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Is there any relationship between role stressors, job tasks, and job satisfaction among Health Surveillance Assistants in Malawi? A cross-sectional study

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RESEARCH

Is there any relationship between role stressors, job tasks, and job satisfaction among Health Surveillance Assistants in Malawi? A cross-sectional study

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Abstract

Objectives: The objective of this study was to explore the role stressors with the view to identify factors for role stressors and suggest some measures for effective control of the role stressors.

Setting: Setting Data were collected from health centres and hospitals of three Malawi districts of Mangochi, Lilongwe and Mzimba

Participants: Respondents were 430 Health Surveillance Assistants (HSAs). 50.2% of them were male while 49.8% were female.

Design A cross sectional study A cross-sectional study of the observational correlational design was carried out

Main outcome measures: Respondents perceptions of job tasks, role stressors and job satisfaction

Results: The key findings of this study were role ambiguity ($r= -.238$, $P<0.001$) and role overload ($r=-.159$, $P<0.01$) were significantly negatively related to job satisfaction, while role conflict ($r= -.004$, $P=0.472$) was insignificantly related to job satisfaction. Additionally, the HSAs curative role was negatively related to role ambiguity ($r= -.108$, $P=0.013$) and positively related to role conflict ($r= .118$, $P=0.008$) and role overload ($r= .105$, $P=0.015$) while the HSAs overall preventive task was positively related to role overload.

Conclusions: Since the HSAs clinical tasks were significantly related to all role stressors there is need by the government of Malawi to design strategies to control the role stressors to ensure increased job performance and job satisfaction among HSAs. Further, studies may be required in future to assist government to control role stressors among HSAs in Malawi

Keywords: Relationship, role ambiguity, role conflict, role overload, job satisfaction, role stressors

2

22 ## Strengths and limitations of this study

23 • We used adequate statistical analysis to relate role stressors and job satisfaction in HSAs

24 • We adapted instruments that have commonly been used and have high reliability in studies related to role

25 stressors and job satisfaction

26 • The study is limited in that it only considers data from HSAs working in Government under

27 government pay roll being studied.

28 • Additionally, the study is limited in terms of literature because it is the first of its kind to be

29 conducted among HSAs

30 • The study being a cross sectional study did not elicit much information about the role stressors in HSAs

31 **Introduction**

32 In Malawi, there is a critical shortage of health workers where the doctor/patient ratio is very high.

33 Additionally, there has been a growing demand for health care in Malawi especially with the advent of the

34 HIV/AIDS pandemic [1]. To meet this high demand for health care, task shifting has been advocated where

35 some of the roles of medical doctors have been delegated to junior cadres such as clinical officers and

36 Health Surveillance Assistants (HSAs). Task shifting is the delegation of tasks to people who are in lower

37 positions [2,3]. Its implementation is wholly supported by the WHO, which recommends each country

38 introducing task shifting through CHWs should have a National Framework to guide the roles and training

39 of CHWs [2,3].

40 The HSAs cadre has its routes from the Alma Ata declaration in Russia, in 1978 [4]. The meeting was a

41 high-level global meeting organized by the World Health Organization (WHO) and United Nations

3

42   Children's Fund (UNICEF) [5]. The meeting was attended by official government representatives from all

43   over the world and UNICEF member countries. At the meeting, the role of the community health worker

44   (CHW) was well defined [5]. Formerly, they were known as smallpox vaccinators or cholera assistants and

45   were renamed HSAs immediately after the Alma Ata declaration [4]. HSAs are a group of one of the

46   community-based health workers in Malawi. Historically, the role of the HSAs focused mainly on the

47   delivery of preventive health services such as hygiene and sanitation promotion, immunization, and health

48   education (6)]. Since then, the HSAs' role has expanded to include roles such as community-based

49   maternal and newborn care (CBMNC), child health, nutrition, and family planning which all are delivered

50   under the essential health package (EHP) programme [4,7].

51   With this expanded role, there is a general feeling among HSAs and other health workers that the HSAs

52   are overloaded with work [3]. In terms of role ambiguity, issues such as the absence of standardized

53   procedures for their selection and training have been featured including lack of job descriptions and work

54   protocols for their use at work [4,5]. Regarding role overload, HSAs have the feeling that they are doing too

55   much and that they are overloaded with work [9]. In terms of role conflict, the HSAs' role overlaps with the

56   roles of other cadres such as nurses, clinical officers and assistant environmental health officers (AEHOs).

57   Additionally, their supervision is complex as it involves many supervisors from both clinical and the

58   preventive section; and in the course of this, role conflict arises due to competing priorities [9]. All this has

59   the likelihood to contribute towards high role overload, lower work performance and lower job satisfaction

60   [10].

61   Role stressors in the literature often times have referred to the terms such as role conflict, role

62   ambiguity, and role overload [11]. Role conflict has been defined as conflicting situations that may arise at

63   the workplace and may affect their compliance [12]. An example to this could be a conflicting situation that

64   may arise between the HSAs and their supervisors or coworkers at the workplace. A very likely example to

4

65 this is a situation where an HSA reports to two supervisors; one supervisor may need the HSA while the

66 HSA is busy with the other supervisor. Situations like this are likely to cause role conflict at the workplace.

67 Role ambiguity is defined as when employees lack some clarity on their roles [12]. A good example to this

68 could be the introduction of a new role without proper orientation or guidelines for the workers. Role

69 overload is defined as when employees have too many roles or tasks to perform [12]. This is likely to

70 happen when employees do not have adequate time for them to perform other roles such as those related

71 to work or family because they have too many roles.

72 Generally, information about the community health workers (CHWs) role ambiguity, role conflict,

73 role overload and job satisfaction are scanty in the literature. Studies have been conducted elsewhere in

74 the developed or developing countries in Asia [9-12] on other professions such as nurses, accounting

75 personnel and teachers. The studies conducted measured role stressors such as role ambiguity, role

76 conflict and role overload and have suggested that If these role stressors remain uncontrolled, they will

77 affect the job performance and the job satisfaction of employees in an organization [12–14]. This is why the

78 researcher conducted the study in order to ascertain the relationships between the role stressors and job

79 satisfaction.

80 **Method**

81 **Study design and sample**

82 Between January 2017 and December 2017, a cross-sectional survey was conducted to

83 investigate the relation between role stressors, job tasks, and job satisfaction among Health Surveillance

84 Assistants in Malawi. Data were collected from HSAs working in three districts of Mangochi, Lilongwe and

85 Mzimba South which represented the south, centre and northern regions of Malawi respectively. Lilongwe

86 district had both urban and rural representation. The urban setting was selected for comparison if there

87 were any differences in the role stressors and job satisfaction between the rural HSAs and the urban HSAs.

5

88   All HSAs working in the three selected districts under the government of Malawi payroll and

89   working in either CHAM or Ministry of Health facilities and had work experience of two or more years were

90   eligible to participate in the study. Overall, the population of HSAs in the three districts was 1924.The

91   sample size for the study was 385 HSAs and was calculated based on Lemeshow et al.[15] sample size

92   calculation formula for a cross-sectional study. Since studies to explore role conflict, role ambiguity, role

93   overload and job satisfaction of HSAs had not been conducted in Malawi, it was assumed that 50% of the

94   HSAs were affected by the phenomenon. 20% was factored in considering the rate of the non-responses.

95   This increased the sample size to 462. Since 9 HSAs did not meet the inclusion criteria a total number of

96   453 questionnaires were distributed and the response rate was 93.5%. Multistage sampling was done at

97   national level to select districts and at district level to select health facilities. This was done to ensure there

98   was no bias and the study results were representative.

99   Prior to the data collection, the questionnaire was with Academicians and HSAs, and a pilot test

100   carried out involving 36 HSAs from another district (data not included in the final analysis). The District

101   Health Officers (DHOs) were asked for permission to distribute the questionnaire within their health facilities

102   (health centres and hospitals). Health facilities with high number of HSAs population were selected using

103   PPS sampling. The research assistants gave an explanation of the research that all the information

104   provided would be used anonymously. Participation was voluntary, considering that neither patients nor

105   patients' data were involved in the study. Additionally, participants were asked to sign a consent form

106   before responding to the questionnaire. Therefore, written consent was obtained from the participants.

107   Ethical clearance was obtained from the College of Medicine Research Ethics Committee (COMREC) of

108   Malawi (Certificate No. P.11/16/2054). A descriptive cross-sectional study design was used in this study.

109   The cross-sectional study design was chosen based on the fact that it was appropriate for exploring the

6

110 relationships that exist between the HSAs tasks, role stressors and job satisfaction at a single given point

111 in time [16].

Patient and Public Involvement statement

113 Patients and public were not involved in the development, design, recruitment and sampling of this study.

Measures

115   A standardized face to face self-administered questionnaire having five sections was used to

116 measure study variables. The first section collected socio-demographic data, while the subsequent sections

117 collected data on HSAs task prioritization (as taken from the HSAs job description), role conflict and role

118 ambiguity, role overload and job satisfaction using adapted instruments. To adapt some items for the

119 questionnaires, permission was sought from the American Psychological Association (APA), the University

120 of Minnesota Vocational Psychology Research through the Rights Link of the Copyright Clearance Centre.

121   *Role conflict and ambiguity* was measured by Role conflict and ambiguity (RCA) scale developed

122 by Rizzo et al.[19]. The scale in total had 14 items, 6 items for role ambiguity and 8 items for role conflict. The

123 scale was a 5-point Likert–type response format (from 1= 'strongly disagree' and 5= 'strongly agree'). The

124 RCA scale was chosen because it has been widely used in literature and is the most dominant tool used in

125 role conflict and role ambiguity studies [17,18].

126   *Role overload* was measured by the use of the Role Overload Scale (ROS) developed by Reilly[23].

127 The ROS is a 13- item questionnaire ("there are too many demands on my time") with a 5-point Likert-type

128 response format (from 1= 'strongly disagree' and 5= 'strongly agree'). The tool had a Cronbach's alpha of

129 0.88. Other researchers had found the Cronbach's alpha ranging from 0.89 to 0.94 [20–22].

130   *The Minnesota Satisfaction Questionnaire of the shorter version, the MSQ20* was used to collect

131 data on job satisfaction. The tool had been widely used in both developed and developing countries [23]. It

7

132 is a 20-item questionnaire with a 5-point Likert type response format (from 1= very dissatisfied to 5 very

133 satisfied). The instrument is also reported to have high Cronbach's alpha ranging between 0.70 to 0.80 [24].

134   The *task inventory scale* developed by Burgel et al[25] was adapted in this study to collect

135 information on HSAs job tasks. The instrument has been used in previous studies by Mbambo[26] and Uys[27]

136 in studies related to job analysis of selected health workers in a district health system in KwaZulu-Natal for

137 the South African PHC package of services. The instrument was modified and tasks not relevant to this

138 study were removed and replaced with HSAs tasks contained in their job description to develop a final

139 instrument. For each task, two options were required: to tick in the most appropriate box whether the task

140 applied to the setting and the frequency the task was carried out (less than once per week, 1-5 times per

141 week, 6-10 times per week and more than ten times per week). In addition, the questionnaire had a

142 demographic section where all information pertaining to demographic variables were collected.

143   The data collection tools were first pre-tested before distribution to respondents. The pre-test was

144 done among HSAs in Nkhotakota a different district from the sampled districts. The pre-test was conducted

145 with the intention to identify items in the questionnaire which were not clearly drafted and might not be clear

146 in the reader's view. The identified items were corrected and once the corrections were made, the

147 questionnaire was ready for distribution to the respondents. The pre-test findings were not incorporated into

148 the main study.

149   Internal consistency was used to assess the reliability of the scales and subscales. This was

150 carried out to find out if there was consistency in the way the respondents responded to the items on the

151 questionnaire. Cronbach's alpha (α) was used for this purpose. The RCA, the ROS and the MSQ scales

152 had all a Cronbach's alpha ≥.70. Originally, the authors had high Cronbach's alpha ranging from .80 to .90

153 but this was deemed acceptable since the instruments were adapted and translated into the vernacular

8

154   language (Chichewa) which is commonly spoken in most districts in Malawi. An alpha value of ≥ 0.70 is

155   desirable, although values that are slightly below 0.70 are usually considered acceptable [28].

Data analysis strategy

157   A profile of HSAs was created from the data and the demographic information such as; age, sex,

158   level of education, and years at service post was reported. Descriptive statistics such as mean,

159   corresponding standard deviations, and percentages formed some of the summary statistics.

160   Role conflict scores for the sample were calculated to get a mean with its standard deviation and

161   range. The possible range of role conflict scores with the tool used was 1.00 to 5.00. A higher number

162   denoted the higher the rate of role conflict. Similarly, role ambiguity scores were calculated to get a mean

163   with its standard deviation and range. The possible range of role ambiguity scores using the tool was 1.00

164   to 5.00

165   Role overload scores for the sample were calculated to get a mean with its standard deviation and

166   range. The possible range of role overload scores with the scale used was 1.00 to 5.00, with the higher

167   score denoting the higher the rate of role overload. And the possible range of role overload scores using

168   the scale was 1.00 to 5.00.

169   Job satisfaction scores for the sample were calculated to get a mean with its standard deviation

170   and range. The possible range of job satisfaction scores with the scale used was 1.00 to 5.00, with the

171   higher score denoting a higher rate of job satisfaction. The possible range of job satisfaction scores using

172   the scale was 1.00 to 5.00.

173   To ascertain if there is a relationship between role conflict or role ambiguity and job satisfaction a

174   Pearson product moment coefficient *r* was used. The possible range of correlation coefficients is -1 and +1.

175   A coefficient of +1 indicated that the two variables were positively correlated while a coefficient of -1

176   indicated a negative relationship between the study variables.

9

177   Similarly, a Pearson product-moment coefficient *r* was used to ascertain if there was a relationship

178   between role overload and job satisfaction. The possible range of correlation coefficients is -1 and +1. A

179   coefficient of +1 indicated that the two variables were positively correlated while a coefficient of -1 indicated

180   a negative relationship between the study variables.

181   To identify if there were any relationships between the HSAs preventive and curative tasks and the

182   role stressors. The analysis involved grouping of HSAs tasks into curative and preventive tasks as

183   illustrated in Table 1. The overall curative and preventive tasks were derived by summing up all row means

184   to get their averages

185   **Table 1: Correlations between HSA tasks and the dependent variables**

Preventive Tasks	Curative Tasks
Immunizations	HIV testing service
Health Education	Drug Management
WASH	Integrated community case management (iCCM)
Water Chlorination	Malaria testing (MRDT)
Antenatal and Post-Natal visits	Family Planning
Salt iodine testing	Home based care (HBC)
Growth monitoring promotion	Nutrition
Village Health Committee meetings	Dispensing of tuberculosis drugs, sputum collection and examination

186   The PCA analysis was conducted using SPSS Statistics V.23 (IBM Corporation) with principal axis

187   factoring to examine the psychometric properties of the measures. The approach employed maximum

188   likelihood extraction and varimax rotation with Kaiser Normalization to ascertain the dimensions underlying

189   the research construct. The Kaiser rule and scree test were used to measure sampling adequacy and the

190   decision was based on the Kaiser-Meyer-Olkin (KMO) >0.60 which is recommended in social sciences [29].

191   The criterion for retaining factors was an eigen value >1. Items were considered to contribute sufficiently to

10

192 a factor when their loading was 0.70 [30]. The Bartlett's test was conducted to ensure it had a statistically

193 significant probability of (p=< 0.001). Subsequent rotation was used to show interrelationships between

194 factors. The Pearson's Product Moment Correlation was used to assess the main items of the dependent

195 variables and to assess relationships between the dependent variables. Appended below in Table 2 are the

196 KMO and Bartlett's test results.

197 **Table 2. Indicating variables and their KMO and Bartlett's test results**

Variable	KMO	Bartlett's test		
		χ^2	*df*	*p*
Role ambiguity	0.755	1380.10	28	$p < 0.001$
Role Conflict	0.647	515.11	21	$p < 0.001$
Role Overload	0.776	967.19	36	$p < 0.001$
Job satisfaction	0.743	2147.41	190	$p < 0.001$

198 **Results**

199 A total of 432 responses were received. Data from two participants was incomplete and was

200 discarded, therefore the study sample consisted of 430 HSAs which is high and can be regarded as

201 acceptable. The characteristics of the study participants were 50.2% male while 49.8% were female.   are

202 provided in Table 2. Two respondents were excluded from the sample because of data incompleteness.

203 Additionally, nine participants were excluded because they did not meet the selection criteria.

204 The overall role ambiguity mean score was 1.76 (SD=0.76) indicating that the HSAs had little role

205 ambiguity. The overall role conflict mean score resulted in a mean score of 3.40 (SD=0.89) indicating that

206 the HSAs had mild levels of role conflict. The overall role overload mean score was 3.18 (SD=0.94)

207 indicating that the HSAs had moderate levels of role overload. The minimum and maximum range for the

11

208   role stressors variables had a range of 1-5. The overall job satisfaction mean score was 1.76 (SD=0.76)

209   indicating that the HSAs had little role ambiguity. The HSAs in this study were highly satisfied with their job.

Table 1: The Means and Standard Deviations of the dependent variables

	Mean	SD	Observed Range	Gold Std Range
R A	1.76	0.74	0.86-4.88	1.00-5.00
RC	3.40	0.89	1.29-5.00	1.00-5.00
RO	3.18	0.94	1.00-5.00	1.00-5.00
JS	3.80	0.47	1.60-4.75	1-5

210

211   Key: RA= role ambiguity, RC= role conflict, RO= role overload, JS= job satisfaction, SD= Standard Deviation

212   As shown in Table 3, there was a significant negative relationship between role ambiguity and job

213   satisfaction (r= -.238, p= .01 at the 1% level of significance). This means that there was an association

214   between role ambiguity and job satisfaction. There was a weak, negative and non-significant association

215   between role conflict and job satisfaction (r= -.004, p=.472) (Table 3). This means that there was no

216   association between role conflict and job satisfaction in HSAs. In addition, there was a weak, negative and

217   significant association between role overload and job satisfaction (r= -.159, p=.01 at the 1% level of

218   significance) (Table 3). This means that there was a negative association between role overload and job

219   satisfaction in HSAs.

