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## Knowledge about sexual orientation among student counselors: A survey in Japan

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**This study targeted clinical psychologists engaged in student counseling in Japan and investigated their level of clinical and psychological knowledge about sexual orientation. This study also assessed the relationship between sexuality education and self-learning experiences and knowledge. A questionnaire which included 13 items assessing basic and clinical knowledge about sexuality, experiences regarding education on homosexuality, experiences of self-learning, and experiences with sexual minorities, was anonymously administered to 484 student counselors trained as clinical psychologists. The total number of valid responses was 321 (66.3%). About 80% of the participants correctly answered the items under the category "basic knowledge about homosexuality," although their clinical knowledge and knowledge regarding differences in sexual orientation and gender identity were limited. 277 had attended graduate school and the proportion of participants who had received education on homosexuality during graduate clinical psychology training was 14.8%. Education on homosexuality received during graduate clinical psychology training and that received via self-learning had little associations with the level of knowledge about sexuality. These results suggest that the level of clinical knowledge of Japanese student counselors was insufficient for appropriate clinical practice. Issues surrounding sexuality education and clinical psychologist training, as well as the limitations of this study, are discussed.**

**Key words:** knowledge about sexual orientation, counselor education, student counselor.

### INTRODUCTION

A person's sexuality comprises the following three components: biological sex, gender identity and sexual orientation. Gender identity refers to the awareness of one's own gender, whether a person considers themselves

male or female; sexual orientation indicates which gender is the object of a person's romantic feelings or sexual desires. Sexual minority is a generic term for people whose sexual orientation, identity or practices differ from

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**Abbreviations:** Interpretative Phenomenological Analysis – IPA; General Practitioner – GP

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that of the majority of the society.

For instance, the minorities in terms of gender identity are people whose gender identities are inconsistent with their biological sex are called transgender (including gender identity disorder), and the minorities in terms of sexual orientation are homosexuals and bisexuals.

Mental health problems have been reported among sexual minorities, such as depression, anxiety, drug and alcohol use, and high rates of suicide attempts (Cochran et al., 2003; Stall et al., 2003; Wichstrom and Hegna, 2003; Hidaka et al., 2006). These problems have been linked to the psychological stress of social stigmatization (Meyer, 1995; Ghindia and Kola 1996; Mays and Cochran, 2001; King et al., 2008; Halkitis, 2012) in Japan and elsewhere.

Homosexuals in Japanese society, which generally assumes everyone to be heterosexual, experience conditions of chronic stress and often have conflicting feelings about their own sexual orientation as a consequence of discrimination and prejudice within society. In a study of more than 1,000 Japanese homosexual men, bisexual men, and men questioning their sexual orientation, 71% had a high level of anxiety, and 13% had a high level of depression. Moreover, 83% experienced bullying in school, and 15% had attempted suicide. Another study of a large sample of Japanese urban youth showed that non-heterosexual men were six times more likely to have attempted suicide than heterosexual men (Hidaka et al., 2008). These results indicate that one of the risk factors for suicide among young Japanese men is being homosexual or bisexual. A study on adolescent milestone events for Japanese gay men reported that the average age of first thoughts about suicide was 16.4 years, the average age of clearly identifying as gay was 17.0 years, and the average age of the first suicide attempt due to sexual orientation was 20.2 years.

In Japanese society, which is dominated by heterosexuality and negative attitudes toward homosexuality, the difficulties that homosexual and bisexual men experience in their early development can lead to a decline in self-esteem. Difficulties such as bullying by others and suicide attempts affect self-esteem and may contribute to increased risks for both suicide and human immunodeficiency virus (HIV) contraction (Hidaka and Operario, 2009). No similar study on lesbians in Japan has been conducted to date. Mental health conditions, suicide ideation, suicide attempts, and HIV infection among 10 to 20 year-old lesbian, gay, or bisexual (LGB) individuals are receiving much attention in other countries, as well as Japan (Russell and Joyner, 2001; Bontempo and D'Augelli, 2002; Berlan et al., 2010). Since sexuality is a major issue between puberty and adolescence, difficulties coping with stigmas against homosexuality might increase during this period (Rotheram-Borus and Fernandez, 1995). It is, therefore, important to enhance psychological support systems that address adolescent

sexuality. However, only a few opportunities exist for discussing LGB clinical psychology in Japan. Although treatment guidelines for gender identity disorder were created by the Japanese society of psychiatry and neurology, only a few professional psychologists have initiated organized discussions on LGB psychology. Moreover, the understanding of sexual orientation may vary among specialists (Sasaki et al., 2012).

In a study that reported on Japanese counselors' clinical biases toward homosexual clients, it was found that counselors showed more negative reactions to homosexual clients than to heterosexual clients, due to factors related to homophobia (Shinagawa, 2006). Although counselors generally intend to treat homosexual clients without bias, they may have an underlying evasive attitude toward such clients (Shinagawa and Kodama, 2005). There is a distinct need for education and training of Japanese clinical psychologists to improve their ability to provide psychological support for LGB clients (Kasai and Okahashi, 2011). However, no study has been conducted to assess the extent to which Japanese clinical psychologists receive sexuality education during their professional training, and what specific knowledge they acquire.

