



# A nurse-led psychoeducational program “BalancingMySwing” improves medication adherence among Taiwanese Han-Chinese with bipolar II disorder

Esther Ching-Lan Lin<sup>1,†</sup>, Michael Berk<sup>2,3</sup>, Pei-Chen Hsu<sup>4</sup> and Ru-Band Lu<sup>5</sup>

## ABSTRACT

### Introduction:

The beneficial effects of combined psychosocial and pharmacological treatments for bipolar disorder have been widely documented. However, little research has specifically looked at bipolar II disorder (BP-II), despite it being the most common variant.

### Methods:

This study used a matched-pairs two-group pretest–posttest design to compare the effectiveness of the 10-session weekly “BalancingMySwing” (BMS) program with treatment as usual in a Han Chinese cohort with bipolar II disorder. Twenty-four participants from a medical center in southern Taiwan with a DSM-IV diagnosis of BP-II were purposively recruited and divided into two matched-pair groups for treatment feasibility. Primary outcome indicators were medication adherence and mood symptoms, which were assessed at baseline and post-treatment. Medication adherence was assessed using the self-reported Medication Adherence Rating Scale (MARS). Mood symptoms were assessed by a blinded rater using the 11-item Young Mania Rating Scale (YMRS) and 17-item Hamilton Depression Rating Scale (HDRS).

### Results:

After 10 weeks, a significant group  $\times$  time interactions for the MARS scores indicated that improvements in medication adherence were greater in the BMS group than in the Treatment-as-Usual (TAU) group. However, there were no significant time effects or group differences for the HDRS or the YMRS scores in either group.

### Conclusion:

Our data support the potential beneficial effects of the nurse-led psychoeducational program on medication adherence in Taiwanese Han Chinese with BP-II. Several limitations and barriers to implementation that might confound results are discussed. Future studies with larger samples and longer follow-ups are needed.

### Keywords

BalancingMySwing (BMS) program, Bipolar II disorder, Han Chinese, medication adherence, Psychoeducational program, Depression, Mania

<sup>1</sup>Department of Nursing, College of Medicine and Hospital, National Cheng Kung University, Tainan, Taiwan

<sup>2</sup>Deakin University, School of Medicine, IMPACT Strategic Research Centre, Barwon Health, Geelong, Australia

<sup>3</sup>Orygen, the National Centre of Excellence in Youth Mental Health, the Department of Psychiatry, and the Florey Institute for Neuroscience and Mental Health, University of Melbourne, Melbourne, Australia

<sup>4</sup>Kaohsiung Municipal Kai-Syuan Psychiatric Hospital, Kaohsiung, Taiwan

<sup>5</sup>Institute of Behavioral Medicine, Department of Psychiatry, College of Medicine and Hospital, National Cheng-Kung University, Tainan, Taiwan

<sup>†</sup>Author for correspondence: Esther Ching-Lan Lin, Associate Professor and adjunct Nursing Supervisor, Department of Nursing, National Cheng Kung University (NCKU) and Hospital, Tainan, Taiwan. Phone: 06-2353535-5038, email: chinglan@mail.ncku.edu.tw

## Introduction

Bipolar disorder (BP) is a severe mental illness **characterized** by a chronic course, pervasive instability, and high recurrence and suicide rates [1]. Bipolar II disorder (BP-II) is a bipolar spectrum disorder that requires at least one episode of hypomania and at least one episode of major depression, but not a full manic episode. Symptoms of hypomanic episodes in BP-II must last for at least four days. The course of BP-II can be more chronic than that of bipolar I disorder (BP-I). BP-II involves more frequent cycling and a greater risk of suicidal thoughts and behaviors than does the course of BP-I, and BP-II patients typically experience more depression and other morbidities, less time in elevated mood states, and more psychological impairment [2,3]. Patients with BP-II often seek help for their depressed state, and nearly 50% of them will be initially diagnosed with unipolar depression and not be given diagnostically appropriate treatments [4].

Although pharmaceutical therapy is a first line strategy for attenuating mood symptoms, it often does not lead to satisfactory remission or functional recovery [5]. Studies of the effectiveness of adjunctive psychosocial treatments combined with pharmacological treatments for BP have increasingly supported their benefits for long-term maintenance [6-8]. New brain-imaging technology is being used to study changes in the brain during psychotherapy [9]; this provides a neurobiological basis for self-regulation and psychosocial treatments.

