Psychometric Properties of Brief Symptom Inventory Malay (BSI-18-M) among Homosexual Males in Malaysia

Qarem Mohamed Mustafa
Universiti Teknologi MARA Cawangan Pulau Pinang Malaysia

Mohd Firdaus Ninam Shah
Jabatan Psikiatri dan Kesihatan Mental, Hospital Raja Perempuan II Malaysia

Abstract
Brief Symptom Inventory (BSI-18) is commonly used to measure psychological distress among numerous population in which the psychometric properties are unique depending on the characteristics of the population. The English original version of the BSI-18 questionnaire was translated into Malay by a forward–backward translation before a cross-sectional study was conducted among 87 homosexual males in Malaysia through purposive sampling. Exploratory Factor Analysis was used to determine the construct validity and Cronbach alpha was obtained to determine reliability. The loading of the items are similar to previous component rotation with minor differences while the Cronbach alpha of each domain ranges from .839 (somatic domain), .845 (depression domain), and .862 (anxiety domain) which suggests good reliability. These findings indicate that the Malay version of BSI-18 is appropriate to measure the psychological distress experienced by sexual minority groups in Malaysia.
Keywords: Validity, Reliability, Distress, Homosexual, Minority

Introduction
Gay man, lesbian and other sexual minority groups face challenges as a result of negative treatments like discrimination and hate crimes from the society due to their orientations (Barrientos et al., 2016; Bostwick et al., 2014). Several research reported some of the challenges are also within themselves, for example, internalized homophobia (Meyer & Dean, 1998; Williamson, 2000), concealment of their sexual orientation (Pachankis, 2007), feeling and expectation of being rejected (Hatzenbuehler & Pachankis, 2016; Westenberg et al., 2004) and low self-esteem (Blais et al., 2014; Canali et al., 2014). In addition, stigma towards gay men and lesbians was reported in severe stage (Herek, 2000; Ryan, Legate & Weinstein, 2015). Due to all these challenges, they are expected to experience poor consequences of well-being like psychological distress (Shah & Mustafa, 2022; Ngamake et al., 2016; Branscombe et al., 2014).

Psychological distress is described as the general psychopathology of an individual with a combination of depressive symptoms, anxiety and perceived stress (Puustinen, 2012). In

several studies, psychological distress is not only highlighted in symptoms of psychological disorders like depression and anxiety, but it also involves physical symptoms like pain in heart or chest, numbness, tingling in parts of the body and nausea (Birkett et al., 2015; Bockting et al., 2013; Mustanski et al., 2010). Therefore, the ability to detect and treat elevated levels of psychological distress may prevent to an increased number of health problems and psychological disorders in this unique population by providing psychosocial care (Ehlke et al., 2020; Kamen et al., 2017). The availability of an instrument that is valid, reliable and easy to score has become an important aim for the screening purpose.

Internationally, Symptom Check-List 90 (SCL-90) is claimed as the most used questionnaire for the assessment of psychological distress, especially in clinical practice (Franke et al., 2017; Roth & Herzberg, 2008). However, due to its very long and time-consuming questionnaire, the Brief Symptom Inventory (BSI) was developed which consists of 53 items (Derogatis, 1993). In order to reduce and prevent an overload to the patients and to ensure an easy screening-tool, the BSI-18 was developed with highest clinical relevance. While the BSI maintains scale structure with the reduced item number of the SCL-90-R (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, anger-hostility, phobic anxiety paranoid ideation and psychoticism), the BSI-18 contains only the three six-item scales (somatization, anxiety, depression) and the global Scale Global Severity Index (GSI). Contrary to the SCL-90-R and the BSI-53, the BSI-18 scores were calculated by sum scores. The GSI therefore ranges between 0-72 and the three scales between 0-24. The BSI-18 was demonstrated in past studies and it was found that the BSI-18 is considered as a suitable instrument for measuring psychological distress and comorbidities in patients with different mental and somatic illnesses (Geng et al., 2022; Calderon et al., 2020; Li et al., 2018; Franke et al., 2017).

