Original Article

Prevalence of Communication Apprehension among College and University Students and Its Association with Demographic Factors; a Systematic Review and Meta-Analysis

Humera Tahir [1,2], John Khor[3], Gamaleldeen Mohamad Mozaka[1], Bakare Kazeem Kayode[1], Tahir Mehmood Khan[4]

[1]Department of Educational Psychology, Faculty of Education, AL –Madinah International University- Malaysia, [2] Department of Psychology, Government College for women, Wah Cantt, Pakistan, [3] School of Medicine, International Medical University, Malaysia, [4] School of Pharmacy, Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, Selangor Malaysia.

Abstract

Objectives: This study aimed to investigate the relationship between communication apprehension and socio-demographic variables in university students. **Methods:** A systematic review was performed to achieve the objectives of the study. Relevant papers were searched across Pubmed, EMBASE, Ovid, and ERIC databases from the inception until July 2017. Studies with similar quantitative data underwent meta-analysis using Review Manager (RevMan), version 5.3. Mean difference was computed together with inverse variance using the random-effect model at the confidence interval (CI) of 95%. **Findings:** A total of 306 records were identified as shown in Figure 1. After applying the inclusion criteria, 23 studies were identified that had used PRCA 24 to assess the CA among the university and college students. Results showed that the possibility of CA during the interview was less like during interviews -0.89 CI 95% [-1.78, -0.01, Heterogeneity: $Tau^2 = 1.65$; $Chi^2 = 152.48$, df = 8 (P <0.00001) in comparison to the general setting. In addition, day-to-day conversation unlike group discussions is very useful for communication [-0.43 CI 95% [-0.71, 1.51]. Further exploration revealed that Male students were observed to have less CA than females [-3.54 CI 95% [-5.63, -1.46]. Based on the academic year, it was revealed that the third-year students have two times less CA compared to the first-year students. [OR 95% = -2.04 [-4.75, 0.68], p <0.007]. However, Alex Foo noted that business students across year 1 & year 3 do not display any differences in CA, while the difference among other disciplines was there.
Summary: PRCA 24 remains a good method to validate the students' communication apprehension. Age, gender, and culture still remain critical components in the intervention. An individual, who has a higher CA communicates only when really motivated.

Keywords: communication apprehension, Age, Gender, Culture

Introduction

Communication apprehension (CA) is defined as *"an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons."*[1] It is a common feature exhibited by students in higher education. Among the reasons that people hesitate to communicate with their peers are social alienation, low self-esteem, cultural norms, skill deficiency, and CA[2, 3]. McCroskey's (1986) Personal Report of CA (PRCA) describes CA as *"the way a person feels about communication not how they communicate"*[4]. CA has an *''internal impact''* on the individual's psychology and emotions and an *''external impact''* in the form of behavior and the creation of social relationships[5].

Of all the age groups, students, and adolescents are particularly affected by CA. Students with high CA are less likely to participate in class, thus achieving less attention from the instructor, and are often misunderstood to be slow, lazy, and disinterested[1, 5-8]. Those individuals with high CA have lower overall grade point averages and a greater propensity to drop out and also they have been found to lack the coping skills necessary to transition from childhood homes to the complex social environments that typically describe the college campus[9, 10]. It is noticed that high CA students obtained GPAs one half-point

Address for correspondence: Mr. Humera Tahir, Department of Psychology, Government College for Women, Wah Cantt, Pakistan.
E-mail: humera.azam@yahoo.com

How to cite this article: Tahir, H., Khor, J., Mozaka, G. M., Kayode, B. K., Mehmood Khan, T. Prevalence of communication apprehension among college and university students and its association with demographic factors; A systematic review and Meta-Analysis. Arch Pharma Pract 2017;8:87-103.

lower than those with low levels of CA[1, 5, 7]. This situation often led to a negative attitude toward school with diminished motivation to learning and thereby resulting in poor final grades [11-13]. Such students also have distant relationships with instructors and will frequently fault instructors for social or learning problems[14]. Overall, those individuals with high levels of CA feel frightened about speaking to other individuals and feel discomfort when contemplating doing so[15]. They have difficulty engaging in involvement, affiliation, and courtesy behaviors with people they do not know well within or even outside of the class[16].

The consequence of high CA will be devastating specifically in the case if the student opts to choose a field that has higher public and peer communication. For example, among marketing and healthcare professionals, effective communication can increase trust and compliance and ensure an effective communication environment with peers and colleagues from other disciplines. Specifically, in healthcare professions, poor communication skills or CA led to poor interaction among peers, and in professional life, CA led to poor inter-professional communication, which might lead to some mistakes that could negatively affect the patient outcomes[17]. It is agreed that technical ideas and results are not useful until and unless they are communicated and discussed [18]. To date, there is hardly any summative evidence that systematically explores the prevalence of CA among higher education students (college and university setting). Therefore, the current systematic review was aimed to explore the prevalence of CA among the college students and sociodemographic factors associated with the CA among college and university students.

METHODS

A systematic review was conducted to explore the CA among the college and university students and sociodemographic characteristics of students with CA. Preferred Reporting Items for Systematic Reviews and Meta-Analyses guideline were followed to identify potential research article from the evidence-based scientific literature (PRISMA Statement).

Search strategy

Pubmed, EMBASE, Ovid & ERIC databases were searched for potential papers of studies from inception until July 2017. The strategic search terms [medical subject headings (MeSH) and keywords] used were as follows: "University" AND "Students" "Communication" AND "Apprehension" AND "PRCA – 24".

Inclusion criteria

1. All quantitative studies published in English that have used PRCA – 24 to assess the CA were included in this systematic review.
2. Article targeting students from higher education (college/university) were included in this systematic review.

Outcomes of interest:

1. To quantify in percentages the sociodemographic of students who experience CA in a classroom setting
2. To identify the form of CA that is most commonly experienced by students.

Study Selection

The articles identified in the initial search strategy were screened by two independent reviewers (KZX & HT) by reading the titles and abstracts of studies and duplicates were removed. The full-text articles of the remaining studies that were considered to meet the inclusion criteria were extracted on a standardized extraction form attached in Appendix 2 and their year of publication, country where the study was carried out, objectives of study, sample size, and outcomes measured i.e. PRCA 24 scores and its respective subunits including participants' characteristics (age, education level, ethnicity, and PRCA 24 scores, the general score, the individual breakdown consisting of group discussion, meeting, public speaking and conversation by two reviewers (KZX, HT) were recorded. Disagreements, if any, were resolved by discussion and consensus by two independent reviewers (HT & GE). The authors agreed that only PRCA 24 questionnaire would be included to provide uniformity and ease of comparison in data analysis.

