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## The effect of a 2-day communication skills training on nursing and midwifery students' empathy: a randomised controlled trial

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# The effect of a 2-day communication skills training on nursing and midwifery students' empathy: a randomised controlled trial

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## ABSTRACT

### Introduction

Empathy is crucial to the fundamental aim and achievement of nursing and midwifery goals. Researchers agree on the positive role empathy plays in interpersonal relationships when providing healthcare. Models of good communication have been developed to assist nurses, midwives, and doctors to improve their ability to communicate with patients. This study investigated the effect of a 2-day communication skills training (CST) on nursing and midwifery students' empathy in a randomised controlled trial.

### Methods

The two groups had a baseline data collection at the same time. The intervention group had a CST, followed by post-test on day 3. The control group had post-test on day 4 just before their CST. The empathy outcome was measured with Jefferson Scales of Empathy - Health Professions Student- version. Both groups had a follow-up test at the same time six months after the CST.

### Results

In this study, there was no statistically significant difference in the scores of empathy between the groups  $F(1, 171) = .18, p = .675$ . Eventhough there were slight increases in the intervention group from baseline - T1 (M = 109.75; SD = 9.76) to post-test - T2 (M = 111.85; SD = 8.95) as compared to the control group from baseline - T1 (M = 107.93; SD = 11.46); to post-test - T2 (M = 110.01; SD = 11.03). Baseline data was collected on 15 April 2013.

### Conclusions

This study has shown that empathy may not be enhanced within short period after CST.

### Keywords

empathy, nursing education, midwifery, randomised controlled trial, Ghana

### Strengths and limitations of this study

- This study used nursing and midwifery students who were actively involved. The use of various methods like group discussions, role-plays, videos, short presentations, and brainstorming sessions in the delivery of the communication skills training (CST) was a also a positive development, since such methods takes care of individual differences.

- There was allocation concealment to the researcher, research assistants, and the participants.
- The empathy measure used was Jefferson Scales of Empathy- Health Professions Student (JSE HPS- version) has construct validity and criterion-related validity which has been reported.
- A limitation of this study is the generalisation of the results to other healthcare professionals. As a self-report outcome, results of this study cannot be generalised beyond the characteristics of this sample.
- Confounding factors can also limit the generalisability of this study, the study could not control for interaction between the groups during the period of the study. This could lead to the problem of contamination between the groups (that is those in the intervention group talking to those in the control group after their days training sessions).

## INTRODUCTION

Empathy is crucial to the fundamental aim and achievement of nursing and midwifery goals[1]. Within the nursing and midwifery field, such skills are considered indicative of best practice[2]. It has also been stressed that empathy is a necessary factor in the provision of quality nursing care[3]. Researchers agree on the positive role empathy plays in interpersonal relationships when providing healthcare[4,5].

Models of good communication have been developed to assist nurses, midwives, and doctors to improve their ability to communicate with patients[6–12]. A Health Maintenance Organisation (Kaiser Permanente in the United States of America) developed the Four Habits Model (4HM), which they have used for more than 20 years, is an effective programme for clinical communication[6,7]. The model has been anchored into four habits; “invest in the beginning (Habit I), elicit patients’ perspective (Habit II), demonstrate empathy (Habit III), and invest in the end (Habit IV)”[6,7]. The habits from this theory was the basis of the communication skills training (CST) that was developed and used for this study. The other theoretical model called the Person-Centred Nursing Framework[13] was an essential component of the CST. Emphasis was made on the Person-Centred Nursing Framework necessary care processes of working with the patients beliefs and values, engagement, shared decision making, having sympathetic presence, and providing wholistic care[13].

### Objective

To investigate the effect of a 2-day CST on nursing and midwifery students’ empathy in a randomised controlled trial.

## METHODOLOGY

### Design and sample

This study was a pre-test post-test design in a randomised controlled trial (RCT) conducted at Tamale Nurses and Midwives College Ghana. The sample consisted of nursing students (n = 181) and midwifery students (n = 49).

1  
2 100 **Power analysis**

3 101 The sample size of the participants was determined by level of significance and effect size. A  
4 102 small effect size ( $d = 0.25$ ) and a two-tail significance test ( $\rho = 0.05$ ) resulted in a sample size of  
5 103 197.

6 104  
7 105 **Ethical approval**

8 106 The Research and Monitoring Department of Tamale Teaching Hospital, Tamale – Ghana, gave  
9 107 Ethical approval for this study on 5<sup>th</sup> May 2013. The approval number is TTH/R6M/SR/13/12.

10 108  
11 109 **Informed consent**

12 110 Informed consent was not written and participants were told that taking part in the CST and  
13 111 answering the questionnaires meant their consent and an agreement to any publication from it.  
14 112 Participants were informed of the objectives of the study and were also given opportunity to ask  
15 113 questions for a better understanding of the study. Participants were informed they could refuse to  
16 114 take part in the research at anytime without having to face any consequence.  
17 115

18 116 **Patient and Public Involvement**

19 117 Participants in this study were nursing and midwifery students and patients were not involved.  
20 118 The students as well as their Tutors were involved in the design of the communication skills  
21 119 training guide.  
22 120

23 121 **Criteria of inclusion and exclusion**

24 122 The inclusion and exclusion criteria are presented in Table 1.  
25 123  
26 124

27  
28  
29 **Table 1: Inclusion and exclusion criteria**

---

30 *Inclusion criteria*

- 31 • Nursing and midwifery students (NMS) in their second year at Tamale Nursing and  
32 Midwifery College.
- 33 • NMS whose ages were above 18 years.
- 34 • NMS in Tamale Nursing and Midwifery College who were available for follow-up data  
35 collection after 6 months.

36 *Exclusion criteria*

- 37 • NMS who were not studying at Tamale Nursing and Midwifery College.
  - 38 • NMS whose ages were below 18 years.
  - 39 • NMS in Tamale Nursing and Midwifery College who were not available for follow-up  
40 data collection after 6 months.
- 

41 126 **Randomisation**

42 127 There was allocation concealment to the researcher, research assistants, and the participants.  
43 128 The researcher (MA) and research Assistants conducted this by allowing participants to pick  
44 129 numbers written on papers, which had been randomly shuffled in a box. The NMS were  
45 130 separated before random assignment to ensure that both professions were approximately equally  
46 131 represented in the groups. Therefore, participants were randomly assigned to either intervention  
47 132 group or a control group.  
48 133

49 134 **Procedure**

50 135 The two groups had a baseline data collection (T1) at the same time. The intervention group had  
51 136 a CST, followed by post-test (T2) on day 3. The control group had post-test (T2) on day 4 just  
52 137 before their CST. The outcome was measured with Jefferson Scales of Empathy - Health  
53 138 Professions Student- version JSE HPS- version)[14]. Both groups had a follow-up test (T3) at the  
54 139 same time six months after the CST (Fig. 1).

Fig. 1: Flowchart showing enrolment, randomisation, CST, and data collection

### Outcome measure

The outcome was empathy measured with Jefferson Scales of Empathy- Health Professions Student (JSE HPS- version)[4]. There are different versions of the Jefferson Scales of Empathy. The versions are comparable in content. Slight changes are made in the words such that the text will be suitable for the planned health professionals. The JSE HPS- version[14] has 20 items in a Likert-type format using seven-point from 1 (strongly disagree) to 7 (strongly agree). It has ten negatively worded items. The negative worded items were items 1, 3, 6, 7, 8, 11, 12, 14, 18, and 19[14].

The scoring of the questionnaire was according to the scoring algorithm of Jefferson Scales of Empathy (JSE). According to the JSE “a respondent must answer at least 16 (80%) of the 20 items; otherwise the form should be regarded as incomplete and excluded from the data analysis. If a respondent fails to answer 4 or fewer items, the missing values should be replaced with the mean score calculated from the items the respondent completed”[14]. To score the questionnaire the negatively worded items were reversed scored (from 1 strongly agree to 7 strongly disagree), while the other items are directly scored on their Likert weights from 1 (strongly disagree) to 7 (strongly agree). The total score was the sum of all item scores. The higher the total empathy scores the higher the empathic behavioural orientation. The maximum total score for each participant is 140 and the minimum score is 20. Higher total scores indicate higher empathy whereas lower total scores indicate lower empathy[14]. According to the owners of the JSE, it takes 5-10 minutes to complete, although they do not endorse a time limit for completing the it[14].

*Psychometric properties:* Construct validity and criterion-related validity of the JSE HPS- version have been reported[15]. Hojat et al.[14] have reported that internal consistency reliability of this version as .89 for medical students and .87 for house officers. Hojat et al.[4] has reported a test-retest reliability for the JSE HPS- version as .65 ( $\rho < 0.01$ ). In their report, they said it was relatively low in magnitude, but acceptable for that kind of instrument considering the time interval between the test[4].

### Data analysis

Analysis of Variance (ANOVA) was used to test the hypothesis that there were statistically significant differences between the two groups at three time points. A significance level of  $\rho < .05$  was planned. However, because several independent analyses (5) were performed on the data the significance level of  $\rho < .05$  was adjusted to  $\rho < .01$  in interpreting the results using Bonferroni correction[16]. “The Bonferroni correction is an adjustment made to  $\rho$  values when several dependent or independent statistical tests are being performed simultaneously on a single data set”[16]. In this study, Bonferroni correction was computed by taking the critical  $\rho$  value ( $\alpha$ ) and divided it by the several dependent analyses (.05/5) resulting in the  $\rho < .01$ . All data were analysed using SPSS.

### Communication skills training (CST)

The author (MA) who was the main trainer, designed and developed the training guide using “Four Habits Model” (4HM)[17] and Person-Centred Nursing Framework (PCNF)[13].

Subsequently, the researcher trained a co-trainer (AAM) who assisted in the CST as well as in the data collection. The trainers used various methods to deliver the training. The methods were

190 small group discussions, brainstorming, personal experience from participants, group reports,  
 191 questions and answers, videos and summaries. Therefore, the training was on shared agenda.  
 192 This approach made it possible for participants to share their previous training knowledge and  
 193 ideas.

194  
 195 At the end of the training, participants were provided with photocopies of some relevant material  
 196 as well as useful reference books and literature that will enable nurses and midwives to learn  
 197 effective communication with patients.

## 199 RESULTS

### 200 Demographic data

201 Participants (N =173) were made of intervention group (n = 93 and control group (n = 80). The  
 202 demographic data are presented in Table 2.