In addition, the psychometric properties of the BSI-18 were discussed internationally that include German, China and Spain, with good ranges of Cronbachs alpha and validity (Geng et al., 2022; Li et al., 2018; Franke et al., 2017). This highlights the benefits of having a valid and reliable BSI-18 that culturally accepted in measuring psychological distress among Malaysian population. As yet, psychometric properties based on a representative sample is not available for Malaysian. As there may be cultural and terminology differences in the original scale that make direct English language usage not appropriate for the Malay-speaking population (Kamaluddin et al., 2013), therefore, having a valid Malay version instrument is considered an important element in a research process (Kamaluddin et al., 2017).

Consequently, the present study sought to test the psychometric properties of the Malay version of the BSI-18 to gay men in Malaysia, hence in the future it could be used as a valid and reliable instrument to identify the psychological distress of the population.

Methodology
Study Design
There are two main phases for the current study which is the translation phase and the validation phase. For the first phase, Forward and Backward translation processes was implemented for the current study to improve the reliability and validity of the Malay version of BSI-18. Four independent bilingual experts were assigned to perform forward translation. After a week, another panel of independent bilingual experts who had no exposure with the

English original version were selected for a back-translation procedure. In order to produce a harmonized Malay version of BSI-18, the researchers compared the original scale with Malay version of BSI-18 and any item that appeared discrepant to the meaning of the original items was translated again. The content was then validated by a psychologist, three psychology postgraduate students and an activist who worked with the populations targeted were assigned to validate the items listed in the Malay version of BSI-18. This is to ensure the concept investigated was tapped by an adequate and representative set of items in a scale (Dharmalingam et al., 2016). Face validity was also conducted to ensure that the expected respondents of the measure will be able to understand each item (Field, 2013). This was carried out by inviting five respondents from the sexual minority group in which three of them are homosexual males and two are homosexual females.

A cross-sectional quantitative study was conducted for the second phase. This was done by distributing questionnaires to the population of interest to obtain numerical data that was then analyzed through factor analysis. This is to obtain the construct validity which is important to ensure that each item measures what it is meant to measure (Field, 2013). A total of 95 respondents were identified through purposive sampling due to the vulnerable nature and highly stigmatized population. However, this number is adequate since the data met the factorability assumptions based on Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Tabachnick & Fidell, 2013). The result can be seen in the findings section. From the 95 participants approached, only 88 completed the questionnaire yielding a response rate of 92.63%.

Measure
The Brief Symptom Inventory 18 (BSI-18) is a simplified version of Brief Symptom Inventory (BSI) developed by Derogatis (1993) to measure psychological distress. The BSI-18 can be divided into three main domains which are depression, anxiety, and somatization that are represented by six items for each domain. Furthermore, the total score of 18-item can be obtain to represent the individual's overall psychological distress (the Global Severity Index [GSI]). The lowest total score of the scale was 0 and the highest total score of the scale is 72. The higher number of total score indicates that the respondent has higher tendency for having depressive symptoms, somatic symptoms, anxiety symptoms, or overall psychological distress. In the study, respondents were instructed to describe how much challenges living as sexual minority individual had bothered them during the past 7 days, including today. For each item, respondents indicate on a 5-point Likert scale how much a particular symptom had distressed or bothered them during the past 7 days: (0) not at all, (1) a little bit, (2) moderately, (3) quite a bit and (4) extremely. Since the inventory had already divided the items into three sub-scales with six items each, the internal consistencies for psychological distress, depression, anxiety and somatization were also measured.

Procedure
A representative from a sexual minority group was approached due to the secretive nature of the population of interest. This group is trusted within the community because they provide support for individuals from counselling to health screening of AIDS. Rapport was built before a debriefing session was conducted and finally the questionnaire was distributed. Both a physical copy and a link to Google Form were distributed among the community members. Informed consent was also given in which they were to that they have the right to stop answering the questionnaire at any moment and to not return the questionnaire even if

it is completed if they were to feel uncomfortable to do so. All the questionnaires that were returned to the researchers were reviewed to check for missing information before the it was keyed in to the data analysis software.