Synthesis of results (quantitative)

Each full-text study was reviewed descriptively evaluating their aim, population, and outcomes. PRCA 24 was chosen as the primary outcome measure as it best reflects whether the university student population has CA. The association of sociodemographic factors to general PRCA 24 scores was then determined and each study was searched for numerical data in the results section to determine its eligibility for meta-analysis.

Data Analysis

Studies that reported their results in the form of continuous or dichotomous data were extracted to estimate the difference by performing a meta-analysis. Studies whose data were not combinable due to marked variations or studies that none of their sociodemographic factors were associated with PRCA 24 scores made narratively studies having similar quantitative data and underwent meta-analysis using Review Manager (RevMan), version 5.3. Mean differences were computed using a random-effect model together with inverse variance and 95% confidence interval (CI) for calculation.

RESULTS

A total of 306 records were identified as shown in Figure 1. Upon application of inclusion criteria n= 23 studies were identified that had used PRCA 24 to assess the CA among university and college students.

Study Characteristics

All 23 studies were descriptive and cross-sectional surveys, and the CA level was assessed using PRCA 24 self-reported questionnaires. The majority of the selected studies were conducted in United States[19-29], followed by New Zealand[19, 30], Malaysia[31, 32], Canada[33], Ireland, United Kingdom & Spain[34], Ireland[35], India[36], Nigeria[37], and Iran[38] (Table 1). Respondents were recruited from any courses from the university settings. A large number of data were from accounting and business students[26, 30-34, 39] (Table 2).

Table 1: Study Characteristics

Author	Year	Country	Objectives	Result	Number	Design	Respondents	Measurement	Methodology
Joseph M. La	2015	USA	To investigate PRCA-24 by race, ISVS by race and relationship between PRCA 24 and ISVS	There were significant differences between races (ie, White, African American, and Asian) on both measures. The PCRA-24 and ISVS were significantly correlated in each racial group.	114	Cross Sectional	4th year PharmD	PRCA 24	Self-administered questionnaire
Ms. Sunanda Patil	2012	India	This study examined the oral communication apprehension in English of 100 engineering students of an engineering college	Only nine out of hundred students (9%) have low communication apprehension. Forty two students (42%) have medium level of communication apprehension and forty nine (49%) have high communication apprehension.	100	Cross Sectional	2nd year Engineer	PRCA 24	Self-administered questionnaire
Jerry L. Allen	2008	USA	To investigate relationship between CA & instructors feedback	Students high in communication apprehension and/or less immediate perceived their instructors as less immediate and less assertive/responsive.	265	Cross Sectional	basic commu classes	PRCA 24	Self-administered questionnaire
James Katt	2016	USA	To investigate CA with correlation to Citizen Clasroom behavior & OCEAN Personality traits	Two of the behavior dimensions, involvement and courtesy, had significant correlations with four traits.	213	Cross Sectional	Intro commu classes	PRCA 24	Self-administered questionnaire
Trevor A. Francis	2007	USA	To investigate level of CA in first generation college students and stratgeies to overcome it	Preparing for social interaction or public speaking, Skills training, Modified Physical Response, Visualization techniques, Humor, Combination, Assertiveness techniques.	161	Cross Sectional	first-gen college students	PRCA 24	Self-administered questionnaire

Michael T. Miller	2009	USA	To understand the CA levels of college students engaged in student self-governance activities	The composite of 64.9 included the following subscale scores: group 16, meeting 15.8, dyad 14.4, and public speaking 18.7.	226	Cross Sectional	General	PRCA 24	Self-administered questionnaire
Michael Z. Hackman	2009	USA, NZ	To understand differences highly individualistic culture seen in the United States, and the more collectivistic culture of New Zealand. Further, the impact of the dimensions of sense of humor on these variables on CA	As reflected in Table 1, New Zealand students were found to be significantly less willing to communicate (WTC) than U.S. students in all four contexts (public speaking, meeting, group, and dyad) and with all three types of receivers (stranger, acquaintance, and friend).	217 + 179	Cross Sectional	Comm & MGMT	PRCA 24	Self-administered questionnaire
IBRAHIM M. ALY	2001	Canada	To understand between native and non-native English speaking commerce students.	communications apprehension reported by both nonnative and native English speakers is not significantly different, nor is their actual academic achievement.	334	Cross Sectional	Account	PRCA 24	Self-administered questionnaire
Hassall	2000	UK, Spain	To understand the levels of CA amongst accounting students.	To compare between the levels of CA between UK & Spain Acccounting students.		Cross Sectional	Account / Business	PRCA 24	Self-administered questionnaire
Gardner	2005	NZ	To investigate the difference between senior students and their juniors in terms of CA	The results fail to find any strong associations between levels of communication apprehension and students' abilities to advance in their studies or average levels of academic performance.	434	Cross Sectional	Account / Business	PRCA 24	Self-administered questionnaire
Hassall	2005	UK	To understand the levels of CA amongst accounting students.			Cross Sectional	Account	PRCA 24	Self-administered questionnaire
Arquero	2007	UK, Spain	The objective of the current study is to compare the two countries in terms of the incidence of CA in students in the respective accounting	The results confirm the high levels of communication apprehension in European accounting students. There are notable differences between the two countries however in certain underlying factors.	1189	Cross Sectional	Account / Business	PRCA 24	Self-administered questionnaire