One organization offering counseling to Japanese youth provides on-campus services for university students. According to the Japan student services organization (2011), 87.9% of Japanese universities, including national, prefectural, municipal and private universities, have more than one student counselor with professional credentials. Such professionals, trained as clinical psychologists or medical doctors, play a support role aimed at helping students with both school-related problems and various mental health and interpersonal relationship issues.

The present study targeted clinical psychologists engaged in student counseling in Japan and investigated their level of clinical knowledge about sexual orientation. We also assessed the relationship between sexuality education and self-learning experiences and knowledge. We hypothesized that counselors who received no/little education regarding homosexual topics would have limited knowledge. Basic data from this study may clarify issues pertaining to sexuality education and training of clinical psychologists.

## METHODOLOGY

### Participants and procedures

This study conducted between October and November, 2012, as a part of the acquired immune deficiency syndrome (AIDS) research projects sponsored by the ministry of health, Labour and welfare in Japan. The study targeted certified clinical psychologists or "university counselors" who were certified by the Japanese association of student counseling, who were engaged in student counseling at four-year universities in the Chu-Shikoku and Kinki

areas. Each campus within the target area on the university list available from the website of the ministry of education, culture, sports, science and Technology of Japan was either called or e-mailed. The presence and number of student counselors who would be eligible to participate was then assessed. Among the universities that confirmed the presence of counselors, questionnaires were sent to all student counseling institutions that agreed to receive them. Anonymously self-administered questionnaires in Japanese were sent to institutions and each study participant returned the questionnaire individually by mail. Participants received stationery as an incentive. Informed consent was requested from all participants on the first page of the questionnaire. The study protocol was approved by the ethics board of Hiroshima Bunkyo women's university.

### Measures

**Knowledge about sexuality:** Thirteen items for the questionnaire were originally created, with response options including: "I think so," "I don't think so," or "I don't know." The questionnaire included the following four categories:

- 1) "Basic knowledge about homosexuality," which contained three items, such as "homosexuality is a mental illness," "Many homosexual (gay) men use feminine language and gestures," and "Many homosexual (lesbian) women use masculine language and gestures;"
- 2) "Knowledge about sexual orientation," which contained four items, such as "one can decide whether to be homosexual or heterosexual," "Homosexuality can be changed to heterosexuality by treatment and effort," "I don't know the difference between gender identity disorder and homosexuality," and "Sexual orientation is a term used to describe homosexuality, heterosexuality, and bisexuality;"
- 3) "Clinical knowledge about homosexuality," which contained four items, such as "One of the main factors involved in becoming homosexual is confusion of gender identity (identifying oneself as a man or woman)," "One of the main factors behind homosexuality is parent-child relationships in childhood," "it is appropriate to psychologically intervene to change homosexuality to heterosexuality for a client wanting to treat homosexuality," and "Current society is likely to worsen the mental health of homosexuals;" and
- 4) "clinical knowledge about gender identity disorder," which contained two items, such as "One of the main factors behind gender identity disorder is parent-child relationships in childhood," "it is appropriate to support a client who is diagnosed with gender identity disorder to be able to live as the gender s/he wants." These categories and items were created based on the findings of a pilot study targeting Japanese counselors. Clinically appropriate answers (correct answers) for each item were decided according to the report of the American psychological association (APA, 2009) .

**Education on homosexuality and self-learning experiences:** Participants were instructed to choose an answer from response alternatives (multiple answers possible) about whether they received education on homosexuality in undergraduate or graduate clinical psychologist training programs. They were also asked about self-learning experiences, outside of undergraduate and graduate education, regarding the clinical psychology of homosexuality. If they reported self-learning experiences, they were asked to select what self-learning source they used from a list of multiple alternatives. If they did not have such experiences, they were asked for explanations, which they could select from response alternatives.

**Experiences of having sexual minority clients:** Participants were

asked about the number of student clients they had counseled who were homosexual men, bisexual men, homosexual women, bisexual women, transgender people and others.

**Screening item:** Participants were asked whether they were certified clinical psychologists or "university counselors" who were certified by the Japanese association of student counseling. If the respondents did not have either of certificates, they were excluded from participants.

**Demographics:** Participants were asked about their gender, age, years of clinical experience and working conditions. In addition, they were asked whether they had received clinical psychology training overseas, and whether they had close homosexual, bisexual, or transgender friends.

### RESULTS

Questionnaires were sent to 484 certified clinical psychologists and "university counselors", including 128 counselors from 54 of the 66 total universities (81.8%) in the Chu-Shikoku area, and 356 counselors from 120 of the 153 total universities (78.4%) in the Kinki area. As a result, the total number of valid responses was 321 (66.3%). Table 1 summarizes the demographic characteristics of participants. The mean age of counselors was 43.1 years (SD=11.0), and the mean number of years of clinical experience was 13.8 (SD=9.4). Of the 321 participants, 253 (78.8%) were female and 68 (21.2%) were male. Sixty-six (20.6%) participants had close friends or acquaintances who were homosexual, 42 (13.1%) had transgender friends and acquaintances, and 230 (71.7%) had neither. During student counseling, 69 (21.6%) had counseled homosexual males, 20 (6.3%) had counseled bisexual males, 61 (19.1%) had counseled homosexual females, 35 (10.9%) had counseled bisexual females, and 90 (28.2%) had counseled transgender individuals.

