Ethiopa** (Aemro *et al.*, 2021)
  - ✓Concerns about SE are the most common reasons for hesitancy reported in these studies .

❑ **Limitations of the Study:**

- 1st: the study was conducted only after the 1st dose was administered, limit 2nd dose.

- 2nd: used non-probability sampling techniques,

- 3rd: HCP who had no access to the internet were not participated

- 4th: an online survey-low RR.

- 5th: the cross-sectional nature of study

Conclusion & Recommendation

❖ Conclusion

- ☐ 3/4th had experienced AEFI
- ☐ AEFI experienced was :
  - **to** lesser/greater extent comparable with d/t studies &
  - **to** the VSM & manufacturing company
- ☐ common Sms, were injection site & majorly mild to moderate
- ☐ Factors associated:
  - Marital status, family size/tested/support, heard any things bad & concerned about AEFI
- ☐ So, the study help to address rumors about SAE associated with the vaccine.

❖ Recommendation:

- ➤ HMgrs at d/t level of HS should encourage full vaccination to any HCP
- ➤ Base line information *for* policy implication & *for* the vaccine to the general population.
- ➤ Also, further studies are required to assess & Ix the long-term SE

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THANK YOU!!

Any Question?