			education systems.						
Ameen,	2010	USA	To determine whether students still perceive accounting as a profession requiring low levels of oral communication	This study indicates students entering the first accounting class perceive accounting as a profession that requires little oral communication.	322	Cross Sectional	Account	PRCA 24	Self-administered questionnaire
Byrne	2009	Ireland			34	Cross Sectional	Account	PRCA 24	Self-administered questionnaire
Illias	2013	Malaysia	This study is looking into communication apprehension for students that can affect communication skills needed for employability in the future.	This study indicated more than 50% of the highest level of CA for the generalized context pertaining to four contexts in group discussions, meetings, interpersonal and public speaking. However, the study only shows significant difference in overall PRCA among gender.	179	Cross Sectional	Account	PRCA 24	Self-administered questionnaire
Trevor A. Francis	2007	USA	To understand the profile of communication-apprehension levels of firstgeneration college students in a case study community college Vs University.	First-generation two-year college students scored 66.9 on the PRCA-24, indicating a high level of oral communication apprehension. 19.3 on the public speaking; statistically significant difference between the levels of communication apprehension associated with dyadic communication of firstgeneration college students at a two- and four-year institution.	7.8% of 161 19.5% of 622	Cross Sectional	2 yr 1st Gen College Student & 4yr Uni	PRCA 24	Self-administered questionnaire
Karl Edward Patyon	2011	USA	To understand CA by making comparisons to students who attended either a public or a private high school	No statistically significant difference exists in communication apprehension levels reported by college freshmen, regardless of high school background (public, private, or homeschool).		Cross Sectional	College Freshman	PRCA 24	Self-administered questionnaire

Jodi Frantz	2005	USA	This study will examine the relationship between communication apprehension and gender, and one's year in college	A statistically significant difference was found between males and females with respect to their overall CA score. The results also showed no significant difference between year in college and CA score.	185	Cross Sectional	All ful time Student	PRCA 24	Self-administered questionnaire
Adeyemo, Saheed O. Adeyemi	2017	Nigeria	To investigate CA has been established as a barrier to communication and therefore has implication for employability.	The mean and SD result of the four CA contexts assessed respectively show Group Discussion (M= 21.16, SD = 4.26), Interview (M=19.60, SD=4.05), Conversation (M=21.51 SD=4.30), Presentation (M= 19.59, SD =4.53), while the overall (M= 81.35 and the SD = 13.34)indicating that most of the respondents were of moderate level of CA.	405 (89%)	Cross Sectional	final year mass communication undergraduates	PRCA 24	Self-administered questionnaire
Alex Foo	2005	Malaysia	To investigate the role of temperament, gender, major of study and personality on Communication Apprehension	Firstly, gender difference is found across the sample. Secondly, there is no significant difference between age group and CA. Apparently, present result shows that there is no statistical difference between accounting and business students in CA. students with higher level of CA are a result of higher scores on neuroticism, and lower scores on extroversion.	1101	Cross Sectional	Account / Business	PRCA 24	Self-administered questionnaire

Hassall	2006	UK	The purpose of this study is to measure the levels of communication apprehension and maths anxiety in students immediately before they undertake their chosen courses at university.	Identifies the existence of high levels of communication apprehension in accounting students and maths anxiety in business studies students at the beginning of their courses. An analysis of the underlying demographic variables such as age, previous educational background, etc. is also undertaken.	289	Cross Sectional	Account / Business	PRCA 24	Self-administered questionnaire

Table 2: Participants Characteristics

Author	Year	Region	Student	Age	Male	Female	Yr 1	Yr 2	Yr 3	Yr 4	PRCA	sd	Group	sd	Meeting	sd	Public	sd	Inter	sd
Joseph M. La	2015	Americas	PharmD	27.1	35	79	x	x	x	114	59.34	18.13	13.16	4.45	14.76	5.56	17.77	5.59	13.65	5.05
		White		27	7	17	x	x	x	24	66.04	17.1	14.58	4.1	17.29	5.15	18.88	5.16	15.29	4.88
		Black		27.3	11	41	x	x	x	52	50.92	14.89	11.33	3.93	12.42	4.7	15.58	5.41	11.6	4.1
		Asian		27	17	21	x	x	x	38	66.63	18.26	14.76	4.47	16.37	5.74	20.08	5.04	15.42	5.38
Ms. Sunanda Patil	2012	India	Engineering	x	x	x	x	x	100	x	x	69.32	12.79	14.58	3.71	18.09	4.63	19.28	4.3	17.37	4.67
Jerry L. Allen	2008	America	Communication	x	119	156	x	x	x	x	65.8	15.1								
James Katt	2016	America	Communication	19.1	(40.8%) 87	(59.2%) 126	(63.8%) 136	(23.5%) 50	(8.5%) 18	(4.2%) 9	66.62	18.22								
Trevor A. Francis	2007	America	First Gen Col	x	x	x	x	x	x	x	66.9	19	15	5.1	16.6	5.6	20.1	6.1	15.4	5.1
Michael T. Miller	2009	America	General	x	x	x	x	x	x	x	64.9	n	16	n	15.8	n	18.7	n	14.4	n
Michael Z. Hackman	2009	America Australia	Comm & MGMT	x	x	x	x	x	x	x										

		USA	Comm & MGMT	x	39%	61%	x	x	x	x	61.2	15.8	14.1	5.3	14.9	4.3	18.3	5.4	13.8	4.4
		NZ	Comm & MGMT	x	56%	44%	x	x	x	x	65.7	14.9	14.5	4.5	16.9	4.8	20.2	5.1	14.1	4
IBRAHIM M. ALY	2001	Canada	Account	x	173	161 151 (45.2%)	x	x	125 (37.4%)		65.6	15.3	15.4	4.8	16.4	4.8	19.3	5.1	14.5	4.2
		Canada	English Speaking	x	x	x	x	x	x	x	70.22	14.65	16.76	4.01	17.7	4.46	20.06	4.19	15.7	5.11
		Canada	Non English Speak	x	x	x	x	x	x	x	68.39	15	16.24	4.35	17.76	4.79	19.27	4.47	15.12	4.58
Hassall	2000	Europe																		
		UK	Account	x	x	x	x	x	x	x	67.5	n	14.7	n	18.8	n	19	n	15	n
		UK	Business	x	x	x	x	x	x	x	63.85		13.62		17.69		19.28		13.26	
		Spain	Business	x	x	x	x	x	x	x	64.23		15.12		20.07		19.86		13.01	
Gardner	2005	Ireland	(Overall)	x	x	x	x	x	x	x	68	13.4	15.7	4	18.4	4.4	19.2	4.8	15	4
			Account	x	x	x	181	x	x	x	68.5	14.4	15.8	4.1	18.2	4.7	19.5	4.8	15	4.2
			Account	x	x	x	x	x	96	x	62,3	11.4	15.1	3.6	20.2	4.2	18.2	5.2	13.9	3.2
			Business	x	x	x	67	x	x	x	63.2	14.4	15.8	4.6	19.9	4	18.5	5	15	3.8
Hassall	2005	UK	Account	x	x	x	x	x	x	x	64.2	n	13.9	n	17.7	n	19.3	n	13.4	n
Arquero	2007	Europe																		
		UK	Account	21	141	95	x	x	x	x	67.77	13.4	14.8	3.8	18.9	4.7	19.1	4.7	15	4.3
		UK	Business	21	160	136	x	x	x	x	63.65									
		Spain	Account	21	99	220	x	x	x	x	67.78	12.6	15.2	4.1	19.9	4.4	19.7	4.6	13.1	4.2
		Spain	Business	21	96	242	x	x	x	x	63.99	x	x	x	x	x	x	x	x	x