203  
 204  
 205 **Table 2: Demographic data**

Characteristics	Intervention Group (n = 93)		Control Group (n = 80)		
	n	%	n	%	
Age	> 18 years	5	5.38	1	1.25
	19 – 21 years	42	45.16	32	40.00
	22 – 24 years	41	44.09	45	56.25
	25 – 27 years	2	2.15	1	1.25
	28 – 30 years	3	3.23	1	1.25
	31 years and above	0	0	0	0
Gender	Female	68	73.12	44	55.00
	Male	25	26.88	36	45.00
Speciality	Nursing student	62	66.67	69	86.25
	Midwifery students	31	33.33	11	13.75
Marital Status	Married	2	2.15	9	11.25
	Unmarried	90	96.77	70	87.50
	Divorced	1	1.08	1	1.25
Religion	Christianity	51	54.84	30	37.50
	Islam	40	43.01	48	60.00
	Other	2	2.15	2	2.50
Do you have children	Yes	1	1.08	8	10.00
	No	92	98.92	72	90.00
Number of children	No child	92	98.92	72	90.00
	1 child	1	1.08	2	2.50
	2 children	0	0	4	5.00
	3 children	0	0	2	2.50
	4 children and above	0	0	0	0
Ethnicity	Akan	11	11.83	5	6.25
	Dagomba	28	30.11	34	42.50
	Ewe	2	2.15	5	6.25
	Fanti	6	6.45	3	3.75
	Frafra (Grunsi)	10	10.75	2	2.50
	Ga-Adangme	3	3.23	0	-
	Gonja	8	8.60	3	3.75
	Kotokoli	0	0	3	3.75
	Basare/Bisa	0	0	2	2.50
	Kasina/Bulsa	0	0	3	3.75
	Dagati/Sisala	5	5.38	4	5.00
	Other tribes	20	21.51	16	20.00
Academic writing and	None	10	10.75	13	16.25



communication (AWC)	1 week	0	0	0	0
	2 weeks	0	0	1	1.25
	3 weeks	0	0	0	0
	1 month	1	1.08	0	0
	2 months	0	0	1	1.25
	3 months	3	3.23	2	2.50
	4 months (1 semester)	70	75.27	57	71.25
	2 semesters	5	5.38	6	7.50
	3 semesters	3	3.23	0	0
	4 Semesters	0	0	0	0
	Above 4 semesters	1	1.08	0	0

Legend: n = sample size in a particular group.

AWC = Academic writing and communication

### Descriptive statistics

The scores showed that there were slight increases in the intervention group from baseline - T1 (M = 109.75; SD = 9.76) to post-test - T2 (M = 111.85; SD = 8.95) as compared to the control group from baseline - T1 (M = 107.93; SD = 11.46); to post-test - T2 (M = 110.01; SD = 11.03) (Table 3).

**Table 3: Descriptive statistics of empathy**

Time	Group	N = 173		
		n	M	SD
Baseline (T1)	Intervention	93	109.75	9.76
	Control	80	107.93	11.46
Post-test (T2)	Intervention	93	111.85	8.95
	Control	80	110.01	11.03
Follow-up (T3)	Intervention	93	109.38	10.42
	Control	80	111.86	8.29

Legend: N = total sample size n = group sample size

M = mean score SD = standard deviation

### Inferential statistics

This study showed that there was no statistically significant difference in the scores of empathy between the groups  $F(1, 171) = .18, p = .675$  (Table 4).

**Table 4: Inferential statistics empathy**

Source	Type III SS	df	MS	F	Sig.
Intercept	6259179.09	1	6259179.09	55379.73	.000
Group	19.91	1	19.91	.18	.675
Error	19326.92	171	113.02		

Significance level  $p < .01$

Measurement is by time point

Transformed variable is by average

Legend: SS = Sum of Squares df = degrees of freedom

MS = Mean Square F = Statistic

Sig. = Significance level

### Effect of the CST, the empathy scores, and the demographic variables

In this study, there was no statistically significant effect between CST, the demographic variables of age, marital status, specialisation, ethnicity, and religion as well as academic writing and communication (AWC) (Table 5).



239 **Table 5: Effect of the CST, the empathy scores, and the demographic variables**

Source	Type III SS	df	MS	F	Sig.
Intercept	35,145.96	1	35,145.96	321.61	.000
Group * Gender	738.51	2	369.25	3.38	.037
Group * Age	431.25	2	215.63	1.97	.142
Group * Marital Status	72.00	2	36.00	0.33	.720
Group * Specialisation	241.87	2	120.94	1.11	.333
Group * Religion	219.32	2	109.66	1.00	.369
Group * Ethnicity	440.74	2	220.37	2.02	.137
Group * AWC	69.25	2	34.63	0.32	.729
Error	17,266.55	158	109.28		

240 Significance level  $\rho < .01$ 

241 Measurement is by time point

242 Transformed variable is by average

243 Legend: SS = Sum of Squares df = degrees of freedom

244 MS = Mean Square F = Statistic

245 Sig: = Significance level AWC = Academic writing and communication

246 **DISCUSSIONS**

247  
248 In this study, there was no statistically significant difference between the groups  $F(1, 171) = .18$ ,  
249  $\rho = .675$  (Table 24). The findings from this study are in contrast to the findings from a similar  
250 study that showed enhancement of empathy in nurses [18–20]. For example a study reported  
251 that nursing students empathy reasonable increase in scores ( $M = 88.63$ ;  $SD = 8.93$ )[19]. Further  
252 in contrast, another study found statistically significant effect in empathy scores following a  
253 training[20].

254  
255 Research has shown that there are a number of studies that doubt the effectiveness of empathy  
256 training programmes in nursing education and rather reported stability in empathy[21–29]. A  
257 study by La Monica et al.[24] did not find improvement in empathy outcomes. In a related study,  
258 they found stability in empathy after a short-term education ( $M = 20.7$ – $22.6$ ;  $SD = 3.0$ – $5.0$ )[25].  
259 In another research, it was reported that empathy was stable[26].

260  
261 Research has demonstrated that there are some relationship between empathy and demographic  
262 variables of gender, education, and experience. In this study, there were no significantly  
263 significant differences in empathy and the demographic variables of gender, age, marital status,  
264 specialisation, religion, number of children, ethnicity between the both groups. The findings  
265 from this study, are inconsistent with other studies where females empathy scores are reported to  
266 be higher than males[18–20,30–36]. For example, a study has demonstrated statistical  
267 significance in females empathy than males ( $\rho < 0.001$ )[19]. In addition, females were reported  
268 to showed increased in mean empathy score than male colleagues,  $M = 5.55$ ,  $SD = 0.46$  and ( $M$   
269  $= 5.35$ ,  $SD = 0.55$ )[33] respectively.

270  
271 This has further been buttressed in another study where the mean females empathy score ( $M =$   
272  $110.8$ ;  $SD = 11.7$ ) was reportedly higher than that of males ( $M = 105.3$ ;  $SD = 13.5$ ;  $\rho = 0.0001$ ;  $d$   
273  $= 0.44$ )[20]. In contrast there have been report of stability in empathy between females and  
274 males[36].

275  
276 Despite the above evidence of empathy in some nursing research in the short term following  
277 empathy training, there have been some doubts on empathy follow-up research[31,37,38]. In this  
278 study, empathy did not show any statistical significant difference between the groups in a follow-  
279 up after 6 months. This study is consistent with another study that found nursing empathy after  
280 training did not improve after 5 times measurement [ $F(1, 29) = 3.91$ ,  $\rho < 0.06$ ][37]. This doubt

1 281 in follow-up has also been reported in an earlier study by Daniels et al.[39].

2 282  
3 283  
4 284 In contrast, a another study found empathy increased 3-months after CST[38]. However, another  
5 285 study reported decreases in empathy as student advance through their nursing programme[40].  
6 286

7 287 It has also been found by some researchers' that there is a positive correlation between nursing  
8 288 students empathy and patient outcomes[41–44]. Yu and Kirk[45], In a systematic review of  
9 289 measurement of empathy in nursing research indicated that in 8 appraisal researches, there were  
10 290 enhancement of empathy levels of students but that it was unclear if such enhancement was  
11 291 sustainable.  
12 292

13 293 The results from this study confirms previous studies findings on nursing and midwifery training  
14 294 that empathy cannot be enhanced in a short period following CST[25–29,36,37]. With these  
15 295 similar finding, there is the need for further studies to determine the effectiveness of  
16 296 communication skills training in enhancing nursing and midwifery students' empathy,  
17 297 Most of the studies have focused on empathy levels of nurses, differences in empathy,  
18 298 relationship between empathy and demographics variables[45]. However, there are limited  
19 299 studies in the area of empathy in nursing and midwifery students (NMS). There are varied  
20 300 studies and the results from the previous studies show low[39,41], moderately enhanced[18,46]  
21 301 and high levels[18,28,46–50] of self-reported nurses' empathy. Other findings on nursing and  
22 302 midwifery training have contradicted this current study by indicating that empathy can be  
23 303 enhance with training[19,20,35]. However, some studies have found that nursing and midwifery  
24 304 students empathy actually decreases after training[40,51]. Other variables like age, gender,  
25 305 education, religion have been considered in research[18].  
26 306

27 307 Despite the fact that some studies have focused on empathy training among healthcare  
28 308 professionals including nursing and midwifery students in other countries, there are no known  
29 309 study in Ghana. This study will therefore add to the literature on how best to enhance  
30 310 communication skills training.  
31 311

## 32 312 33 313 **CONCLUSIONS**

34 314 This study has shown that empathy may not be enhanced within short period after  
35 315 communication skills training (CST). This is the first RCT using communication skills training  
36 316 (CST) in a nursing and midwifery school in Ghana. A study of this nature may better be  
37 317 evaluated by multi-centre location in RCT across several regions. This may offer a much better  
38 318 comparison.  
39 319

40 320 Despite the limitations and strengths of this current study, the following recommendations are  
41 321 made for future studies. This communication skills training (CST), had used a 2-day training  
42 322 period. A longer training period could have offered a better comparison. It does look like  
43 323 participants did not have the opportunity to read and reflect on the 2-day training before having a  
44 324 post-test. This study used one location and a multi-centre location in RCT across several nursing  
45 325 and midwifery schools probably could provide better outcomes.  
46 326

47 327 This study explored the effect CST the in post-test and 6-months post-training, however, the  
48 328 long-term examination could have been very useful. Further studies exploring the longer-term  
49 329 impact of the CST in other healthcare professionals and multi-location using cluster sampling  
50 329

330 may be beneficial. There is the need for additional studies to find out which aspects of CST for  
 331 nursing and midwifery students will enhance empathy.

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17 445

## 446 DECLARATIONS

### 447 List of abbreviations

448 AWC - Academic writing and communication

449 CST - Communication skills training

450 JSE HPS version- Jefferson Scales of Empathy- Health Professions Student- version

451 NMS -Nursing and midwifery students

452 RCT - Randomised controlled trials

### 454 Ethics Approval

455 The Research and Monitoring Department of Tamale Teaching Hospital, Tamale – Ghana, gave  
456 Ethical approval for this study on 5<sup>th</sup> May 2013. The approval number is TTH/R6M/SR/13/12.

### 458 Consent to Participate

459 Informed consent were taken from participants before the study. Informed consent was not  
460 written. Participants were informed of the objectives of the study and were also given  
461 opportunity to ask questions for a better understanding of the study. Participants were informed  
462 they could refuse to take part in the research at anytime without having to face any consequence.

### 464 Consent to Publish

465 Consent to publication was verbal. Participants were informed that those who do not consent to  
466 the publication of data taking from them in this study could withdraw at any time during the  
467 study. Therefore, participants were made to understand that taking part in the CST and  
468 answering the questionnaires meant consenting and an agreement to any publication(s) from it.

### 470 Availability of data and materials

471 The datasets supporting the conclusions of this article are included within the article (Extra data  
472 is available by emailing mustaph@uds.edu.gh).

### 474 Competing interests

475 The author declare that there are no competing interests.

### 477 Funding

478 This study had no funding.

1  
2 480 **Authors' contributions**

3 481 The author (MA) designed, undertook data collection, data analysis, and wrote this article.

4 482

5 483 **Authors' information**

6 484 The author (MA) is a lecturer at University for Development Studies, School of Allied Health  
7 485 Sciences, Tamale - Ghana.

