

Weight stigma exposure inventory (WeSEI): Validity and reliability study of the Chinese version in Hong Kong

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Highlights:

- WeSEI is a valid and reliable tool for measuring weight stigma exposure in Hong Kong.
- WeSEI's original seven-factor structure was confirmed, indicating its cross-cultural robustness.
- The scale demonstrates high internal consistency and acceptable convergent and discriminant validity.
- WeSEI scores were positively correlated with psychological distress and physical activity avoidance.

Abstract

This study examined the validity and reliability of the Weight Stigma Exposure Inventory (WeSEI), Chinese version, among the Hong Kong population. The WeSEI was developed by Ruckwongpatr et al. (2025) and then translated by the present authors to Chinese for the Hong Kong population. The study recruited 949 Hong Kong adults (Mean_{age} = 23.07; 68.6% female) to complete the 35-item WeSEI, a self-report instrument with seven factors (television sources, traditional media sources, social media sources, parental sources, extraneous sources, significant other sources, and friends sources). The seven factors assess how participants observed (or were exposed to) weight stigma from different sources. The psychometric properties of the scale analyzed in the present study included factor structure using confirmatory factor analysis (CFA), internal consistency using McDonald's ω and Cronbach's α , discriminant validity using heterotrait-monotrait (HTMT) ratio, and convergent validity using average variance extracted (AVE) values. Pearson correlations with related measures, such as the Depression Anxiety Stress Scale (DASS-21), Tendency to Avoid Physical Activity and Sport (TAPAS), Weight Self-Stigma Questionnaire (WSSQ), and Perceived Weight Stigmatization Scale (PWSS), were used to assess WeSEI's concurrent validity. The findings indicate that the WeSEI has a confirmed seven-factor structure, possesses high internal consistency, and exhibits acceptable convergent and discriminant validity. The WeSEI total score and its subscale scores showed statistically positive correlations with the other measures used. The WeSEI Chinese version can be used as a valid and reliable self-report psychometric tool for assessing Hong Kong participants' exposure to weight stigma in future research.

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1. Introduction

Weight Stigma (WS) is a common form of prejudice and discrimination against individuals who are overweight or obese (i.e., those having a higher weight). This stigma manifests in various ways in the media, healthcare services, and interpersonal relationships, particularly among parents and peers (de Macêdo et al., 2022; Lessard & Puhl, 2021; Panza et al., 2023; Pearl et al., 2015). Weight Stigma Exposure (WSE), the exposure of individuals to negative attitudes and behaviors to overweight/obesity, is how an individual observes the weight stigma scenarios/situations. These scenarios have significant and detrimental effects on public health. Research demonstrates the devastating effects of WSE on both physical and mental health outcomes. At the physiological level, exposure to weight stigma has been shown to lead to significant increases in blood pressure and heart rate, especially in obese women with high blood pressure (Panza et al., 2023). Psychologically, Perceived Weight Stigma (PWS) and Weight Self-Stigma (WSS) are strongly associated with psychological distress such as depression, anxiety, and stress (Ahorsu et al., 2024; Alimoradi et al., 2020; Chan et al., 2019; Cheng et al., 2018; Huang et al., 2024; Lin et al., 2020a; Lin et al., 2020b).

Even in pre-adolescence, WS is linked to internalizing symptoms and mental health problems (Zancu & Diaconu-Gherasim, 2024). At the behavioral level, WSE can lead to disordered eating patterns such as binge eating, eating addiction, and problematic eating behaviors in general (Ahorsu et al., 2020; Cheng et al., 2018; Fung et al., 2024; Huang et al., 2024; Lin et al., 2020a). Furthermore, WS may reduce individuals' enjoyment of physical activity and increase their tendency to avoid physical activity. This may contribute to increased sedentary lifestyles (Bevan et al., 2021; Ruckwongpatr et al., 2021; Saffari et al., 2024; Soraci et al., 2024). Paradoxically, in some individuals who have experienced stigma in the past, exposure to stigmatizing media may result in a short-term increase in exercise intention and behavior; however, this effect is associated with a "pursuit of thinness" that carries a risk of long-term adverse health outcomes (Pearl et al., 2015). WS can also negatively impact body self-esteem and lead to body dissatisfaction (Lessard & Puhl, 2021; Soraci et al., 2024; Zancu & Diaconu-Gherasim, 2024). Rather than actual weight, how an individual perceives their weight may play a more important role in the experience of peer bullying (Lin et al., 2018).