Data Analysis
IBM Statistical Package for the Social Sciences (SPSS) version 26.0 was used in this study for the data to be organized and analysed. Three different types of analyses which are descriptive, factor analysis and reliability analysis were done. Descriptive analysis was performed to generate the demographic profiles of the samples and to obtained the mean and standard deviation. The preliminary analyses were performed specifically Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity to ensure factorability of the data such that the sample will be considered adequate if two conditions are met: KMO values must be more than 0.60 and Bartlett's test of sphericity must be significant ($p < 0.05$) (Field, 2013). The KMO value of the data gathered from the current sample is .846 and Bartlett's test of sphericity is significant at .000.

Following the preliminary analyses, factorial validation was carried out to test the construct validity. The factorial validity of items were tested using Exploratory Factor Analysis (EFA) by extracting factors via Principal Component Analysis (PCA). The factors were rotated using Varimax rotation with Kaizer normalization to get the best possible loadings on the factors. A loading factor of more than plus or minus 0.3 was considered as acceptable.

The final number of items in the Malay version of the BSI-18 was subjected to internal reliability testing. Reliability analysis was done to determine the internal consistency of the dimensions of the scale. The internal consistency of each dimension in the scale was measured using the Cronbach's Alpha coefficient (α) method. The Internal consistency can be defined as the overall degree of relatedness of each item in the Malay version of the BSI-18 within the dimension or scale (Field, 2013).

Results
The mean age of the respondents is 26.86 (SD= 5.43) with the youngest being 18 years old and the oldest being 52 years old of age. All of the respondents are male (100%) and Malay (100%). Most of the respondents are Muslims (94.3%) while four respondents considered themselves atheist (4.6%) and only one considered to make his religion unknown (1.1%). A high percentage of the respondents have a bachelor degree (n=38, 43.7%) while only one respondent has a PhD (1.1%). The type of occupations were divided into three categories which are skilled professional, semi-skilled, and unemployed or students in which a majority is in semi-skilled labour (n=33, 37.9%) and a small percentage is unemployed or students (n=24, 27.6%). A more detailed information can be seen in Table 1.

Table 1

Sociodemographic Information of Respondents

Sociodemographic	Mean	SD
Age	26.86	5.42
	n	*%*
Religion		
i. Islam	82	94.3
ii. Atheist	4	4.6
iii. Unknown	1	1.1
Level of Education		
i. SPM/O-Level	7	8.0
ii. STPM/A-Level/Matriculation	7	8.0
iii. Diploma	26	29.9
iv. Bachelor Degree	38	43.7
v. Masters Degree	8	9.2
vi. PhD	1	1.1
Occupation		
i. Skilled professional	30	34.5
ii. Semi-skilled	33	37.9
iii. Unemployed/students	24	27.6

The 18 items of the Brief Symptom Inventory (BSI-18) were subjected to principal components analysis which revealed the presence of four components with eigenvalues exceeding 1 with a variance of 41.98, 12.63, 7.39, and 5.89 respectively. The scree plot test was inspected suggesting a clear break after the third component which is used to decided the total component for further analysis (Catell, 1966). Varimax rotation was performed revealing a simple structure with all components showing a number of strong loadings. More information can be seen in Table 2.

Table 2
Standardized factor loadings for BSI-18-M

NO.	ITEMS	ORIGINAL SUB-SCALE	VARIMAX PATTERN MATRIX			COMMUNALITIES	NEW SUB-SCALE
			COMPONENT 1	COMPONENT 2	COMPONENT 3		
1	Feeling blue	D	0.844			0.752	D
2	Feeling lonely	D	0.795			0.682	D
3	Feeling worthless	D	0.771			0.748	D
4	Feeling no interest in things	D	0.48			0.439	D
5	Feeling hopeless about the future	D	0.486			0.645	D
6	Feeling tense	A	0.495			0.446	D
7	Numbness or tingling in parts of your body	S		0.823		0.722	S
8	Pains in heart and chest	S		0.805		0.692	S
9	Trouble getting to breath	S		0.746		0.616	S
10	Faintess or dizziness	S		0.682		0.515	S
11	Nausea or upset stomach	S		0.606		0.466	S
12	Feeling weak in parts of your body	S		0.554		0.551	S
13	Suddenly scared for no reason	A			0.337	0.678	A
14	Feeling fearful	A			0.803	0.763	A
15	Feeling restless you could not sit still	A			0.644	0.65	A
16	Nervousness or shakiness inside	A			0.632	0.615	A
17	Spells of terror or panic	A			0.532	0.52	A
18	Thoughts of ending your life	D			0.77	0.66	A