Ameen,	2010	America	Account	21.04	50.30%	49.70%	x	x	x	x	66.3	n	16.1	n	16.0	n	18.7	n	15.4	n
Byrne	2009	Europe	Account	x	x	x	x	x	x	x	63.6	n	14.6	n	16.5	n	18.6	n	13.9	n
Illias	2013	Asia	Account	x	x	x	x	x	x	x	73.9	3.8	18.4	2.2	18.7	1.6	18.6	1.7	18.2	1.5
				x	55	x	x	x	x	x	72.8	2.99	18	1.63	18.4	1.5	18.2	1.76	18.1	1.5
				x	x	124	x	x	x	x	74.4	3.97	18.5	2.43	18.8	1.7	18.8	1.66	18.2	1.46
Trevor A. Francis	2007	America	Undergraduate																	
				x	x	x	x	13	x	x	66.9	19	15	5.1	16.6	5.6	20.1	6.1	15.4	5.1
			University	x	x	x	122		x	x	63.5	17.9	15	5.2	15.8	5.5	18.3	5.7	14.4	4.6
Karl Edward Patyon	2011	America	Undergraduate																	
			Homeschool	> 18	x	x	30	x	x	x	57.73	14.73	12.67	3.47	14.77	4.73	17.07	5.19	13.23	4.42
			Public School	> 18	x	x	312	x	x	x	61.38	20.92	14.04	4.94	15.31	5.13	18.34	6.11	13.7	4.73
			Private	> 18	x	x	62	x	x	x	62.68	19.87	14.32	4.79	15.35	5.67	18.76	4.79	14.24	4.62
Jodi Frantz	2005	America	Undergraduate	x	47	x	x	x	x	x	62.62	16.06								
				x	x	138	x	x	x	x	69.12	13.49.								
				x	x	x	57 (30.8%)	x	x	x							18.68		13.93,	
				x	x	x	x	33 (17.8%)	x	x							20.03		14.52,	
				x	x	x	x	x	49 (26.5%)	x							20		14.08	
				x	x	x	x	x	x	46 (24.9%)							18.39.		14.52	

Adeyemo, Saheed	2017	Nigeria	Mass Communication	x	x	x	x	x	x	81.85	13.34	21.16	4.26	19.6	4.05	19.59	4.53	21.51	4.3
Alex Foo	2005	Malaysia	Account	19 - 22	x	x	x	x	x	x	74.94	11.82	16.39	3.66	21.44	3.59	20.24	4	16.95	4.11
				x	x	148	x	x	x	x	x	72.56	10.9							
				x	x		476	x	x	x	x	75.69	12.01							
				x	x	88	223	311	x	x	x	75.26	11.76							
				x	x	32	146	x	180	x	x	75.16	11.66							
				x	x	27	98	x	x	133	x	73.84	12.22							
			Business	19 - 22							74.3	11.26	16.1	3.7	21.13	3.76	20.08	3.55	17.02	4.04
				x	x	171	x	x	x	x	x	70.98	10.77							
				x	x	x	306	x	x	x	x	76.11	11.12							
				x	x	50	79	133	x	x	x	72.93	10.81							
				x	x	77	158	x	239	x	x	75.43	10.06							
				x	x	36	62	x	x	102	x	73.4	14.07							
Hasall	2007	Malaysia			x	x	x	x	x	x										
			Business	x	x	x	x	x	x	x	67.62									
				x	50.60%	x	x	x	x	x	66.63									
				x	x	49.40%	x	x	x	x	68.64									
			Account	x	x	x	x	x	x	x	68.72									

					x	0.631	x	x	x	x	x	67.31										
					x	x	0.359	x	x	x	x	71.12										
Rahmani, Diyako;	2017	Finland	Communication Tech	17 to 61	x	x	x	x	x	x	x	57.36	14.67	14.28	4.74	13.75	4.45	15.65	4.9	13.68	3.98
					x				89				x	x	x	x	x					
					x	x	6	x	x	x	x											
Dacia	2017	America	Computing		x	x	x	x	x	x	x	73.16	4.97	17.1	1.63	17.88	1.9	18.14	2.22	11.06	1.57