The adverse effects of WS often manifest through mediating mechanisms such as WSS and psychological distress (Huang et al., 2024; Saffari et al., 2024; Zancu & Diaconu-Gherasim, 2024). Furthermore, technology addictions such as smartphone addiction and problematic internet use may also exacerbate physical inactivity by influencing the relationship between weight self-stigma and physical activity (Liu et al., 2022; Saffari et al., 2022). Increased media exposure of WS and its effects on adolescents' body dissatisfaction have also been examined during the COVID-19 pandemic (de Macêdo et al., 2022; Fung et al., 2021; Lessard & Puhl, 2021).

Research demonstrates the profoundly devastating effects of exposure to WS on individuals' physical and mental health. Given these wide-ranging impacts, it becomes essential to engage key stakeholders across multiple sectors. Healthcare providers, researchers, public health policymakers, and educators must understand and address the issue of WS (Alimoradi et al., 2020; Panza et al., 2023). Early interventions to prevent WS, especially during pre-adolescence (Zancu & Diaconu-Gherasim, 2024), and strategies targeting stigma and internalized bias (Saffari et al., 2024) play a vital role in promoting physical activity and improving overall health. Reducing weight stigma and increasing awareness can support individuals in engaging in healthy behaviors and preventing associated negative health outcomes.

Scales assessing perceived and self-stigmatized weight stigma (Perceived Weight Stigma Scale [PWSS], Weight Self-Stigma Questionnaire [WSSQ], Weight Bias Internalization Scale [WBIS], Modified Weight Bias Internalization Scale [WBIS-M]) have been found valid and reliable in different populations (Chinese adolescents, Iranian adolescents, Asian children, university students; Ahorsu et al., 2024; Lin et al., 2020b; Pakpour et al., 2019; Rozzell-Voss et al., 2024). In the literature, the WSSQ (Lillis et al., 2010) and PWSS (Cheng et al., 2018) are widely used to assess WS. However, scales assessing WSE or observed WS are relatively insufficient in the literature when compared to WSS or PWS. When assessing WSE, the exposure could be from interpersonal (e.g., family members) and non-interpersonal sources (e.g., social media posts; Ruckwongpatr et al., 2021). To the best of the present authors' knowledge, only one measures assess WSE using both sources: the Weight Stigma Exposure Inventory (WeSEI; Ruckwongpatr et al., 2021).

The WeSEI has also been adapted for use in different cultures, including two additional regions that use Chinese as the official language (i.e., Taiwan and mainland China; Ruckwongpatr et al., 2021). Apart from Chinese versions for Taiwanese and Chinese, the WeSEI has been validated in a Malay version (Gan et al., 2025) and a Turkish version (Çarkıt et al., 2025); both Malay and Turkish versions of WeSEI were found to have a seven-factor structure concurring with the original WeSEI version. The seven-factor structure was then found to be invariant across gender and weight status groups (Gan et al., 2025). Moreover, internal consistency of the

WeSEI was satisfactory in both Malay and Turkish versions (Çarkıt et al., 2025; Gan et al., 2025). Therefore, WeSEI can be considered as a culturally robust measure. To quantify WSE among the Hong Kong population, the present study aimed to validate the Chinese version of WeSEI developed by Ruckwongpatr et al. (2021) in the Hong Kong population.

2. Method

2.1. Participants

The study was conducted on 949 Hong Kong adults (women = 68.6%; male = 31.4%). The participants were reached by convenience sampling method, which is one of the non-probability sampling methods. The mean age of the participants was 23.07 years old with S.D. = 5.27 (range = 18-67 years). The majority of the participants is single (95%). The mean height of the participants is 165 cm with S.D. = 8.05 cm (range = 142 - 190 cm). Their mean weight is 57.79 kg with S.D. = 11.59 kg (range = 35 - 160 kg).