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224 **Table 3: Relationships between the dependent variables**

		RA	RC	RO	JS
RA	*R*	1			
	p				
RC	*r*	-.247**	1		
	p	.01			
RO	*r*	-.097*	-.307**	1	
	p	.022	.01		
JS	*r*	-.238**	-.004	-.159**	1
	p	.01	.472	.01	

225 ** Correlation is significant at the 0.01 level (1 tailed); * Correlation is significant at the 0.05 level (1 tailed),

226 **Key:** RA= role ambiguity, RC= Role Conflict, RO= Role Overload and JS= Job Satisfaction

227   The correlation analysis that was carried out to determine relationships between the overall

228 curative and preventive tasks revealed that the HSAs overall curative task was positively correlated with

229 role conflict (r= 0.118, *p*=0.008) and role overload (*r*= .105, *p*= 0.015) while it was negatively correlated with

230 role ambiguity (r=.108, p=0.013). The HSAs overall preventive task was only positively correlated with role

231 overload (*r*= .129, *p*= 0.004) (Fig 1). Both the overall preventive and curative tasks were positively

232 correlated with role overload but not with role ambiguity. This finding suggests preventive tasks were

233 related to role overload in HSAs while the curative tasks were related to all the role stressors.

13

234   Three factors contributing to role ambiguity were extracted. The first factor explained 45.26% of the

235 total variance while all the three components explained 73.63% of the total variance (Table 4). The

236 extraction was done with a loading factor value of 0.7 where Component 1 loaded on three items which

237 reflected on the 'Supervisor' with an eigenvalue of 3.62, Component 2 loaded on three items which

238 reflected on 'role clarity' with an eigenvalue of 1.27 and Component 3 loaded on one item which reflected

239 on 'work guidelines' with an eigenvalue of 1.00 (Table 4).

240   Two factors contributing to role conflict were extracted after conducting the PCA analysis. The first

241 factor explained 33.19% of the total variance while all the two factors combined explained 54.64% of the

242 total variance (Table 3). The extraction was carried out with a factor loading value of 0.7 and loaded three

243 items on Component 1 with an eigenvalue of 2.32 which reflected on 'incompatibility' and two items on

244 Component 2 with an eigenvalue of 1.50 which reflected on 'time & person values' (Table 4).

245   Three factors contributing to role overload were extracted after conducting the PCA. The first factor

246 explained 45.26% of the total variance while all the three factors when combined explained 63.04% of the

247 total variance. In this analysis, Component 1 loaded 2 items, Component 2 loaded 2 items and Component

248 3 loaded 1 item. Component 1 items reflected on issues of 'time pressure' with an eigenvalue of 3.37 while,

249 Component 2 reflected on the issue of 'task overload' with an eigenvalue of 1.20 and Component 3

250 reflected on issues of 'work prioritization' with an eigenvalue of 1.11 (Table 4).

251   Six factors contributing to job satisfaction were extracted after conducting the PCA. The first factor

252 explained 23.31% of the total variance while all the six factors explained 58.84% of the total variance

253 (Table 4). The six factors were advancement, work conditions, supervision, ability utilization, social service

254 and activity (Table 4).

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259 **Table 4: Summarized results indicating factors for role stressors identified during PCA**

Variable	EV	% of Var	Cum. Tot.
Role Ambiguity			
Supervisor	3.62	45.26	30.3
Role clarity	1.27	15.84	60.05
Guidelines	1	12.53	73.63
Role Conflict			
Incompatibility	2.32	33.19	32.78
Time & personal values	1.5	54.64	54.64
Role Overload			
Time pressure	3.37	45.26	26.03
Task overload	1.2	21.36	47.39
Prioritization	1.11	15.65	63.04
Job Satisfaction			
Advancement	4.66	23.31	12.39
Work conditions	1.88	9.41	24.59
Supervision	1.64	8.20	34.97
Ability utilization	1.42	7.10	43.43
Social service	1.09	5.43	51.43
Activity	1.08	5.39	58.84

260 Key: EV= eigenvalue, % of Var= Percentage of variance, Cum. Tot. = Cumulative total

261

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262

Discussion and conclusions

264   The purpose of this study was to explore role stressors and their relationships with job satisfaction.

265 The key finding of this study is that the addition of clinical tasks to HSAs related to the role stressors. Other

266 literature evidences are in support of this assertion as they have reported similar finding that HSAs in Malawi

267 are experiencing the role stressors in their work due to high workload [8,9,31–33]. Additionally, other literature

268 evidence suggests the introduction of clinical roles among HSAs in Malawi has not only expanded their role

269 but also divided their time and attention. It is further argued in the literature, that they spend most of their

270 time at the health facility unlike at the community [33]. Furthermore, HSAs are engaged in certain roles, of

271 which some are incompatible with their traditional roles [9]. Subsequently, the changes made to the HSAs

272 roles require new skills, sufficient time and quality supervision for them to be effectively delivered at the

273 community level. Previously, the HSAs were only performing a few preventive health tasks such as WASH,

274 immunizations and growth monitoring [8]. With the increasing health demands at the community level and

275 the critical shortage of health workers, has necessitated the addition of new roles the HSAs [34]. Evidence

276 from the literature suggests role stressors among employees are likely to contribute to lower job satisfaction

277 and poor job performance if mitigation measures are not put in place [8]. Therefore, it is imperative for Malawi

278 Ministry of Health to consider this when adding new roles to HSAs.

279   In terms of role overload, the most important factor was time pressure. This finding is in agreement

280 to the finding by Davis et al.[35] who found CHWs working under pressure to provide services related to their

281 new roles. Additionally, it is reported that the addition of new clinical roles to the CHWs has affected their

282 traditional roles to the extent that some of their traditional roles have been forgotten [1,6] Evidence from

283 literature suggests that when employees are overloaded with tasks they tend to prioritize tasks they feel are

284 important [1,9,35]. For example, tasks such as immunization of children are considered important and this

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285 is why in this study, vaccination and growth monitoring promotion were frequently conducted about 6-10

286 times per week by over 70% of the respondents.

287   Further, role overload in this study was positively correlated to tasks such as growth monitoring,

288 HIV testing service and Village Health Committee meetings indicating both clinical and preventive tasks

289 were responsible for role overload among HSAs. However, considering the significant health gains the

290 Ministry of Health in Malawi has made in achieving 4 out of 8 millennium development goals (MDGs) of

291 which three are health related: reducing child mortality, combating HIV and AIDS, malaria and other

292 diseases [36], this task shifting is not only necessary but relevant for the Malawi Ministry of Health. Much

293 of this achievement is attributed to HSAs work at the community level and weighing at these achievements,

294 their positive health outcomes and the growing demands for health care, it is important to continue with the

295 task shifting but with some regulation. Although the guidelines for HSAs task shifting are available, it would

296 be important if the Ministry of Health went further to introduce an independent body for HSAs task

297 regulation such as the Medical Council of Malawi or the Nurses Council of Malawi.

298   The most important factor for role ambiguity in this study was the supervisor. Additionally, the

299 HSAs curative tasks were negatively related to role ambiguity. These results suggest that the HSAs

300 supervision and the introduction of clinical roles have a contribution towards HSA role ambiguity.

301   The HSAs in Malawi are well known for being poorly supervised [32,33]. Evidence from the

302 literature suggests supervision should be done regularly and that the supervisors should be experts in the

303 field who should be able to provide new knowledge and actively engage the supervisees during supervision

304 [37]. Currently, the AEHOs are considered as the principal supervisors for the HSAs and are supported by

305 Senior HSAs (SHSAs), clinical officers and community nurses. In light of the expansion of their role,

306 supervision really needs to be given a priority as the country has a critical shortage of clinicians and nurses

307 to provide the requisite supervision. Some of the barriers that have been reported as barriers for effective

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308 supervision of CHWs include travel expenses and logistics for face to face interaction meetings with the

309 CHWs, lack of appropriate supervisory tools, inadequate understanding of CHW roles, and the poor

310 general perception managers have towards CHWs supervision, lack of supervisory training and resources

311 to provide a conducive climate for CHWs and their oversight due to some existing bureaucracies [38].

312 In terms of job satisfaction, the main important factor for job satisfaction was compensation and

313 advancement. This finding is consistent with the findings of other researchers where compensation and

314 advancement has been identified as the most important predictors for job satisfaction [39–42]. Similarly, the

315 HSAs in Malawi are lacking good compensation and a clear career structure for their advancement which is

316 demotivating and dissatisfying considering that the majority of them work in very rural and remote areas

317 where communication is a challenge. The current practice for HSAs advancement is that they have to get

318 back to school and improve their grades and later enroll in a college to train either as a nurse or medical

319 assistant [43]. In light of this, there is need to understand more about their needs [41] and that it is

320 important they are fully supported inorder to ensure their optimization and productivity to achieve improved

321 health outcomes [44–47]. Mpembeni[41] suggests job satisfaction should be looked at as key to the retention

322 of CHWs. It is quite surprising to note that in Government there are other cadres with short duration of

323 training as HSAs but are considered for promotion within their career structure without going back to

324 school. It is therefore important that Government should look at these critical issues to ensure HSAs

325 remain motivated and satisfied in their work. This study therefore urges policy makers at the Ministry of

326 Health to review the community health strategy to ensure HSAs have a clear career structure for

327 advancement.

328 Considering that some HSAs tasks are correlated to role stressors, it is important that their address

329 should be given a priority. If mitigation measures are not initiated, the role stressors would very likely

330 contribute to low performance at work and lower job satisfaction among HSAs. Additionally stress

18

331 conditions such as depression, dissatisfaction, anxiety and tension would arise [48]. Therefore, there is an

332 urgent need by the authorities and partners to join hands to address these role stressors for the HSAs to

333 continue enjoying high job satisfaction and good performance at work. This study, therefore, would like to

334 recommend that Government should introduce measures that would control role ambiguity, role conflict and

335 role overload levels in HSAs. This study, therefore, proposes to Government to introduce an independent

336 regulatory body that would regulate HSAs tasks in Malawi. Additionally, supervision of HSAs should be

337 intensified to overcome the role stressors. Since the HSAs role is broader than the roles of other health

338 cadres it would be imperative to adopt an integrated approach towards the supervision of HSAs. This study,

339 therefore, would like to propose interprofessional supervision (IPS) as an approach for the effective

340 supervision of the HSAs in order to enhance HSAs supervision in Malawi. IPS involves supervision by

341 supervisors from different professional disciplines [49]. This would help to address the challenges faced in

342 the supervision of the HSAs, as their role is more interprofessional requiring supervisors from different

343 health professional backgrounds. We propose this to start right at college by letting students from different

344 professional background working and learning together in a class to ensure effective teams for supervision

345 are formed for greater performance and improved health outcomes.

346 **Acknowledgement:**

347 We the authors would like to thank all HSAs who participated in their study

348 **Contributors:**

349 SN designed the study and wrote the protocol (Corresponding Author), EC supervised the work of the

350 research carried out and critically reviewed the manuscript for content, AM; was responsible for statistical

351 analysis. All authors contributed to critical revisions of the manuscript. All authors read and approved the

352 final manuscript.

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Funding:

We have not declared a specific grant for this research from any funding agency in the public, commercial or non-profit sectors

Data sharing statement: No additional unpublished data from the study are available

Competing interests:

The authors declare that they do not have competing interests.

Patient consent for publication: Not required

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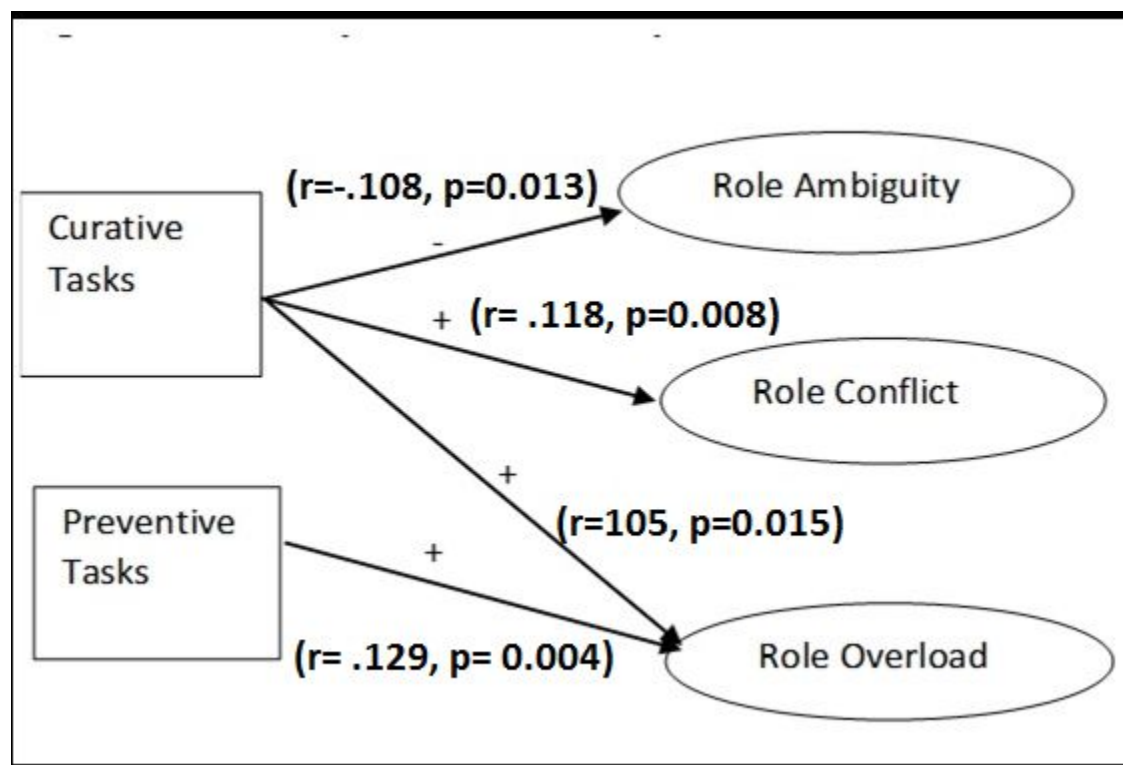473   Beddoe-Mowjood.pdf

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Figure 1: Relationships between tasks and role stressors

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-4
Objectives	3	State specific objectives, including any prespecified hypotheses	
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8-10
		(*b*) Describe any methods used to examine subgroups and interactions	
		(*c*) Explain how missing data were addressed	
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5,10
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	

Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	1
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	2
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15
Generalisability	21	Discuss the generalisability (external validity) of the study results	5
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

The relationship between role stressors, job tasks, and job satisfaction among Health Surveillance Assistants in Malawi. A cross-sectional study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-037000.R1
Article Type:	Original research
Date Submitted by the Author:	25-Jun-2020
Complete List of Authors:	Ntopi, Simon; University of Malawi Kamuzu College of Nursing, Applied Sciences Chirwa, Ellen; University of Malawi Maluwa, Alfred; Malawi University of Science and Technology, Research Directorate
Primary Subject Heading:	Public health
Secondary Subject Heading:	Cardiovascular medicine, Global health, Health services research
Keywords:	Human resource management < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

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RESEARCH

The relationship between role stressors, job tasks, and job satisfaction among Health Surveillance

Assistants in Malawi. A cross-sectional study.

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Abstract

Objectives: The objective of this study was to investigate the role stressors, sociodemographic characteristics and job tasks of Health Surveillance Assistants (HSAs) and to explore major predictors of role stressors and job satisfaction of HSAs in Malawi.

Setting: Setting Data were collected from health centres and hospitals of three Malawi districts of Mangochi, Lilongwe and Mzimba

Participants: Respondents were 430 Health Surveillance Assistants (HSAs). 50.2% of them were male while 49.8% were female.

Design: A cross sectional study of the observational correlational design was carried out

Main outcome measures: Respondents perceptions of job tasks, role stressors and job satisfaction

Results: The key findings of this study were role ambiguity and role overload were significantly negatively related to job satisfaction, while role conflict was insignificantly related to job satisfaction. Additionally, the clinical tasks

of the HSAs and some of the sociodemographic variables were associated with the role stressors and job satisfaction of the HSAs in Malawi.

Conclusions: Since the HSAs clinical tasks were significantly related to all role stressors there is need by the government of Malawi to design strategies to control the role stressors to ensure increased job performance and job satisfaction among HSAs. Further, studies may be required in future to assist government to control role stressors among HSAs in Malawi

Keywords: Relationship, role ambiguity, role conflict, role overload, job satisfaction, role stressors

2

22 | **Strengths and limitations of this study**

23 • We used adequate statistical analysis to relate role stressors and job satisfaction in HSAs

24 • We adapted instruments that have commonly been used and have high reliability in studies related to

25 role stressors and job satisfaction

26 • The study is limited in that it only considers data from HSAs working in Government under government

27 pay roll being studied.

28 • Additionally, the study is limited in terms of literature because it is the first of its kind to be conducted

29 among HSAs

30 • The study being a cross sectional study did not elicit much information about the role stressors in HSAs

31 **Introduction**

32 In Malawi, there is a critical shortage of health workers where the doctor/patient ratio is as low as 3 doctors

33 per 100,000 people, lower than the WHO's prescribed norm of 1 doctor for 1000 people. Additionally, there

34 has been a growing demand for health care in Malawi especially with the advent of the HIV/AIDS pandemic

35 [1]. To meet this high demand for health care, task shifting has been advocated where some of the roles of

36 medical doctors have been delegated to junior cadres such as clinical officers and Health Surveillance

37 Assistants (HSAs). Task shifting is the delegation of tasks to people who are in lower positions [2,3]. Its

38 implementation is wholly supported by the WHO, which recommends each country introducing task shifting

39 through community health workers (CHWs) should have a National Framework to guide the roles and

40 training of CHWs [3].

41 The HSAs cadre has its routes from the Alma Ata declaration in Russia, in 1978 [4]. The meeting was a

42 high-level global meeting organized by the World Health Organization (WHO) and United Nations

3

43 Children's Fund (UNICEF) [5]. The meeting was attended by official government representatives from all

44 over the world and UNICEF member countries. At the meeting, the role of the community health worker

45 (CHW) was well defined [5]. Formerly, they were known as smallpox vaccinators or cholera assistants and

46 were renamed HSAs immediately after the Alma Ata declaration [6]. HSAs are a group of one of the

47 community-based health workers in Malawi. Historically, the role of the HSAs focused mainly on the

48 delivery of preventive health services such as hygiene and sanitation promotion, immunization, and health

49 education[6]. Since then, the HSAs' role has expanded to include roles such as community-based maternal

50 and newborn care (CBMNC), child health, nutrition, and family planning all of which are delivered under the

51 essential health package (EHP) programme [7].