x= no values were reported, sD is standard deviation

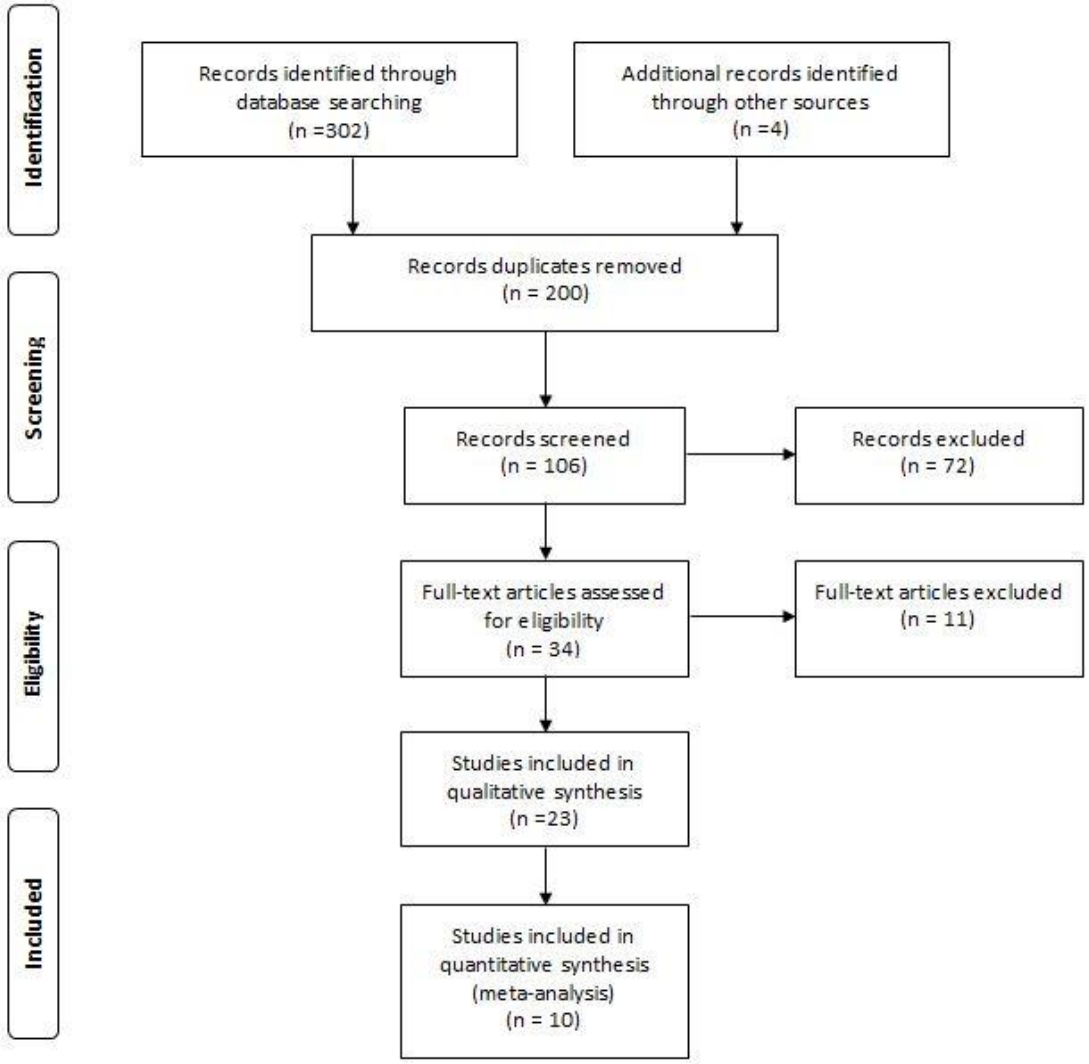

Figure 1: PRISMA flow diagram

Participant's characteristics

The included studies all involved women respondents with a total sample size of 3867 (Table 2). Respondents consisted of the university students, the population in which the PRCA 24 was specifically designed by McCroskey (Table 2). Of the 23 papers, 11 were authored in the United States[19-29], 2 in United Kingdom[34, 39], 2 in New Zealand[19, 30], 2 in Malaysia[31, 32], 1 in India[36], 1 in Canada[33], 1 in Ireland[35], 1 in Iran[38]. 4 papers included also contained collaboration with foreign researchers to compare CA between the university students of each country. In this case, 2 papers contained partnership between researchers in the United Kingdom & Spain[34, 39] while 1 paper contained partnership between researchers in the United States & New Zealand[24].

Outcomes of interest

In most included studies, the primary outcome assessed was general scores of the PRCA 24 so as to gauge the prevalence of CA as a whole among targeted university students (Table 1). The secondary outcomes consisted of the breakdown of individual CA components such as communication in group discussion, meetings, public speaking, and dyad conversation. Out of the 23 papers included in the analysis, General PRCA 24 score was available for all 17 studies[19, 21-23, 25-28, 30-33, 35-39] and individual breakdown for PRCA 24 data was missing in 4 research papers [20, 24, 29, 34].

Prevalence of Communication Apprehension by General PRCA 24 scores

Analyzing studies that reported general PRCA 24 score (N = 17), it was discovered that all had PRCA 24 scores in the range of 55 to 83. Of these studies, only two reported a general score above 70 (Illias et al., 2013; Alex Foo, 2015) and only one (Adeyemo et al., 2017) mentioned 81.85, which is the closest score to the range of high CA (83 and 120). These findings revealed that CA amongst all the university students reported via this systematic review had an average level of CA.

Communication Apprehension by Individual PRCA 24 scores

Across the analysis of 23 studies, it was noted that most students do not feel anxious when it comes to interpersonal communication (range: 11.6 – 18.2). However, they do have CA as far as public speaking is concerned (range: 17.77 – 20.1). Moreover, university students have similar ranges of CA in Group discussion (12.67 – 21.6) and Meeting (12.42 – 21.44).

Comparison across Regions versus PRCA 24 scores

All 20 studies had a clear delineation of the location of the study. When compared across countries, western countries (n=15) had a lower PRCA 24 scores (range: 59.34 – 73.16) [19, 21-23, 25-28, 30, 33, 35, 39] compared to non-western countries (n=5) with a score of (range: 57.36 - 81.85)[31, 32, 36-38]. The study by Joseph M La. Et al. (2015), The United States revealed a general PRCA 24 score of 59.34; this stood in sharp contrast to the score of 81.85 in the study done by Adeyemo et al. (2017), Nigeria.

Age versus PRCA 24 scores

Age was included in 6 papers and hence, only mean age is reported to maintain consistency. James Katt et al. (2016) had the youngest students at mean age of 19.1 years (PRCA = 66.62); Ameen et al. (2010) had students aged 21.04 years (PRCA = 66.3); Joseph M La et al. had students aged 27.1 years (PRCA = 59.34) while Rahmani et al. (2017) had the oldest students with the mean age of 34.27 years (PRCA = 57.36). The trend was noticed as students increased in age, they had a decrease in PRCA 24 score.

Two other studies by Illias et al. (2013) and Alex Foo (2015), conducted in Malaysia, provided only the age range of students with similar ranges from 18 to 22 years old (PRCA = 73.9) and 19 to 22 years old (PRCA = 74.94), respectively.