2.2. Weight Stigma Exposure Inventory (WeSEI)

The WeSEI has been translated into Chinese for Taiwanese and Chinese populations (Ruckwongpatr et al., 2025). Therefore, the present study used the Chinese WeSEI to pilot test on several Hong Kong people to evaluate whether its content can be understandable in this population. In general, all WeSEI item contents can be interpreted by the pilot participants without difficulties. Therefore, the WeSEI Chinese version is finalized for formal psychometric testing among Hong Kong people. WeSEI is a seven-factor instrument (television sources, traditional media sources, social media sources, parental sources, extraneous sources, significant other sources, and friends sources) comprising a total of 35 self-reported psychometric items, with five items in each factor. The validity and reliability of the original WeSEI have been tested on Taiwanese young adults, Chinese adolescents, and Chinese young adults with good reliability (Ruckwongpatr et al., 2025). The original five-point Likert scale (1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, 5 = Almost always) was retained to align with the original WeSEI. The construct validity, criterion validity, and reliability of the scale were analyzed on a group of 949 Hong Kong adult participants in the present study.

2.3. Other Measures

Different measures were used to examine the concurrent validity of WeSEI. The structural information of the scales and the internal consistency coefficients calculated in this study are presented below.

2.3.1. Depression Anxiety Stress Scale-21 (DASS -21)

The DASS-21 (Henry & Crawford, 2005) is the short form of the DASS (Lovibond & Lovibond, 1995). It was developed with three subscales to measure depression (seven items; sample item = I felt that life was meaningless), anxiety (seven items; sample item = I felt scared without any good reason) and stress (seven items; sample item = I felt that I was rather touchy). Items are rated on a four-point scale from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). McDonald's ω and Cronbach's α internal consistency coefficients calculated for the DASS-21 subscales were between .822 and .899 and .808 and .893.

2.3.2. Tendency to Avoid Physical Activity and Sport (TAPAS)

The TAPAS (Bevan et al., 2022; Fan et al., 2023) assesses participants' physical activity and sport contexts, consists of a total of 10 items. Items are rated on a five-point scale from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating a greater tendency to avoid physical activity or sport (Sample item = I avoid physical activity because I might get teased about my weight). Calculated McDonald's ω and Cronbach's α internal consistency coefficients were .936 and .933, respectively.

2.3.3. Weight Self-Stigma Questionnaire (WSSQ)

The WSSQ was used to assess participants' perceptions of weight-related self-stigma (Lillis et al., 2010). It has 12 items and is self-rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores on the WSSQ indicate greater weight-based self-stigma (Sample item = I became overweight because I am a weak person). Calculated McDonald's ω and Cronbach's α internal consistency coefficients were 0.928 and 0.926, respectively.

2.3.4. Perceived Weight Stigmatization Scale (PWSS)

Participants' perceived weight stigma was assessed with PWSS (Cheng et al., 2018). The PWSS contains 10 items, and all items are rated on a dichotomous scale of 1 (yes) and 0 (no), with higher PWSS scores reflecting

higher perceived weight stigma (Sample item = People pretend to be afraid of you). Calculated McDonald's ω and Cronbach's α internal consistency coefficients were 0.664 and 0.660, respectively.

2.4. Statistical Analysis

Jeffreys's Amazing Statistics Program (JASP version 0.18.3) was used in all analyses. A CFA was conducted to verify whether the original factor structure of the WeSEI was validated. The following fit indices calculated from CFA were used to describe whether the factor structure of the original scale was confirmed: comparative fit index (CFI) > .90, incremental fit index (IFI) > .90, root mean square error of approximation (RMSEA) < .08, and standardized root mean square residual (SRMR) < .08 (Byrne, 2016; Kline, 2023). The entire WeSEI and its sub-dimensions were analyzed for internal consistency using both McDonald's ω and Cronbach's α . An internal consistency coefficient value (i.e., ω or α) > 0.80 indicates a high degree of scale reliability (George & Mallery, 2019). Then, the heterotrait-monotrait (HTMT) ratio method was used to examine the discriminant validity of the WeSEI. According to Kline (2023), discriminant validity is supported when the HTMT ratio is < 0.85. Additionally, average variation extracted (AVE) values were calculated to assess the convergent validity of WeSEI's sub-dimensions. AVE values > .05 are sufficient for convergent validity (Shrestha, 2021).