8 486

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10 488 The author (MA) wish to thank the research assistant (AAM), management of Tamale Nursing  
11 489 and Midwifery college and the nursing and midwifery students for their participation in this  
12 490 study.

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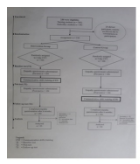


Fig. 1 - Flowchart showing enrollment, randomisation, CST, and data collection

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## CONSORT 2010 checklist of information to include when reporting a randomised trial\*

Section/Topic	Item No	Checklist item	Reported on page No
<b>Title and abstract</b>			
	1a	Identification as a randomised trial in the title	Yes, Page 1
	1b	Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)	Yes, Page 1
<b>Introduction</b>			
Background and objectives	2a	Scientific background and explanation of rationale	Yes, Page 2
	2b	Specific objectives or hypotheses	Yes, Page 2
<b>Methods</b>			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	Yes, Page 2
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	Not applicable
Participants	4a	Eligibility criteria for participants	Yes, Page 3
	4b	Settings and locations where the data were collected	Yes, Page 3
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	Yes, Page 3
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	Yes, Page 3
	6b	Any changes to trial outcomes after the trial commenced, with reasons	Not applicable
Sample size	7a	How sample size was determined	Yes, Page 2
	7b	When applicable, explanation of any interim analyses and stopping guidelines	Not applicable
<b>Randomisation:</b>			
Sequence generation	8a	Method used to generate the random allocation sequence	Yes, Page 3
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	Yes, Page 3
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	Yes, Page 3
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	Yes, Page 3
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those	Yes, Page 3

1			
2		assessing outcomes) and how	
3			
4		11b If relevant, description of the similarity of interventions	<u>Not applicable</u>
5	Statistical methods	12a Statistical methods used to compare groups for primary and secondary outcomes	<u>Yes, Page 4</u>
6		12b Methods for additional analyses, such as subgroup analyses and adjusted analyses	<u>Not applicable</u>
7			
8	<b>Results</b>		
9	Participant flow (a	13a For each group, the numbers of participants who were randomly assigned, received intended treatment, and	<u>Yes, Page 3</u>
10	diagram is strongly	were analysed for the primary outcome	
11	recommended)	13b For each group, losses and exclusions after randomisation, together with reasons	<u>Not applicable</u>
12	Recruitment	14a Dates defining the periods of recruitment and follow-up	<u>Yes, Page 3</u>
13		14b Why the trial ended or was stopped	<u>Not applicable</u>
14	Baseline data	15 A table showing baseline demographic and clinical characteristics for each group	<u>Yes, Page 5</u>
15	Numbers analysed	16 For each group, number of participants (denominator) included in each analysis and whether the analysis was	<u>Yes, Page 5</u>
16		by original assigned groups	
17			
18	Outcomes and	17a For each primary and secondary outcome, results for each group, and the estimated effect size and its	<u>Yes, Page 6</u>
19	estimation	precision (such as 95% confidence interval)	
20		17b For binary outcomes, presentation of both absolute and relative effect sizes is recommended	<u>Not applicable</u>
21	Ancillary analyses	18 Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing	<u>Not applicable</u>
22		pre-specified from exploratory	
23			
24	Harms	19 All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	<u>Not applicable</u>
25			
26	<b>Discussion</b>		
27	Limitations	20 Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	<u>Not applicable</u>
28	Generalisability	21 Generalisability (external validity, applicability) of the trial findings	<u>Yes, Page 8</u>
29	Interpretation	22 Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	<u>Yes, Page 8</u>
30			
31	<b>Other information</b>		
32	Registration	23 Registration number and name of trial registry	<u>Not applicable</u>
33	Protocol	24 Where the full trial protocol can be accessed, if available	<u>Not applicable</u>
34	Funding	25 Sources of funding and other support (such as supply of drugs), role of funders	<u>Not applicable</u>
35			

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37 \*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration for important clarifications on all the items. If relevant, we also

38 recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials.

39 Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see [www.consort-statement.org](http://www.consort-statement.org).

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# BMJ Open

## The effect of a 2-day communication skills training on nursing and midwifery students' empathy: a randomised controlled trial

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# The effect of a 2-day communication skills training on nursing and midwifery students' empathy: a randomised controlled trial

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## Abstract

**Introduction** Empathy is crucial to the fundamental aim and achievement of nursing and midwifery goals. Researchers agree on the positive role empathy plays in interpersonal relationships when providing healthcare. Models of good communication have been developed to assist nurses, midwives, and doctors to improve their ability to communicate with patients. This study investigated the effect of a 2-day communication skills training on nursing and midwifery students' empathy in a randomised controlled trial.

**Methods** The two groups had a baseline data collection at the same time. The intervention group had a communication skills training, followed by post-test on day 3. The control group had post-test on day 4 just before their communication skills training. The empathy outcome was measured with Jefferson Scales of Empathy - Health Professions Student- version. Both groups had a follow-up test at the same time six months after the communication skills training.

**Results** In this study, there was no statistically significant difference in the scores of empathy between the groups  $F(1, 171) = .18, p = .675$ . The intervention group had baseline - T1 ( $M = 109.75$ ;  $SD = 9.76$ ), and post-test - T2 ( $M = 111.85$ ;  $SD = 8.95$ ), whereas the control group had baseline - T1 ( $M = 107.93$ ;  $SD = 11.46$ ); and post-test - T2 ( $M = 110.01$ ;  $SD = 11.03$ ). Baseline data was collected on 15 June 2013.

**Conclusions** This study has shown that empathy may not be enhanced within short period after communication skills training.

## Keywords

empathy, nursing education, midwifery, randomised controlled trial, Ghana

## Strengths and limitations of this study

- This study used nursing and midwifery students who were actively involved. The use of various methods like group discussions, role-plays, videos, short presentations, and

brainstorming sessions in the delivery of the communication skills training was also a positive development, since such methods takes care of individual differences.

- There was allocation concealment to the researcher, research assistants, and the participants.
- The empathy measure used was Jefferson Scales of Empathy- Health Professions Student (JSE HPS- version) has construct validity and criterion-related validity which has been reported.
- A limitation of this study is the generalisation of the results to other healthcare professionals. As a self-report outcome, results of this study cannot be generalised beyond the characteristics of this sample.
- Confounding factors can also limit the generalisability of this study, the study could not control for interaction between the groups during the period of the study. This could lead to the problem of contamination between the groups (that is those in the intervention group talking to those in the control group after their days training sessions).

## Introduction

Empathy is crucial to the fundamental aim and achievement of nursing and midwifery goals[1]. Within the nursing and midwifery field, such skills are considered indicative of best practice[2]. It has also been stressed that empathy is a necessary factor in the provision of quality nursing care[3]. Researchers agree on the positive role empathy plays in interpersonal relationships when providing healthcare[4,5].

Models of good communication have been developed to assist nurses, midwives, and doctors to improve their ability to communicate with patients[6–12]. A Health Maintenance Organisation (Kaiser Permanente in the United States of America) developed the Four Habits Model (4HM), which they have used for more than 20 years, is an effective programme for clinical communication[6,7]. The model has been anchored into four habits; “invest in the beginning (Habit I), elicit patients’ perspective (Habit II), demonstrate empathy (Habit III), and invest in the end (Habit IV)”[6,7]. The habits from this theory was the basis of the communication skills training that was developed and used for this study. The other theoretical model called the Person-Centred Nursing Framework[13] was an essential component of the communication skills training. Emphasis was made on the Person-Centred Nursing Framework necessary care processes of working with the patients beliefs and values, engagement, shared decision making, having sympathetic presence, and providing wholistic care[13].

## Objective

To investigate the effect of a 2-day communication skills training on nursing and midwifery students’ empathy in a randomised controlled trial.

## Methodology

### Design and sample

This study was a 2 (intervention condition, between) x 3 (time, repeated) design in a randomised controlled trial (RCT) conducted at Tamale Nurses and Midwives College Ghana. The sample consisted of nursing students (n = 181) and midwifery students (n = 49).

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6 97 **Power analysis**

7 98 The sample size of the participants was based upon a power analysis. Relationship have been  
8 99 shown between training interventions and improved communication skills, measured with Roter  
9 100 Interaction Analysis System (RIAS), with an effect size between medium and high [14]. Fixing  
10 101 the effect size medium ( $d = 0.25$ ), using a two-tail significance test ( $p = 0.05$ ), a sample size of  
11 102 197 resulted in an acceptable power coefficient of 0.95 [15]. The sample size was computed  
12 103 using G\*Power software[15,16].

13 105 **Ethical approval**

14 106 The Research and Monitoring Department of Tamale Teaching Hospital, Tamale – Ghana, gave  
15 107 Ethical approval for this study on 5<sup>th</sup> May 2013. The approval number is TTH/R6M/SR/13/12.

16 108  
17 109 **Informed consent**

18 110 Informed consent was not written and participants were told that taking part in the  
19 111 communication skills training and answering the questionnaires meant their consent and an  
20 112 agreement to any publication from it. Participants were informed of the objectives of the study  
21 113 but not in detail such that they would know that the study wants to determine their empathy  
22 114 level, but were also given opportunity to ask questions to enable them decide to take part in this  
23 115 study. Participants were informed they could refuse to take part in the research at anytime  
24 116 without having to face any consequence.

25 118 **Patient and Public Involvement**

26 119 Participants in this study were nursing and midwifery students and patients were not involved.  
27 120 The students as well as their Tutors were involved in the design of the communication skills  
28 121 training guide.

29 122  
30 123 **Criteria of inclusion and exclusion**

31 124 The inclusion and exclusion criteria are presented in Table 1.

32 125 **Table 1: Inclusion and exclusion criteria**

33 126 *Inclusion criteria*

- Nursing and midwifery students in their second year at Tamale Nursing and Midwifery College.
- Nursing and midwifery students whose ages were above 18 years.
- Nursing and midwifery students in Tamale Nursing and Midwifery College who were available for follow-up data collection after 6 months.

38 127 *Exclusion criteria*

- Nursing and midwifery students who were not studying at Tamale Nursing and Midwifery College.
- Nursing and midwifery students whose ages were below 18 years.
- Nursing and midwifery students in Tamale Nursing and Midwifery College who were not available for follow-up data collection after 6 months.

43 128 **Randomisation**

44 129 There was allocation concealment to the researcher, research assistants, and the participants.  
45 130 The researcher (MA) and research Assistants conducted this by allowing participants to pick  
46 131 numbers written on papers, which had been randomly shuffled in a box. The Nursing and midwifery  
47 132 students were separated before random assignment to ensure that both professions were  
48 133 approximately equally represented in the groups. Therefore, participants were randomly assigned  
49 134 to either intervention group or a control group.