Race versus communication apprehension

One paper discussed the relationship between race and CA. Joseph M. La et al. concluded that Africans have the lowest apprehension among university students. African Americans have less CA (50.92 years) than Whites (66.04 years) and Asian (66.63 years). However, their counterparts in Africa as reported by Adeyemo et al. (2017) suffer from a higher overall CA (81.85). Both studies were carried out separately. Other students including Asians corroborated these findings by taking into consideration other papers included in the Asian setting, namely in India (69.32 years) by Sunanda Patil et al. and Malaysia (74.94 years) by Alex Foo (2015). Across these papers, Asians can be said to have the highest level of communication.

Comparison across discipline of study versus communication apprehension

Attempts were made to stratify university students according to the field of study in order to facilitate understanding of the differences between science & art subject students. Discipline wise, papers sourced were from accounting students (n=9), followed by business (n=4), communication (n=3), engineering (n=1), and pharmacy (n=1). Engineering & pharmacy are considered harder sciences than art subjects consist of accounting, communication, and business. Of the 17 papers included, 3 papers contained hard sciences; while 14 papers contained art students; 3 papers had missing data regarding the field of study. Art students (n=14) had general PRCA score at the range of 63.6 - 81.85 [19, 21-22, 25, 26, 30-33, 35, 37, 39] while science students (n = 3) had a general PRCA score at the range of 59.34 - 73.16 [21, 28, 36].

Meta-Analysis of analysis of outcomes

Communication apprehension in formal settings

CA in formal settings such as Meeting/interview & Public Speaking varied a lot among university students. Ibrahim et al. (2001) found that most students are less apprehensive when it comes to interviewing; this view is further corroborated by Gardner et al. (2005), Dacia et al. (2015), Joseph M. La et al. (2015), and Sunanda Patil et al. (2012). However, other authors such as Adeyemo et al. (2017), Alex Foo et al. (2015), and Illias et al. (2013) found that university students have more apprehension when it comes to public speaking (Maximum Score: 19.59; Minimum Score: 18.14). The results of the meta-analysis confirmed that the likelihood of CA was a lot lesser in formal settings than public speaking. The possibility of CA during the interview was less like during interviews -0.89 CI

95% [-1.78, -0.01, Heterogeneity: Tau² = 1.65; Chi² = 152.48, df = 8 (P <0.00001) in comparison to general setting. Details are shown in Figure 2.

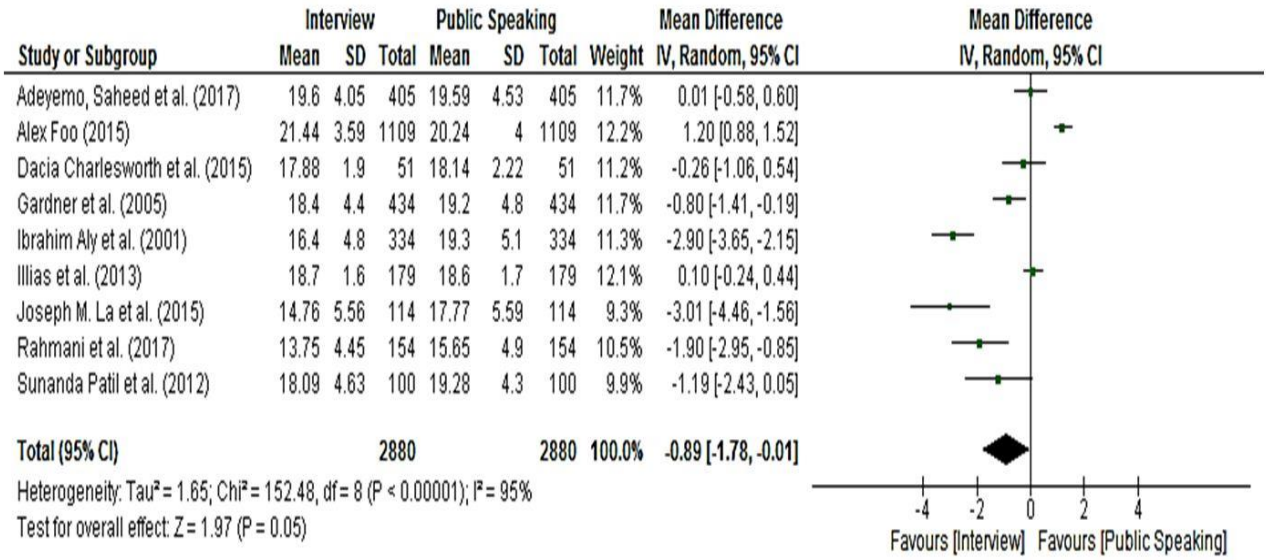

Figure 2: Mean difference of CA in formal and public speaking

Communication apprehension in informal settings

CA in informal settings, mainly divided into daily conversation (conversation between two people) and group discussion and revealed interesting results. Conversation was a much-favored setting for communication as opposed to group discussions [-0.43 CI 95% [-0.71, 1.51] (Figure 3).