Table 2 summarizes the results of the 13 questionnaire items regarding knowledge about sexuality. The percentage of correct answers for the category "basic knowledge about homosexuality" (items 1-3) was about 80%. However, the percentage of correct answers for the category "knowledge about sexual orientation" was much lower. Among all study participants, 39.7% knew the meaning of the term "sexual orientation" (item 7), only about half correctly responded to the prompt "one can decide whether to be homosexual or heterosexual" (item 4), and 76.6% correctly responded to the prompt "it is appropriate to support a client who is diagnosed with gender identity disorder to be able to live as the gender s/he wants" (item 11), which was an item in the category "clinical knowledge about gender identity disorder."

Conversely, only 22.3% correctly responded to the prompt "it is appropriate to psychologically intervene to change homosexuality to heterosexuality for a client wanting to treat homosexuality" (item 12), which was an item in the category "clinical knowledge about homosexuality." Moreover, there were a number of

**Table 1.** Demographic characteristics of participants

	<b>N</b>	<b>%</b>
<b>Age group</b>		
20 to 29	30	9.3
30 to 39	115	35.8
40 to 49	78	24.3
50 to 59	58	18.1
60+	34	10.6
No answer	6	1.9
Total	321	100.0
<b>Gender</b>		
Female	253	78.8
Male	68	21.2
Other	0	.0
Total	321	100.0
<b>Academic degree<sup>a</sup></b>		
Bachelor's only	44	13.7
Bachelor's & Master's	277	86.3
Total	321	100.0
<b>Years of clinical experience</b>		
1 to 5	65	20.2
6 to 10	95	29.6
11 to 15	48	15.0
16 to 20	42	13.1
21 to 25	20	6.2
26 to 30	28	8.7
31 to 35	11	3.4
36 to 40	6	1.9
No answer	6	1.9
Total	321	100.0
<b>Certifications (multiple answers possible)</b>		
Certified clinical psychologist	311	96.9
University counselor	33	10.3
<b>Working condition</b>		
Full-time	93	29.0
Part-time	226	70.4
No answer	2	.6
Total	321	100.0
<b>Having close friends or acquaintances belonging to a sexual minority (multiple answers possible)</b>		
Homosexual/Bisexual	66	20.6
Transgender	42	13.1
None	230	71.7

Table 1. Contd.

<b>Having clients belonging to a sexual minority (multiple answers possible)</b>		
Homosexual men	69	21.5
Bisexual men	20	6.2
Homosexual women	61	19.0
Bisexual women	35	10.9
Transgender people	90	28.0
Other	6	1.9
None	146	45.5
<b>Receiving clinical psychology training overseas</b>		
Yes	15	4.7
No	302	94.1
No answer	4	1.2

Note.<sup>a</sup> In Japan, a Bachelor's degree is a prerequisite for becoming a certified clinical psychologist or "university counselor."

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participants who did not realize that they had confused issues of sexual orientation and gender identity. Of the participants, 78.8% responded "I don't think so" to the prompt "I don't know the difference between gender identity disorder and homosexuality" (item 6), and 37.8% correctly responded to the prompt "one of the factors involved in becoming homosexual is confusion about gender identity (identifying oneself as man or woman)" (item 9). A  $\chi^2$  test on each of the 13 items revealed differences in the response rate for all items except item 9 (Table 2).

Forty-four (13.7%) participants reported having received education on homosexuality in undergraduate training. Of all participants, 277 had attended graduate school and 41 (14.8%) of those reported receiving education on homosexuality during their graduate clinical psychology training. The percentage of those who received education on homosexuality was low in both undergraduate and graduate schools. Table 3 shows the topics learned by participants who had received education on homosexuality. In both undergraduate and graduate schools, less than 30% of participants had received education on "counseling skills," and some responded that they "can't remember" what they learned (27.3% undergraduate and 17.1% graduate programs).

When asked about self-learning outside of undergraduate and graduate education (Table 4), 216 (67.3%)

reported having learned on their own. The majority of participants (122; 56.5%) reported having "read books on homosexuality," while 101 (46.8%) reported having "browsed websites about homosexuality." Participants who did not have self-learning experiences about the clinical psychology of homosexuality were asked for an explanation. The majority (67.6%) answered that they had "never been aware of homosexuality."

As professional training for counselors in Japan is usually covered in graduate schools, this study focused on homosexuality education received during graduate school and via self-learning and assessed their associations with knowledge on sexuality. Table 5 is a cross tabulation for the percentage of correct answers to questions on sexuality and homosexuality education received during graduate school and via self-learning. A two-way (graduate education  $\times$  self-learning) analysis of variance using the arcsine transformation method was applied to correct the answer rate on each cell. The effect of homosexuality education during graduate school was significant for only one item ("8. One of the main factors behind gender identity disorder is parent-child relationships in childhood."), indicating that the percentage of correct answers was significantly higher among participants who received homosexuality education in graduate schools ( $p < .05$ ). The effect of homosexuality education via self-learning was also significant for only one item ("7.