The entire WeSEI and its sub-dimensions were examined for their concurrent validity with relevant measures (i.e., DASS-21, TAPAS, WSSQ, and PWSS). Pearson's product-moment correlations were used for concurrent validity, provided that all measure scores met the assumption of normality (Wilcox, 2017). In the present study, skewness and kurtosis coefficients were between -2.0 and + 2.0 indicating normal distribution (Hair et al., 2010) for all the measures. Therefore, Pearson's correlations are appropriate to assess concurrent validity in the present study.

3. Results

Table 1 presents the CFA results for the WeSEI. The seven-factor structure of the WeSEI was confirmed by the acceptable fit obtained from the CFA, using data from 949 participants. AVE values of the factors were calculated to assess convergent validity, and an HTMT analysis was conducted to evaluate discriminant validity. Convergent validity was supported because the AVE value calculated for each factor was > .50, and discriminant validity was supported because the HTMT ratio of factor loadings was < .85.

Table 1. Scale Properties of the Weight Stigma Exposure Inventory (WeSEI)

	WeSEI	Social media sources	Traditional media sources	Television sources	Parent sources	Friend sources	Significant others sources	Stranger source
McDonald's ω	.947	.882	.936	.934	.899	.884	.904	.929
Cronbach's α	.960	.891	.939	.932	.899	.895	.913	.938
CFA								
CFI	.901	--	--	--	--	--	--	--
IFI	.901	--	--	--	--	--	--	--
RMSEA	.078	--	--	--	--	--	--	--
SRMR	.056	--	--	--	--	--	--	--
HTMT method								
Social media sources	--	--						
Traditional media sources	--	.598	--					
Television sources	--	.632	.632	--				
Parent sources	--	.433	.452	.465	--			
Friend sources	--	.568	.522	.510	.656	--		
Significant others sources	--	.409	.492	.454	.646	.704	--	
Stranger source	--	.597	.519	.565	.420	.592	.422	--
AVE	--	.621	.754	.738	.661	.633	.695	.752

Note. CFA = confirmatory factor analysis; CFI = comparative fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; HTMT = heterotrait-monotrait ratio; AVE = average variance extracted.

Additionally, the internal consistency of the entire WeSEI and all its sub-dimensions was calculated and presented in Table 1. It was found that the entire WeSEI and its sub-dimensions were reliable. In addition,

McDonald's ω and Cronbach's α values were also calculated for the internal consistency and presented in Table 1. It was observed that the whole WeSEI and its sub-dimensions were reliable.

Table 2 presents the correlations between the entire WeSEI, its sub-dimensions, the DASS-21's subscales (i.e., depression, anxiety, and stress), TAPAS, WSSQ, and PWSS. The entire WeSEI and its sub-dimensions (i.e., social media sources, traditional media sources, television sources, parent sources, friend sources, significant others sources, and stranger sources), as well as the DASS-21's subscales, TAPAS, WSSQ, and PWSS, exhibit a statistically positive correlation.

4. Discussion

This study aimed to investigate the reliability and validity of the Chinese version of the WeSEI in a Hong Kong sample. The findings clearly indicate that the WeSEI Chinese version, similar to other WeSEI language versions (Çarkit et al., 2025; Gan et al., 2025; Ruckwongpatr et al., 2025), is a valid and reliable self-reported psychometric instrument for assessing WSE. The present findings extend the use of WeSEI from Taiwan, mainland China, Malaysia, and Türkiye to the Hong Kong population.

Table 2. Concurrent Validity of the Weight Stigma Exposure Inventory (WeSEI)