50 135  
51 136 **Procedure**

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6 137 The two groups had a baseline data collection (T1) at the same time. The intervention group had  
7 138 a communication skills training , followed by post-test (T2) on day 3. The control group had  
8 139 post-test (T2) on day 4 just before their communication skills training . The communication  
9 140 skills training for both groups were the same. The tutors were aware of the training and data  
10 141 collection for the intervention and control group, however the intervention and control groups  
11 142 were not aware. The outcome was measured with Jefferson Scales of Empathy - Health  
12 143 Professions Student- version JSE HPS- version)[17]. Both groups had a follow-up test (T3) at the  
13 144 same time six months after the communication skills training (Fig. 1).  
14 145

14 146 Fig. 1: Flowchart showing enrolment, randomisation, communication skills training , and data  
15 147 collection  
16 148

### 17 149 **Outcome measure**

18 150 The outcome was empathy measured with Jefferson Scales of Empathy- Health Professions  
19 151 Student (JSE HPS- version)[4]. The JSE HPS version was in English Language. This  
20 152 questionnaire was administered in English Language. There are different versions of the  
21 153 Jefferson Scales of Empathy. The versions are comparable in content. Slight changes are made in  
22 154 the words such that the text will be suitable for the planned health professionals. The JSE HPS-  
23 155 version[17] has 20 items in a Likert-type format using seven-point from 1 (strongly disagree) to  
24 156 7 (strongly agree). It has ten negatively worded items. The negative worded items were items 1,  
25 157 3, 6, 7, 8, 11, 12, 14, 18, and 19[17].

26 159 The scoring of the questionnaire was according to the scoring algorithm of Jefferson Scales of  
27 160 Empathy (JSE). According to the JSE “a respondent must answer at least 16 (80%) of the 20  
28 161 items; otherwise the form should be regarded as incomplete and excluded from the data analysis.  
29 162 If a respondent fails to answer 4 or fewer items, the missing values should be replaced with the  
30 163 mean score calculated from the items the respondent completed”[17]. To score the questionnaire  
31 164 the negatively worded items were reversed scored (from 1 strongly agree to 7 strongly disagree),  
32 165 while the other items are directly scored on their Likert weights from 1 (strongly disagree) to 7  
33 166 (strongly agree). The total score was the sum of all item scores. The higher the total empathy  
34 167 scores the higher the empathic behavioural orientation. The maximum total score for each  
35 168 participant is 140 and the minimum score is 20. Higher total scores indicate higher empathy  
36 169 whereas lower total scores indicate lower empathy[17]. According to the owners of the JSE, it  
37 170 takes 5-10 minutes to complete, although they do not endorse a time limit for completing the  
38 171 it[17].

39 173 *Psychometric properties:* Construct validity and criterion-related validity of the JSE HPS-  
40 174 version have been reported[18]. Hojat et al.[17] have reported that internal consistency reliability  
41 175 of this version as .89 for medical students and .87 for house officers. Hojat et al.[4] has reported  
42 176 a test-retest reliability for the JSE HPS- version as .65 ( $\rho < 0.01$ ). In their report, they said it was  
43 177 relatively low in magnitude, but acceptable for that kind of instrument considering the time  
44 178 interval between the test[4].  
45 179

### 46 180 **Data analysis**

47 181 Analysis of Variance (ANOVA) was used to test the hypothesis that there were statistically  
48 182 significant differences between the two groups at three time points. A Shapiro-Wilk's test ( $\rho <$   
49 183 .05) [19,20] and a visual inspection of their histograms showed variable scores were  
50 184 approximately normally distributed. A significance level of  $\rho < .05$  was planned. However,  
51 185 because several independent analyses (5) were performed on the data the significance level of  $\rho$   
52 186  $< .05$  was adjusted to  $\rho < .01$  in interpreting the results using Bonferroni correction[21]. “The



Bonferroni correction is an adjustment made to  $\rho$  values when several dependent or independent statistical tests are being performed simultaneously on a single data set"[21]. In this study, Bonferroni correction was computed by taking the critical  $\rho$  value ( $\alpha$ ) and divided it by the several dependent analyses (.05/5) resulting in the  $\rho < .01$ . All data were analysed using SPSS.

### Communication skills training (CST)

The author (MA) who was the main trainer, designed and developed the training guide using "Four Habits Model" (4HM)[22] and Person-Centred Nursing Framework (PCNF)[13].

Subsequently, the researcher trained a co-trainer (AAM) who assisted in the communication skills training as well as in the data collection. The data was analysed by the author (MA) without blinding. The trainers used various methods to deliver the training. The methods were small group discussions, brainstorming, personal experience from participants, group reports, role-playing, questions and answers, videos and summaries. Therefore, the training was on shared agenda. This approach made it possible for participants to share their previous training knowledge and ideas.

At the end of the training, participants were provided with photocopies of some relevant material as well as useful reference books and literature that will enable nurses and midwives to learn effective communication with patients.

## Results

### Demographic data

Participants (N=173) were made of intervention group (n = 93 and control group (n = 80). The demographic data are presented in Table 2.

**Table 2: Demographic data**

Characteristics	Intervention Group (n = 93)		Control Group (n = 80)		
	n	%	n	%	
Age	> 18 years	5	6	1	1
	19 – 21 years	42	45	32	40
	22 – 24 years	41	44	45	57
	25 – 27 years	2	2	1	1
	28 – 30 years	3	3	1	1
31 years and above	0	0	0	0	
Gender	Female	68	73	44	55
	Male	25	27	36	45
Speciality	Nursing student	62	67	69	86
	Midwifery students	31	33	11	14
Marital Status	Married	2	2	9	11
	Unmarried	90	97	70	88
	Divorced	1	1	1	1
Religion	Christianity	51	55	30	38
	Islam	40	43	48	60
	Other	2	2	2	2
Number of children	No child	92	99	72	90
	1 child	1	1	2	2
	2 children	0	0	4	5
	3 children	0	0	2	3
	4 children and above	0	0	0	0

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Ethnicity	Akan	11	12	5	6
	Dagomba	28	30	34	43
	Ewe	2	2	5	6
	Fanti	6	6	3	4
	Frafra (Grunsi)	10	12	2	2
	Ga-Adangme	3	3	0	0
	Gonja	8	9	3	4
	Kotokoli	0	0	3	4
	Basare/Bisa	0	0	2	2
	Kasina/Bulsa	0	0	3	4
	Dagati/Sisala	5	5	4	5
	Other tribes	20	21	16	20
Academic writing and communication (AWC)	None	10	11	13	16
	1 week	0	0	0	0
	2 weeks	0	0	1	1
	3 weeks	0	0	0	0
	1 month	1	1	0	0
	2 months	0	0	1	1
	3 months	3	3	2	3
	4 moths (1 semester)	70	75	57	71
	2 semesters	5	6	6	8
	3 semesters	3	3	0	0
	4 Semesters	0	0	0	0
	Above 4 semesters	1	1	0	0

Legend: n = sample size in a particular group.  
AWC = Academic writing and communication

**Descriptive statistics**

The scores showed that there were slight increases in the intervention group from baseline - T1 (M = 109.75; SD = 9.76) to post-test - T2 (M = 111.85; SD = 8.95) as compared to the control group from baseline - T1 (M = 107.93; SD = 11.46); to post-test - T2 (M = 110.01; SD = 11.03). The effect sizes were Time 1 (0.160), Time 2 (0.201), and Time 3 (-0.252) (Table 3).

**Table 3: Descriptive statistics of empathy**

Time	Group	N = 173			95% CI for Cohen's d		
		n	M	SD	Cohen's d	Lower	Upper
Baseline (T1)	Intervention	93	109.75	9.76	0.160	-0.139	0.458
	Control	80	107.93	11.46			
Post-test (T2)	Intervention	93	111.85	8.95	0.201	-0.098	0.499
	Control	80	110.01	11.03			
Follow-up (T3)	Intervention	93	109.38	10.42	-0.252	-0.551	0.048
	Control	80	111.86	8.29			

Legend: N = total sample size n = group sample size  
M = mean score SD = standard deviation

**Inferential statistics**

This study showed that there was no statistically significant difference in the scores of empathy between the groups  $F(1, 171) = .18, p = .675$  (Table 4).

**Table 4: Inferential statistics empathy**

Source	Type III SS	df	MS	F	Sig.
Intercept	6259179.09	1	6259179.09	55379.73	.000
Group	19.91	1	19.91	.18	.675
Error	19326.92	171	113.02		

Significance level  $p < .01$   
Measurement is by time point  
Transformed variable is by average

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Legend: SS = Sum of Squares      df = degrees of freedom  
MS = Mean Square      F = Statistic  
Sig: = Significance level

### Effect of the communication skills training, the empathy scores, and the demographic variables

In this study, there was no statistically significant effect between communication skills training, the demographic variables of age, marital status, specialisation, ethnicity, and religion as well as academic writing and communication (AWC) (Table 5).

**Table 5: Effect of the communication skills training, the empathy scores, and the demographic variables**

Source	Type III SS	df	MS	F	Sig.
Intercept	35,145.96	1	35,145.96	321.61	.000
Group * Gender	738.51	2	369.25	3.38	.037
Group * Age	431.25	2	215.63	1.97	.142
Group * Marital Status	72.00	2	36.00	0.33	.720
Group * Specialisation	241.87	2	120.94	1.11	.333
Group * Religion	219.32	2	109.66	1.00	.369
Group * Ethnicity	440.74	2	220.37	2.02	.137
Group * AWC	69.25	2	34.63	0.32	.729
Error	17,266.55	158	109.28		

Significance level  $\rho < .01$

Measurement is by time point

Transformed variable is by average

Legend: SS = Sum of Squares      df = degrees of freedom

MS = Mean Square      F = Statistic

Sig: = Significance level      AWC = Academic writing and communication

## Discussions

In this study, there was no statistically significant difference between the groups  $F(1, 171) = .18$ ,  $\rho = .675$  (Table 24). The findings from this study are in contrast to the findings from a similar study that showed enhancement of empathy in nurses [23–26]. For example a study reported that nursing students empathy reasonable increase in scores ( $M = 88.63$ ;  $SD = 8.93$ )[24][23]. Further in contrast, another study found statistically significant effect in empathy scores following a training[25].

Research has shown that there are a number of studies that doubt the effectiveness of empathy training programmes in nursing education and rather reported stability in empathy[27–35]. A study by La Monica et al.[30] did not find improvement in empathy outcomes. In a related study, they found stability in empathy after a short-term education ( $M = 20.7$ – $22.6$ ;  $SD = 3.0$ – $5.0$ )[31]. In another research, it was reported that empathy was stable[32].

Research has demonstrated that there are some relationship between empathy and demographic variables of gender, education, and experience. In this study, there were no significantly significant differences in empathy and the demographic variables of gender, age, marital status, specialisation, religion, number of children, ethnicity between the both groups. The findings from this study, are inconsistent with other studies where females empathy scores are reported to be higher than males[23–25,36–42]. For example, a study has demonstrated statistical significance in females empathy than males ( $\rho < 0.001$ )[24]. In addition, females were reported to showed increased in mean empathy score than male colleagues,  $M = 5.55$ ,  $SD = 0.46$ ) and ( $M = 5.35$ ,  $SD = 0.55$ [39] respectively.