Sexual orientation is a term used to describe homosexuality, heterosexuality, and bisexuality.”), indicating that the percentage of correct answers was significantly higher among self-learning participants ( $p < .01$ ). The interaction effect was not significant for all items.

Other factors may be associated with knowledge on sexuality such as having close friends or acquaintances belonging to a sexual minority, having clients belonging to

a sexual minority, education received during undergraduate school, and years of clinical experience. Therefore, we assessed the associations of these factors with the participants' actual level of knowledge of sexuality. We first calculated a total score using 13 items, with correct answers receiving one point and incorrect answers receiving zero points ( $M=7.74$ ,  $SD=2.54$ ). With this score as the base variable, we conducted a multiple  
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**Table 2.** Knowledge about sexuality (Total).

	I think so		I don't think so		I don't know		$\chi^2(2)$
	n	%	N	%	n	%	
<b>Basic knowledge about homosexuality</b>							
1. Homosexuality is a mental illness. ( $n=320$ )	13	4.1	253	79.1	54	16.9	309.01***
2. Many homosexual (gay) men use feminine language and gestures. ( $n=321$ )	28	8.7	274	85.4	19	5.9	391.35***
3. Many homosexual (lesbian) women use masculine language and gestures. ( $n=321$ )	12	3.7	287	89.4	22	6.9	454.67***
<b>Knowledge about sexual orientation</b>							
4. One can decide whether to be homosexual or heterosexual.	101	31.6	151	47.2	68	21.3	32.74***
5. Homosexuality can be changed to heterosexuality by treatment and effort. ( $n=321$ )	9	2.8	205	63.9	107	33.3	179.51***
6. I don't know the difference between gender identity disorder and homosexuality. ( $n=321$ )	40	12.5	253	78.8	28	8.7	299.50***
7. Sexual orientation is a term used to describe homosexuality, heterosexuality, and bisexuality. ( $n=320$ )	127	39.7	100	31.3	93	29.1	6.04*
<b>Clinical knowledge about homosexuality</b>							
9. One of the main factors involved in becoming homosexual is confusion of gender identity (identifying oneself as a man or woman). ( $n=320$ )	101	31.6	121	37.8	98	30.6	2.93
10. One of the main factors behind homosexuality is parent-child relationships in childhood. ( $n=320$ )	66	20.6	126	39.4	128	40.0	23.28***
12. It is appropriate to psychologically intervene to change homosexuality to heterosexuality for a client wanting to treat homosexuality. ( $n=319$ )	65	20.4	71	22.3	183	57.4	83.09***
13. Current society is likely to worsen the mental health of homosexuals. ( $n=320$ )	203	63.4	40	12.5	77	24.1	136.92***
<b>Clinical knowledge about gender identity disorder</b>							
8. One of the main factors behind gender identity disorder is parent-child relationships in childhood. ( $n=321$ )	41	12.8	175	54.5	105	32.7	83.96***
11. It is appropriate to support a client who is diagnosed with gender identity disorder to be able to live as the gender s/he wants. ( $n=321$ )	246	76.6	12	3.7	63	19.6	283.01***

Note. Italic font indicates the correct answer for each prompt. \* $p < 0.05$ . \*\*\* $p < 0.001$ .

linear regression analysis (forced entry) with the following six factors as explanatory variables: undergraduate

education on sexuality, graduate education on sexuality, self-learning on sexuality, experiences with homosexual/

bisexual clients, having homosexual/bisexual friends and acquaintances, and years of professional experience as a counselor.

Except years of professional experience, each explanatory variable was entered as a dummy variable with “yes” as one and “no” as zero. Years of professional experience was entered as a dummy variable with the group with low number of years of experience as zero

and that with high number of years of experience as one. The low group consisted of participants with less than 14 years of professional experience and the high group consisted of participants with 14 or more years of professional experience, based on the average value of 13.8 years. Only experiences through self-learning had a significant positive standard partial regression coefficient with the knowledge score (Table 6).

**Table 3.** Education on homosexuality

	n	%
<b>Contents of undergraduate education (n=44, multiple answers possible)</b>		
Definition of homosexuality	29	65.9
Distress of homosexuals	19	43.2
Counseling skills	5	11.4
Can't remember	12	27.3
Other	1	2.3
<b>Contents of graduate education (n=41, multiple answers possible)</b>		
Definition of homosexuality	27	61.4
Distress of homosexuals	23	56.1
Counseling skills	12	29.3
Can't remember	7	17.1
Other	2	4.9

**Table 4.** Self-learning experiences about homosexuality

	n	%
<b>Yes: self-learning tools (n=216, multiple answers possible)</b>		
Training seminar (student counseling <sup>a</sup> )	27	12.5
Training seminar (school counseling <sup>b</sup> )	9	4.2
Training seminar (HIV)	27	12.5
Training seminar (other)	66	30.6
Conference presentation	38	17.6
Book	122	56.5
Academic paper	73	33.8
Internet	101	46.8
Other	20	9.3
<b>No: explanation (n=105, multiple answers possible)</b>		
Never seen information	23	21.9
Never been aware of it	71	67.6
No need since it is not a disability	12	11.4
Won't encounter a homosexual	19	18.1
Feel uncomfortable about homosexual issues	2	1.9
Feel uncomfortable about sexual issues	5	4.8
Other	13	12.4

Note. <sup>a</sup> Student counseling refers to counseling for university students, <sup>b</sup> School counseling refers to counseling for high school and younger students

## DISCUSSION

In this study, associations were found between knowledge about sexuality among Japanese student counselors and past education received. Although about 80% of the participants answered correctly for the category “basic knowledge about homosexuality,” their clinical

knowledge and understanding of gender identity and differences in sexual orientation were limited.