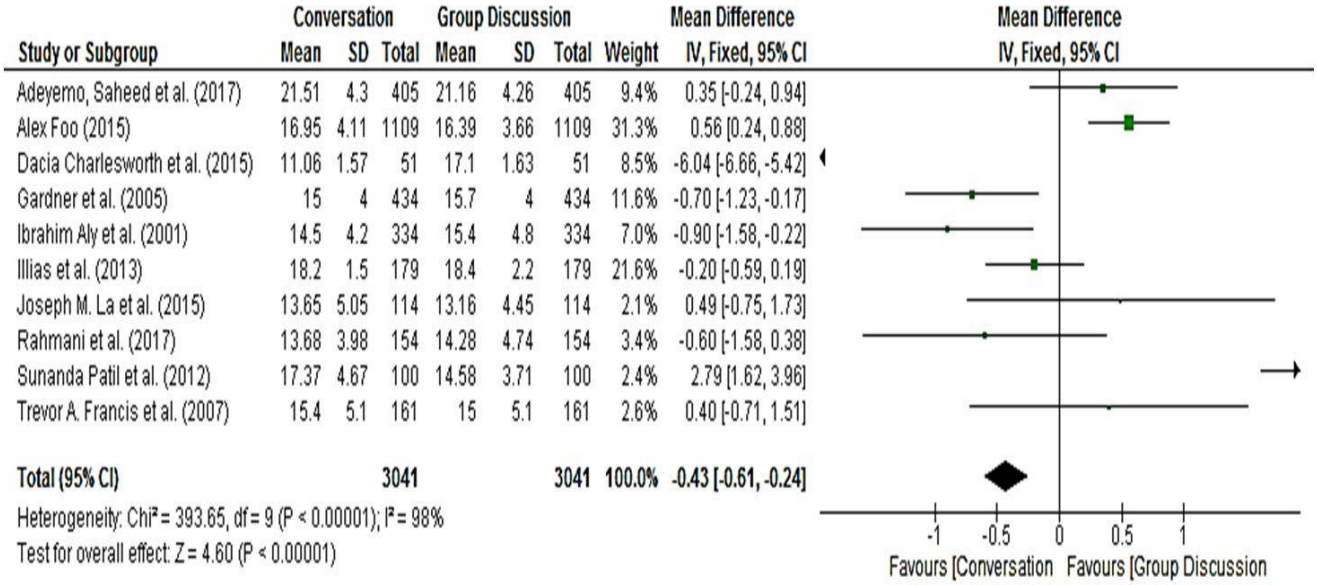

Figure 3: Mean difference of CA in conversation and group discussion

Authors who reported this findings included Dacia et al. (2015), Gardner et al. (2005), Ibrahim et al. (2001), Illias et al. (2001), Rahim et al. (2017); while authors who reported group discussion to be the less apprehensive included Alex Foo (2015), Sunanda Patil et al. (2012), and Adeyemo et al. (2017). Further exploration revealed that male students were observed to have less CA when compared to females [-3.54 CI 95% [-5.63, -1.46]. Details are shown in Figure 4.

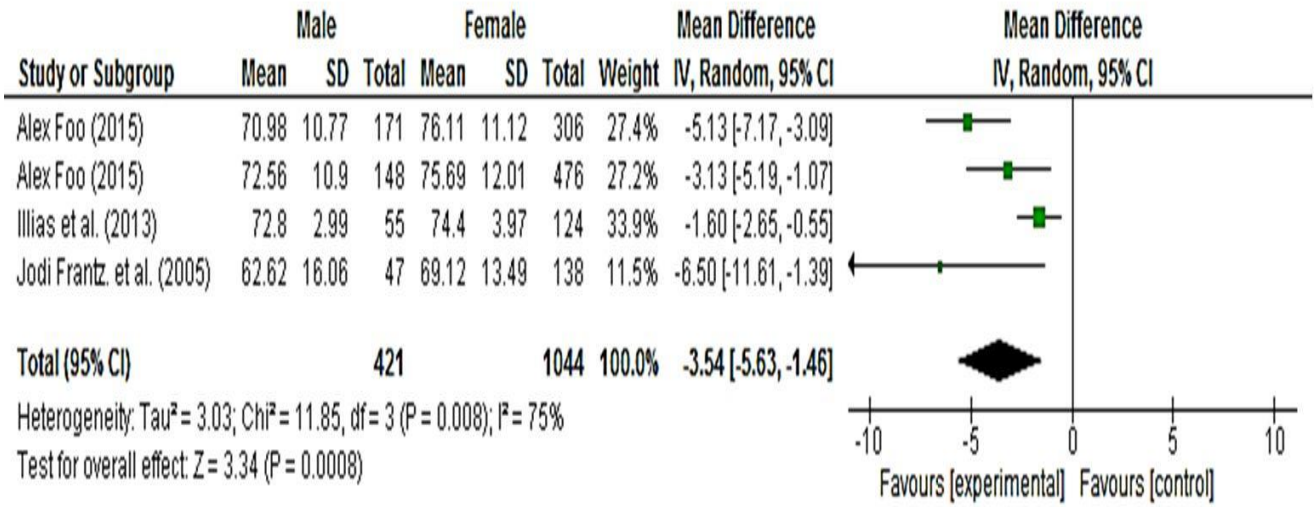

Figure 4: Mean difference of CA based on gender

Addressing the situation based on the academic year, it was revealed that Year 3 students had two times less CA than Year 1 students. [OR 95% = -2.04 [-4.75, 0.68], p <0.007]. However, Alex Foo noted that business students across year 1 and year 3 students did not show any differences in CA, while there were differences among other disciplines (Figure 5).

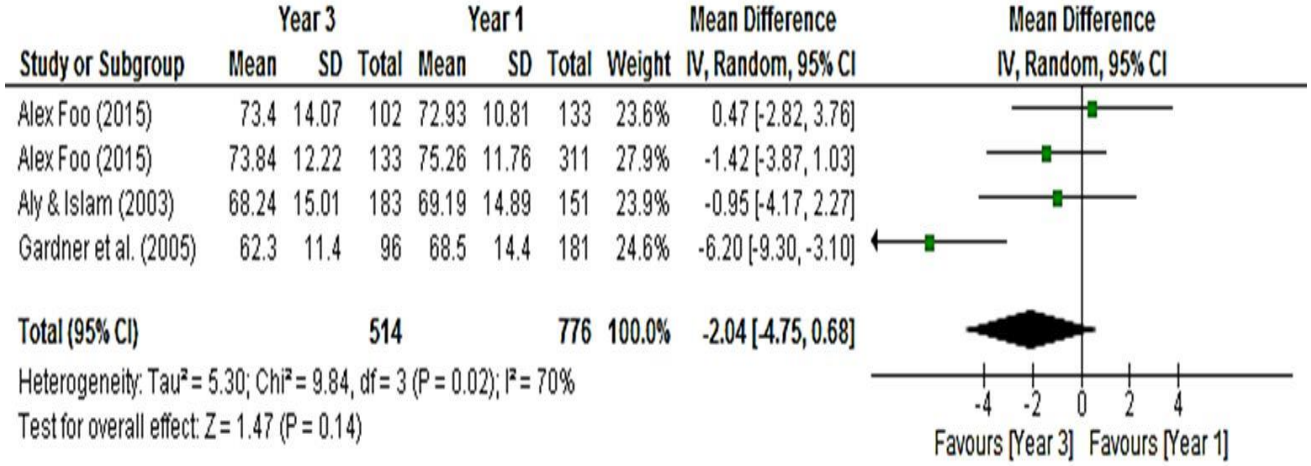

Figure 5: Mean difference of CA among year 1 and year 3 students

Discussion

This systematic review is perhaps the first to quantitatively explore the impact of CA among students. Our reviews of papers indicated that as people get older, they tend to have better CA. Our results were corroborated by studies that depicted a positive relationship between CA and age[40, 41]. However, it is refuted by another study that stated there is a negative relationship between CA and age[42]. There are also papers that depicted no relationship between CA and age[43]. We suggest that elderly students may require less attention as they are capable of communicating independently. Previous studies of age suggested that in more collectivist cultures, older people are venerated due to their knowledge, sageness, and experience resulting from age[44]. As one of the Middle Eastern cultures, the Kurdish community values age as a prominent element to determine the social place of the individuals[45]. As people get older, they experience higher social importance and respect. Thus, due to an increase in social confidence, aging could decrease apprehension indirectly. They could have also experienced more in life, which necessitates them to voice out whatever they deem necessary.