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6 279 This has further been buttressed in another study where the mean females empathy score (M =  
7 280 110.8; SD = 11.7) was reportedly higher than that of males (M = 105.3; SD = 13.5;  $\rho = 0.0001$ ;  $d$   
8 281 = 0.44)[25]. In contrast there have been report of stability in empathy between females and  
9 282 males[42].  
10 283

11 284 Despite the above evidence of empathy in some nursing research in the short term following  
12 285 empathy training, there have been some doubts on empathy follow-up research[37,43,44]. In this  
13 286 study, empathy did not show any statistical significant difference between the groups in a follow-  
14 287 up after 6 months. This study is consistent with another study that found nursing empathy after  
15 288 training did not improve after 5 times measurement [ $F(1, 29) = 3.91, \rho < 0.06$ ][43]. This doubt  
16 289 in follow-up has also been reported in an earlier study by Daniels et al.[45].  
17 290

18 291 | In contrast, another study found empathy increased 3-months after communication skills training  
19 292 [44]. However, another study reported decreases in empathy as student advance through their  
20 293 nursing programme[46].  
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23 296 It has also been found by some researchers' that there is a positive correlation between nursing  
24 297 students empathy and patient outcomes[47–50]. Yu and Kirk[51], In a systematic review of  
25 298 measurement of empathy in nursing research indicated that in 8 appraisal researches, there were  
26 299 enhancement of empathy levels of students but that it was unclear if such enhancement was  
27 300 sustainable.  
28 301

29 302 The results from this study confirms previous studies findings on nursing and midwifery training  
30 303 that empathy cannot be enhanced in a short period following communication skills training  
31 304 | ~~EST~~[31–35,42,43]. With these similar finding, there is the need for further studies to determine  
32 305 the effectiveness of communication skills training in enhancing nursing and midwifery students'  
33 306 empathy,  
34 307

35 308 Most of the studies have focused on empathy levels of nurses, differences in empathy,  
36 309 relationship between empathy and demographics variables[51]. However, there are limited  
37 310 studies in the area of empathy in nursing and midwifery students. There are varied studies and  
38 311 the results from the previous studies show low[45,47], moderately enhanced[23,52] and high  
39 312 levels[23,34,52–56] of self-reported nurses' empathy. Other findings on nursing and midwifery  
40 313 training have contradicted this current study by indicating that empathy can be enhance with  
41 314 training[24,25,41]. However, some studies have found that nursing and midwifery students  
42 315 empathy actually decreases after training[46,57]. Other variables like age, gender, education,  
43 316 religion have been considered in research[23].  
44 317

45 318 Despite the fact that some studies have focused on empathy training among healthcare  
46 319 professionals including nursing and midwifery students in other countries, there are no known  
47 320 study in Ghana. This study will therefore add to the literature on how best to enhance  
48 321 communication skills training.  
49 322

## 322 Conclusions

323 This study has shown that empathy may not be enhanced within short period after  
324 | communication skills training-. The participants were made aware of empathy being an outcome  
325 of this study and since JES is self-reported, it may have impacted their self-report. Selection bias  
326 may have impacted the lack of significance. It's possible that participants that volunteered were  
327 more empathetic compared to baseline and JES is self-report. More so, the 2-day training time  
328 was not enough and that could have accounted for none enhancement of empathy.  
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330 This is the first RCT using communication skills training in a nursing and midwifery school in  
331 Ghana. A study of this nature may better be evaluated by multi-centre location in RCT across  
332 several regions. This may offer a much better comparison.

333 |  
334 In this study, the females outnumbered the males both in the intervention and control. This is a  
335 limitation in the sense that females turn to be empathetic then males. Also, 99% of participants  
336 were either Christians or Muslims, as one is aware region teaches its members to be empathetic  
337 towards one another and this could have an effect the outcome of this study.

338 |  
339 Despite the limitations and strengths of this current study, the following recommendations are  
340 made for future studies. This communication skills training, had used a 2-day training period. A  
341 longer training period could have offered a better comparison. It does look like participants did  
342 not have the opportunity to read and reflect on the 2-day training before having a post-test. This  
343 study used one location and a multi-centre location in RCT across several nursing and midwifery  
344 schools probably could provide better outcomes.

345 |  
346 This study explored the effect communication skills training the in post-test and 6-months post-  
347 training, however, the long-term examination could have been very useful. Further studies  
348 exploring the longer-term impact of the communication skills training in other healthcare  
349 professionals and multi-location using cluster sampling may be beneficial. There is the need for  
350 additional studies to find out which aspects of communication skills training for nursing and  
351 midwifery students will enhance empathy.

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## Footnotes

### List of abbreviations

AWC - Academic writing and communication

JSE HPS version- Jefferson Scales of Empathy- Health Professions Student- version

RCT - Randomised controlled trials

**Contributors:** The author (MA) designed, undertook data collection, data integrity, accuracy of the analyses, and writing of this article.

ORCID: Mustapha Alhassan - <http://orcid.org/0000-0002-5635-8955>

**Funding:** None declared.

**Competing interest:** None declared.

**Patient consent:** Obtained

**Ethics approval:** The Research and Monitoring Department of Tamale Teaching Hospital, Tamale – Ghana, gave Ethical approval for this study on 5<sup>th</sup> May 2013. The approval number is TTH/R6M/SR/13/12.

**Provenance and peer review:** Not commissioned; externally peer reviewed.

**Data Sharing statement:** Data available from the Dryad Digital Repository site at <https://doi.org/10.5061/dryad.k08hc77>

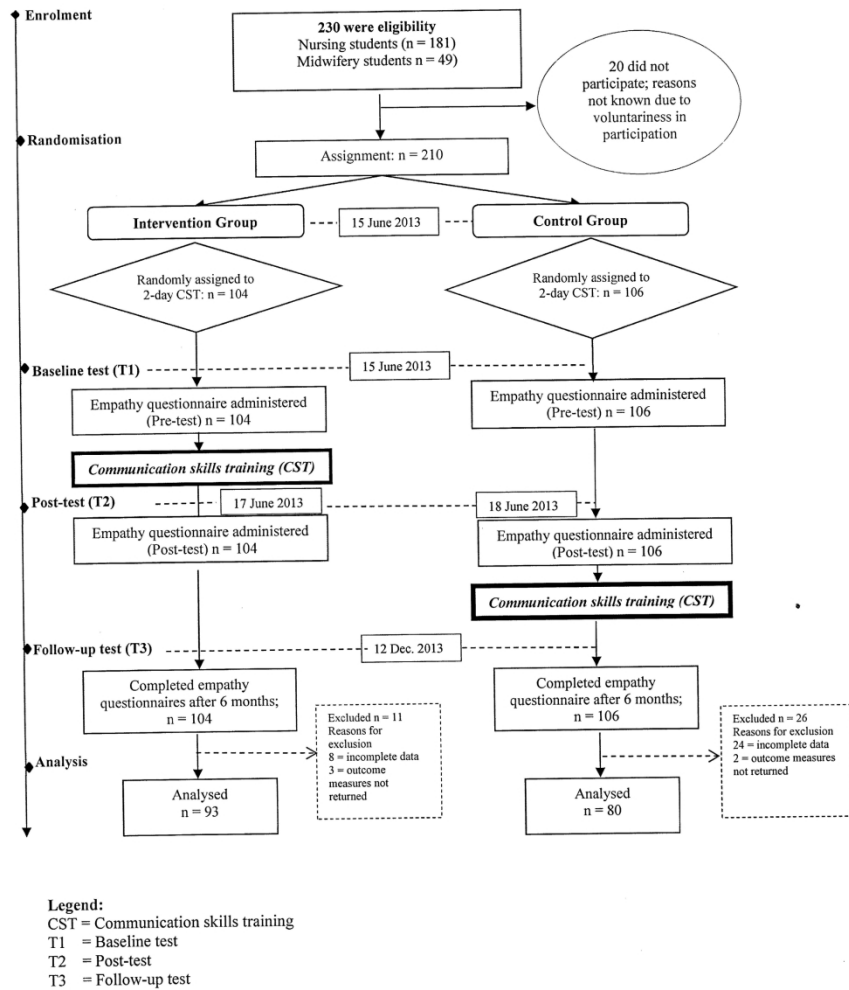


Fig. 1: Flowchart showing enrolment, randomisation, CST, and data collection

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## CONSORT 2010 checklist of information to include when reporting a randomised trial\*

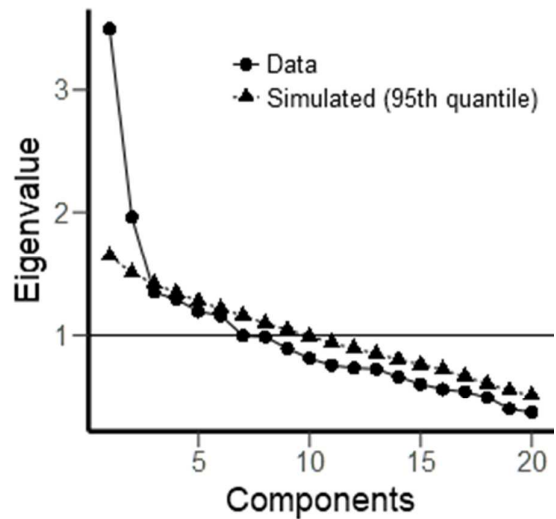
Section/Topic	Item No	Checklist item	Reported on page No
<b>Title and abstract</b>			
	1a	Identification as a randomised trial in the title	Yes, Page 1
	1b	Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)	Yes, Page 1
<b>Introduction</b>			
Background and objectives	2a	Scientific background and explanation of rationale	Yes, Page 2
	2b	Specific objectives or hypotheses	Yes, Page 2
<b>Methods</b>			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	Yes, Page 2
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	Not applicable
Participants	4a	Eligibility criteria for participants	Yes, Page 3
	4b	Settings and locations where the data were collected	Yes, Page 3
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	Yes, Page 3
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	Yes, Page 3
	6b	Any changes to trial outcomes after the trial commenced, with reasons	Not applicable
Sample size	7a	How sample size was determined	Yes, Page 2
	7b	When applicable, explanation of any interim analyses and stopping guidelines	Not applicable
<b>Randomisation:</b>			
Sequence generation	8a	Method used to generate the random allocation sequence	Yes, Page 3
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	Yes, Page 3
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	Yes, Page 3
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	Yes, Page 3
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those	Yes, Page 3

		assessing outcomes) and how	
	11b	If relevant, description of the similarity of interventions	Not applicable
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	Yes, Page 4
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	Not applicable
<b>Results</b>			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	Yes, Page 3
	13b	For each group, losses and exclusions after randomisation, together with reasons	Not applicable
Recruitment	14a	Dates defining the periods of recruitment and follow-up	Yes, Page 3
	14b	Why the trial ended or was stopped	Not applicable
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	Yes, Page 5
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	Yes, Page 5
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	Yes, Page 6
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	Not applicable
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	Not applicable
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	Not applicable
<b>Discussion</b>			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	Not applicable
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	Yes, Page 8
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	Yes, Page 8
<b>Other information</b>			
Registration	23	Registration number and name of trial registry	Not applicable
Protocol	24	Where the full trial protocol can be accessed, if available	Not applicable
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	Not applicable

\*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration for important clarifications on all the items. If relevant, we also recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials. Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see [www.consort-statement.org](http://www.consort-statement.org).