52 With this expanded role, there is a general feeling among HSAs and other health workers that the HSAs

53 are overloaded with work [8,9]. In terms of role ambiguity, issues such as the absence of standardized

54 procedures for their selection and training have been featured including lack of job descriptions and work

55 protocols for their use at work [10]. Regarding role overload, HSAs have the feeling that they are doing too

56 much and that they are overloaded with work [11]. In terms of role conflict, the HSAs' role overlaps with the

57 roles of other cadres such as nurses, clinical officers and assistant environmental health officers (AEHOs).

58 Additionally, their supervision is complex as it involves many supervisors from both clinical and the

59 preventive section; and in the course of this, role conflict arises due to competing priorities [11]. All this has

60 the likelihood to contribute towards high role overload, lower work performance and lower job satisfaction

61 [12]

62 Role stressors in the literature often times have referred to the terms such as role conflict, role

63 ambiguity, and role overload [13]. Role conflict among HSAs could refer to conflicting situations that may

64 arise at the workplace and may affect their compliance [14]. An example to this could be a conflicting

65 situation that may arise between the HSAs and their supervisors or coworkers at the workplace. A very

4

66   likely example to this is a situation where an HSA reports to two supervisors; one supervisor may need the

67   HSA while the HSA is busy with the other supervisor. Situations like this are likely to cause role conflict at

68   the workplace. Role ambiguity is defined as when employees lack some clarity on their roles [14]. A good

69   example to this could be the introduction of a new role without proper orientation or guidelines for the

70   workers. Role overload is defined as when employees have too many roles or tasks to perform [14]. This is

71   likely to happen when employees do not have adequate time for them to perform other roles such as those

72   related to work or family because they have too many roles.

73   Generally, information about the CHWs' role ambiguity, role conflict, role overload and job

74   satisfaction are scanty in the literature. Studies have been conducted elsewhere in the developed or

75   developing countries in Asia [15,16] on other professions such as nurses, accounting personnel and

76   teachers. The studies conducted measured role stressors such as role ambiguity, role conflict and role

77   overload and have suggested that If these role stressors remain uncontrolled, they will affect the job

78   performance and the job satisfaction of employees in an organization [17]. This current study was

79   specifically aimed to explore 1) perceptions of HSAs on role stressors and job satisfaction, 2) the effect of

80   job tasks and sociodemographic characteristics on the role stressors and job satisfaction and 3) identify the

81   main predictors of role stressors and job satisfaction.

Theoretical Framework

82

83   The Role Episode Model (REM) by Katz and Kahn [18] was integrated with the job satisfaction

84   theories to further explore role conflict, role ambiguity, role overload and job satisfaction of HSAs. The

85   model suggests factors such as organizational (i.e. formal power structure, level in the organization, role

86   requirements, task characteristics, physical setting, and organizational practices); personal and

87   interpersonal factors (i.e. individual's status, needs, values, education, ability, age, sex or gender, and

5

88 tenure) affect the communication process in the role episode model. The model was used to identify

89 predictors associated with role stressors and job satisfaction in the management of stress.

90   Role theory states that when the behaviours expected of an individual are inconsistent, there is likely

91 to be role conflict which may lead to stress and eventually get the employee dissatisfied with the job and

92 have lower work performance [19,20]. Additionally, the theory states that the absence of information such as

93 work guidelines can contribute to role ambiguity and job dissatisfaction as the employee tries to develop

94 coping mechanisms and a defensive mechanism to avoid stress [21]. In line with what has been stipulated

95 above, this study suggests HSAs occupy a role, and this role is accompanied by expected and perceived

96 behaviours' and actions which are applicable to the successful performance of their role [22].

97   Herzberg's motivator-hygiene theory of job satisfaction was also applied in the study. Factors such

98 as achievement, recognition, advancement, compensation, authority, responsibility and the job itself were

99 considered as motivational factors (intrinsic job satisfaction) while, organization policies and practices,

100 supervision, relationship with co-workers, job security, social status and work conditions were considered as

101 hygiene factors (extrinsic satisfaction) [23]. In line with this view, it was our assumption that HSAs are satisfied

102 with motivational factors and are dissatisfied with hygiene factors

103 **Method**

104 **Study design and sample**

105   Between January 2017 and December 2017, a cross-sectional survey was conducted to

106 investigate the relationship between role stressors, job tasks, and job satisfaction among Health

107 Surveillance Assistants in Malawi. Data were collected from HSAs working in three districts of Mangochi,

108 Lilongwe and Mzimba South which represented the southern, central and northern regions of Malawi

109 respectively. Lilongwe district had both urban and rural representation. The urban setting was selected for

6

110   comparison if there were any differences in the role stressors and job satisfaction between the rural HSAs

111   and the urban HSAs.

112   All HSAs working in the three selected districts under the government of Malawi payroll and

113   working in either CHAM or Ministry of Health facilities and had work experience of two or more years were

114   eligible to participate in the study. Overall, the population of HSAs in the three districts was 1924 and 9 did

115   not meet the inclusion criteria .The sample size for the study was 385 HSAs and was calculated based on

116   Lemeshow et al.[24]sample size calculation formula for a cross-sectional study. Since studies to explore

117   role stressors and job satisfaction of HSAs had not been conducted in Malawi, it was assumed that 50% of

118   the HSAs were affected by the phenomena. 20% was factored in considering the rate of the non-

119   responses. A total number of 462 questionnaires were distributed and the response rate was 93.5%.

120   Multistage sampling was done at national level to select districts and at district level to select health

121   facilities. This was done to ensure there was no bias and the study results were representative.

122   Prior to the data collection, the questionnaire was reviewed by experts in the field and some HSAs

123   to ensure it had the right content. A pilot test was conducted in Nkhotakota, a district different from the

124   sampled districts among 36 HSAs (data not included in the final analysis). The District Health Officers

125   (DHOs) were asked for permission to distribute the questionnaire within their health facilities (health centres

126   and hospitals). Health facilities with high number of HSAs population were selected using Probability

127   Proportional to size (PPS) sampling. The research assistants gave an explanation of the research that all

128   the information provided would be used anonymously. Participation was voluntary, considering that neither

129   patients nor patients' data were involved in the study. Additionally, participants were asked to sign a

130   consent form before responding to the questionnaire. Further, ethical clearance was obtained from the

131   College of Medicine Research Ethics Committee (COMREC) of Malawi (Certificate No. P.11/16/2054). The

132   study used a descriptive cross-sectional study design and this decision was based on the fact that it was

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133 appropriate for exploring the relationships that exist between the HSAs tasks, role stressors and job

134 satisfaction at a single given point in time [25].

Patient and Public Involvement statement

136 Patients and public were not involved in the development, design, recruitment and sampling of this study.

Measures

138 A standardized face to face self-administered questionnaire having five sections was used to

139 measure study variables. The first section collected socio-demographic data with the intention to identify if

140 there were some confounding variables that play a role in the relationship between role stressors and job

141 satisfaction. Subsequent sections collected data on HSAs' job tasks (as taken from the HSAs job description),

142 role conflict and role ambiguity, role overload and job satisfaction using adapted instruments. To adapt some

143 items for the questionnaires, permission was sought from the American Psychological Association (APA), the

144 University of Minnesota Vocational Psychology Research through the Rights Link of the Copyright

145 Clearance Centre.

146 A profile of HSAs was created from the data and the sociodemographic information such as age,

147 sex, level of education, and years at service post was reported. Descriptive statistics such as mean,

148 corresponding standard deviations, and percentages formed some of the summary statistics.

149 Role conflict and ambiguity was measured by role conflict and ambiguity (RCA) scale developed by

150 Rizzo et al.[26]The scale in total had 14 items: 6 items for role ambiguity and 8 items for role conflict. The

151 scale was a 5-point Likert–type response format (from 1= 'strongly disagree' and 5= 'strongly agree'). The

152 RCA scale was chosen because it has been widely used in literature and is the most dominant tool used in

153 role conflict and role ambiguity studies [27,28]. Role conflict scores for the sample were calculated to get a

154 mean with its standard deviation and range. The possible range of role conflict scores with the tool used

155 was 1.00 to 5.00. A higher number denoted a higher rate of role conflict. Similarly, role ambiguity scores

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156 were calculated to get a mean with its standard deviation and range. The possible range of role ambiguity

157 scores using the tool was 1.00 to 5.00

158 Role overload was measured by the use of the Role Overload Scale (ROS) developed by Reilly

159 [29]. The ROS is a 13- item questionnaire ("there are too many demands on my time") with a 5-point Likert-

160 type response format (from 1= 'strongly disagree' and 5= 'strongly agree'). The tool had a Cronbach's alpha

161 of 0.88. Other researchers had found the Cronbach's alpha ranging from 0.89 to 0.94 [30–32]. Role

162 overload scores for the sample were calculated to get a mean with its standard deviation and range. The

163 possible range of role overload scores with the scale used was 1.00 to 5.00, with the higher score denoting

164 a higher rate of role overload. And the possible range of role overload scores using the scale was 1.00 to

165 5.00.

166 The Minnesota Satisfaction Questionnaire of the shorter version, the MSQ20 was used to collect

167 data on job satisfaction. The tool had been widely used in both developed and developing countries [33]. It

168 is a 20-item questionnaire with a 5-point Likert type response format (from 1= very dissatisfied to 5 very

169 satisfied). The instrument is also reported to have high Cronbach's alpha ranging between 0.70 to 0.80

170 [34].

171 Job satisfaction scores for the sample were calculated to get a mean with its standard deviation

172 and range. The possible range of job satisfaction scores with the scale used was 1.00 to 5.00, with the

173 higher score denoting a higher rate of job satisfaction. The possible range of job satisfaction scores using

174 the scale was 1.00 to 5.00.

175 The task inventory scale developed by Burgel et al [35] was adapted in this study to collect

176 information on HSAs job tasks. The instrument has been used in previous studies by Mbambo [36] and Uys

177 [37] in studies related to job analysis of selected health workers in a district health system in KwaZulu-Natal

178 for the South African PHC package of services. The instrument was modified and tasks not relevant to this

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179 study were removed and replaced with HSAs' tasks contained in their job description to develop a final

180 instrument. For each task, two options were required: to tick in the most appropriate box whether the task

181 applied to the setting and the frequency with which the task was carried out (less than once per week, 1-5

182 times per week, 6-10 times per week and more than ten times per week). In addition, the questionnaire had

183 a demographic section where all information pertaining to demographic variables were collected.

184   The data collection tools were first pre-tested before distribution to respondents. The pre-test was

185 done among HSAs in Nkhotakota, a different district from the sampled districts. The pre-test was conducted

186 with the intention to identify items in the questionnaire which were not clearly drafted and might not be clear

187 in the reader's view. The identified items were corrected and once the corrections were made, the

188 questionnaire was ready for distribution to the respondents. The pre-test findings were not incorporated into

189 the main study.

190   Internal consistency was used to assess the reliability of the scales and subscales. This was

191 carried out to find out if there was consistency in the way the respondents responded to the items on the

192 questionnaire. Cronbach's alpha (α) was used for this purpose. The RCA, the ROS and the MSQ scales

193 had all a Cronbach's alpha ≥.70. Originally, the authors had high Cronbach's alpha ranging from .80 to .90

194 but this was deemed acceptable since the instruments were adapted with some minor modifications and

195 translated into the vernacular language (Chichewa) which is commonly spoken in most districts in Malawi.

196 The Cronbach's alpha for the Task Inventory Scale was 0.60. An alpha value of ≥ 0.70 is desirable,

197 although values that are slightly below 0.70 are usually considered acceptable [38].

198   Content validity was used to ensure that the instrument captured relevant information and it

199 measured role stressors and job satisfaction in all HSAs in a similar manner to avoid bias [39]. Experts in the

200 field were given the questionnaire to look at the items to determine whether the items in the scale accurately

201 reflected the constructs of role stressors and job satisfaction and the HSAs tasks. Additionally, validity was

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202 achieved by bias control through multistage sampling that ensured all the three regions of the country,

203 districts, health facilities and the HSAs in the sampled districts had an equal chance of representation.

204 Further, the researcher ensured that all questionnaire items were based on the objectives of the study [40].

205 Permission to use the instruments was sought from the owners before use. The questionnaire was

206 translated into the vernacular language, (Chichewa) and back translated into English for consistency of

207 meaning. The translation process for the questionnaire from English to the vernacular language (Chichewa)

208 followed a method as illustrated by WHO [41] and involved both forward and back translation to ensure

209 there was the consistency of meaning.

210 The data analysis involved the use of statistics such as mean scores, standard deviation, chi-

211 square, Principal component analysis (PCA) and multiple regression. More details on their use have been

212 provided in the subsequent sub sections of this study.

213 To ascertain if there was a relationship between role conflict or role ambiguity and job satisfaction,

214 a Pearson product moment coefficient r was used. The possible range of correlation coefficients is -1 and

215 +1. A coefficient of +1 indicated that the two variables were positively correlated while a coefficient of -1

216 indicated a negative relationship between the study variables.

217 Similarly, a Pearson product-moment coefficient r was used to ascertain if there was a relationship

218 between role overload and job satisfaction. The possible range of correlation coefficients is -1 and +1. A

219 coefficient of +1 indicated that the two variables were positively correlated while a coefficient of -1 indicated

220 a negative relationship between the study variables.

221 The PCA analysis was conducted using SPSS Statistics V.23 (IBM Corporation) with principal axis

222 factoring to examine the psychometric properties of the measures. The approach employed maximum

223 likelihood extraction and varimax rotation with Kaiser Normalization to ascertain the dimensions underlying

224 the research construct. The Kaiser rule and scree test were used to measure sampling adequacy and the

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225 decision was based on the Kaiser-Meyer-Olkin (KMO) >0.60 which is recommended in social sciences [42].

226 The criterion for retaining factors was an eigen value >1. Items were considered to contribute sufficiently to

227 a factor when their loading was 0.70 [43]. The Bartlett's test was conducted to ensure it had a statistically

228 significant probability of (p=< 0.001). Subsequent rotation was used to show interrelationships between

229 factors. The Pearson's Product Moment Correlation was used to assess the main items of the dependent

230 variables and to assess relationships between the dependent variables. Appended below in Table 1 is the

231 KMO and Bartlett's test results.

232 **Table 1. Indicating variables and their KMO and Bartlett's test results**

Variable	KMO	Bartlett's test		
		χ2	*df*	*p*
Role ambiguity	0.755	1380.10	28	$p < 0.001$
Role Conflict	0.647	515.11	21	$p < 0.001$
Role Overload	0.776	967.19	36	$p < 0.001$
Job satisfaction	0.743	2147.41	190	$p < 0.001$

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234 **Results**

235 A total of 432 responses were received. Data from two participants was incomplete and was

236 discarded, therefore the study sample consisted of 430 HSAs which is high and can be regarded as

237 acceptable. According to the sociodemographic characteristics of the study participants 50.2% were male

238 while 49.8% were female (Table 2). The data were approximately normally distributed by an eyeball test used

239 in determining the normality of data. The Q-Q ("Q" stands for quantile) plot results indicated all the data points

240 had a linear tendency and lying on the diagonal [44].

241 **Relationships between sociodemographic variables and the role stressors and job satisfaction**

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242   From Table 2 highly significant relationships were observed between sociodemographic

243 characteristics of the participants and the role stressors and job satisfaction. Age was significantly related

244 to role ambiguity, role conflict, role overload and job satisfaction. Gender, was significantly related to role

245 ambiguity, role conflict and job satisfaction. However insignificant associations were observed between

246 gender and role overload.

247   Marital status, was significantly related to role overload and iinsignificant relationships were found

248 with role ambiguity, role conflict and job satisfaction. Additionally, this study findings indicate that role

249 overload was high among divorced women. Level of education was significantly related to role conflict, role

250 overload and job satisfaction. Findings for role ambiguity and education level were however not significant.

251 This means that education level was related to role conflict, role overload and job satisfaction. Slightly high

252 role conflict levels were observed among the respondents with a primary school leaving certificate of

253 education (PSLCE), role overload among participants with a diploma and job satisfaction among

254 participants with a Junior Certificate of Education (JCE). The addition of new roles was significantly related

255 to all the role stressors and job satisfaction.

256   Intention to quit is a reactionary measure that occur among employees that are stressed and

257 dissatisfied in their work. Some employees when stressed usually resort to quitting their jobs. In this study,

258 only two HSAs had the intention to quit and statistically significant results were obtained with role conflict

259 while insignificant results were obtained with role ambiguity and role overload.

260   HSAs' work location either at a rural or urban area had some significant findings in this study. The

261 HSAs working at either rural or urban areas are all similar in terms of training and nature of activities. Highly

262 significant findings were found between working at either rural area or urban areas and the role stressors

263 and job satisfaction. (Table 2). This study findings indicate that respondents in health facilities based in

264 rural areas had high role ambiguity, role overload and job satisfaction compared to those in the cities (Table

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265 2). However, respondents in health facilities based in the urban area had high perception of role conflict

266 compared to those in the rural area.

267 Further, significant relationships were observed between years at service post with role ambiguity,

268 role conflict and job satisfaction. This means that years at service post were related to role ambiguity, role

269 conflict and job satisfaction. HSAs who had served for a period range of 11-19 years had slightly high role

270 conflict while, those with fewer than 10 years at work had slightly high role ambiguity compared to those in

271 the other age ranges. However, satisfaction was high in those who had served for a period greater than 20

272 years (Table 2).