Overall, males have less CA than females. Research shows women tend to be more apprehensive than men[42, 46] except for Lin and Rancer (2003) who found men to be more apprehensive[47]. Differences in the level of apprehensiveness of men and women are often ascribed to the cultural biases resulting from social roles[48] and psychological stereotypes of the genders[49]. Women had significantly higher dyadic CA and public CA than males, which is consistent with a previous

literature[41]. Correspondingly, Simons et al. (1995) found evidence of gender differences in the levels of CA[50]. The initial observation of Daly and Miller (1975) revealed that female students have significantly higher overall oral CA scores and higher scores associated with formal speaking contexts; namely, the meeting and public speaking subscale scores.

Difference in communication apprehension from east to west

Students who receive western forms of education have less CA than that of the east. This was also evident from the study when African Americans were compared with Africans. Similarly, Kurds also have less CA. Yet, the trend is changing in recent years as societies are getting more individualistic or westernized [51].

Getting deeper into such prospects, Asians have lower ability and comfort scores on average compared to Caucasians and African-Americans, respectively with an increase in CA. Nevertheless, the relationship was significantly weaker in African-Americans compared to Asians and Caucasians. Similarly, African-Americans demonstrated a higher level of interprofessional socialization compared to Asians. African-Americans have more positive perceptions of interprofessional teamwork and education compared to other racial groups[28].

Asian students have lower scores than American students on team cohesion scales. In a team task study, Asian students had less team and social cohesiveness and performance scores than the American students, where the majority of the latter (70%) were White[52]. Further exploration depicted that such a poor score is attributed to varying factors. As an example, Asian cultures tend to use high-context communication, which includes communication styles that are less direct such as feelings, interpersonal sensitivity, and incline more towards silence. A collectivistic culture such as the Maori society utilizes silence rather than verbal expression when they are uncomfortable or are attempting to gather their thoughts[53]. Higher levels of CA and lower willingness to communicate may be related to the physical isolation and general lack of opportunity to communicate with people outside one's immediate social group. European cultures tend to use low-context communication, which includes dominant, animated, friendly, open, and attentive communication styles[54].

Our findings also suggest a difference between the social context of support i.e. collectivistic and individualistic culture. In an individualistic or western culture, the ability to recognize and to use humor may serve to bolster confidence. In a collectivistic culture, such abilities may generate inappropriate individual attention, leading to feelings of anxiety; as such, individuals in collectivistic cultures do not wish to draw attention. The US students, coming from a highly individualistic culture, would probably have less difficulty with the idea of standing out from the group. Indeed, many in the US would likely welcome such attention.

Impact of academic year on communication apprehension

Our meta-analysis revealed that students in year 3 of study have less CA than that of year 1 students. However, this may not be the case in all studies.

Alex Foo (2015) states that it appears that university education exposure is not necessary to support the belief that CA is something capable to be trained and improved. This skill gap reflects the lack of knowledge that the accountants today are to be communication-competent as part of their value-added service. This could be because students who are predisposed to relatively higher scores of CA (associated with high neuroticism and low extroversion) are more likely to select the course that they think require little communication such as accounting. The stereotype of professions enables a false impression in which they attempt to avoid social interaction[31].

This finding further corroborates with the study of Aly and Islam (2005), which suggested the lack of relationship between years of experience and student's CA[55]. As mentioned, past studies generally lean on social learning theory in explaining CA. It is to no surprise that Aly and Islam (2005) speculated a change in CA but found it to be otherwise. Educators desire that the students improve in both technical and soft skills during their five years of university exposure. The common belief that people learn by getting engaged in a task, and that over time the learning experience contributes to better skill, it is was stressed that students be exposed to various speaking environments to lessen their CA [55]. However, the result appears to be consistent across different years of study. It validates Aly and Islam's (2003) notion that student's CA is not different between those who are entering and exiting the accounting program[56]. These past studies revealed that the student's CA is largely enduring across different year levels. It would seem that the education process encompassing activities such as discussions and presentations should help little through classroom exposures.

Limitations

This study focused only on PRCA 24 as the analysis of CA. There are other instruments out there that are utilized in CA such as willing to communication (WTC), foreign language CA scale (PSCAS). We hope that further research in the future can integrate other questionnaires discussing CA into the findings of our study. We hope that further research done in the future can provide a more meticulous breakdown of details to allow for a meaningful comparison across years, age, gender, and field of study.

Conclusion

PRCA 24 is a good method to validate student's CA. Age, gender, and culture still remains a critical component in intervention. An individual, who has higher CA, engages communication context only when really motivated. The source of motivation may come from higher perceived reward. In short, the higher the level of perceived reward, the greater stimuli available for BAS activation, which leads to action. For anxiety dimension, students with high CA will appear to be more inclined to the neurotic side of temperament. Various techniques such as positive tone and systematic desensitization (SD) technique can be employed in assisting such individuals to overcome their fear of communication.

Availability of data and material

All relevant data are presented in this paper.

Funding

None

Consent for publication

Not required, this paper is not presenting any detail, images, or videos relating to an individual person.

Ethics approval and consent to participate

Not required for systematic reviews and meta-analysis.

Authors contributions

The study was conceived by GE and HT. Data extraction was done by HT and verified by JK, HT, and GE. Data analysis was performed by TMK, JK, and HT. HT and JK wrote the initial draft and it was finalized by GE.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Acknowledgments

We would like to thank library staff of Monash University Malaysia for their support to this project.

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