Measures	Pearson correlation with an external criterion measure						Descriptive statistics		
	Depression	Anxiety	Stress	TAPAS	WSSQ	PWSS	Mean (SD)	Skewness	Kurtosis
WeSEI total scale	.23	.24	.28	.27	.29	.32	2.27 (.70)	.16	-.37
Social media sources	.20	.18	.23	.22	.21	.24	2.65 (.94)	-.05	-.58
Traditional media sources	.14	.15	.17	.20	.21	.22	2.16 (.94)	.50	-.50
Television sources	.15	.17	.22	.18	.14	.18	2.72 (.96)	-.21	-.64
Parent sources	.21	.19	.23	.24	.30	.29	1.98 (.90)	.71	-.05
Friend sources	.19	.22	.22	.21	.25	.27	2.13 (.89)	.49	-.36
Significant others sources	.20	.23	.21	.20	.25	.27	1.82 (.86)	.86	.09
Stranger source	.16	.14	.20	.21	.17	.22	2.42 (1.03)	.15	-.95
Depression	--						.68 (.64)	1.11	.83
Anxiety	.72	--					.59 (.53)	.98	.51
Stress	.77	.77	--				.91 (.66)	.51	-.53
TAPAS	.29	.29	.31	--			2.55 (.92)	.37	-.57
WSSQ	.34	.30	.30	.63	--		2.25 (.82)	.32	-.57
PWSS	.32	.31	.32	.31	.37	--	.08 (.13)	1.69	1.86

Note. $N = 949$; all $p < .01$; Depression, Anxiety, and Stress were measured using the Depression, Anxiety, Stress Scale-21; TAPAS = Tendency to Avoid Physical Activity and Sport; WSSQ = Weight Self-Stigma Questionnaire; PWSS = Perceived Weight Stigmatization Scale; SD = standard deviation.

The CFA results confirmed the original seven-factor structure of the WeSEI. This indicates that the scale retains the intended structure in the Hong Kong context. The confirmation of the seven-factor structure of the Chinese version for Hong Kong people is consistent with findings from previous adaptations of the WeSEI to Malay (Gan et al., 2025) and Turkish (Çarkit et al., 2025) cultures. This consistency reinforces that the WeSEI is a robust measurement tool in different cultural contexts.

WeSEI and its sub-dimensions were found to have high internal consistency. Both McDonald's ω and Cronbach's α values meet the high reliability threshold (above .80) for the overall scale and all subscales. This suggests that the scale items consistently measure the same construct and that the WeSEI provides reliable measures in the Hong Kong population. In addition, it was determined that WeSEI has acceptable convergent and discriminant validity. The AVE values calculated for the factors are above .50, which supports convergent validity, and the HTMT ratios are below .85, which supports discriminant validity. These findings reveal that WeSEI can distinguish the construct it aims to measure from other constructs and is consistent within its own factors.

Moreover, the WeSEI and its subscales demonstrated statistically significant positive correlations with relevant external measures (i.e., DASS-21, TAPAS, WSSQ, and PWSS), thereby establishing the concurrent validity of the scale. These correlations are in line with existing literature showing that exposure to WS is associated with individuals' psychological distress (i.e., depression, anxiety, stress), tendency to avoid physical activity, and levels of WSS (Ahorsu et al., 2024; Alimoradi et al., 2020; Bevan et al., 2021; Chan et al., 2019; Cheng et al., 2018; Fung et al., 2024; Huang et al., 2024; Lin et al., 2020a; Ruckwongpatr et al., 2021; Saffari et al., 2024;

Soraci et al., 2024). WS has physiological effects such as increased blood pressure and heart rate (e.g., Panza et al., 2023), as well as eating disorders (e.g., Ahorsu et al., 2020; Fung et al., 2024; Huang et al., 2024; Lin et al., 2020a), physical activity avoidance (e.g., Bevan et al., 2021; Ruckwongpatr et al., 2021; Saffari et al., 2024; Soraci et al., 2024) and body dissatisfaction (e.g., Lessard & Puhl, 2021; Soraci et al., 2024; Zancu & Diaconu-Gherasim, 2024). The fact that the WeSEI is associated with these adverse outcomes suggests that the scale can reflect the wide range of effects of weight stigmatization.