Subscales: A=Anxiety, D=Depression, S=Somatization

The three components revealed are consistent with previous research on BSI-18 psychometric properties. The items for the somatic domain are also consistent with past research. However, one items that is originally the item for the depression domain loaded at the anxiety domain and one item that is originally the item for the anxiety domain loaded at the depression domain. The other items for both domains are consistent with past research. The Cronbach alpha for the new rotated items were found to be within a good range (depression=.845; somatic=.839; anxiety=.862) (Hair et al., 2016).

Discussion
The present study examines the psychometric properties of BSI-18 specifically the construct validity and reliability based on internal consistency to be used among sexual minority group particularly homosexual males. This is to ensure that there is an instrument that can be used to measure the psychological distress experienced being a minority group and provide meaningful data.

Exploratory Factor Analysis revealed three primary factors consistent to the original proposed theoretical structure (Derogatis, 1993) which are depression, somatization, and anxiety. This is also consistent with findings from past studies (Geng et al., 2022; Li et al., 2018; Franke et al., 2017). However, there is a minor difference in terms of where the item loaded for the depression domain and the anxiety domain. One item that was originally represent the depression domain loaded in the anxiety component while one item that was originally represent the anxiety domain loaded in the depression domain. This tend to happen when test adaptation occurs due to the semantic differences (Geng et al., 2022; Li et al., 2018) but

also how different population have difference experience of depression and anxiety (Geng et al., 2022).

Meyer (2003) Minority Stress Model highlighted how minority groups experienced distal and proximal challenges. Proximal challenges are negative cognitive appraisals or meanings based on an individual perception of their experience or identity (Denton et al., 2014). This suggest that the suicidal thoughts they have by the sexual minority group creates feeling of fear instead of sadness or the suicidal thoughts is outcome of excessive fear (Bentley et al., 2016) of being prosecuted for being a homosexual in Malaysia. The practice of homosexuality is rejected in Malaysia by law as stated in Section 377A of the Malaysian Panel Code and is strongly rejected by the society (Shah & Mustafa, 2022). With regards to the item that loaded in the depression component instead of the original subscale of anxiety, it is important to note that there is a physiological component to the be qualified for depressive disorder based on the manual used to diagnose individuals with mental illness (American Psychiatric Assocation, 2013). Therefore, it is possible for the item to be used to represent the depression domain.

The internal consistency of the items for each domain was found to be within a good range based on the Cronbach alpha value (Hair et al., 2016) suggesting that the translated BSI can reliably measure the specific psychological distress experienced by sexual minority group. This reliability is consistent with past studies (Geng et al., 2022; Calderon et al., 2020; Li et al., 2018; Franke et al., 2017) which highlighted how it is a good instrument to be used in numerous populations. The high internal consistency can also be explained by the steps taken in the process of adaption from the original language to the Malay language such as forward-backward translation and obtaining face validity from a few individuals that is representative for the population of interest.

Conclusion

To conclude, the current findings regarding the psychometric properties of BSI-18 that was translated to Malay language suggest that it can be as useful of an instrument for many population which now includes individuals who are part of a sexual minority group in Malaysia. Similar domain score can be obtained by using the Malay translated BSI-18 as intended by the original author. Future studies can improve in the current research by increasing the sample size which can be performed by communication with more sexual minority groups that provide support to the respective population. Moreover, the respondents of the current study are only Malays. A more diverse group of race can yield different findings with regards to their understanding of each item. Having known the psychometric properties of BSI-18-M indicates that future studies can identify the relationship the psychological distress experienced by the sexual minority group with other variables. The findings can be helpful to provide preventative measures to ensure that the there is a low risk of mental health issues among sexual minority groups.

Acknowledgement

support provided by Universiti Teknologi MARA Cawangan Pulau Pinang for publication purposes.

Corresponding Author
Qarem Mohamed Mustafa
Faculty of Health Sciences, UiTM Cawangan Pulau Pinang, Malaysia
Email: qaremuitm@gmail.com

References
American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). iGroup Press Co. Ltd.