We found that Japanese clinical psychologists rarely received formal education on homosexuality during the course of their professional training. It appeared instead that most clinical psychologists relied on self-learning. Prior studies in Western countries have indicated Matsutaka et al. 81

**Table 5.** Associations between percentage of correct answers on sexuality knowledge questions and graduate education or self-learning about homosexuality

Item no.		Graduate education: No		Graduate education: Yes		Two-way ANOVA <sup>a</sup>
		Self-learning No	Self-learning Yes	Self-learning No	Self-learning Yes	
<b>Basic knowledge about homosexuality</b>						
1	Correct answer	56(66.7%)	122(80.3%)	5(83.3%)	30(88.2%)	NS
	Total	84	151	6	34	
2	Correct answer	64(76.2%)	136(90.1%)	5(83.3%)	33(94.3%)	NS
	Total	84	151	5	35	
3	Correct answer	66(78.6%)	144(95.4%)	5(83.3%)	32(91.4%)	NS
	Total	84	151	6	35	
<b>Knowledge about sexual orientation</b>						
4	Correct answer	33(39.3%)	71(47.0%)	2(33.3%)	24(68.6%)	NS
	Total	84	151	6	35	
5	Correct answer	45(53.6%)	103(68.2%)	5(83.3%)	24(68.6%)	NS
	Total	84	151	6	35	
6	Correct answer	58(69.0%)	123(81.5%)	4(66.7%)	29(82.9%)	NS
	Total	84	151	6	35	
7	Correct answer	25(29.8%)	69(45.7%)	0(.00%)	16(45.7%)	Self-learning $\chi^2 = 9.22^{**}$
	Total	84	151	6	35	
<b>Clinical knowledge about homosexuality</b>						
9	Correct answer	25(30.1%)	62(41.1%)	1(16.7%)	16(45.7%)	NS
	Total	83	151	6	35	
10	Correct answer	27(32.1%)	56(37.1%)	3(50.0%)	20(58.8%)	NS
	Total	84	151	6	34	
12	Correct answer	22(26.2%)	27(18.0%)	1(16.7%)	10(29.4%)	NS
	Total	84	150	6	34	
13	Correct answer	47(56.6%)	101(66.9%)	2(33.3%)	22(62.9%)	NS
	Total	83	151	6	35	
<b>Clinical knowledge about gender identity disorder</b>						
8	Correct answer	38(45.2%)	81(53.6%)	4(66.7%)	28(80.0%)	Graduate education $\chi^2 = 4.73^*$
	Total	84	151	6	35	
11	Correct answer	63(75.0%)	115(76.2%)	4(66.7%)	27(77.1%)	NS
	Total	84	151	6	35	

**Note.** <sup>a</sup> Using the arcsine transformation method, NS Not significant, \*\*  $p < .01$ , \*  $p < .05$ .

**Table 6.** Multiple regression analysis for sexuality knowledge score

Variables	$\beta$
Experiences with homosexual / bisexual client	.016

Having homosexual / bisexual friends or acquaintances	.048
Under graduate education	.061
Graduate education	.070
Self-learning	.245***
Years of clinical experience	.018
$R^2$	.087**
$adj-R^2$	.066**

**Note.**  $\beta$  Standardized partial regression coefficient, \*\* $p < .01$ , \*\*\* $p < .001$

inadequate levels of sexuality education (Eliason and Huges, 2004; Malley et al. 2004; Javaherian et al., 2008), and the results in Japan were similar. This study demonstrated that neither graduate school learning experiences nor self-learning were helpful in improving the level of knowledge of sexuality.

Such experiences did not necessarily translate into appropriate clinical practice. For instance, if a counselor believes that "one of the main factors involved in becoming homosexual is confusion of gender identity," s/he might inappropriately bring up issues of gender identity or gender role when counseling a homosexual. Such actions may lead to a failure to develop rapport with the counselee, or hinder the counselee from understanding her/his sexual identity. It is imperative that a strategy be developed to include sexuality education in the training of Japanese clinical psychologists. Such a strategy must necessarily include opportunities for those already working as clinical psychologists to receive educational training, as well as the development of educational tools. Since the most common response for having never initiated self-learning was "I have never been aware of homosexuality," campaigns to increase the awareness of and efforts to highlight the challenges faced by homosexuals are also needed.

One strength of this study was its high response rate, with 66% of questionnaire recipients responding by mail. Had the collection rate been low, there would have been suspicion of result bias, as only counselors who were interested in this theme would have participated (Alderson et al., 2009). Limitations of this study include the targeting of only two geographical areas and that only a limited number of student counselors were trained as clinical psychologists. In order to provide psychological support to homosexuals, a positive attitude toward diverse sexuality is important, along with training in actual skills for dealing with distress arising from sexuality issues. Further research on these themes is warranted.