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**Fig. 2: Scree Plot**



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**Table 6: Principal component analysis****Component Loadings**

	RC 1	RC 2	Uniqueness
JSE_T1_Qn1	.	0.553	0.701
JSE_T1_Qn10	0.485	.	0.735
JSE_T1_Qn11	.	0.552	0.638
JSE_T1_Qn12	.	0.622	0.605
JSE_T1_Qn13	0.477	.	0.767
JSE_T1_Qn14	.	.	0.842
JSE_T1_Qn15	0.591	.	0.657
JSE_T1_Qn16	0.676	.	0.526
JSE_T1_Qn17	.	.	0.886
JSE_T1_Qn18	-0.551	.	0.703
JSE_T1_Qn19	.	.	0.927
JSE_T1_Qn2	0.446	.	0.798
JSE_T1_Qn20	0.689	.	0.535
JSE_T1_Qn3	.	.	0.848
JSE_T1_Qn4	0.551	.	0.596
JSE_T1_Qn5	0.535	.	0.713
JSE_T1_Qn6	.	0.432	0.766
JSE_T1_Qn7	.	.	0.825
JSE_T1_Qn8	.	0.499	0.756
JSE_T1_Qn9	.	.	0.725

**Table 7: Chi-squared Test**

	Value	df	p
Model	213.474	151	< .001

**Table 8: Independent Samples T-Test**

	t	df	p	Cohen's d	95% CI for Cohen's d	
					Lower	Upper
Time 1	1.051	172.0	0.295	0.160	-0.139	0.458
Time 2	1.323	172.0	0.187	0.201	-0.098	0.499
Time 3	-1.658	172.0	0.099	-0.252	-0.551	0.048

*Note.* Student's t-test.



# BMJ Open

## The effect of a 2-day communication skills training on nursing and midwifery students' empathy: a randomised controlled trial

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# The effect of a 2-day communication skills training on nursing and midwifery students' empathy: a randomised controlled trial

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## Abstract

**Introduction:** Empathy is crucial to the fundamental aim and achievement of nursing and midwifery goals. Researchers agree on the positive role empathy plays in interpersonal relationships when providing healthcare. Models of good communication have been developed to assist nurses, midwives, and doctors to improve their ability to communicate with patients. This study investigated the effect of a 2-day communication skills training on nursing and midwifery students' empathy in a randomised controlled trial.

**Methods:** The two groups had a baseline data collection at the same time. The intervention group had a communication skills training, followed by post-test on day 3. The control group had post-test on day 4 just before their communication skills training. The empathy outcome was measured with Jefferson Scales of Empathy - Health Professions Student- version. Both groups had a follow-up test at the same time six months after the communication skills training.

**Results:** In this study, there was no statistically significant difference in the scores of empathy between the groups  $F(1, 171) = .18, p = .675$ . The intervention group had baseline - T1 (M = 109.8, SD = 9.8,  $d = 0.160$ ), and post-test - T2 (M = 111.9, SD = 9.0,  $d = 0.201$ ), whereas the control group had baseline - T1 (M = 107.9, SD = 11.46,  $d = 0.160$ ); and post-test - T2 (M = 110.0, SD = 11.0,  $d = 0.201$ ). Baseline data was collected on 15 June 2013.

**Conclusions:** This study has shown that empathy may not be enhanced within short period after communication skills training.

## Keywords

empathy, nursing education, midwifery, randomised controlled trial, Ghana

## Strengths and limitations of this study

- This study used nursing and midwifery students who were actively involved. The use of various methods like group discussions, role-plays, videos, short presentations, and

brainstorming sessions in the delivery of the communication skills training was also a positive development, since such methods take care of individual differences.

- There was allocation concealment to the researcher, research assistants, and the participants.
- The empathy measure used was Jefferson Scales of Empathy- Health Professions Student (JSE HPS- version) has construct validity and criterion-related validity which has been reported.
- A limitation of this study is the generalisation of the results to other healthcare professionals. As a self-report outcome, results of this study cannot be generalised beyond the characteristics of this sample.
- Confounding factors can also limit the generalisability of this study, the study could not control for interaction between the groups during the period of the study. This could lead to the problem of contamination between the groups (that is those in the intervention group talking to those in the control group after their days training sessions).

## Introduction

Empathy is crucial to the fundamental aim and achievement of nursing and midwifery goals[1]. Within the nursing and midwifery field, such skills are considered indicative of best practice[2]. It has also been stressed that empathy is a necessary factor in the provision of quality nursing care[3]. Researchers agree on the positive role empathy plays in interpersonal relationships when providing healthcare[4,5].

Models of good communication have been developed to assist nurses, midwives, and doctors to improve their ability to communicate with patients[6–12]. A Health Maintenance Organisation (Kaiser Permanente in the United States of America) developed the Four Habits Model (4HM), which they have used for more than 20 years, is an effective programme for clinical communication[6,7]. The model has been anchored into four habits; “invest in the beginning (Habit I), elicit patients’ perspective (Habit II), demonstrate empathy (Habit III), and invest in the end (Habit IV)”[6,7]. The habits from this theory was the basis of the communication skills training that was developed and used for this study. The other theoretical model called the Person-Centred Nursing Framework[13] was an essential component of the communication skills training. Emphasis was made on the Person-Centred Nursing Framework necessary care processes of working with the patients beliefs and values, engagement, shared decision making, having sympathetic presence, and providing wholistic care[13].

## Objective

To investigate the effect of a 2-day communication skills training on nursing and midwifery students’ empathy in a randomised controlled trial.

## Methodology

### Design and sample

This study was a 2 (intervention condition, between) x 3 (time, repeated) design in a randomised controlled trial (RCT) conducted at Tamale Nurses and Midwives College Ghana. The sample consisted of nursing students (n = 181) and midwifery students (n = 49).

## Power analysis

The sample size of the participants was based upon a power analysis. Relationship have been shown between training interventions and improved communication skills, measured with Roter Interaction Analysis System (RIAS), with an effect size between medium and high [14]. Fixing the effect size medium ( $d = 0.25$ ), using a two-tail significance test ( $p = 0.05$ ), a sample size of 197 resulted in an acceptable power coefficient of 0.95 [15]. The sample size was computed using G\*Power software[15,16].

## Ethical approval

The Research and Monitoring Department of Tamale Teaching Hospital, Tamale – Ghana, gave Ethical approval for this study on 5<sup>th</sup> May 2013. The approval number is TTH/R6M/SR/13/12.

## Informed consent

Informed consent was not written and participants were told that taking part in the communication skills training and answering the questionnaires meant their consent and an agreement to any publication from it. Participants were informed of the objectives of the study but not in detail such that they would know that the study wants to determine their empathy level, but were also given opportunity to ask questions to enable them decide to take part in this study. Participants were informed they could refuse to take part in the research at anytime without having to face any consequence.

## Patient and Public Involvement

Participants in this study were nursing and midwifery students and patients were not involved. The students as well as their tutors were involved in the design of the communication skills training guide.

## Criteria of inclusion and exclusion

The inclusion and exclusion criteria are presented in Table 1.

**Table 1: Inclusion and exclusion criteria**

*Inclusion criteria*

- Nursing and midwifery students in their second year at Tamale Nursing and Midwifery College.
- Nursing and midwifery students whose ages were above 18 years.
- Nursing and midwifery students in Tamale Nursing and Midwifery College who were available for follow-up data collection after 6 months.

*Exclusion criteria*

- Nursing and midwifery students who were not studying at Tamale Nursing and Midwifery College.
- Nursing and midwifery students whose ages were below 18 years.
- Nursing and midwifery students in Tamale Nursing and Midwifery College who were not available for follow-up data collection after 6 months.

## Randomisation

There was allocation concealment to the researcher, research assistants, and the participants. The researcher (MA) and research Assistants conducted this by allowing participants to pick numbers written on papers, which had been randomly shuffled in a box. The Nursing and midwifery students were separated before random assignment to ensure that both professions were approximately equally represented in the groups. Therefore, participants were randomly assigned to either intervention group or a control group.

## 137 Procedure

138 The two groups had a baseline data collection (T1) at the same time. The intervention group had  
139 a communication skills training, followed by post-test (T2) on day 3. The control group had post-  
140 test (T2) on day 4 just before their communication skills training. The communication skills  
141 training for both groups were the same. The tutors were aware of the training and data collection  
142 for the intervention and control group, however the intervention and control groups were not  
143 aware. The outcome was measured with Jefferson Scales of Empathy - Health Professions  
144 Student- version JSE HPS- version)[17]. Both groups had a follow-up test (T3) at the same time  
145 six months after the communication skills training (Fig. 1).  
146

147 <Insert Fig. 1: Flowchart showing enrolment, randomisation, communication skills training, and  
148 data collection>  
149

## 150 Outcome measure

151 The outcome was empathy measured with Jefferson Scales of Empathy- Health Professions  
152 Student (JSE HPS- version)[4]. The JSE HPS version was in English Language. This  
153 questionnaire was administered in English Language. This is because the students are very fluent  
154 in English. They are taught in English language from primary school because English in the  
155 official language in Ghana, and they will practice in English. There are different versions of the  
156 Jefferson Scales of Empathy. The versions are comparable in content. Slight changes are made in  
157 the words such that the text will be suitable for the planned health professionals. The JSE HPS-  
158 version[17] has 20 items in a Likert-type format using seven-point from 1 (strongly disagree) to  
159 7 (strongly agree). It has ten negatively worded items. The negative worded items were items 1,  
160 3, 6, 7, 8, 11, 12, 14, 18, and 19[17].  
161

162 The scoring of the questionnaire was according to the scoring algorithm of Jefferson Scales of  
163 Empathy (JSE). According to the JSE “a respondent must answer at least 16 (80%) of the 20  
164 items; otherwise the form should be regarded as incomplete and excluded from the data analysis.  
165 If a respondent fails to answer 4 or fewer items, the missing values should be replaced with the  
166 mean score calculated from the items the respondent completed”[17]. To score the questionnaire  
167 the negatively worded items were reversed scored (from 1 strongly agree to 7 strongly disagree),  
168 while the other items are directly scored on their Likert weights from 1 (strongly disagree) to 7  
169 (strongly agree). The total score was the sum of all item scores. The higher the total empathy  
170 scores the higher the empathic behavioural orientation. The maximum total score for each  
171 participant is 140 and the minimum score is 20. Higher total scores indicate higher empathy  
172 whereas lower total scores indicate lower empathy[17]. According to the owners of the JSE, it  
173 takes 5-10 minutes to complete, although they do not endorse a time limit for completing the  
174 it[17].  
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176 *Psychometric properties:* Construct validity and criterion-related validity of the JSE HPS-  
177 version have been reported[18]. Hojat et al.[17] have reported that internal consistency reliability  
178 of this version as .89 for medical students and .87 for house officers. Hojat et al.[4] has reported  
179 a test-retest reliability for the JSE HPS- version as .65 ( $p < .01$ ). In their report, they said it was  
180 relatively low in magnitude, but acceptable for that kind of instrument considering the time  
181 interval between the test[4].  
182

## 183 Data analysis

184 Analysis of Variance (ANOVA) was used to test the hypothesis that there were statistically  
185 significant differences between the two groups at three time points. A Shapiro-Wilk's test ( $p <$   
186 .05) [19,20] and a visual inspection of their histograms showed variable scores were

187 approximately normally distributed. I have included the results as supplementary file in the form  
 188 of principal component analysis, Chi-squared test, Independent t-test, and Scree plot (Additional  
 189 file 1: Table 1, Table 2, Table 3 and Additional file 2: Fig. 1).

191 A significance level of  $p < .05$  was planned. However, because several independent analyses (5)  
 192 were performed on the data the significance level of  $p < .05$  was adjusted to  $p < .01$  in  
 193 interpreting the results using Bonferroni correction[21]. “The Bonferroni correction is an  
 194 adjustment made to  $p$  values when several dependent or independent statistical tests are being  
 195 performed simultaneously on a single data set”[21]. In this study, Bonferroni correction was  
 196 computed by taking the critical  $p$  value ( $\alpha$ ) and divided it by the several dependent analyses  
 197 (.05/5) resulting in the  $p < .01$ . All data were analysed using SPSS.