This study is significant in that it provides a culturally appropriate and robust tool for assessing WSE in the Hong Kong population. Unlike other existing WS scales, the WeSEI comprehensively assesses interpersonal and non-interpersonal sources of exposure, such as social media and family members, taking into account contemporary influences as well as traditional media sources (Ruckwongpatr et al., 2025). This broad scope is important for understanding the multifaceted nature of weight stigmatization in today's society. Weight stigmatization is a pervasive form of prejudice and discrimination that has devastating effects on public health. This issue must be understood and addressed by healthcare providers, researchers, public health policy makers, and educators (Alimoradi et al., 2020; Panza et al., 2023). The validation of the Chinese version of the WeSEI as a valid and reliable instrument among Hong Kong population will provide a solid foundation for future research. In particular, the WeSEI could be used in the development of early interventions to prevent WSE in pre-adolescence (Zancu & Diaconu-Gherasim, 2024) and strategies targeting internalized bias (Saffari et al., 2024). The fact that WeSEI provides a general framework that allows comparative analysis of the results of different studies will contribute to the advancement of weight stigma research internationally.

5.1. Limitations and Future Research

This study employed a cross-sectional design, which may limit the ability to make direct inferences about cause-and-effect relationships. Future research could include longitudinal studies to better understand the long-term effects and mediating mechanisms of exposure to WS. Furthermore, validity and reliability studies of the WeSEI in other cultural contexts would further reinforce the scale's generalizability. Testing the WeSEI in clinical populations and across different age groups may also enhance the scale's applicability. Finally, using the WeSEI to evaluate the effectiveness of weight stigma intervention programmes will provide valuable information for practitioners. Such an evaluation is critical, given that weight stigma has devastating effects on public health and needs to be understood and addressed by healthcare providers, researchers, public health policymakers, and educators.

5. Conclusion

As a result, the Chinese version of WeSEI has acceptable psychometric properties (i.e., internal consistency, concurrent validity, convergent validity, and discriminant validity) among Hong Kong population. The Chinese version of the WeSEI is a valid and reliable self-report psychometric tool for assessing Hong Kong participants' exposure to weight stigma in future research. The Chinese version of WeSEI, similar to WeSE in other language versions, offers a general framework for comparative analysis of results from various studies. The validation of this valid and reliable instrument will provide a solid foundation for future research and support the development of early interventions (especially in pre-adolescence) and strategies targeting internalized bias.

Statement of Researchers

Researchers' contribution rate statement:

J-KC: Conceptualization, data curation, investigation, project administration, resources, supervision, writing – review & editing. **OR:** Conceptualization, methodology, writing, review, and editing. **C-WF:** Conceptualization, Methodology, Writing – review & editing. **KMO:** Conceptualization, methodology, writing – review & editing. **AG:** Formal analysis, methodology, software, validation, visualization, writing – original draft. **ND:** Formal analysis, Methodology, Software, Validation, Visualization, Writing – original draft. **C-YL:** Conceptualization, investigation, methodology, project administration, resources, supervision, writing – original draft, writing – review & editing.

Conflict statement:

Chung-Ying Lin is the editor-in-chief of the Journal of Social Media Research. However, he has no role in the review process of this paper; this paper went through rigorous peer review and revision. All other authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability Statement:

The data supporting this study's findings are available from the corresponding author upon reasonable request.

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Ethical Considerations:

All procedures performed in studies involving human participants were by the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Ethical approval was granted by the Chinese University of Hong Kong Ethics Committee (Ethics Number: SBRE-23-0685).

The Authors' Biographies

Ji-Kang Chen, PhD, is currently a Professor at the Department of Social Work at the Chinese University of Hong Kong. His primary research interests include cross-national comparative research on violence and bullying in school and cyberspace, adolescents' mental health, and children's well-being. Specifically, his research aims to contribute to the theoretical and practical knowledge of school violence, cyberbully, mental health, and children's well-being in Chinese societies and other countries to help design effective intervention strategies and policies to alleviate school violence and promote adolescent mental health and well-being.

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Kerry M. O'Brien received training in psychology and public health, completing an honours degree in psychology/neuroscience, and PhD in applied cognitive psychology. Kerry M. O'Brien has since broadened research interests into a range of mental and physical health related topics, and social harms broadly, including the potential antecedents and mediators. Kerry M. O'Brien is particularly interested in developing and testing new research methodologies and measures, including psychometric testing of new measures, and application research designs and program evaluations in complex real-world settings. Since arriving at Monash, Kerry M. O'Brien has been lead chief investigator of co-lead chief investigator on over \$4.5 million in competitive research grants. This includes two ARC grants, two NHMRC grants, and 12 competitive research grants totalling.

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6. References

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