## CONCLUSION

Our findings clarified the level of Japanese student counselors' clinical knowledge and the issues pertaining to sexuality education and training of clinical psychologists. It is important to standardize counselor education regarding homosexuality and raise the awareness of

counselors, in order to provide appropriate support to LGB students, and to thereby, help reduce the frequency of suicide attempts, depression, etc. in this population.

## Conflict of Interests

The authors have not declared any conflict of interests.

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*Full Length Research Paper*

# Memory training and academic achievement in mathematics among basic seven students in Lagos metropolis

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**The study investigates memory training and academic achievement in mathematics among basic seven students in Lagos metropolis who were randomly selected based on scoring after a conducted validated test on memory. T-test was used to test the three formulated hypotheses. The results revealed that there was significant difference in pre- and post-test mathematics achievement scores of the experimental group. There was significant gender difference in the post-test mathematics achievement score of students who went through memory training and also significant difference in the post-test mathematics achievement scores of the experimental and control groups.**

**Key words:** Mathematics achievement scores, academic achievement, memory training, Lagos metropolis.

## INTRODUCTION

We experience in our daily life that sometimes we want to recall name of a friend or some piece of information but fail to recall such information at that time but at different condition or occasion the name or information comes back more or less spontaneously. This phenomenon is called TOT (tip of the tongue) (Chauhan, 1998). Tip of the tongue shows how non availability of appropriate cues hinders retention. According to Chauhan (1998), forgetting is often a temporary rather than a permanent phenomenon. He opined further that forgetting is not like losing something but rather is more like being unable to find it. When cues that were present at the time of learning are not available at the time of recall, retention suffers. If stimulus terms are altered, recall will be reduces, forgetting therefore occurs because of failure in mechanism responsible for remembering. Memory

provides a mental workspace that is used in many important activities in learning and is a pure measure of a child's learning potential. Memory deficits contribute to difficulties in learning and making poor academic progress among learners (Gathercole and Alloway, 2008).

Ilogu (2009) defines memory as the retention of information or response after the criterion has been reached. Memory according to Joni et al. (2010) is the mental faculty that allows us to retain information as well as recall experiences for a long time. Live science (2010) submitted that human memory is a highly complex neurological system and every individual's ability to encode, store, retrieve and interpret their own memory help to distinguish one person from the other. Memory could be measured generally by the three methods described by psychologists. These include:

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1. Recall
2. Recognition
3. Re-learning

**Recall:** This is used to measure memory of the students in the examination. It requires reproducing correctly what has been previously learned. Recall is simple to measure and the score is percentage correct.

**Recognition:** This is discrimination between seen or unseen. This is what we do in the process of taking multiple choice tests that is, recognizing the correct choice out of a number of choices.

**Re-learning:** This is the third technique of measuring retention instead of asking the subjects to recall or recognize material that have appeared in his past experience, we may ask him to relearn the material at some later stage. The difference between the number of trials or opportunities requires learning the material initially and the number of trials required to re-learn is then considered to be an index of retention. This index of retention is often referred to as a saving score.

Gathercole and Allow (2008) submitted that those children whose memory (working) abilities fall in the bottom 10%, over 80% of them have substantial problems in either reading or solving mathematics or most commonly in both. Odogwu (2005) affirmed that students achievement in mathematics dwindle as years go by and many students seem to have negative attitude towards the subjects. According to Odogwu (2005), there is an equal and opposing forces drawing students to and away from mathematics bearing in mind the potential benefits of studying and excelling in mathematics, the students may approach mathematics with zeal and enthusiasm with effective conceptualization of mathematics terms. If appropriate teaching methods and psychological supports are given, this zeal can be translated to high achievement. Obioma (1991) and odogwu (1995) have both submitted that the expository method of teaching mathematics in schools have contributed to the poor performance of students in the subject. Odogwu (1995) further submitted that teaching method and teaching aids affect students' achievement and retention in mathematics.

### Memory training

Every classroom teacher faces the problem of how to improve the retention of his students. Experimental studies suggest that we cannot eliminate forgetting completely, but we can take steps to lessen it. According to Chauhan (2009). The following methods could be used to improve retention or memory training.

1. **Over Learning:** It is an established fact that retention is greater when subject matter is well learned. The better something is learned, the better are its chances of survival despite interference due to learning other materials. Over learning is the term used to describe practice that continues after a perfect recall has been scored.

2. **Meaningfulness and organization of subject matter:** The most effective method to improve retention is the method of making the subject matter meaningful.

3. **Use of mnemonic device:** We are sometimes required to learn materials that come close to meaningless material in such instances it may be useful to use mnemonic devices to retain the material. Mnemonic systems when used by persons of capable visual memory can result in credible feats of memory. Information in the brain is deliberately transformed into a more meaningful organization to improve memory.

4. **Self recitation:** Psychologists are of the opinion that recitation is helpful in the process of retention. The experiment of Gates (1964) shows the greater effectiveness of self recitation. The materials his students learned consisted of both non – sense syllables and short biographies. Gates (1964) submitted that students performed best when they spent only 30% of their time reading the syllables and 80% of their time in self recitation.