### 199 **Communication skills training (CST)**

200 The author (MA) who was the main trainer, designed and developed the training guide using  
 201 “Four Habits Model” (4HM)[22] and Person-Centred Nursing Framework (PCNF)[13].

203 Subsequently, the researcher trained a co-trainer (AAM) who assisted in the communication  
 204 skills training as well as in the data collection. The data was analysed by the author (MA)  
 205 without blinding. The trainers used various methods to deliver the training. The methods were  
 206 small group discussions, brainstorming, personal experience from participants, group reports,  
 207 role-playing, questions and answers, videos and summaries. Therefore, the training was on  
 208 shared agenda. This approach made it possible for participants to share their previous training  
 209 knowledge and ideas.

211 At the end of the training, participants were provided with photocopies of some relevant material  
 212 as well as useful reference books and literature that will enable nurses and midwives to learn  
 213 effective communication with patients.

## 215 **Results**

### 216 **Demographic data**

217 Participants (N =173) were made of intervention group (n = 93 and control group (n = 80). The  
 218 demographic data are presented in Table 2.

220 **Table 2: Demographic data**

Characteristics	Intervention Group (n = 93)		Control Group (n = 80)		
	n	%	n	%	
Age	> 18 years	5	6	1	1
	19 – 21 years	42	45	32	40
	22 – 24 years	41	44	45	57
	25 – 27 years	2	2	1	1
	28 – 30 years	3	3	1	1
	31 years and above	0	0	0	0
Gender	Female	68	73	44	55
	Male	25	27	36	45
Speciality	Nursing student	62	67	69	86
	Midwifery students	31	33	11	14
Marital Status	Married	2	2	9	11
	Unmarried	90	97	70	88
	Divorced	1	1	1	1
Religion	Christianity	51	55	30	38
	Islam	40	43	48	60

	Other	2	2	2	2
Number of children	No child	92	99	72	90
	1 child	1	1	2	2
	2 children	0	0	4	5
	3 children	0	0	2	3
	4 children and above	0	0	0	0
Ethnicity	Akan	11	12	5	6
	Dagomba	28	30	34	43
	Ewe	2	2	5	6
	Fanti	6	6	3	4
	Frafra (Grunsi)	10	12	2	2
	Ga-Adangme	3	3	0	0
	Gonja	8	9	3	4
	Kotokoli	0	0	3	4
	Basare/Bisa	0	0	2	2
	Kasina/Bulsa	0	0	3	4
	Dagati/Sisala	5	5	4	5
	Other tribes	20	21	16	20
Academic writing and communication (AWC)	None	10	11	13	16
	1 week	0	0	0	0
	2 weeks	0	0	1	1
	3 weeks	0	0	0	0
	1 month	1	1	0	0
	2 months	0	0	1	1
	3 months	3	3	2	3
	4 moths (1 semester)	70	75	57	71
	2 semesters	5	6	6	8
	3 semesters	3	3	0	0
	4 Semesters	0	0	0	0
Above 4 semesters	1	1	0	0	

Legend: n = sample size in a particular group.  
AWC = Academic writing and communication

### Descriptive statistics

The scores showed that there were slight increases in the intervention group from baseline - T1 (M = 109.8, SD = 9.8,  $d = 0.160$ ) to post-test - T2 (M = 111.9, SD = 9.0,  $d = 0.201$ ) as compared to the control group from baseline - T1 (M = 107.9, SD = 11.5,  $d = 0.160$ ); to post-test - T2 (M = 110.0, SD = 11.0,  $d = 0.201$ ) (Table 3).

**Table 3: Descriptive statistics of empathy**

Time	Group	N = 173			95% CI for Cohen's d		
		n	M	SD	Cohen's d	Lower	Upper
Baseline (T1)	Intervention	93	109.8	9.8	0.160	-0.139	0.458
	Control	80	107.9	11.5			
Post-test (T2)	Intervention	93	111.9	9.0	0.201	-0.098	0.499
	Control	80	110.0	11.0			
Follow-up (T3)	Intervention	93	109.4	10.4	-0.252	-0.551	0.048
	Control	80	111.9	8.3			

Legend: N = total sample size      n = group sample size  
M = mean score      SD = standard deviation

### Inferential statistics

This study showed that there was no statistically significant difference in the scores of empathy between the groups  $F(1, 171) = .18, p = .675$  (Table 4).



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**Table 4: Inferential statistics empathy**

Source	Type III SS	df	MS	F	Sig.
Intercept	6259179.09	1	6259179.09	55379.73	.000
Group	19.91	1	19.91	.18	.675
Error	19326.92	171	113.02		

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Significance level  $p < .01$   
Measurement is by time point  
Transformed variable is by average  
Legend: SS = Sum of Squares      df = degrees of freedom  
MS = Mean Square      F = Statistic  
Sig: = Significance level

### Effect of the communication skills training, the empathy scores, and the demographic variables

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In this study, there was no statistically significant effect between communication skills training, the demographic variables of age, marital status, specialisation, ethnicity, and religion as well as academic writing and communication (AWC) (Table 5).

**Table 5: Effect of the communication skills training, the empathy scores, and the demographic variables**

Source	Type III SS	df	MS	F	Sig.
Intercept	35,145.96	1	35,145.96	321.61	.000
Group * Gender	738.51	2	369.25	3.38	.037
Group * Age	431.25	2	215.63	1.97	.142
Group * Marital Status	72.00	2	36.00	0.33	.720
Group * Specialisation	241.87	2	120.94	1.11	.333
Group * Religion	219.32	2	109.66	1.00	.369
Group * Ethnicity	440.74	2	220.37	2.02	.137
Group * AWC	69.25	2	34.63	0.32	.729
Error	17,266.55	158	109.28		

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Significance level  $p < .01$   
Measurement is by time point  
Transformed variable is by average  
Legend: SS = Sum of Squares      df = degrees of freedom  
MS = Mean Square      F = Statistic  
Sig: = Significance level      AWC = Academic writing and communication

## Discussions

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In this study, there was no statistically significant difference between the groups  $F(1, 171) = .18$ ,  $p = .675$  (Table 24). The findings from this study are in contrast to the findings from a similar study that showed enhancement of empathy in nurses [23–26]. For example a study reported that nursing students empathy reasonable increase in scores ( $M = 88.63$ ;  $SD = 8.93$ )[24][23]. Further in contrast, another study found statistically significant effect in empathy scores following a training[25].

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Research has shown that there are a number of studies that doubt the effectiveness of empathy training programmes in nursing education and rather reported stability in empathy[27–35]. A study by La Monica et al.[30] did not find improvement in empathy outcomes. In a related study, they found stability in empathy after a short-term education ( $M = 20.7–22.6$ ;  $SD = 3.0–5.0$ )[31]. In another research, it was reported that empathy was stable[32].

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Research has demonstrated that there are some relationship between empathy and demographic variables of gender, education, and experience. In this study, there were no significantly

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2 279 significant differences in empathy and the demographic variables of gender, age, marital status,  
3 280 specialisation, religion, number of children, ethnicity between the both groups. The findings  
4 281 from this study, are inconsistent with other studies where females empathy scores are reported to  
5 282 be higher than males[23–25,36–42]. For example, a study has demonstrated statistical  
6 283 significance in females empathy than males ( $p < 0.001$ )[24]. In addition, females were reported  
7 284 to showed increased in mean empathy score than male colleagues,  $M = 5.55$ ,  $SD = 0.46$ ) and ( $M$   
8 285  $= 5.35$ ,  $SD = 0.55$ [39] respectively.

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10 287 This has further been buttressed in another study where the mean females empathy score ( $M =$   
11 288  $110.8$ ;  $SD = 11.7$ ) was reportedly higher than that of males ( $M = 105.3$ ;  $SD = 13.5$ ;  $p = 0.0001$ ;  $d$   
12 289  $= 0.44$ )[25]. In contrast there have been report of stability in empathy between females and  
13 290 males[42].

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15 292 Despite the above evidence of empathy in some nursing research in the short term following  
16 293 empathy training, there have been some doubts on empathy follow-up research[37,43,44]. In this  
17 294 study, empathy did not show any statistically significant difference between the groups in a  
18 295 follow-up after 6 months. This study is consistent with another study that found nursing empathy  
19 296 after training did not improve after 5 times measurement [ $F(1, 29) = 3.91$ ,  $p < 0.06$ ][43]. This  
20 297 doubt in follow-up has also been reported in an earlier study by Daniels et al.[45].

21 298  
22 299 In contrast, another study found empathy increased 3-months after communication skills training  
23 300 [44]. However, another study reported decreases in empathy as student advance through their  
24 301 nursing programme[46].

25 302  
26 303 It has also been found by some researchers' that there is a positive correlation between nursing  
27 304 students empathy and patient outcomes[47–50]. Yu and Kirk[51], In a systematic review of  
28 305 measurement of empathy in nursing research indicated that in 8 appraisal researches, there were  
29 306 enhancement of empathy levels of students but that it was unclear if such enhancement was  
30 307 sustainable.

31 308  
32 309 The results from this study confirms previous studies findings on nursing and midwifery training  
33 310 that empathy cannot be enhanced in a short period following communication skills training [31–  
34 311 35,42,43]. With these similar finding, there is the need for further studies to determine the  
35 312 effectiveness of communication skills training in enhancing nursing and midwifery students'  
36 313 empathy.

37 314  
38 315 Most of the studies have focused on empathy levels of nurses, differences in empathy,  
39 316 relationship between empathy and demographics variables[51]. However, there are limited  
40 317 studies in the area of empathy in nursing and midwifery students. There are varied studies and  
41 318 the results from the previous studies show low[45,47], moderately enhanced[23,52] and high  
42 319 levels[23,34,52–56] of self-reported nurses' empathy. Other findings on nursing and midwifery  
43 320 training have contradicted this current study by indicating that empathy can be enhance with  
44 321 training[24,25,41]. However, some studies have found that nursing and midwifery students  
45 322 empathy actually decreases after training[46,57]. Other variables like age, gender, education,  
46 323 religion have been considered in research[23].

47 324  
48 325 Despite the fact that some studies have focused on empathy training among healthcare  
49 326 professionals including nursing and midwifery students in other countries, there are no known  
50 327 study in Ghana. This study will therefore add to the literature on how best to enhance  
51 328 communication skills training.

## Conclusions

This study has shown that empathy may not be enhanced within short period after communication skills training. The participants were made aware of empathy being an outcome of this study and since JES is self-reported, it may have impacted their self-report. Selection bias may have impacted the lack of significance. It's possible that participants that volunteered were more empathetic compared to baseline and JES is self-report. More so, the 2-day training time was not enough and that could have accounted for none enhancement of empathy.

This is the first RCT using communication skills training in a nursing and midwifery school in Ghana. A study of this nature may better be evaluated by multi-centre location in RCT across several regions. This may offer a much better comparison.

In this study, the females outnumbered the males both in the intervention and control. This is a limitation in the sense that females turn to be empathetic then males. Also, 99% of participants were either Christians or Muslims, as one is aware religion teaches its members to be empathetic towards one another and this could have an effect the outcome of this study.

Despite the limitations and strengths of this current study, the following recommendations are made for future studies. This communication skills training had used a 2-day training period. A longer training period could have offered a better comparison. It does look like participants did not have the opportunity to read and reflect on the 2-day training before having a post-test. This study used one location and a multi-centre location in RCT across several nursing and midwifery schools probably could provide better outcomes.