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273 **Table 2: Frequency and relationships between sociodemographic variables and the dependent variables**

Variable	N	%	Role Ambiguity M	Role Ambiguity X2	Role Ambiguity p	Role Conflict M	Role Conflict X2	Role Conflict p	Role Overload M	Role Overload X2	Role Overload p	Job Satisfaction M	Job Satisfaction X2	Job Satisfaction p
Age				78.20	.001		87.15	0.001		129.35	.001	75.55	319.31	.000
26-35	154	35.8	13.86			24.30			28.56			74.87		
36-45	221	51.4	13.87			23.83			29.00			76.19		
46-55	52	12.1	15.52			22.32			26.40			75.31		
56-60	3	0.70	11.33			22.00			31.00			67.00		
Gender				51.52	.016		50.17	0.004		48.02	.128	75.54	84.41	0.031
Male	216	50.2	13.84			23.41			28.5			75.70		
Female	214	49.8	14.25			24.20			28.59			75.39		
Marital Status				105.30	0.242	23.81	67.19	0.864	28.51			75.52	205.87	.151
Married	365	85.10	13.90			23.86			28.69			75.62		
Unmarried	53	12.40	15.15			23.47			26.94			75.21		
Divorced	8	1.90	14.00			23.87			32.37			74.00		
Widowed	3	0.70	11.67			23.67			23.67			73.33		
Education				116.79	.073		124.78	0.001		187.36	.000	75.55	248.71	.001
PSLCE	8	1.90	14.25			24.88			29.75			73.62		
JCE	193	44.90	14.38			23.62			27.4			75.83		
MSCE	217	50.70	13.98			23.99			29.28			75.52		
Diploma	12	2.80	9.83			22.75			32.75			72.75		
Clinical roles				52.59	.012		53.27	0.002		82.32	.001	75.56	105.63	.000
Yes	350	81.60	14.23			23.87			28.76			75.75		
No	79	18.40	13.23			23.50			27.54			74.75		
Location				105.63	.001		76.75	0.001		82.97	.001	75.55	191.50	.000
Rural	330	76.70	14.14			23.54			28.77			76.22		
Urban	100	23.3	13.67			24.84			27.63			72.92		
District of Work				71.39	.246		29.92	0.997		64.73	0.82	75.55	110.62	.799
Mangochi	95	22.10	14.74			23.98			28.28			75.91		
Lilongwe	278	64.70	13.86			23.69			28.18			75.19		
Mzimba	57	13.30	13.81			24.07			30.70			76.68		
Yrs at Serv. Post				52.91	.011		48.83	0.000		47.49	.139	14.04	156.19	0.027
<10 years	300	80.60	14.5			23.18			27.5			74.90		
11-19 years	63	16.90	13.73			24.42			28.69			13.78		
≥20 years	9	2.40	14.10			22.75			28.04			14.38		
Intention to quit				14.07	16.13	0.991	23.78	57.04	0.001	28.55	32.61	0.72	75.54	122.17	.000
Yes	**9**	**2.10**	**12.00**			**21.44**			**31.11**			**72.44**		
No	**422**	**97.9**	**14.11**			**23.83**			**28.50**			**75.61**		

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275 **Role stressors and job satisfaction levels in HSAs**

276 From Table 3 the overall role ambiguity mean score was 1.76 (SD=0.76) indicating that the HSAs

277 had little role ambiguity. The overall role conflict mean score resulted in a mean score of 3.40 (SD=0.89)

278 indicating that the HSAs had mild levels of role conflict. The overall role overload mean score was 3.18

279 (SD=0.94) indicating that the HSAs had moderate levels of role overload. The minimum and maximum

280 range for the role stressors' mean scores had a range of 1-5. The overall job satisfaction mean score was

281 3.80 (SD=0.47) indicating that the HSAs had high job satisfaction level. The HSAs in this study were highly

282 satisfied with their job.

283 **Table 3: The Means and Standard Deviations of the dependent variables**

	Mean	SD	Observed Range	Gold Std Range
R A	1.76	0.74	0.86-4.88	1.00-5.00
RC	3.40	0.89	1.29-5.00	1.00-5.00
RO	3.18	0.94	1.00-5.00	1.00-5.00
JS	3.80	0.47	1.60-4.75	1-5

284 Key: RA= role ambiguity, RC= role conflict, RO= role overload, JS= job satisfaction, SD= Standard Deviation

285 **Task frequency**

286 In this study, vaccination and growth monitoring came out clearly as frequently carried out tasks by the

287 respondents. Tasks that were rarely performed were salt testing for iodine and sputum collection and

288 examination (See Fig 1).

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Correlations between HSA tasks and the dependent variables

293   From Table 4 out of the 17 HSAs tasks 9 had significant relationships with the role stressors and job

294   satisfaction, while 4 had insignificant relationships and for three tasks (sanitation promotion, IEC and vaccination) their

295   correlation failed to complete due to the presence of constants as all the respondents had similar responses with

296   nothing to correlate. The tasks that were negatively significantly related to role ambiguity were Antenatal care (ANC)

297   and postnatal care (PNC) visits, family planning, drug dispensing and nutrition. The tasks that were positively correlated

298   with role ambiguity were salt testing for iodine and growth monitoring promotion (GMP). In terms of role conflict, salt

299   testing was negatively correlated with role conflict. Tasks that were positively significantly related to role conflict were

300   GMP and home-based care (HBC), drug dispensing, HIV Testing Service (HTS), malaria rapid diagnosis testing

301   (MRDT) and nutrition. Tasks that were positively correlated with role overload were GMP, VHC meetings and HTS

302   while those that were significantly positively related to job satisfaction were sputum collection and examination, Village

303   Health Committee (VHC) meetings and family planning.

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Table 4: Correlations between HSA tasks and the dependent variables

		Role Ambiguity	Role Conflict	Role Overload	Job Satisfaction
Water Chlorination	r	.006	-.022	.040	-.029
	Sig. (1-tailed)	.453	.324	.203	.278
ANC &PNC	r	-.107*	.065	.079	.046
	Sig. (1-tailed)	.016	.096	.056	.180
Salt testing	r	.110*	-.137**	-.075	-.068
	Sig. (1-tailed)	.012	.003	.064	.082
GMP	r	.185**	.159**	.137**	-.071
	Sig. (1-tailed)	.000	.001	.002	.072
TB	r	-.045	-.030	.009	-.079
	Sig. (1-tailed)	.182	.272	.431	.057
HTS	r	-.030	.111*	.088*	.033
	Sig. (1-tailed)	.273	.012	.036	.254
Drug Custodian	r	-.123**	.109*	.046	.076
	Sig. (1-tailed)	.006	.013	.174	.061
iCCM	r	.000	.070	.073	-.043
	Sig. (1-tailed)	.497	.077	.071	.195
MRDT	r	-.009	.096*	.031	-.038
	Sig. (1-tailed)	.425	.026	.268	.222
Sputum Examination	r	-.037	.079	.066	-.131**
	Sig. (1-tailed)	.232	.056	.092	.004
VHC Meetings	r	.040	-.017	.136**	-.103*
	Sig. (1-tailed)	.206	.367	.003	.017
FP	r	-.091*	-.078	-.068	-.105*
	Sig. (1-tailed)	.034	.059	.088	.018
HBC	r	-.068	.141**	.006	-.035
	Sig. (1-tailed)	.087	.002	.456	.240
Nutrition	r	-.120**	.086*	.068	.036
	Sig. (1-tailed)	.007	.041	.083	.231
Note **. Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level					

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Relationships between the role stressors and job satisfaction

317   As shown in Table 5, there was a significant negative relationship between role ambiguity and job

318   satisfaction. This means that there was an association between role ambiguity and job satisfaction. There

319   was a weak, negative and non-significant association between role conflict and job satisfaction. This

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320 means that there was no association between role conflict and job satisfaction in HSAs. In addition, there

321 was a weak, negative and significant association between role overload and job satisfaction. This means

322 that there was a negative association between role overload and job satisfaction in HSAs.

323 **Table 5: Relationships between the role stressors and job satisfaction**

		RA	RC	RO	JS
RA	*R*	1			
	p				
RC	*r*	-.247**	1		
	p	.01			
RO	*r*	-.097*	-.307**	1	
	p	.022	.01		
JS	*r*	-.238**	-.004	-.159**	1
	p	.01	.472	.01	

324 ** Correlation is significant at the 0.01 level (1 tailed); * Correlation is significant at the 0.05 level (1 tailed),

325 **Key:** RA= role ambiguity, RC= Role Conflict, RO= Role Overload and JS= Job Satisfaction

326 **Identification of factors for role stressors and job satisfaction through Principal Component**

327 **Analysis (PCA)**

328 **Role ambiguity**

329   From Table 6 three factors contributing to role ambiguity were extracted. The first factor explained

330 45.26% of the total variance while all the three components explained 73.63% of the total variance. The

331 extraction was done with a loading factor value of 0.7 where Component 1 loaded on three items which

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332 reflected on the 'Supervisor' with an eigenvalue of 3.62, Component 2 loaded on three items which

333 reflected on 'role clarity' with an eigenvalue of 1.27 and Component 3 loaded on one item which reflected

334 on 'work guidelines' with an eigenvalue of 1.00.

Role conflict

336   From Table 6 two factors contributing to role conflict were extracted after conducting the PCA

337 analysis. The first factor explained 33.19% of the total variance while all the two factors combined

338 explained 54.64% of the total variance. The extraction was carried out with a factor loading value of 0.7 and

339 loaded three items on Component 1 with an eigenvalue of 2.32 which reflected on 'incompatibility' and two

340 items on Component 2 with an eigenvalue of 1.50 which reflected on 'time & person values'.

Role overload

342   From Table 6 three factors contributing to role overload were extracted after conducting the PCA.

343 The first factor explained 45.26% of the total variance while all the three factors when combined explained

344 63.04% of the total variance. In this analysis, Component 1 loaded 2 items, Component 2 loaded 2 items

345 and Component 3 loaded 1 item. Component 1 items reflected on issues of 'time pressure' with an

346 eigenvalue of 3.37 while, Component 2 reflected on the issue of 'task overload' with an eigenvalue of 1.20

347 and Component 3 reflected on issues of 'work prioritization' with an eigenvalue of 1.11.

Job satisfaction

349   From Table 6 six factors contributing to job satisfaction were extracted after conducting the PCA.

350 The first factor explained 23.31% of the total variance while all the six factors explained 58.84% of the total

351 variance. The six factors were advancement, work conditions, supervision, ability utilization, social service

352 and activity.

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357 **Table 6: Summarized results indicating factors for role stressors identified during PCA**

Variable	EV	% of Var	Cum. Tot.
Role Ambiguity			
Supervisor	3.62	45.26	30.3
Role clarity	1.27	15.84	60.05
Guidelines	1	12.53	73.63
Role Conflict			
Incompatibility	2.32	33.19	32.78
Time & personal values	1.5	54.64	54.64
Role Overload			
Time pressure	3.37	45.26	26.03
Task overload	1.2	21.36	47.39
Prioritization	1.11	15.65	63.04
Job Satisfaction			
Advancement	4.66	23.31	12.39
Work conditions	1.88	9.41	24.59
Supervision	1.64	8.20	34.97
Ability utilization	1.42	7.10	43.43
Social service	1.09	5.43	51.43
Activity	1.08	5.39	58.84

358 Key: EV= eigenvalue, % of Var= Percentage of variance, Cum. Tot. = Cumulative total

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Multiple linear regression analysis with role stressors and Job satisfaction among HSAs (n=430)

362   From Table 7 some sociodemographic variables, job tasks and factors identified in PCA were

363 identified as predictors of role stressors and job satisfaction. In terms of role ambiguity, location (working in

364 an urban or rural area), marital status, HIV testing and role overload were identified as predictors of role

365 ambiguity along with the supervisor, role clarity, and work guidelines as identified in the PCA analysis. The

366 predictors for role conflict were intention to quit, VHC meetings, job satisfaction and role ambiguity along

367 with intrasender conflict and intrarole and person role conflict as identified in PCA analysis. For role

368 overload the predictors identified were gender, growth monitoring, HIV testing, clinical related work, role

369 ambiguity along with the three variables identified in PCA analysis for role overload time pressure, task

370 overload and work prioritization. For job satisfaction, the predictors were location, years at service post, role

371 overload and role ambiguity along with its PCA components advancement and recognition, work conditions

372 and organization policies, supervision, ability utilization, social service and activity.

373   The multiple linear regression analysis was conducted using the enter method with the role

374 ambiguity, role conflict, role overload and job satisfaction as dependent variables and the social

375 demographic variables, job tasks and the identified PCA components as independent variables.

376 Additionally, the multiple linear regression for job satisfaction had role ambiguity, role conflict and role

377 overload as independent variables. Using the values of the coefficients (β) from the regression coefficients

378 in Table 7. The estimated multiple linear regression equations for role ambiguity, role overload and job

379 satisfaction are as follows:

380   The predicted frequency of role ambiguity = 1.785 -.007 (role overload) - .018 (Location) + .008

381 (marital status) + .011 (HTS) - .029 (HBC) + .554 (Supervisor) + .406 (Clarity) + .279 (Work guidelines)

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382   The predicted frequency of role conflict = 3.485 - .007 (intention to quit) - .018 (VHC) + .008

383   (satisfaction) +.011 (RA) - .029 (intrasender) +.554 (IPC)

384   The predicted frequency of role overload = 3.221 + .008 (gender) +.024 (Clinical role) + .639

385   (GMP) - .012 (HTS) - .007 (RA) + .666 (time pressure) + (task overload) + .345 (Work Prioritization).

386   For job satisfaction = 3.772 + .027 (RA) + .036 (RO) - .105 (Location) -.028 (Years at service post)

387   +.235 (Advancement & Recognition) + .119 (Work Conditions) + .182 (supervision) +.158 (Ability

388   Utilization) + .174 (Social service) + .207 (Activity).

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Table 7: Multiple linear regression analysis with role stressors and Job satisfaction among HSAs	Role Ambiguity			Role Conflict			Role Overload			Job Satisfaction		
	β	SE	P-Value	β	SE	P-Value	β	SE	P-Value	β	SE	P-Value
(Constant)	1.785	.040	.000	3.485	.114	.000	3.221	.039	.000	3.772	.154	.000
Location	.018	.006	.004	.010	.017	.532	.003	.006	.564	-.105	.027	.000
Age	.002	.003	.620	-.004	.009	.660	.003	.003	.268	.002	.013	.903
Gender	.006	.004	.117	.012	.011	.254	.008	.004	.027	.003	.016	.858
Marital status	.008	.004	.043	-.006	.010	.548	.000	.004	.930	.012	.016	.439
Education Level	-.004	.003	.221	-.005	.009	.615	-.005	.003	.104	.007	.014	.613
Yrs at serv. Post	.000	.003	.960	.016	.008	.059	-.004	.003	.228	-.028	.013	.025
Clinical role	.010	.005	.057	-.012	.014	.407	.024	.005	.000	-.007	.022	.760
Intention to quit	.001	.012	.946	.071	.035	.041	-.016	.012	.192	.055	.053	.300
Salt testing	.001	.009	.923	-.065	.024	.008	-.014	.009	.107	-.025	.038	.521
GMP	-.036	.017	.037	-.010	.047	.834	.039	.016	.017	-.055	.074	.464
HTS	.011	.005	.027	.007	.013	.579	-.012	.005	.013	.005	.021	.821
Dispensing	-.005	.004	.210	.005	.011	.637	.000	.004	.956	-.009	.017	.606
TB-Sputum	.002	.005	.649	-.004	.012	.735	-.006	.004	.151	.010	.019	.599
VHC Meetings	.011	.009	.221	-.066	.026	.012	-.010	.009	.269	.001	.043	.981
Family Planning	-.003	.004	.507	.003	.012	.822	-.004	.004	.394	.000	.018	.988
HBC	-.029	.009	.002	.011	.025	.678	.008	.009	.427	.036	.040	.371
Nutrition	.002	.007	.760	-.039	.020	.050	-.001	.007	.939	-.001	.029	.986
Job Satisfaction	.004	.004	.372	-.026	.012	.023	-.003	.004	.444			
Role Overload	-.007	.002	.001	.017	.006	.006				.036	.009	.000
Role Conflict	-.005	.002	.052				-.001	.002	.702	-.015	.010	.135
Role Ambiguity				-.021	.009	.023	-.007	.003	.007	.027	.012	.019
Supervisor	.554	.002	.000									
Role Clarity	.406	.002	.000									
Guidelines	.279	.002	.000									
ISC				.769	.006	.000						
IPRC				.416	.007	.000						
Time Pressure							.666	.002	.000			
Task Overload							.564	.002	.000			
Work Prioritization							.345	.002	.000			
Advancement & Recognition										.235	.009	.000
WCOP										.119	.008	.000
Supervision										.182	.008	.000
Ability Utilization										.158	.009	.000
Social Service										.174	.008	.000
Activity										.207	.008	.000

24

401 **Key: HBC= Home Based Care, ISC= Intra-sender Conflict, IPRC= Intrarole and Person Role Conflict, WCOP= Work conditions and**

402 **organization policies, HTS= HIV testing service**

403

404 **Discussion**

405   To our knowledge, this study was the first to explore role stressors and job satisfaction of HSAs in

406 Malawi and to determine the role of the sociodemographic and work-related variables on the relationship

407 between the role stressors and job satisfaction. This study has contributed to the body of knowledge by

408 providing empirical evidence to decision makers in Malawi and other countries facing similar challenges of

409 workforce shortages and need to learn about the role stressors and job satisfaction among CHWs.

410 **Relationships between the role stressors and job satisfaction**

411   This study has revealed significant findings between role ambiguity and role overload and job

412 satisfaction. Role ambiguity was negatively significantly related with job satisfaction while role overload was

413 negatively significantly related to job satisfaction. The finding is consistent with the findings of earlier studies

414 conducted in other professions [45]. However, role conflict was negatively insignificantly related to job

415 satisfaction and for this reason we will only discuss the findings of role ambiguity, role overload and job

416 satisfaction. Other studies conducted in other professions have reported similar findings [46]. Although, the

417 levels of role ambiguity and role overload are lower and mild in HSAs there is need by government to initiate

418 measures to control these role stressors in order to ensure continued job satisfaction and good work

419 performance among HSAs.

420 **Role overload**

421   In terms of role overload, the most important factor was time pressure. This finding is in agreement

422 with Davis et al. [47]who found CHWs working under pressure to provide services related to their new

423 roles. Evidence from literature suggests that when employees are overloaded with tasks they tend to

25

424 prioritize tasks they feel are important [48] . For example, tasks such as immunization of children are

425 considered important and this is why in this study, vaccination and growth monitoring promotion were

426 frequently conducted about 1-5 times per week by over 70% of the respondents.