Barrientos, J., Cardenas, M., Gomez, F., & Guzman, M. (2016). Gay men and male-to-female transgender persons in Chile: An exploratory quantitative study on stigma, discrimination, victimization, happiness and social wellbeing. In Th. Kollen (Ed), *Sexual orientation and transgender issues in organizations: Global perspectives on LGBT workforce diversity* (Chapter 15). Switzerland: Springer International Publishing.

Bentley, K. H., Franklin, J. C., Ribeiro, J. D., Kleiman, E. M., Fox, K. R., & Nock, M. K. (2016). Anxiety and its disorders as risk factors for suicidal thoughts and behaviors: A meta-analytic review. *Clinical psychology review*, *43*, 30-46.

Birkett, M., Newcomb, M. E., & Mustanski, B. (2015). Does it get better? A longitudinal analysis of psychological distress and victimization in lesbian, gay, bisexual, transgender, and questioning youth. *Journal of Adolescent Health*, *56*(3), 280-285.

Blais, M., Gervais, J., & Hebert, M. (2014). Internalized homophobia as a partial mediator between homophobic bullying and self-esteem among youths of sexual minorities in Quebec (Canada). *Ciencia & Saude Coletiva, 19*, 727-735.

Bockting, W. O., Miner, M. H., Romine, R. E. S., Hamilton, A., & Coleman, E. (2013). Stigma, mental health, and resilience in an online sample of the US transgender population. *American Journal of Public Health, 103(5),* 943-951.

Bostwick, W. B., Boyd, C. J., Hughes, T. L., West, B. T., & McCabe, S. E. (2014). Discrimination and mental health among lesbian, gay, and bisexual adults in the United States. *American Journal of Orthopsychiatry*, *84*(1), 35-45.

Calderon, C., Ferrando, P. J., Lorenzo-Seva, U., Hernandez, R., Oporto-Alonso, M., & Jimenez-Fonseca, P. (2020). Factor structure and measurement invariance of the Brief Symptom Inventory (BSI-18) in cancer patients. *International Journal of Clinical and Health Psychology*, *20*(1), 71-80.

Canali, T. J., Oliveira, S. M. S. D., Vinholes, D. B., & Feldens, V. P. (2014). Evaluation of self-esteem among homosexuals in the southern region of the state of Santa Catarina, Brazil. *Ciencia & Saude Coletiva*, *19*, 4569-4576.

Catell, R. B. (1966). The scree test for number of factors. Multivariate Behavioral Research, 1, 245–76.

Denton, F. N., Rostosky, S. S., & Danner, F. (2014). Stigma-related stressors, coping self-efficacy, and physical health in lesbian, gay, and bisexual individuals. *Journal of Counseling Psychology*, *61*(3), 383-391.

Derogatis, L. R. (1993). *BSI-Brief Sypmtom Inventory: Administration, Scoring, and Procedures Manual.* Minneapolis: Pearson.

Derogatis, L. R. (2000). *The Brief Symptom Inventory–18 (BSI-18): Administration, Scoring and Procedures Manual*. Minneapolis, MN: National Computer Systems.

Ehlke, S. J., Braitman, A. L., Dawson, C. A., Heron, K. E., & Lewis, R. J. (2020). Sexual Minority Stress and Social Support Explain the Association between Sexual Identity with Physical and Mental Health Problems among Young Lesbian and Bisexual Women. *Sex roles, 83*(5-6), 370–381.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics (4th ed.)*. SAGE Publications.

Franke, G. H., Jaeger, S., Glaesmer, H., Barkmann, C., Petrowski, K., & Braehler, E. (2017). Psychometric analysis of the brief symptom inventory 18 (BSI-18) in a representative German sample. *BMC Medical Research Methodology*, *17*(1), 14.

Geng, Y., Ni, X., Wang, Y., Fan, J., Qian, Y., & Li, X. (2022). Factor Structure and Measurement Invariance of the Brief Symptom Inventory-18 Among Chinese Adults. *Frontiers in Psychology*, *13*.

Hair, J. F., Celsi, M., Money, A. H., Samouel, P., & Page, M. (2015). *The essentials of business research methods.* Third edition. New York, Routledge.