5. **Formation of clear concept:** Another technique of training and improving memory which a teacher can use is to develop clear concepts with the help of various type of audio – visual material. Teacher should as well try to involve more than one senses in learning activity.

Of all the techniques listed above Chauhan (2009) stressed that “**Self Recitation**” is much more efficient way of retaining learned material, and more appropriate in memory training.

### Purpose of the study

The purpose of this study is to investigate the effects of memory training on academic achievement in mathematics among basic seven students in Lagos metropolis. The study seeks to examine if variable such as gender has effects on retention.

### Research questions

1. Will there be any significant difference in pre- and post-test mathematics achievement scores of the experimental group?
2. Will there be any significant difference due to post-test Mathematics achievement scores of the experimental group?

3. Will there be any significant difference in post-test mathematics achievement score between the treatment and the control group?

### Research hypotheses

The following hypotheses were formulated to guide the study:

- 1 There is no significant difference in pre- and post-test mathematics achievement scores of students who went through memory training (treatment group).
- 2 There is no significant gender difference in post-test mathematics achievement scores of students who went through memory training (treatment group).
- 3 There is no significant difference in post-test mathematics achievement scores between students who went through memory training (treatment) and the control group.

### METHODOLOGY

The study is a quasi experimental design. The population consists of basic seven students in Lagos metropolis. A sample of 92 male and 100 female (192) students were used. The samples were selected using multi-stage sampling techniques. The data collection instrument was developed by the researcher and psychometrics properties of the instrument had 0.75 as reliability index established during the pilot study. The researcher adopted self-recitation techniques in memory training of selected basic seven students in Lagos metropolis. The researcher administered a pre-mathematics achievement test to the selected sample and commences treatment using self-recitation technique of memory training and administered a post – mathematics achievement test after four weeks of treatment.

### RESULTS AND DISCUSSION

Hypothesis 1 which stated “There is no significant difference in pre and post test mathematics achievement scores of the treatment group” was tested with t-test statistical analysis and the result is as shown in Table 1.

From the table the calculated t. ( $t\text{-cal} = 2.661$ ) is significantly greater than the critical t ( $t\text{-critical} = 1.645$ ) given 190 degree of freedom at 0.05 level of significance. As a result the null hypothesis which states that “There is no significant difference in pre and post test mathematics score of students who went through memory training is therefore rejected and the alternative hypothesis is accepted.

Hypothesis 2 which stated “There is no significant difference due to gender in post test Mathematics achievement scores of the treatment group” was also tested using t-test statistical analysis and the result is as shown in Table 2.

Table 2 shows that  $t\text{-cal} (2.015) > t\text{-critical} (1.645)$  at

0.05 level of significance, Null hypothesis two is therefore rejected and the alternative hypothesis is accepted “There is significant gender difference in post test Mathematics achievement score of students who went through memory training.

Hypothesis 3 which stated “There is no significant difference in post test mathematics scores of the experimental and control groups” was also tested with t-test statistical analysis and the result is as shown in Table 3. Table 3 shows that  $t\text{-cal} (2.012) > t\text{-cal} (1.542)$  at 0.05 level of significance. Null hypothesis three is therefore rejected and the alternative hypothesis is accepted that is “There is significant difference in post test scores of the treatment and control group.

### DISCUSSION

The findings of this study shows that “There is significant difference in pre and post test mathematics scores of students who went through memory training”. The finding is in agreement with the submission of Odogwu (2001) that “Teaching methods and teaching aids affect students’ achievement and retention in mathematics. The findings of the study also reveals that “There is significant gender difference in post-test Mathematics score of students who went through memory training. The findings conformed to the submission of Obe (1980), that “Memory factor among men occurs rapidly in rote learning especially memory for numbers, words and designs, and finally the findings shows that “there is a significant difference in post test mathematics scores of experimental and control group. This finding is in line with the submission of Anderson (2009) which states “that there is a correlation between the degree of retention and academic achievement.

### Counselling Implications

1. Counseling as a helping relationship becomes relevant in providing awareness to teachers of Mathematics that the expository method of teaching Mathematics have not seem to improve Mathematics achievement.
2. Counseling should be organized for teachers of Mathematics in the basic schools on the need to improve the retention level of learners.
3. Counseling should be one the medium of awareness to teachers that “working memory training” has been found to improve fluid intelligence in normal adults.
4. Counseling should be organized for both teachers and students of Mathematics on how Mathematics could be used to increase students’ store of knowledge.
5. There is a need for counseling clinic to be established in each of the schools in Lagos Metropolis and to be manned by professional counselors to enhance effectiveness.

**Table 1.** T-test statistical analysis of the Pre- and post- test mathematics achievement scores of the treatment group.

Treatment group	N	Mean	SD	Tcal	Tcrit
Pre test	192	11.00	6.51		
Post test	192	16.20	8.42	2.661	1.645

Significant at 0.05.

**Table 2.** T-test statistical analysis of the post- test mathematics achievement scores of the treatment group (Male and female).

Variable	N	Mean	S.D	Df	t-cal	t-critical
Male	92	16.00	2.54			
Female	100	10.10	2.06	190	2.015	1.645

Significant at 0.05.