427 Additionally, the addition of clinical tasks to existing HSAs' job tasks is related to role overload. Other

428 literature evidence is in support of this assertion as similar findings have been reported elsewhere following

429 introduction of additional roles [49]. Other literature evidence suggests the introduction of clinical roles among

430 HSAs in Malawi has not only expanded their role but also divided their time and attention. It is further argued

431 in the literature, that HSAs spend most of their time at the health facility unlike at the community [50]. Further,

432 HSAs are engaged in certain roles, of which some are incompatible with their traditional roles [51]. Arguably,

433 the changes made to the HSAs' roles require new skills, sufficient time and quality supervision for them to be

434 effectively delivered at the community level [51]. Previously, the HSAs were only performing a few preventive

435 health tasks such as WASH, immunizations and growth monitoring [52]. Increased health demands at the

436 community level and the critical shortage of health workers, have necessitated the addition of new roles to

437 the HSAs [53]. Evidence from the literature suggests role stressors among employees are likely to contribute

438 to lower job satisfaction and poor job performance if mitigation measures are not put in place [54].Therefore,

439 it is imperative for Malawi Ministry of Health to consider this when adding new roles to HSAs.

440 Furthermore, it is reported that the addition of new clinical roles to the CHWs has affected their

441 traditional roles to the extent that some of their traditional roles have been forgotten [55]. The tasks that were

442 identified as predictors for role overload were growth monitoring and HTS. However, considering the

443 significant health gains that the Ministry of Health in Malawi has made in achieving 4 out of 8 millennium

444 development goals (MDGs) of which three are health related: reducing child mortality, combating HIV and

445 AIDS, malaria and other diseases [56], this task shifting is not only necessary but relevant for the Malawi

446 Ministry of Health. Much of this achievement is attributed to HSAs' work at the community level. Looking at

26

447 these achievements, their positive health outcomes and the growing demands for health care, it is important

448 to continue with the task shifting but with some regulation. Although the guidelines for HSAs' task shifting are

449 available, it would be important if the Ministry of Health went further to introduce an independent body for

450 HSAs' task regulation such as the Medical Council of Malawi or the Nurses Council of Malawi.

451 　　　　Furthermore, role overload in this study was positively correlated to tasks such as growth

452 monitoring and HTS were responsible for role overload among HSAs. However, considering the significant

453 health gains that the Ministry of Health in Malawi has made in achieving 4 out of 8 millennium development

454 goals (MDGs) of which three are health related: reducing child mortality, combating HIV and AIDS, malaria

455 and other diseases [56], this task shifting is not only necessary but relevant for the Malawi Ministry of

456 Health. Much of this achievement is attributed to HSAs' work at the community level. Looking at these

457 achievements, their positive health outcomes and the growing demands for health care, it is important to

458 continue with the task shifting but with some regulation. Although the guidelines for HSAs' task shifting are

459 available, it would be important if the Ministry of Health went further to introduce an independent body for

460 HSAs' task regulation such as the Medical Council of Malawi or the Nurses Council of Malawi.

461 **Role ambiguity**

462 　　　　The most important factor for role ambiguity in this study was the supervisor. Additionally, the

463 HSAs curative tasks were negatively related to role ambiguity. These results suggest that the HSAs'

464 supervision and the introduction of clinical roles have a contribution towards HSA role ambiguity.

465 　　　　The HSAs in Malawi are well known for being poorly supervised [57]. Evidence from the literature

466 suggests supervision should be done regularly and that the supervisors should be experts in the field and

467 should be able to provide new knowledge and actively engage the supervisees during supervision [58].

468 Currently, the AEHOs are considered as the principal supervisors for the HSAs and are supported by

469 Senior HSAs (SHSAs), clinical officers and community nurses. In light of the expansion of the HSAs' role,

27

470   supervision really needs to be given a priority as the country has a critical shortage of clinicians and nurses

471   to provide the requisite supervision [59]. Some of the barriers to effective supervision of CHWs that have

472   been reported include travel expenses and logistics for face to face interaction meetings with the CHWs,

473   lack of appropriate supervisory tools, inadequate understanding of CHW roles, and the poor general

474   perception managers have towards CHWs supervision, lack of supervisory training and resources to

475   provide a conducive climate for CHWs and their oversight due to some existing bureaucracies [60].

476   **Job satisfaction**

477   In terms of satisfaction, extrinsic factors (supervision, work conditions and organization policies)

478   and intrinsic factors (advancement and recognition, ability utilization, social service and activity) were

479   identified as factors for HSAs job satisfaction. The intrinsic factor of 'advancement and recognition' was

480   identified as the major predictor for job satisfaction. This finding is consistent with the findings of other

481   researchers where compensation and advancement have been identified as the most important predictors

482   for job satisfaction [61–64]. Similarly, the HSAs in Malawi are lacking good compensation and a clear

483   career structure for their advancement which is demotivating and dissatisfying considering that the majority

484   of them work in very rural and remote areas where communication is a challenge. The current practice for

485   HSAs advancement is that they have to get back to school and improve their grades and later enroll in a

486   college to train either as a nurse or medical assistant Ntopi [65]. In light of this, there is need to understand

487   more about their needs and that it is important that they are fully supported inorder to ensure their

488   optimization and productivity to achieve improved health outcomes [66–69]. Bacotic [70] suggests job

489   satisfaction should be looked at as key to the retention of employees. It is quite surprising to note that in

490   Government there are other cadres with short duration of training as HSAs but are considered for

491   promotion within their career structure without going back to school. It is therefore important that

492   Government should look at these critical issues to ensure that HSAs remain motivated and satisfied in their

28

493   work. This study therefore urges policy makers at the Ministry of Health to review the community health

494   strategy to ensure that HSAs have a clear career structure for advancement.

495   Sociodemographic variables and the role stressors and job satisfaction

496   In addition to the predictors discussed above, sociodemographic characteristics such as work

497   location and years at service post were significantly associated with HSAs role stressors and job

498   satisfaction.

499   First, HSAs' work location (either rural or urban) was significantly related to role ambiguity and job

500   satisfaction. HSAs in rural areas had slightly high role ambiguity, role overload and job satisfaction levels

501   compared with those in urban areas. This finding is in agreement with findings of another study in India on

502   impact of job stress on urban and rural employees which found location had an impact on the job stress of

503   employees [71].

504   . The role ambiguity and role overload in HSAs might be explained by the fact that many HSAs are

505   deployed in rural areas, in health centre catchment areas, where they are likely to experience challenges in

506   supervision compared to their colleagues in urban area. However, this finding is inconsistent with the findings

507   of earlier studies conducted in other professions that found no significant associations based on location

508   (urban, suburban and rural settings) [72]. Additionally, work location was related to job satisfaction where the

509   HSAs working in rural areas were slightly more satisfied than their colleagues in urban area. This finding is

510   consistent with findings of Liu et al. [73] who found that rural health workers in 11 western provinces of China

511   with slight job satisfaction.

512   Second, HSAs' years at service post were significantly related to job satisfaction. This finding is

513   consistent with findings from earlier studies conducted on job satisfaction where they found years at service

514   post (tenure) had a relationship with job satisfaction [74].

29

515   Third, gender was significantly related to role overload. This finding is consistent with the finding by

516   Duc et al.[75] who found that gender had significant differences in the variances of the employees at a Bank

517   for Investment and Development of Vietnam (BIDV) in Quangnam. Female employees' lives in Malawi is

518   divided between home and work as they have to fulfill both familial and work obligations. However, other

519   literature has found that there is no significant relationship between gender and role overload [76].

520   Fourth, marital status was significantly related to role ambiguity. In this study, HSAs that were

521   unmarried had high role ambiguity compared with those that were married. Empirical evidence suggests

522   higher exposure to role ambiguity is due to lower perception of coping resources among women that are

523   unmarried and less educated compared with men, married and highly educated and wealthier individuals

524   [77]. In Malawi, this is exacerbated by situations where some unmarried persons are single mothers with a

525   lot of responsibilities and with little income.

526   In summary, the findings of this study have indicated that sociodemographic variables of HSAs have

527   a role to play on their role stressors and the jo satisfaction of HSAs. Therefore, it is important for Government

528   of Malawi and all that are involved in HSAs' deployment to take note of the effect of these sociodemographic

529   variables.

530   **Limitations**

531   One of the major limitations of this study is that it is a cross-sectional study and its results cannot institute

532   causality among the relationships established.

533   **Conclusion**

534   Considering that some HSAs' tasks are correlated to role stressors, it is important that they should

535   be addressed as a matter of priority. If mitigation measures are not initiated, the role stressors would very

536   likely contribute to low performance at work and lower job satisfaction among HSAs. Additionally stress

537   conditions such as depression, dissatisfaction, anxiety and tension would arise [78]. Therefore, there is an

30

538 urgent need by the authorities and partners to join hands to address these role stressors for the HSAs to

539 continue enjoying high job satisfaction and good performance at work. This study, therefore, would like to

540 recommend that Government should introduce measures that would control role stressors among HSAs.

541 This study, therefore, proposes to Government to introduce an independent regulatory body that would

542 regulate HSAs' tasks in Malawi. Additionally, supervision of HSAs should be intensified to overcome the

543 role stressors. Since the HSAs role is broader than the roles of other health cadres, it would be imperative

544 to adopt an integrated approach towards the supervision of HSAs. This study, therefore, would like to

545 propose interprofessional supervision (IPS) as an approach for the effective supervision of the HSAs in

546 order to enhance HSAs supervision in Malawi. IPS involves supervision by supervisors from different

547 professional disciplines (79)]. This would help to address the challenges faced in the supervision of the

548 HSAs, as their role is more interprofessional requiring supervisors from different health professional

549 backgrounds. We propose this to start right at college by letting students from different professional

550 background working and learning together in a class to ensure that effective teams for supervision are

551 formed for greater performance and improved health outcomes.

Acknowledgement:

553 We the authors would like to thank all HSAs who participated in their study

Contributors:

555 SN designed the study and wrote the protocol (Corresponding Author), EC supervised the work of the

556 research carried out and critically reviewed the manuscript for content, AM; was responsible for statistical

557 analysis. All authors contributed to critical revisions of the manuscript. All authors read and approved the

558 final manuscript.

Funding:

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560   We have not declared a specific grant for this research from any funding agency in the public, commercial

561   or non-profit sectors

562   **Data sharing statement:** No additional unpublished data from the study are available

563   **Competing interests:**

564   The authors declare that they do not have competing interests.

565   **Patient consent for publication:** Not required

566   **References:**

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37

758   **Legend**

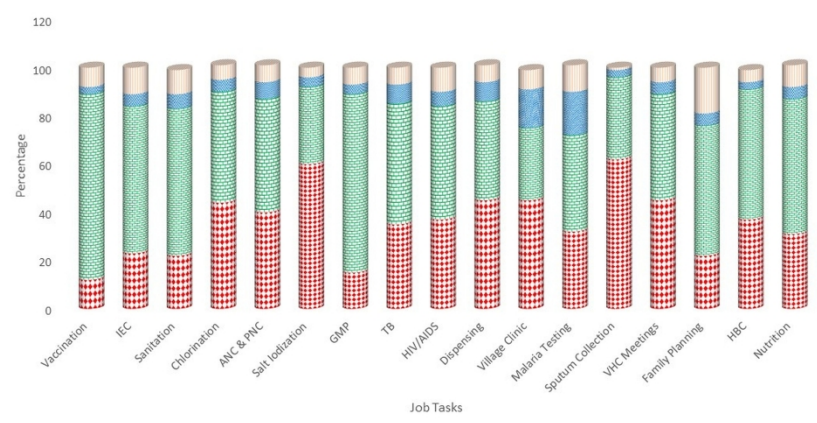759

<1 per Week	1-5 per week	6-10 per week	>10 per week

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FIG 1 FREQUENCY OF HSAS JOB TASKS

FREQUENCY OF HSAS JOB TASKS

338x190mm (300 x 300 DPI)

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-4
Objectives	3	State specific objectives, including any prespecified hypotheses	
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8-10
		(*b*) Describe any methods used to examine subgroups and interactions	
		(*c*) Explain how missing data were addressed	
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5,10
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	

Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders		10
		(b) Indicate number of participants with missing data for each variable of interest		
Outcome data	15*	Report numbers of outcome events or summary measures		1
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included		
		(*b*) Report category boundaries when continuous variables were categorized		
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses		
Discussion				
Key results	18	Summarise key results with reference to study objectives		10-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias		2
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence		15
Generalisability	21	Discuss the generalisability (external validity) of the study results		5
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based		

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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The relationship between role stressors, job tasks, and job satisfaction among Health Surveillance Assistants in Malawi. A cross-sectional study

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RESEARCH

The relationship between role stressors, job tasks, and job satisfaction among Health Surveillance

Assistants in Malawi. A cross-sectional study.

Word count: 8,419

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Abstract

Objectives: The objective of this study was to investigate the role stressors, sociodemographic characteristics and job tasks of Health Surveillance Assistants (HSAs) and to explore major predictors of role stressors and job satisfaction of HSAs in Malawi.

Setting: Setting Data were collected from health centres and hospitals of three Malawi districts of Mangochi, Lilongwe and Mzimba

Participants: Respondents were 430 Health Surveillance Assistants (HSAs). 50.20% of them were male while 49.8% were female.

Design: A cross sectional study of the observational correlational design was carried out

Main outcome measures: Respondents perceptions of job tasks, role stressors and job satisfaction

Results: The key findings of this study were role ambiguity and role overload were significantly negatively related to job satisfaction, while role conflict was insignificantly related to job satisfaction. Additionally, the clinical tasks of the HSAs and some of the sociodemographic variables were associated with the role stressors and job satisfaction of the HSAs in Malawi.

Conclusions: Since the HSAs clinical tasks were significantly related to all role stressors there is need by the government of Malawi to design strategies to control the role stressors to ensure increased job performance and job satisfaction among HSAs. Further, studies may be required in future to assist government to control role stressors among HSAs in Malawi

Keywords: Relationship, role ambiguity, role conflict, role overload, job satisfaction, role stressors

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Strengths and limitations of this study

- We used adequate statistical analysis to relate role stressors and job satisfaction in HSAs

- We adapted instruments that have commonly been used and have high reliability in studies related to role stressors and job satisfaction

- The study is limited in that it only considers data from HSAs working in Government under government pay roll being studied.

- Additionally, the study is limited in terms of literature because it is the first of its kind to be conducted among HSAs

- The study being a cross sectional study did not elicit much information about the role stressors in HSAs

Introduction

In Malawi, there is a critical shortage of health workers where the doctor/patient ratio is as low as 3 doctors per 100,000 people, lower than the WHO's prescribed norm of 1 doctor for 1000 people. Additionally, there has been a growing demand for health care in Malawi especially with the advent of the HIV/AIDS pandemic [1]. To meet this high demand for health care, task shifting has been advocated where some of the roles of medical doctors have been delegated to junior cadres such as clinical officers and Health Surveillance Assistants (HSAs). Task shifting is the delegation of tasks to people who are in lower positions [2,3]. Its implementation is wholly supported by the WHO, which recommends each country introducing task shifting through community health workers (CHWs) should have a National Framework to guide the roles and training of CHWs [3].

3

42 The HSAs cadre has its routes from the Alma Ata declaration in Russia, in 1978 [4]. The meeting was a

43 high-level global meeting organized by the World Health Organization (WHO) and United Nations

44 Children's Fund (UNICEF) [5]. The meeting was attended by official government representatives from all

45 over the world and UNICEF member countries. At the meeting, the role of the community health worker

46 (CHW) was well defined [5]. Formerly, they were known as smallpox vaccinators or cholera assistants and

47 were renamed HSAs immediately after the Alma Ata declaration [6]. HSAs are a group of one of the

48 community-based health workers in Malawi. Historically, the role of the HSAs focused mainly on the

49 delivery of preventive health services such as hygiene and sanitation promotion, immunization, and health

50 education [6]. Since then, the HSAs' role has expanded to include roles such as community-based

51 maternal and newborn care (CBMNC), child health, nutrition, and family planning all of which are delivered

52 under the essential health package (EHP) programme [7].

53 With this expanded role, there is a general feeling among HSAs and other health workers that the HSAs

54 are overloaded with work [8,9]. In terms of role ambiguity, issues such as the absence of standardized

55 procedures for their selection and training have been featured including lack of job descriptions and work

56 protocols for their use at work [10]. Regarding role overload, HSAs have the feeling that they are doing too

57 much and that they are overloaded with work [11]. In terms of role conflict, the HSAs' role overlaps with the

58 roles of other cadres such as nurses, clinical officers and assistant environmental health officers (AEHOs).

59 Additionally, their supervision is complex as it involves many supervisors from both clinical and the

60 preventive section; and in the course of this, role conflict arises due to competing priorities [11]. All this has

61 the likelihood to contribute towards high role overload, lower work performance and lower job satisfaction

62 [12]

63   Role stressors in the literature often times have referred to the terms such as role conflict, role

64 ambiguity, and role overload [13]. Role conflict among HSAs could refer to conflicting situations that may

4

65 arise at the workplace and may affect their compliance [14]. An example to this could be a conflicting

66 situation that may arise between the HSAs and their supervisors or coworkers at the workplace. A very

67 likely example to this is a situation where an HSA reports to two supervisors; one supervisor may need the

68 HSA while the HSA is busy with the other supervisor. Situations like this are likely to cause role conflict at

69 the workplace. Role ambiguity is defined as when employees lack some clarity on their roles [14]. A good

70 example to this could be the introduction of a new role without proper orientation or guidelines for the

71 workers. Role overload is defined as when employees have too many roles or tasks to perform [14]. This is

72 likely to happen when employees do not have adequate time for them to perform other roles such as those

73 related to work or family because they have too many roles.

74 Generally, information about the CHWs' role ambiguity, role conflict, role overload and job

75 satisfaction are scanty in the literature. Studies have been conducted elsewhere in the developed or

76 developing countries in Asia [15,16] on other professions such as nurses, accounting personnel and

77 teachers. The studies conducted measured role stressors such as role ambiguity, role conflict and role

78 overload and have suggested that If these role stressors remain uncontrolled, they will affect the job

79 performance and the job satisfaction of employees in an organization [17]. This current study was

80 specifically aimed to explore 1) perceptions of HSAs on role stressors and job satisfaction, 2) the effect of

81 job tasks and sociodemographic characteristics on the role stressors and job satisfaction and 3) identify the

82 main predictors of role stressors and job satisfaction.