This study explored the effect communication skills training the in post-test and 6-months post-training, however, a long-term examination could have been very useful. Further studies exploring the longer-term impact of the communication skills training in other healthcare professionals and multi-location using cluster sampling may be beneficial. There is the need for additional studies to find out which aspects of communication skills training for nursing and midwifery students will enhance empathy.

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## 16 489 Additional Files

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19 490 Additional file 1: Table 1; Principal component analysis, Table 2; Chi-squared test, and Table 3;  
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22 491 Independent samples t-test  
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26 493 Additional file 2: Fig. 1; Scree plot  
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## 30 31 32 495 Footnotes

### 33 34 496 List of abbreviations

- 35  
36  
37 497 AWC - Academic writing and communication  
38  
39 498 JSE HPS version- Jefferson Scales of Empathy- Health Professions Student- version  
40  
41  
42 499 RCT - Randomised controlled trials  
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46 501 **Contributors:** The author (MA) designed, undertook data collection, data integrity, accuracy of  
47  
48 502 the analyses, and writing of this article.  
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53 504 ORCID: Mustapha Alhassan - <http://orcid.org/0000-0002-5635-8955>  
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2 507 **Competing interest:** None declared.  
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6 509 **Patient consent:** Obtained  
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11 511 **Ethics approval:** The Research and Monitoring Department of Tamale Teaching Hospital,  
12

13 512 Tamale – Ghana, gave Ethical approval for this study on 5<sup>th</sup> May 2013. The approval number is  
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15 513 TTH/R6M/SR/13/12.  
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20 515 **Provenance and peer review:** Not commissioned; externally peer reviewed.  
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25 517 **Data Sharing statement:** Data available from the Dryad Digital Repository site at  
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27 518 <https://doi.org/10.5061/dryad.k08hc77>  
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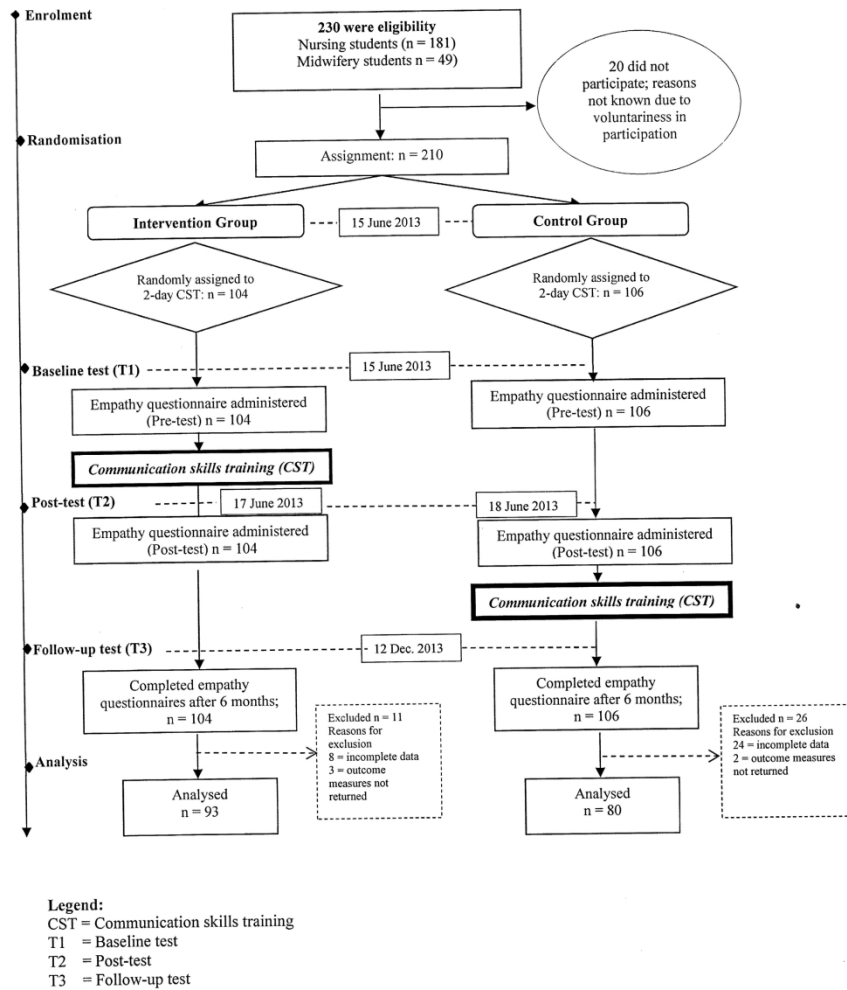


Fig. 1: Flowchart showing enrolment, randomisation, CST, and data collection

216x216mm (300 x 300 DPI)

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**Additional file 1: Table 1; Principal component analysis**

**Component Loadings**

	<b>RC 1</b>	<b>RC 2</b>	<b>Uniqueness</b>
JSE_T1_Qn1	.	0.553	0.701
JSE_T1_Qn10	0.485	.	0.735
JSE_T1_Qn11	.	0.552	0.638
JSE_T1_Qn12	.	0.622	0.605
JSE_T1_Qn13	0.477	.	0.767
JSE_T1_Qn14	.	.	0.842
JSE_T1_Qn15	0.591	.	0.657
JSE_T1_Qn16	0.676	.	0.526
JSE_T1_Qn17	.	.	0.886
JSE_T1_Qn18	-0.551	.	0.703
JSE_T1_Qn19	.	.	0.927
JSE_T1_Qn2	0.446	.	0.798
JSE_T1_Qn20	0.689	.	0.535
JSE_T1_Qn3	.	.	0.848
JSE_T1_Qn4	0.551	.	0.596
JSE_T1_Qn5	0.535	.	0.713
JSE_T1_Qn6	.	0.432	0.766
JSE_T1_Qn7	.	.	0.825
JSE_T1_Qn8	.	0.499	0.756
JSE_T1_Qn9	.	.	0.725

**Additional file 1: Table 2; Chi-squared test**

	<b>Value</b>	<b>df</b>	<b>p</b>
Model	213.474	151	< .001

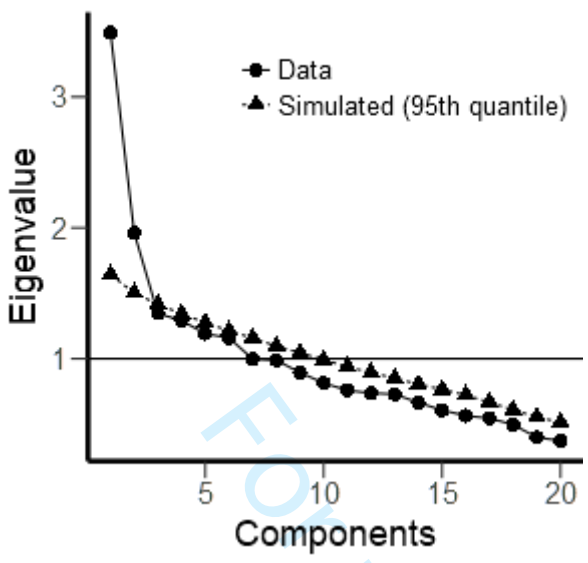
**Additional file 1: Table 3; Independent Samples T-test**

	<b>t</b>	<b>df</b>	<b>p</b>	<b>Cohen's d</b>	<b>95% CI for Cohen's d</b>	
					<b>Lower</b>	<b>Upper</b>
Time 1	1.051	172.0	0.295	0.160	-0.139	0.458
Time 2	1.323	172.0	0.187	0.201	-0.098	0.499
Time 3	-1.658	172.0	0.099	-0.252	-0.551	0.048

*Note.* Student's t-test.

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**Additional file 2: Fig. 1; Scree plot**





## CONSORT 2010 checklist of information to include when reporting a randomised trial\*

Section/Topic	Item No	Checklist item	Reported on page No
<b>Title and abstract</b>			
	1a	Identification as a randomised trial in the title	Yes, Page 1
	1b	Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)	Yes, Page 1
<b>Introduction</b>			
Background and objectives	2a	Scientific background and explanation of rationale	Yes, Page 2
	2b	Specific objectives or hypotheses	Yes, Page 2
<b>Methods</b>			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	Yes, Page 2
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	Not applicable
Participants	4a	Eligibility criteria for participants	Yes, Page 3
	4b	Settings and locations where the data were collected	Yes, Page 3
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	Yes, Page 3
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	Yes, Page 3
	6b	Any changes to trial outcomes after the trial commenced, with reasons	Not applicable
Sample size	7a	How sample size was determined	Yes, Page 2
	7b	When applicable, explanation of any interim analyses and stopping guidelines	Not applicable
<b>Randomisation:</b>			
Sequence generation	8a	Method used to generate the random allocation sequence	Yes, Page 3
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	Yes, Page 3
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	Yes, Page 3
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	Yes, Page 3
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those	Yes, Page 3

1			
2		assessing outcomes) and how	
3			
4		11b If relevant, description of the similarity of interventions	<u>Not applicable</u>
5	Statistical methods	12a Statistical methods used to compare groups for primary and secondary outcomes	<u>Yes, Page 4</u>
6		12b Methods for additional analyses, such as subgroup analyses and adjusted analyses	<u>Not applicable</u>
7			
8	<b>Results</b>		
9	Participant flow (a	13a For each group, the numbers of participants who were randomly assigned, received intended treatment, and	<u>Yes, Page 3</u>
10	diagram is strongly	were analysed for the primary outcome	
11	recommended)	13b For each group, losses and exclusions after randomisation, together with reasons	<u>Not applicable</u>
12	Recruitment	14a Dates defining the periods of recruitment and follow-up	<u>Yes, Page 3</u>
13		14b Why the trial ended or was stopped	<u>Not applicable</u>
14	Baseline data	15 A table showing baseline demographic and clinical characteristics for each group	<u>Yes, Page 5</u>
15	Numbers analysed	16 For each group, number of participants (denominator) included in each analysis and whether the analysis was	<u>Yes, Page 5</u>
16		by original assigned groups	
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18	Outcomes and	17a For each primary and secondary outcome, results for each group, and the estimated effect size and its	<u>Yes, Page 6</u>
19	estimation	precision (such as 95% confidence interval)	
20		17b For binary outcomes, presentation of both absolute and relative effect sizes is recommended	<u>Not applicable</u>
21	Ancillary analyses	18 Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing	<u>Not applicable</u>
22		pre-specified from exploratory	
23			
24	Harms	19 All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	<u>Not applicable</u>
25			
26	<b>Discussion</b>		
27	Limitations	20 Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	<u>Not applicable</u>
28	Generalisability	21 Generalisability (external validity, applicability) of the trial findings	<u>Yes, Page 8</u>
29	Interpretation	22 Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	<u>Yes, Page 8</u>
30			
31	<b>Other information</b>		
32	Registration	23 Registration number and name of trial registry	<u>Not applicable</u>
33	Protocol	24 Where the full trial protocol can be accessed, if available	<u>Not applicable</u>
34	Funding	25 Sources of funding and other support (such as supply of drugs), role of funders	<u>Not applicable</u>
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37 \*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration for important clarifications on all the items. If relevant, we also

38 recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials.

39 Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see [www.consort-statement.org](http://www.consort-statement.org).

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