**Table 3.** T-test statistical analysis of the post- test mathematics achievement scores of the experimental and control groups.

Group	Mean	S.D	Df	t-cal	t-critical
Treatment	16.20	3.200			
Control group	8.01	2.120	190	2.012	1.542

Significant at 0.05.

6. Counseling should be used to spread the gospel that enhancement of working memory capacity could lead to attention and improvements in daily cognitive functioning.

## CONCLUSION

The result of this study support the literature previously cited. It concluded that significant difference exist in pre and post test mathematics score of students went through memory training similarly "There is a significant gender difference in pre and post test mathematics achievement scores of students who went through memory training and finally significant difference exist in post test mathematics scores of the experimental and the control group.

## RECOMMENDATIONS

This paper is of the opinion that the counselors in Nigeria with the present vibrant field of professional activities in consonance with the findings of this study should make spirited efforts in finding solutions to the problems confronting effective teaching and learning of mathematics. Since mathematics occupies a central place

in pre-tertiary curricular and mathematics as a discipline helps to develop both scientific and logical thinking of students and their ability to imagine, rationalize and manipulate accurately. There is also a need to meet the basic need of teachers, especially mathematics teachers therefore the federal government should introduce welfare package or packages that will guarantee good living conditions.

## Conflict of Interests

The author(s) have not declared any conflict of interests.

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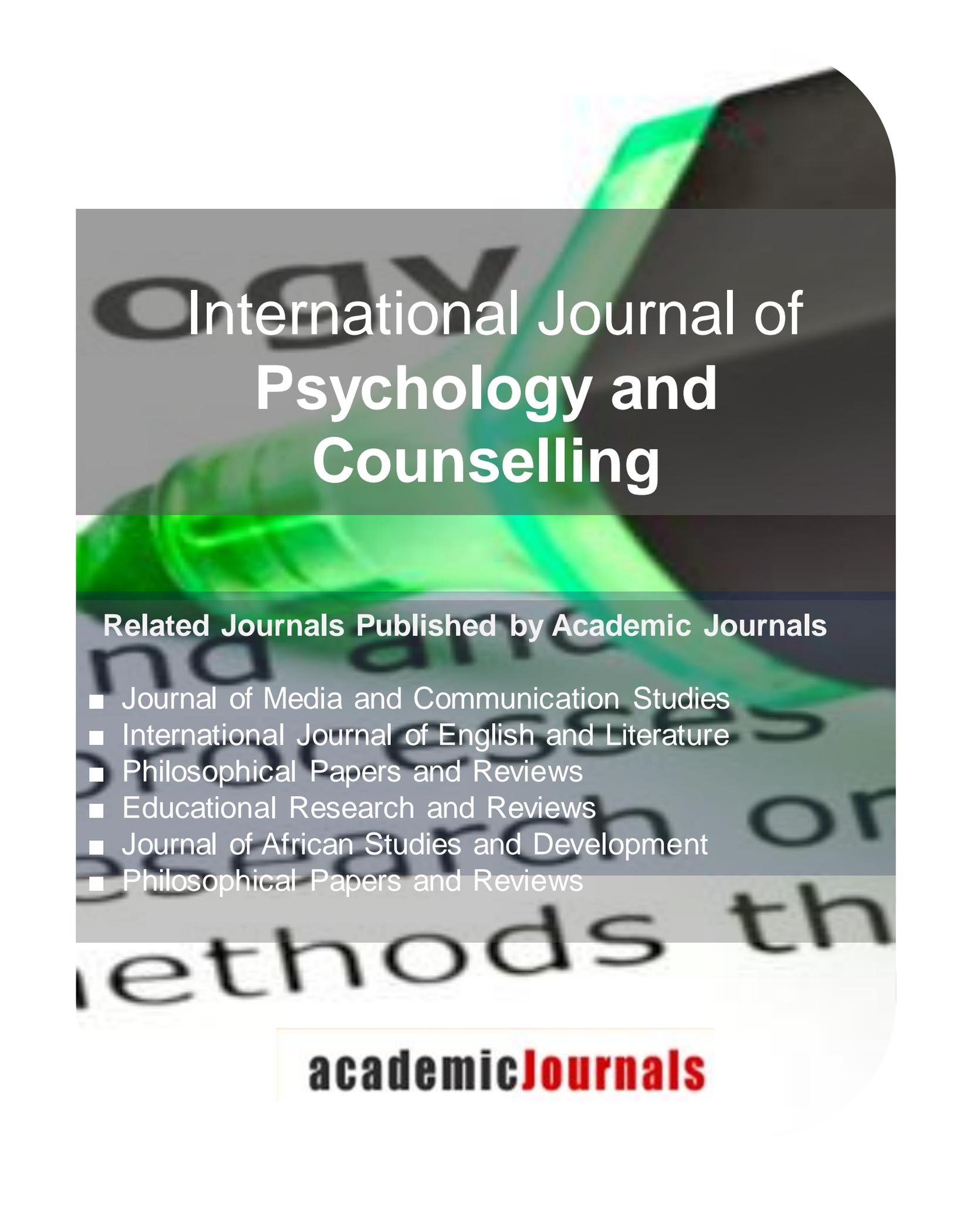
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