83 **Theoretical Framework**

84 The Role Episode Model (REM) by Katz and Kahn [18] was integrated with the job satisfaction

85 theories to further explore role conflict, role ambiguity, role overload and job satisfaction of HSAs. The

86 model suggests factors such as organizational (i.e. formal power structure, level in the organization, role

87 requirements, task characteristics, physical setting, and organizational practices); personal and

5

88   interpersonal factors (i.e. individual's status, needs, values, education, ability, age, sex or gender, and

89   tenure) affect the communication process in the role episode model. The model was used to identify

90   predictors associated with role stressors and job satisfaction in the management of stress.

91   Role theory states that when the behaviours expected of an individual are inconsistent, there is likely

92   to be role conflict which may lead to stress and eventually get the employee dissatisfied with the job and

93   have lower work performance [19,20]. Additionally, the theory states that the absence of information such as

94   work guidelines can contribute to role ambiguity and job dissatisfaction as the employee tries to develop

95   coping mechanisms and a defensive mechanism to avoid stress [21]. In line with what has been stipulated

96   above, this study suggests HSAs occupy a role, and this role is accompanied by expected and perceived

97   behaviours' and actions which are applicable to the successful performance of their role [22].

98   Herzberg's motivator-hygiene theory of job satisfaction was also applied in the study. Factors such

99   as achievement, recognition, advancement, compensation, authority, responsibility and the job itself were

100   considered as motivational factors (intrinsic job satisfaction) while, organization policies and practices,

101   supervision, relationship with co-workers, job security, social status and work conditions were considered as

102   hygiene factors (extrinsic satisfaction) [23]. In line with this view, it was our assumption that HSAs are satisfied

103   with motivational factors and are dissatisfied with hygiene factors

104   **Method**

105   **Study design and sample**

106   Between January 2017 and December 2017, a cross-sectional survey was conducted to

107   investigate the relationship between role stressors, job tasks, and job satisfaction among Health

108   Surveillance Assistants in Malawi. Data were collected from HSAs working in three districts of Mangochi,

109   Lilongwe and Mzimba South which represented the southern, central and northern regions of Malawi

110   respectively. Lilongwe district had both urban and rural representation. The urban setting was selected for

6

111 comparison if there were any differences in the role stressors and job satisfaction between the rural HSAs

112 and the urban HSAs.

113   All HSAs working in the three selected districts under the government of Malawi payroll and

114 working in either CHAM or Ministry of Health facilities and had work experience of two or more years were

115 eligible to participate in the study. Overall, the population of HSAs in the three districts was 1924 and 9 did

116 not meet the inclusion criteria .The sample size for the study was 385 HSAs and was calculated based on

117 Lemeshow et al.[24] sample size calculation formula for a cross-sectional study. Since studies to explore

118 role stressors and job satisfaction of HSAs had not been conducted in Malawi, it was assumed that 50% of

119 the HSAs were affected by the phenomena. 20% was factored in considering the rate of the non-

120 responses. A total number of 462 questionnaires were distributed and the response rate was 93.5%.

121 Multistage sampling was done at national level to select districts and at district level to select health

122 facilities. This was done to ensure there was no bias and the study results were representative.

123   Prior to the data collection, the questionnaire was reviewed by experts in the field and some HSAs

124 to ensure it had the right content. A pilot test was conducted in Nkhotakota, a district different from the

125 sampled districts among 36 HSAs (data not included in the final analysis). The District Health Officers

126 (DHOs) were asked for permission to distribute the questionnaire within their health facilities (health centres

127 and hospitals). Health facilities with high number of HSAs population were selected using Probability

128 Proportional to size (PPS) sampling. The research assistants gave an explanation of the research that all

129 the information provided would be used anonymously. Participation was voluntary, considering that neither

130 patients nor patients' data were involved in the study. Additionally, participants were asked to sign a

131 consent form before responding to the questionnaire. Further, ethical clearance was obtained from the

132 College of Medicine Research Ethics Committee (COMREC) of Malawi (Certificate No. P.11/16/2054). The

133 study used a descriptive cross-sectional study design and this decision was based on the fact that it was

7

134 appropriate for exploring the relationships that exist between the HSAs tasks, role stressors and job

135 satisfaction at a single given point in time [25].

136 **Patient and Public Involvement statement**

137 Patients and public were not involved in the development, design, recruitment and sampling of this study.

138 **Measures**

139 A standardized face to face self-administered questionnaire having five sections was used to

140 measure study variables. The first section collected socio-demographic data with the intention to identify if

141 there were some confounding variables that play a role in the relationship between role stressors and job

142 satisfaction. Subsequent sections collected data on HSAs' job tasks (as taken from the HSAs job description),

143 role conflict and role ambiguity, role overload and job satisfaction using adapted instruments. To adapt some

144 items for the questionnaires, permission was sought from the American Psychological Association (APA), the

145 University of Minnesota Vocational Psychology Research through the Rights Link of the Copyright

146 Clearance Centre.

147 A profile of HSAs was created from the data and the sociodemographic information such as age,

148 sex, level of education, and years at service post was reported. Descriptive statistics such as mean,

149 corresponding standard deviations, and percentages formed some of the summary statistics.

150 Role conflict and ambiguity was measured by role conflict and ambiguity (RCA) scale developed by

151 Rizzo et al.[26]The scale in total had 14 items: 6 items for role ambiguity and 8 items for role conflict. The

152 scale was a 5-point Likert–type response format (from 1= 'strongly disagree' and 5= 'strongly agree'). The

153 RCA scale was chosen because it has been widely used in literature and is the most dominant tool used in

154 role conflict and role ambiguity studies [27,28]. Role conflict scores for the sample were calculated to get a

155 mean with its standard deviation and range. The possible range of role conflict scores with the tool used

156 was 1.00 to 5.00. A higher number denoted a higher rate of role conflict. Similarly, role ambiguity scores

8

157 were calculated to get a mean with its standard deviation and range. The possible range of role ambiguity

158 scores using the tool was 1.00 to 5.00.

159 Role overload was measured by the use of the Role Overload Scale (ROS) developed by Reilly

160 [29]. The ROS is a 13- item questionnaire ("there are too many demands on my time") with a 5-point Likert-

161 type response format (from 1= 'strongly disagree' and 5= 'strongly agree'). The tool had a Cronbach's alpha

162 of 0.88. Other researchers had found the Cronbach's alpha ranging from 0.89 to 0.94 [30–32]. Role

163 overload scores for the sample were calculated to get a mean with its standard deviation and range. The

164 possible range of role overload scores with the scale used was 1.00 to 5.00, with the higher score denoting

165 a higher rate of role overload. And the possible range of role overload scores using the scale was 1.00 to

166 5.00.

167 The Minnesota Satisfaction Questionnaire of the shorter version, the MSQ20 was used to collect

168 data on job satisfaction. The tool had been widely used in both developed and developing countries [33]. It

169 is a 20-item questionnaire with a 5-point Likert type response format (from 1= very dissatisfied to 5 very

170 satisfied). The instrument is also reported to have high Cronbach's alpha ranging between 0.70 to 0.80

171 [34].

172 Job satisfaction scores for the sample were calculated to get a mean with its standard deviation

173 and range. The possible range of job satisfaction scores with the scale used was 1.00 to 5.00, with the

174 higher score denoting a higher rate of job satisfaction. The possible range of job satisfaction scores using

175 the scale was 1.00 to 5.00.

176 The task inventory scale developed by Burgel et al [35] was adapted in this study to collect

177 information on HSAs job tasks. The instrument has been used in previous studies by Mbambo [36] and Uys

178 [37] in studies related to job analysis of selected health workers in a district health system in KwaZulu-Natal

179 for the South African PHC package of services. The instrument was modified and tasks not relevant to this

9

180 study were removed and replaced with HSAs' tasks contained in their job description to develop a final

181 instrument. For each task, two options were required: to tick in the most appropriate box whether the task

182 applied to the setting and the frequency with which the task was carried out (less than once per week, 1-5

183 times per week, 6-10 times per week and more than ten times per week). In addition, the questionnaire had

184 a demographic section where all information pertaining to demographic variables were collected.

185 The data collection tools were first pre-tested before distribution to respondents. The pre-test was

186 done among HSAs in Nkhotakota, a different district from the sampled districts. The pre-test was conducted

187 with the intention to identify items in the questionnaire which were not clearly drafted and might not be clear

188 in the reader's view. The identified items were corrected and once the corrections were made, the

189 questionnaire was ready for distribution to the respondents. The pre-test findings were not incorporated into

190 the main study.

191 Internal consistency was used to assess the reliability of the scales and subscales. This was

192 carried out to find out if there was consistency in the way the respondents responded to the items on the

193 questionnaire. Cronbach's alpha (α) was used for this purpose. The RCA, the ROS and the MSQ scales

194 had all a Cronbach's alpha $\geq$.70. Originally, the authors had high Cronbach's alpha ranging from .80 to .90

195 but this was deemed acceptable since the instruments were adapted with some minor modifications and

196 translated into the vernacular language (Chichewa) which is commonly spoken in most districts in Malawi.

197 The Cronbach's alpha for the Task Inventory Scale was 0.60. An alpha value of $\geq$ 0.70 is desirable,

198 although values that are slightly below 0.70 are usually considered acceptable [38].

199 Content validity was used to ensure that the instrument captured relevant information and it

200 measured role stressors and job satisfaction in all HSAs in a similar manner to avoid bias [39]. Experts in the

201 field were given the questionnaire to look at the items to determine whether the items in the scale accurately

202 reflected the constructs of role stressors and job satisfaction and the HSAs tasks. Additionally, validity was

10

203   achieved by bias control through multistage sampling that ensured all the three regions of the country,

204   districts, health facilities and the HSAs in the sampled districts had an equal chance of representation.

205   Further, the researcher ensured that all questionnaire items were based on the objectives of the study [40].

206   Permission to use the instruments was sought from the owners before use. The questionnaire was

207   translated into the vernacular language, (Chichewa) and back translated into English for consistency of

208   meaning. The translation process for the questionnaire from English to the vernacular language (Chichewa)

209   followed a method as illustrated by WHO [41] and involved both forward and back translation to ensure

210   there was the consistency of meaning.

211   The data analysis involved the use of statistics such as mean scores, standard deviation, chi-

212   square, Principal component analysis (PCA) and multiple regression. More details on their use have been

213   provided in the subsequent sub sections of this study.

214   To ascertain if there was a relationship between role conflict or role ambiguity and job satisfaction,

215   a Pearson product moment coefficient r was used. The possible range of correlation coefficients is -1 and

216   +1. A coefficient of +1 indicated that the two variables were positively correlated while a coefficient of -1

217   indicated a negative relationship between the study variables.

218   Similarly, a Pearson product-moment coefficient r was used to ascertain if there was a relationship

219   between role overload and job satisfaction. The possible range of correlation coefficients is -1 and +1. A

220   coefficient of +1 indicated that the two variables were positively correlated while a coefficient of -1 indicated

221   a negative relationship between the study variables.

222   The PCA analysis was conducted using SPSS Statistics V.23 (IBM Corporation) with principal axis

223   factoring to examine the psychometric properties of the measures. The approach employed maximum

224   likelihood extraction and varimax rotation with Kaiser Normalization to ascertain the dimensions underlying

225   the research construct. The Kaiser rule and scree test were used to measure sampling adequacy and the

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226 decision was based on the Kaiser-Meyer-Olkin (KMO) >0.60 which is recommended in social sciences [42].

227 The criterion for retaining factors was an eigen value >1. Items were considered to contribute sufficiently to

228 a factor when their loading was 0.70 [43]. The Bartlett's test was conducted to ensure it had a statistically

229 significant probability of (p=< 0.001). Subsequent rotation was used to show interrelationships between

230 factors. The Pearson's Product Moment Correlation was used to assess the main items of the dependent

231 variables and to assess relationships between the dependent variables. Appended below in Table 1 is the

232 KMO and Bartlett's test results.

233 **Table 1. Indicating variables and their KMO and Bartlett's test results**

Variable	KMO	Bartlett's test		
		χ^2	*df*	*p*
Role ambiguity	0.755	1380.10	28	$p< 0.001$
Role Conflict	0.647	515.11	21	$p< 0.001$
Role Overload	0.776	967.19	36	$p< 0.001$
Job satisfaction	0.743	2147.41	190	$p< 0.001$

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235 **Results**

236   A total of 432 responses were received. Data from two participants was incomplete and was

237 discarded, therefore the study sample consisted of 430 HSAs which is high and can be regarded as

238 acceptable. According to the sociodemographic characteristics of the study participants 50.2% were male

239 while 49.8% were female (Table 2). The data were approximately normally distributed by an eyeball test used

240 in determining the normality of data. The Q-Q ("Q" stands for quantile) plot results indicated all the data points

241 had a linear tendency and lying on the diagonal [44]. All the requirements for multicollinearity were met for

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242 me to conduct multiple linear regression analysis. This was achieved through collinearity statistics which

243 indicated no multicollinearity issue as all variables had tolerance above .84.

Relationships between sociodemographic variables and the role stressors and job satisfaction

245 From Table 2 highly significant relationships were observed between sociodemographic

246 characteristics of the participants and the role stressors and job satisfaction. Age was significantly related

247 to role ambiguity, role conflict, role overload and job satisfaction. Gender, was significantly related to role

248 ambiguity, role conflict and job satisfaction. However insignificant associations were observed between

249 gender and role overload.

250 Marital status, was significantly related to role overload and iinsignificant relationships were found

251 with role ambiguity, role conflict and job satisfaction. Additionally, this study findings indicate that role

252 overload was high among divorced women. Level of education was significantly related to role conflict, role

253 overload and job satisfaction. Findings for role ambiguity and education level were however not significant.

254 This means that education level was related to role conflict, role overload and job satisfaction. Slightly high

255 role conflict levels were observed among the respondents with a primary school leaving certificate of

256 education (PSLCE), role overload among participants with a diploma and job satisfaction among

257 participants with a Junior Certificate of Education (JCE). The addition of new roles was significantly related

258 to all the role stressors and job satisfaction.

259 Intention to quit is a reactionary measure that occur among employees that are stressed and

260 dissatisfied in their work. Some employees when stressed usually resort to quitting their jobs. In this study,

261 only two HSAs had the intention to quit and statistically significant results were obtained with role conflict

262 while insignificant results were obtained with role ambiguity and role overload.

263 HSAs' work location either at a rural or urban area had some significant findings in this study. The

264 HSAs working at either rural or urban areas are all similar in terms of training and nature of activities. Highly

265 significant findings were found between working at either rural area or urban areas and the role stressors

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266 and job satisfaction. (Table 2). This study findings indicate that respondents in health facilities based in

267 rural areas had high role ambiguity, role overload and job satisfaction compared to those in the cities (Table

268 2). However, respondents in health facilities based in the urban area had high perception of role conflict

269 compared to those in the rural area.

270 Further, significant relationships were observed between years at service post with role ambiguity,

271 role conflict and job satisfaction. This means that years at service post were related to role ambiguity, role

272 conflict and job satisfaction. HSAs who had served for a period range of 11-19 years had slightly high role

273 conflict while, those with fewer than 10 years at work had slightly high role ambiguity compared to those in

274 the other age ranges. However, satisfaction was high in those who had served for a period greater than 20

275 years (Table 2).

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276 **Table 2: Frequency and relationships between sociodemographic variables and the dependent variables**

Variable	N	%	Role Ambiguity M	X2	p	Role Conflict M	X2	p	Role Overload M	X2	p	Job Satisfaction M	X2	p
Age				78.20	.001		87.15	0.001		129.35	.001	75.55	319.31	.000
26-35	154	35.8	13.86			24.30			28.56			74.87		
36-45	221	51.4	13.87			23.83			29.00			76.19		
46-55	52	12.1	15.52			22.32			26.40			75.31		
56-60	3	0.70	11.33			22.00			31.00			67.00		
Gender				51.52	.016		50.17	0.004		48.02	.128	75.54	84.41	0.031
Male	216	50.2	13.84			23.41			28.5			75.70		
Female	214	49.8	14.25			24.20			28.59			75.39		
Marital Status				105.30	0.242	23.81	67.19	0.864	28.51			75.52	205.87	.151
Married	365	85.10	13.90			23.86			28.69			75.62		
Unmarried	53	12.40	15.15			23.47			26.94			75.21		
Divorced	8	1.90	14.00			23.87			32.37			74.00		
Widowed	3	0.70	11.67			23.67			23.67			73.33		
Education				116.79	.073		124.78	0.001		187.36	.000	75.55	248.71	.001
PSLCE	8	1.90	14.25			24.88			29.75			73.62		
JCE	193	44.90	14.38			23.62			27.4			75.83		
MSCE	217	50.70	13.98			23.99			29.28			75.52		
Diploma	12	2.80	9.83			22.75			32.75			72.75		
Clinical roles				52.59	.012		53.27	0.002		82.32	.001	75.56	105.63	.000
Yes	350	81.60	14.23			23.87			28.76			75.75		
No	79	18.40	13.23			23.50			27.54			74.75		
Location				105.63	.001		76.75	0.001		82.97	.001	75.55	191.50	.000
Rural	330	76.70	14.14			23.54			28.77			76.22		
Urban	100	23.3	13.67			24.84			27.63			72.92		
District of Work				71.39	.246		29.92	0.997		64.73	0.82	75.55	110.62	.799
Mangochi	95	22.10	14.74			23.98			28.28			75.91		
Lilongwe	278	64.70	13.86			23.69			28.18			75.19		
Mzimba	57	13.30	13.81			24.07			30.70			76.68		
Yrs at Serv. Post				52.91	.011		48.83	0.000		47.49	.139	14.04	156.19	0.027
<10 years	300	80.60	14.5			23.18			27.5			74.90		
11-19 years	63	16.90	13.73			24.42			28.69			13.78		
≥20 years	9	2.40	14.10			22.75			28.04			14.38		
Intention to quit			14.07	16.13	0.991	23.78	57.04	0.001	28.55	32.61	0.72	75.54	122.17	.000
Yes	9	2.10	12.00			21.44			31.11			72.44		
No	422	97.9	14.11			23.83			28.50			75.61		

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278 **Role stressors and job satisfaction levels in HSAs**

279 From Table 3 the overall role ambiguity mean score was 1.76 (SD=0.76) indicating that the HSAs

280 had little role ambiguity. The overall role conflict mean score resulted in a mean score of 3.40 (SD=0.89)

281 indicating that the HSAs had mild levels of role conflict. The overall role overload mean score was 3.18

282 (SD=0.94) indicating that the HSAs had moderate levels of role overload. The minimum and maximum

283 range for the role stressors' mean scores had a range of 1.00-5.00. The overall job satisfaction mean score

284 was 3.80 (SD=0.47) indicating that the HSAs had high job satisfaction level. The HSAs in this study were

285 highly satisfied with their job.