Hatzenbuehler, M. L., & Pachankis, J. E. (2016). Stigma and minority stress as social determinants of health among lesbian, gay, bisexual, and transgender youth: Research evidence and clinical implications. *Pediatric Clinics*, *63*(6), 985-997.

Herek, G. M. (2000). Sexual prejudice and gender: Do heterosexuals' attitudes toward lesbians and gay men differ?. *Journal of Social Issues*, *56*(2), 251-266.

Kamaluddin, M. R., Nasir, R., Sulaiman, W. S. W., Khairudin, R., & Zamani, Z. A. (2017). Validity and psychometric properties of Malay translated religious orientation scalerevised among Malaysian adult samples. *Akademika, 87*(2), 133-144.

Kamaluddin, M. R., Sharif, N. S. M., & Saat, G. A. M. (2013). A unidimensional scale for self-control within Malaysian settings. *Education Medical Journal 5*(4): 60-66.

Kamen, C., Jabson, J. M., Mustian, K. M., & Boehmer, U. (2017). Minority stress, psychosocial resources, and psychological distress among sexual minority breast cancer survivors. *Health psychology : official journal of the Division of Health Psychology, American Psychological Association, 36*(6), 529–537.

Li, M., Wang, M. C., Shou, Y., Zhong, C., Ren, F., Zhang, X., & Yang, W. (2018). Psychometric properties and measurement invariance of the brief symptom inventory-18 among chinese insurance employees. *Frontiers in psychology*, *9*, 519.

Meyer, I. H., & Dean, L. (1998). Internalized homophobia, intimacy, and sexual behavior among gay and bisexual men. *Psychological Perspectives on Lesbian and Gay Issues*, *4*, 160-186.

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychological Bulletin*, *129*(5), 674-697.

Westenberg, P. M., Drewes, M. J., Goedhart, A. W., Siebelink, B. M., & Treffers, P. D. (2004). A developmental analysis of self-reported fears in late childhood through mid-adolescence: Social-evaluative fears on the rise?. *Journal of Child Psychology and Psychiatry*, *45*(3), 481-495.

Mustanski, B. S., Garofalo, R., & Emerson, E. M. (2010). Mental health disorders, psychological distress, and suicidality in a diverse sample of lesbian, gay, bisexual, and transgender youths. *American Journal of Public Health*, *100*(12), 2426-2432.

Pachankis, J. E. (2007). The psychological implications of concealing a stigma: a cognitive-affective-behavioral model. *Psychological Bulletin*, *133*(2), 328-345.

Puustinen, P. J. (2012). Screening for psychological distress. In: H. Ohayashi & S. Yamada (Eds.) *Hauppauge Psychology of Emotions, Motivations and Actions: Psychological Distress:*

Symptoms, Causes and Coping (pp. 49- 66). Hauppauge, NY: Nova Science Publishers Inc.

Roth, M., & Herzberg, P. Y. (2008). Psychodiagnostik in der Praxis: State of the art?. *Klinische Diagnostik und Evaluation*, *1*(1), 5-18.

Ryan, W. S., Legate, N., & Weinstein, N. (2015). Coming out as lesbian, gay, or bisexual: The lasting impact of initial disclosure experiences. *Self and Identity*, *14*(5), 549-569.

Schmitt, M. T., Branscombe, N. R., Postmes, T., & Garcia, A. (2014). The consequences of perceived discrimination for psychological well-being: A meta-analytic review. *Psychological Bulletin*, *140*(4), 921-948.

Shah, N. M. F., & Mustafa, M. Q. (2022). Experience of minority sexual group in Malaysia: the relationship between perceived discrimination and psychological well-being. *Journal of Islamic, Social, Economics and Development*, *7*(46), 423-432.

Tabachnick, B. G., & Fidell, L. S. (2013). Using multivariate statistics (6th edn). Boston: Pearson Education.

Walch, S. E., Ngamake, S. T., Bovornusvakool, W., & Walker, S. V. (2016). Discrimination, internalized homophobia, and concealment in sexual minority physical and mental health. *Psychology of Sexual Orientation and Gender Diversity*, *3*(1), 37-48.

Williamson, I. R. (2000). Internalized homophobia and health issues affecting lesbians and gay men. *Health Education Research*, *15*(1), 97-107.