286 **Table 3: The Means and Standard Deviations of the dependent variables**

	Mean	SD	Observed Range	Gold Std Range
R A	1.76	0.74	0.86-4.88	1.00-5.00
RC	3.40	0.89	1.29-5.00	1.00-5.00
RO	3.18	0.94	1.00-5.00	1.00-5.00
JS	3.80	0.47	1.60-4.75	1.00-5.00

287 Key: RA= role ambiguity, RC= role conflict, RO= role overload, JS= job satisfaction, SD= Standard Deviation

288 **Task frequency**

289 In this study, vaccination and growth monitoring came out clearly as frequently carried out tasks by the

290 respondents. Tasks that were rarely performed were salt testing for iodine and sputum collection and

291 examination (See Fig 1).

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Correlations between HSA tasks and the dependent variables

296   From Table 4 out of the 17 HSAs tasks 9 had significant relationships with the role stressors and job

297   satisfaction, while 4 had insignificant relationships and for three tasks (sanitation promotion, IEC and vaccination) their

298   correlation failed to complete due to the presence of constants as all the respondents had similar responses with

299   nothing to correlate. The tasks that were negatively significantly related to role ambiguity were Antenatal care (ANC)

300   and postnatal care (PNC) visits, family planning, drug dispensing and nutrition. The tasks that were positively correlated

301   with role ambiguity were salt testing for iodine and growth monitoring promotion (GMP). In terms of role conflict, salt

302   testing was negatively correlated with role conflict. Tasks that were positively significantly related to role conflict were

303   GMP and home-based care (HBC), drug dispensing, HIV Testing Service (HTS), malaria rapid diagnosis testing

304   (MRDT) and nutrition. Tasks that were positively correlated with role overload were GMP, VHC meetings and HTS

305   while those that were significantly positively related to job satisfaction were sputum collection and examination, Village

306   Health Committee (VHC) meetings and family planning.

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317 **Table 4: Correlations between HSA tasks and the dependent variables**

		Role Ambiguity	Role Conflict	Role Overload	Job Satisfaction
Water Chlorination	r	.006	-.022	.040	-.029
	Sig. (1-tailed)	.453	.324	.203	.278
ANC &PNC	r	-.107*	.065	.079	.046
	Sig. (1-tailed)	.016	.096	.056	.180
Salt testing	r	.110*	-.137**	-.075	-.068
	Sig. (1-tailed)	.012	.003	.064	.082
GMP	r	.185**	.159**	.137**	-.071
	Sig. (1-tailed)	.000	.001	.002	.072
TB	r	-.045	-.030	.009	-.079
	Sig. (1-tailed)	.182	.272	.431	.057
HTS	r	-.030	.111*	.088*	.033
	Sig. (1-tailed)	.273	.012	.036	.254
Drug Custodian	r	-.123**	.109*	.046	.076
	Sig. (1-tailed)	.006	.013	.174	.061
iCCM	r	.000	.070	.073	-.043
	Sig. (1-tailed)	.497	.077	.071	.195
MRDT	r	-.009	.096*	.031	-.038
	Sig. (1-tailed)	.425	.026	.268	.222
Sputum Examination	r	-.037	.079	.066	-.131**
	Sig. (1-tailed)	.232	.056	.092	.004
VHC Meetings	r	.040	-.017	.136**	-.103*
	Sig. (1-tailed)	.206	.367	.003	.017
FP	r	-.091*	-.078	-.068	-.105*
	Sig. (1-tailed)	.034	.059	.088	.018
HBC	r	-.068	.141**	.006	-.035
	Sig. (1-tailed)	.087	.002	.456	.240
Nutrition	r	-.120**	.086*	.068	.036
	Sig. (1-tailed)	.007	.041	.083	.231
Note **. Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level					

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319 **Relationships between the role stressors and job satisfaction**

320   As shown in Table 5, there was a significant negative relationship between role ambiguity and job

321 satisfaction. This means that there was an association between role ambiguity and job satisfaction. There

322 was a weak, negative and non-significant association between role conflict and job satisfaction. This

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323 means that there was no association between role conflict and job satisfaction in HSAs. In addition, there

324 was a weak, negative and significant association between role overload and job satisfaction. This means

325 that there was a negative association between role overload and job satisfaction in HSAs.

326 **Table 5: Relationships between the role stressors and job satisfaction**

		RA	RC	RO	JS
RA	*R*	1			
	p				
RC	*r*	-.247**	1		
	p	.01			
RO	*r*	-.097*	-.307**	1	
	p	.022	.01		
JS	*r*	-.238**	-.004	-.159**	1
	p	.01	.472	.01	

327 ** Correlation is significant at the 0.01 level (1 tailed); * Correlation is significant at the 0.05 level (1 tailed),

328 **Key:** RA= role ambiguity, RC= Role Conflict, RO= Role Overload and JS= Job Satisfaction

329 **Identification of factors for role stressors and job satisfaction through Principal Component**

330 **Analysis (PCA)**

331 **Role ambiguity**

332   From Table 6 three factors contributing to role ambiguity were extracted. The first factor explained

333 45.26% of the total variance while all the three components explained 73.63% of the total variance. The

334 extraction was done with a loading factor value of 0.70 where Component 1 loaded on three items which

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335 reflected on the 'Supervisor' with an eigenvalue of 3.62, Component 2 loaded on three items which

336 reflected on 'role clarity' with an eigenvalue of 1.27 and Component 3 loaded on one item which reflected

337 on 'work guidelines' with an eigenvalue of 1.00.

Role conflict

339 From Table 6 two factors contributing to role conflict were extracted after conducting the PCA

340 analysis. The first factor explained 33.19% of the total variance while all the two factors combined

341 explained 54.64% of the total variance. The extraction was carried out with a factor loading value of 0.70

342 and loaded three items on Component 1 with an eigenvalue of 2.32 which reflected on 'incompatibility' and

343 two items on Component 2 with an eigenvalue of 1.50 which reflected on 'time & person values'.

Role overload

345 From Table 6 three factors contributing to role overload were extracted after conducting the PCA.

346 The first factor explained 45.26% of the total variance while all the three factors when combined explained

347 63.04% of the total variance. In this analysis, Component 1 loaded 2 items, Component 2 loaded 2 items

348 and Component 3 loaded 1 item. Component 1 items reflected on issues of 'time pressure' with an

349 eigenvalue of 3.37 while, Component 2 reflected on the issue of 'task overload' with an eigenvalue of 1.20

350 and Component 3 reflected on issues of 'work prioritization' with an eigenvalue of 1.11.

Job satisfaction

352 From Table 6 six factors contributing to job satisfaction were extracted after conducting the PCA.

353 The first factor explained 23.31% of the total variance while all the six factors explained 58.84% of the total

354 variance. The six factors were advancement, work conditions, supervision, ability utilization, social service

355 and activity.

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360 **Table 6: Summarized results indicating factors for role stressors identified during PCA**

Variable	EV	% of Var	Cum. Tot.
Role Ambiguity			
Supervisor	3.62	45.26	30.3
Role clarity	1.27	15.84	60.05
Guidelines	1	12.53	73.63
Role Conflict			
Incompatibility	2.32	33.19	32.78
Time & personal values	1.5	54.64	54.64
Role Overload			
Time pressure	3.37	45.26	26.03
Task overload	1.2	21.36	47.39
Prioritization	1.11	15.65	63.04
Job Satisfaction			
Advancement	4.66	23.31	12.39
Work conditions	1.88	9.41	24.59
Supervision	1.64	8.20	34.97
Ability utilization	1.42	7.10	43.43
Social service	1.09	5.43	51.43
Activity	1.08	5.39	58.84

361 Key: EV= eigenvalue, % of Var= Percentage of variance, Cum. Tot. = Cumulative total

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Multiple linear regression analysis with role stressors and Job satisfaction among HSAs (n=430)

365   Multiple linear regression results have indicated that some sociodemographic variables, job tasks

366 and factors identified in PCA were identified as predictors of role stressors and job satisfaction. In terms of

367 role ambiguity, Model 1 demonstrated that no variable was significantly correlated to role ambiguity. Model

368 2 place of work (either at a District Hospital or Health Centre) was significantly correlated to role ambiguity.

369 Model 3, place of work and the job tasks of salt iodization and growth monitoring promotion (GMP) were

370 significantly corelated to role ambiguity. In the full model, Model 4, job tasks such as ANC/PNC visits and

371 GMP, and all the factors identified from PCA (supervisor, role clarity and guidelines) were significantly

372 correlated to role ambiguity (Table 7).

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390 **Table 7: Multiple regression of factors related to role ambiguity**

	Model 1	Model 2	Model 3	Model 4
	β(95%CI)	β(95%CI)	β (95%CI)	β (95%CI)
Demographic characteristics				
Age	.049(-.064-.171)	-.074(-.072-.206)	.085(-.043-.227)	.001(-.005-.008)
Gender	.041(-.101-.226	.062(-.079-.250)	.061(-.070-.253)	.001(-.006-.009)
Marital status	.006(-.153-.172)	.057(-.153-.175)	.004(-.153-.165)	.005(-.001-.015)
Education Level	-.074(-.228-.042)	.007(-.179-.111)	-.023(-.170-.112)	-.003(-.010-.004)
Work related factors				
Place of work		-.027(-.503--.031)*	-.173(-.547--.093)***	-.001(-.013-.009)
Urban area		-.144(-.256-.291)	.092(-.098-.489)	.006(-.002-.027)
Service post		.008(-.200-.226)	-.005(-.217-.200)	.002(-.006-.014)
Clinical role		.008(-.345-.108)	-.009(-.244-.207)	.004(-.002-.020)
Intention to quit		-.055(-.342-.732)	.029(-.376-.674)	-.001(-.028-.022)
Job tasks				
ANC/PNC visits			-.077(-.538-.127)	-.012(-.049--.017)***
Salt testing			.189(.296-1.128)***	-.001(-.024-.017)
GMP			.278(.741-2.094)***	-.007(-.073--.003)*
TB			-.025(-.334-.229)	.005(-.003-.024)
HTS			-.058(-.340-.125)	.006(.000-.022)
Drug dispensing			-.103(-.333-.008)	-.002(-.011-.005)
VHC Meetings			-.095(-.647-.089)	.003(-.010-.025)
Family Planning			-.040(-.245-.114)	.000(-.009-.008)
HBC			.025(-.360-.529	-.003(-.031-.011)
Nutrition			-.056(-.451-.150)	.001(-.013-.016)
PCA components				
Supervisor				.752(.550-.558)***
Role Clarity				.498(.405-.413)***
Guidelines				.373(.275-.283)***

*p<0.05, **p<0.01, ***p<0.001.

Model 1: Adjusted for age, gender, marital status and education level, Module 2 Adjusted for variables in Module 1 and work-related variables, Module 3: Adjusted for variables in Module 2 and job tasks Module 4: Adjusted for variables in Module 3 and factors identified in PCA for role ambiguity.

Acronyms: ANC/PNC= Antenatal care/Postnatal care, GMP=Growth Monitoring Promotion, TB= Tuberculosis, HTS= HIV Testing Service, VHC= Village Health Committee, PCA= Principal Component Analysis

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396   In terms of role conflict, Model 1 demonstrated no single variable was significantly correlated to

397 role conflict. Model 2 demonstrated that age and place of work were significantly correlated to role conflict.

398 In Model 3, age, education level, place of work and some job tasks for HSAs such as salt iodization, GMP

399 and VHCs were significantly correlated to role conflict. Overall Model 4, demonstrated years at service

400 post, salt iodization task and all the factors identified from PCA (intrasender role conflict and intrarole and

401 person role conflict) were significantly correlated to role conflict (Table 8).

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423 **Table 8: Multiple regression of factors related to role conflict**

	Model 1	Model 2	Model 3	Model 4
	β(95%CI)	β(95%CI)	β (95%CI)	β (95%CI)
Demographic characteristics				
Age	-.133(-.307--.034)*	-.125(-.317--.003)*	-.137(-.329--.023)*	-.004(-.023-.013)
Gender	.061(-.080-.297)	.035(-.124-.247	.062(-.073.292)	.002(-.017-.025)
Marital status	.004(-.182-.196)	.023(-.146-.229)	.026(-.136-.227)	-.003(-.025-.016)
Education Level	-.004(-.163-.150)	-.083(-.286-.043)	-.123(-.342--.020)*	.004(-.012-.025)
Work related factors				
Place of work		.193(.159-.687)***	.179(.137-.644)*	.000(-.030-.029)
Urban area		.086(-.091-.511)	.069(-.155.492)	-.001(-.040-.034)
Servpost		-.065(-.369-.107)	-.057(-.348-.120)	.014(.001-.055)*
Clinical role		-.018(-.301-.211)	-.026(-.321-.189)	-.010(-.055-.003)
Intention to quit		.075(-.161-1.065)	.065(-.205-.993)	.006(-.032-.106)
Job tasks				
ANC/PNC visits			-.054(-.527-.201)	-.007(-.065-.020)
Salt testing			-.132(-.997--.108)*	-.017(-.122--.019)***
GMP			.241(.685-2.229)***	-.005(-.120-.060)
TB			-.021(-.365-.263)	.004(-.026-.046)
HTS			.031(-.197-.330)	-.003(-.036-.024)
Drug dispensing			.094(-.018-.367)	.005(-.013-.032)
VHC Meetings			-.222(-1.195--.354)***	-.011(-.088-.011)
Family Planning			-.126(-.446--.042)	.004(-.016-.030)
HBC			.186(.252-1.233)	.008(-.027-.087)
Nutrition			-.009(-.370-.316)	-.009(-.069-.009)
PCA components				
Intrasender Conflict				.883(.770-.790***
Intrarole & Person Role Conflict				.484(.413-.434)***

*p<0.05, **p<0.01, ***p<0.001.

Model 1: Adjusted for age, gender, marital status and education level, Module 2 Adjusted for variables in Module 1 and work-related variables, Module 3: Adjusted for variables in Module 2 and job tasks Module 4: Adjusted for variables in Module 3 and factors identified in PCA for role conflict

Acronyms: ANC/PNC= Antenatal care/Postnatal care, GMP=Growth Monitoring Promotion, TB= Tuberculosis, HTS= HIV Testing Service, VHC= Village Health Committee, PCA= Principal Component Analysis

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427   In terms of role overload, in Model 1, education level was significantly correlated to role overload.

428 In Model 2, no variable was significantly correlated to role overload. In Model 3 the ANC/PNC task was

429 significantly correlated to role overload. Overall, in Model 4, the clinical role, the ANC/PNC visits task and

430 the identified PCA factors (time pressure, task overload and work prioritization) were significantly correlated

431 to role overload (Table 9).

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454 **Table 9 Multiple regression of factors related to role overload**

	Model 1	Model 2	Model 3	Model 4
	β(95% CI)	β(95% CI)	β (95% CI)	β (95% CI)
Demographic characteristics				
Age	-.036(-.195-.098)	-.060(-.255-.090)	-.059(-.254-.094)	.002(-.003-.009)
Gender	.038(-.131-.276)	.031(-.147-.264)	.054(-.107-.310)	.003(-.001-.014)
Marital status	-.009(-.220-.187)	.005(-.197-.217)	.034(-.142-.271)	.000(-.007-.007)
Education Level	.108(.002-.339) *	.082(-.053-.312)	.071(-.072-.296)	-.003(-.012-.001)
Work related factors				
Place of work		.040(-.201-.386)	.020(-.245-.337)	.002(-.005-.015)
Urban area		.015(-.300-.380)	-.043(-.497-.268)	.002(-.009-.018)
Servpost		.012(-.237-.290)	.015(-.236-.298)	-.001(-.011-.008)
Clinical role		-.088(-.520-.047)	-.100(-.563-.023)	.010(.016-.036)***
Intention to quit		-.043(-.954-.396)	-.068(-1.121-.241)	-.002(-.039-.009)
Job tasks				
ANC/PNC visits			.127(-.001-.827)*	-.005(-.031--.001)*
Salt testing			-.097(-.961-.066)	-.004(-.035-.002)
GMP			.092(-.284-1.475)	.004(-.008-.055)
TB			.048(-.237-.489)	.000(-.012-.014)
HTS			-.022(-.051)	-.004(-.021-.001)
Drug dispensing			-.004(-.008)	-.001(-.009-.007)
VHC Meetings			.088(.327)	-.002(-.026-.008)
Family Planning			-.076(-.158)	-.002(-.013-.004)
HBC			-.024(-.103)	.003(-.007-.035)
Nutrition			.084(.284)	.000(-.015-.013)
PCA components				
Time Pressure				.692(.663-.670)***
Task Overload				.591(.560-.568)***
Work Prioritization				.313(.341-.349)***

*p<0.05, **p<0.01, ***p<0.001.

Model 1: Adjusted for age, gender, marital status and education level, Module 2 Adjusted for variables in Model 1 and work-related variables, Module 3: Adjusted for variables in Module 2 and job tasks Module 4: Adjusted for variables in Model 3 and factors identified in PCA for role overload

Acronyms: ANC/PNC= Antenatal care/Postnatal care, GMP=Growth Monitoring Promotion, TB= Tuberculosis, HTS= HIV Testing Service, VHC= Village Health Committee, PCA= Principal Component Analysis

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458   In terms of job satisfaction, Model 1, none of the variables were significantly correlated to job

459   satisfaction. In Model 2, location (either rural or urban) and years at service post were significantly

460   correlated to job satisfaction. In Model 3, location, years at service post, and the job tasks of salt

461   iodization, HTS and family planning were significantly correlated to job satisfaction and overall in Model 4,

462   place of work, location, years at service post and all the factors identified from PCA (advancement and

463   recognition, work conditions and organization policies, supervision, ability utilization, social service and

464   activity) were significantly corelated to job satisfaction (Table 10).

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485 **Table 10 Multiple regression of factors related to job satisfaction**

	Model 1	Model 2	Model 3	Model 4
	β(95% CI)	β(95% CI)	β (95% CI)	β (95% CI)
Demographic characteristics				
Age	-.010(-.081-.067)	.081(-.031-.139)	.075(-.035-.136)	.017(-.015-.037)
Gender	-.017(-.117-.087)	-.004(-.105-.097)	.011(-.093-.113)	.008(-.024-.039)
Marital status	-.017(-.119-.086)	-.009(-.111-.095)	.002(-.101-.104)	.018(-.014-.049
Education Level	.013(-.075-.095)	.064(-.040-.140)	.050(-.052-.130)	.016(-.017-.041)
Work related actors				
Place of work		.020(-.119-.165)	.026(-.112-.171)	-.055(-.062)***
Urban area		-.149(-.353--.028)*	-.176(-.410--.040)*	-.073(-.094)***
Servpost		-.142(-.278--.020)*	-.133(-.272--.008)*	-.053(-.056)***
Clinical role		-.086(-.252-.027)	-.099(-.275-.016)	-.012(-.063-.030)
Intention to quit		.075(-.098-.594)	.087(-.062-.634)	.017(-.051-.164)
Job tasks				
ANC/PNC visits			.028(-.160-.248)	-.005(-.071-.054)
Salt testing			-.117(-.513--.003)*	-.023(-.131-.028)
GMP			-.128(-.842-.049)	.001(-.140-.145)
TB			.000(-.182-.181)	.026(-.021-.090)
HTS			.129(.000-.298)*	.003(-.043-.049)
Drug dispensing			.076(-.035-.183)	-.011(-.044-.023)
VHC Meetings			.013(-.241-.291)	-.009(-.099-.064)
Family Planning			-.116(-.232--.003)*	-.010(-.046-.026)
HBC			.017(-.253-.324)	.007(-.074-.104)
Nutrition			.007(-.179-.201)	.003(-.054-.062)
PCA components				
Advancement & Recognition				.480(.208-.241)***
Work Conditions & Organization Policies				.241(.097-.128) ***
Supervision				.371(.158-.188) ***
Ability Utilization				.300(.127-.163)***
Social Service				.375(.157-.187)***
Activity				.466(.202-.233)***
*p<0.05, **p<0.01, ***p<0.001.				

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> Model 1: Adjusted for age, gender, marital status and education level, Module 2 Adjusted for variables in Module 1 and work-related variables, Module 3: Adjusted for variables in Module 2 and job tasks Module 4: Adjusted for variables in Module 3 and factors identified in PCA for job satisfaction
>
> Acronyms: ANC/PNC= Antenatal care/Postnatal care, GMP=Growth Monitoring Promotion, TB= Tuberculosis, HTS= HIV Testing Service, VHC= Village Health Committee, PCA= Principal Component Analysis

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Discussion

488   To our knowledge, this study was the first to explore role stressors and job satisfaction of HSAs in

489 Malawi and to determine the role of the sociodemographic and work-related variables on the relationship

490 between the role stressors and job satisfaction. This study has contributed to the body of knowledge by

491 providing empirical evidence to decision makers in Malawi and other countries facing similar challenges of

492 workforce shortages and need to learn about the role stressors and job satisfaction among CHWs.

Relationships between the role stressors and job satisfaction

494   This study has revealed significant findings between role ambiguity and role overload and job

495 satisfaction. Role ambiguity was negatively significantly related with job satisfaction while role overload was

496 negatively significantly related to job satisfaction. The finding is consistent with the findings of earlier studies

497 conducted in other professions [45]. However, role conflict was negatively insignificantly related to job

498 satisfaction and for this reason we will only discuss the findings of role ambiguity, role overload and job

499 satisfaction. Other studies conducted in other professions have reported similar findings [46]. Although, the

500 levels of role ambiguity and role overload are lower and mild in HSAs there is need by government to initiate

501 measures to control these role stressors in order to ensure continued job satisfaction and good work

502 performance among HSAs.

Role overload

504   In terms of role overload, the most important factor was time pressure. This finding is in agreement

505 with Davis et al. [47] who found CHWs working under pressure to provide services related to their new

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506   roles. Evidence from literature suggests that when employees are overloaded with tasks they tend to

507   prioritize tasks they feel are important [48] . For example, tasks such as immunization of children are

508   considered important and this is why in this study, vaccination and growth monitoring promotion were

509   frequently conducted about 1-5 times per week by over 70% of the respondents.

510   Additionally, the addition of clinical tasks to existing HSAs' job tasks is related to role overload. Other

511   literature evidence is in support of this assertion as similar findings have been reported elsewhere following

512   introduction of additional roles [49]. Other literature evidence suggests the introduction of clinical roles among

513   HSAs in Malawi has not only expanded their role but also divided their time and attention. It is further argued

514   in the literature, that HSAs spend most of their time at the health facility unlike at the community [50]. Further,

515   HSAs are engaged in certain roles, of which some are incompatible with their traditional roles [51]. Arguably,

516   the changes made to the HSAs' roles require new skills, sufficient time and quality supervision for them to be

517   effectively delivered at the community level [51]. Previously, the HSAs were only performing a few preventive

518   health tasks such as WASH, immunizations and growth monitoring [52]. Increased health demands at the

519   community level and the critical shortage of health workers, have necessitated the addition of new roles to

520   the HSAs [53]. Evidence from the literature suggests role stressors among employees are likely to contribute

521   to lower job satisfaction and poor job performance if mitigation measures are not put in place [54].Therefore,

522   it is imperative for Malawi Ministry of Health to consider this when adding new roles to HSAs.

523   Further, it is reported that the addition of new clinical roles to the CHWs has affected their traditional

524   roles to the extent that some of their traditional roles have been forgotten [55]. The tasks that were identified

525   as predictors for role overload were growth monitoring and HTS. However, considering the significant health

526   gains that the Ministry of Health in Malawi has made in achieving 4 out of 8 millennium development goals

527   (MDGs) of which three are health related: reducing child mortality, combating HIV and AIDS, malaria and

528   other diseases [56], this task shifting is not only necessary but relevant for the Malawi Ministry of Health.

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529 Much of this achievement is attributed to HSAs' work at the community level. Looking at these achievements,

530 their positive health outcomes and the growing demands for health care, it is important to continue with the

531 task shifting but with some regulation. Although the guidelines for HSAs' task shifting are available, it would

532 be important if the Ministry of Health went further to introduce an independent body for HSAs' task regulation

533 such as the Medical Council of Malawi or the Nurses Council of Malawi.

534   Furthermore, role overload in this study was positively correlated to tasks such as growth

535 monitoring and HTS were responsible for role overload among HSAs. However, considering the significant

536 health gains that the Ministry of Health in Malawi has made in achieving 4 out of 8 millennium development

537 goals (MDGs) of which three are health related: reducing child mortality, combating HIV and AIDS, malaria

538 and other diseases [56], this task shifting is not only necessary but relevant for the Malawi Ministry of

539 Health. Much of this achievement is attributed to HSAs' work at the community level. Looking at these

540 achievements, their positive health outcomes and the growing demands for health care, it is important to

541 continue with the task shifting but with some regulation. Although the guidelines for HSAs' task shifting are

542 available, it would be important if the Ministry of Health went further to introduce an independent body for

543 HSAs' task regulation such as the Medical Council of Malawi or the Nurses Council of Malawi.

544 **Role ambiguity**

545   The most important factor for role ambiguity in this study was the supervisor. Additionally, the

546 HSAs curative tasks were negatively related to role ambiguity. These results suggest that the HSAs'

547 supervision and the introduction of clinical roles have a contribution towards HSA role ambiguity.

548   The HSAs in Malawi are well known for being poorly supervised [57]. Evidence from the literature

549 suggests supervision should be done regularly and that the supervisors should be experts in the field and

550 should be able to provide new knowledge and actively engage the supervisees during supervision [58].

551 Currently, the AEHOs are considered as the principal supervisors for the HSAs and are supported by

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552 Senior HSAs (SHSAs), clinical officers and community nurses. In light of the expansion of the HSAs' role,

553 supervision really needs to be given a priority as the country has a critical shortage of clinicians and nurses

554 to provide the requisite supervision [59]. Some of the barriers to effective supervision of CHWs that have

555 been reported include travel expenses and logistics for face to face interaction meetings with the CHWs,

556 lack of appropriate supervisory tools, inadequate understanding of CHW roles, and the poor general

557 perception managers have towards CHWs supervision, lack of supervisory training and resources to

558 provide a conducive climate for CHWs and their oversight due to some existing bureaucracies [60].

559 Additionally, the place of work, either at a health centre or district hospital had a role in terms of

560 role ambiguity where HSAs at a health centre had high role ambiguity compared to their colleagues at the

561 district hospital. This may be related to the supervision factor earlier alluded to. Evidence from the literature

562 suggests role ambiguity arises when trainees are unsure of supervisory expectations for their performance

563 or evaluation. Further evidence indicates that in Malawi, there are challenges with the supervision of HSAs

564 due to human resources shortage, lack of financial resources and lack of transportation for mobility by

565 supervisors [61].

566 **Job satisfaction**

567 In terms of satisfaction, extrinsic factors (supervision, work conditions and organization policies)

568 and intrinsic factors (advancement and recognition, ability utilization, social service and activity) were

569 identified as factors for HSAs job satisfaction. The intrinsic factor of 'advancement and recognition' was

570 identified as the major predictor for job satisfaction. This finding is consistent with the findings of other

571 researchers where compensation and advancement have been identified as the most important predictors

572 for job satisfaction [62–65]. Similarly, the HSAs in Malawi are lacking good compensation and a clear

573 career structure for their advancement which is demotivating and dissatisfying considering that the majority

574 of them work in very rural and remote areas where communication is a challenge. The current practice for

575 HSAs advancement is that they have to get back to school and improve their grades and later enroll in a

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576   college to train either as a nurse or medical assistant Ntopi [66]. In light of this, there is need to understand

577   more about their needs and that it is important that they are fully supported inorder to ensure their

578   optimization and productivity to achieve improved health outcomes [67–70]. Bacotic, 2016 [71] suggests

579   job satisfaction should be looked at as key to the retention of employees. It is quite surprising to note that in

580   Government there are other cadres with short duration of training as HSAs but are considered for

581   promotion within their career structure without going back to school. It is therefore important that

582   Government should look at these critical issues to ensure that HSAs remain motivated and satisfied in their

583   work. This study therefore urges policy makers at the Ministry of Health to review the community health

584   strategy to ensure that HSAs have a clear career structure for advancement.

585   **Sociodemographic variables and the role stressors and job satisfaction**

586   In addition to the predictors discussed above, sociodemographic characteristics such as work

587   location and years at service post were significantly associated with HSAs role stressors and job

588   satisfaction.

589   First, HSAs' work location (either rural or urban) was significantly related to role ambiguity and job

590   satisfaction. HSAs in rural areas had slightly high role ambiguity, role overload and job satisfaction levels

591   compared with those in urban areas. This finding is in agreement with findings of another study in India on

592   impact of job stress on urban and rural employees which found location had an impact on the job stress of

593   employees [72].

594   . The role ambiguity and role overload in HSAs might be explained by the fact that many HSAs are

595   deployed in rural areas, in health centre catchment areas, where they are likely to experience challenges in

596   supervision compared to their colleagues in urban area. However, this finding is inconsistent with the findings

597   of earlier studies conducted in other professions that found no significant associations based on location

598   (urban, suburban and rural settings) [73]. Additionally, work location was related to job satisfaction where the

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599 HSAs working in rural areas were slightly more satisfied than their colleagues in urban area. This finding is

600 consistent with findings of Liu et al. [74] who found that rural health workers in 11 western provinces of China

601 with slight job satisfaction.

602 Second, HSAs' years at service post were significantly related to job satisfaction. This finding is

603 consistent with findings from earlier studies conducted on job satisfaction where they found years at service

604 post (tenure) had a relationship with job satisfaction [75].

605 Third, gender was significantly related to role overload. This finding is consistent with the finding by

606 Duc et al.[76] who found that gender had significant differences in the variances of the employees at a Bank

607 for Investment and Development of Vietnam (BIDV) in Quangnam. Female employees' lives in Malawi is

608 divided between home and work as they have to fulfill both familial and work obligations. However, other

609 literature has found that there is no significant relationship between gender and role overload [77].

610 In summary, the findings of this study have indicated that sociodemographic variables of HSAs have

611 a role to play on their role stressors and the jo satisfaction of HSAs. Therefore, it is important for Government

612 of Malawi and all that are involved in HSAs' deployment to take note of the effect of these sociodemographic

613 variables.

Limitations

615 One of the major limitations of this study is that it is a cross-sectional study and its results cannot institute

616 causality among the relationships established.

Conclusion

618 Considering that some HSAs' tasks are correlated to role stressors, it is important that they should

619 be addressed as a matter of priority. If mitigation measures are not initiated, the role stressors would very

620 likely contribute to low performance at work and lower job satisfaction among HSAs. Additionally stress

621 conditions such as depression, dissatisfaction, anxiety and tension would arise [78]. Therefore, there is an

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622 urgent need by the authorities and partners to join hands to address these role stressors for the HSAs to

623 continue enjoying high job satisfaction and good performance at work. This study, therefore, would like to

624 recommend that Government should introduce measures that would control role stressors among HSAs.

625 This study, therefore, proposes to Government to introduce an independent regulatory body that would

626 regulate HSAs' tasks in Malawi. Additionally, supervision of HSAs should be intensified to overcome the

627 role stressors. Since the HSAs role is broader than the roles of other health cadres, it would be imperative

628 to adopt an integrated approach towards the supervision of HSAs. This study, therefore, would like to

629 propose interprofessional supervision (IPS) as an approach for the effective supervision of the HSAs in

630 order to enhance HSAs supervision in Malawi. IPS involves supervision by supervisors from different

631 professional disciplines [79]. This would help to address the challenges faced in the supervision of the

632 HSAs, as their role is more interprofessional requiring supervisors from different health professional

633 backgrounds. We propose this to start right at college by letting students from different professional

634 background working and learning together in a class to ensure that effective teams for supervision are

635 formed for greater performance and improved health outcomes.

Acknowledgement:

637 We the authors would like to thank all HSAs who participated in their study

Contributors:

639 SN designed the study and wrote the protocol (Corresponding Author), EC supervised the work of the

640 research carried out and critically reviewed the manuscript for content, AM; was responsible for statistical

641 analysis. All authors contributed to critical revisions of the manuscript. All authors read and approved the

642 final manuscript.

Funding:

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644   We have not declared a specific grant for this research from any funding agency in the public, commercial

645   or non-profit sectors

646   **Data sharing statement:** No additional unpublished data from the study are available

647   **Competing interests:** None declared.

648   **Patient consent for publication:** Not required

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826   **Figure Legends**
827   Fig 1: HSAs Tasks Frequencies.
828   Data are the percentage indicating the frequency of HSAs job tasks. For clarity <1 per week indicates rarely
829   performed tasks when mentioned by 50% or more of the respondents, <1 per week when mentioned by 80%
830   or more means very rarely performed, tasks performed 1-5 times per week are frequently conducted when
831   mentioned by 70% of the respondents, tasks performed 6-10 times per week and more than ten times per
832   week are very frequently conducted when mentioned by over 70% of the respondents.
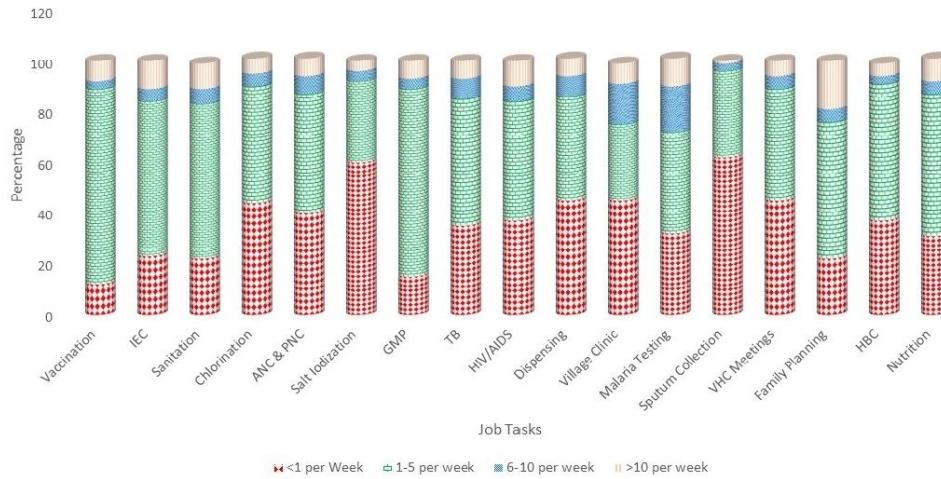
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90x56mm (300 x 300 DPI)

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	5,6,7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5,6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7,21,31,32
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7,8
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Not Applicable
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7,10,11,12
		(*b*) Describe any methods used to examine subgroups and interactions	Not Applicable
		(*c*) Explain how missing data were addressed	Not Applicable
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	Not Applicable
		(*e*) Describe any sensitivity analyses	Not Applicable
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5,10
		(b) Give reasons for non-participation at each stage	Not Applicable

		(c) Consider use of a flow diagram		Not Applicable
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders		10
		(b) Indicate number of participants with missing data for each variable of interest		Not Applicable
Outcome data	15*	Report numbers of outcome events or summary measures		1
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included		Not Applicable
		(*b*) Report category boundaries when continuous variables were categorized		Not Applicable
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		Not Applicable
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses		Not Applicable
Discussion				
Key results	18	Summarise key results with reference to study objectives		10-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias		2
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence		15
Generalisability	21	Discuss the generalisability (external validity) of the study results		5
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based		Not Applicable

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.