A meta-analysis of psychosocial treatments for BP supports the notion that psychotherapies (cognitive-behavioral therapy (CBT), interpersonal social rhythm therapy, and family therapy) augmented with mood stabilizers reduced relapse rates (OR: 0.57; 95% CI: 0.39-0.82) over 1-2 years [10]. Specific mediating mechanisms included increasing medication adherence, teaching self-monitoring and early intervention with emergent episodes, and increasing interpersonal functioning and family communication. Although the evidence was not sufficient to support a particular treatment as preferred, a group psychoeducation trial was more cost-effective than individual therapies with equivalent effect sizes for recurrence. Similarly, a systematic review supported the usefulness of psychoeducation for preventing mood episode relapses [11]. In their review of adjunctive non-pharmacological interventions

for managing mania in an inpatient setting, Crowe and Porter suggested “sleep and circadian regulation” as a critical element that focused on the establishment and maintenance of regular daily rhythms, particularly in relation to sleep-wake times, meal times, and socialization [12]. Parikh, *et al.* (2012) followed-up the effects of 6-session group psychoeducation and 20-session individual cognitive-behavioral therapy programs for 72 weeks [13]. They concluded that both treatments had similar drop-out and completion rates and attenuation of symptom severity and relapse rates. Psychoeducation is less expensive than is CBT with individualized and longer treatment duration (US\$180 *vs.* US\$1200), and it requires less clinician training. Another randomized controlled trial also attested to the immediate and lasting effects of a 4-session psychoeducation program on their knowledge and attitudes about their illness for patients with BP [14]. Psychoeducation promises to be a cost-effective intervention for patients with BP. Some of these approaches are now adapted to internet delivery, with positive preliminary data [15].

Although psychoeducation has been tested in BP at different stages of progression and severity, its effectiveness for BP-II patients is unknown. Information about effective psychosocial treatments for BP-II is scant, contrasting with the greater prevalence of BP II than BP I disorder, representing a major unmet need. Similarly, there is a paucity of transcultural studies, with most trials conducted in the Anglosphere, such that information about developing psychosocial interventions in more diverse populations such as the Han Chinese is similarly an unmet need. We thus examined the effectiveness of a nurse-led psychoeducation intervention for medication adherence and attenuating mood symptoms in Taiwanese Han Chinese with BP-II.

## Methods

### ■ Research design and setting

A quasi-experimental, matched-pairs two-group pretest/post-test design was used—randomized assignment was not feasible—to compare the effectiveness of a nurse-led BalancingMySwing (BMS) program with that of TAU in the psychiatric outpatient department at National Cheng Kung University Hospital, a 1200-bed medical center in southern Taiwan. The human rights protection protocols and all ethical considerations were approved by the hospital’s Institutional Review Board (No. B-ER-103-

222) before any patients were recruited. Eligible participants were given a letter that explained all of the study’s details and informed them of their right to withdraw from the study at any time, and for any reason, in accordance with the Declaration of Helsinki. Signed written permissions from all participants were obtained before data were collected.

### ■ Participants

All patients who were > 20 years old and had a DSM-IV diagnosis of BP-II from National Cheng Kung University Hospital were purposively recruited for this study. They were also interviewed using the Chinese version of the Modified Schedule of Affective Disorder and Schizophrenia-Lifetime (SADS-L) [16]. The Chinese version of the modified SADS-L, which has good inter-rater reliability, is a semi-structured interview aimed at formulating the main diagnosis based upon DSM-IV criteria [17]. Patients who, based on the interview, required immediate hospitalization, who met the criteria for a DSM-IV current BP-I diagnosis, who had mixed mood episodes, who had depression not otherwise specified, who had any comorbidity with substance abuse, or who were of aboriginal ethnicity were excluded. Twenty-four eligible patients signed informed consents and completed the assessments. They were invited to participate and asked about their availability to attend the ten 90-min psychoeducation sessions.

### ■ Intervention

#### Treatment-as-Usual

All participants were under the outpatient care of a medical center and permitted to visit their psychiatrists once a month, and were given usual outpatient treatment, which is primarily pharmacological and supportive counselling throughout the study.

#### The nurse-led BalancingMySwing program

In addition to the TAU, a psychiatric nurse with a master’s degree and 5 years of psychoeducational intervention experience administered the BMS program to participants in the intervention group. The program was adapted from the MAPS model [18] for Taiwanese Han Chinese with BP-II in an outpatient setting which integrates CBT strategies, including monitoring mood and circadian rhythms (M), assessing prodromes (A), preventing relapse (P) and setting Specific, Measurable, Achievable, Realistic, Time-framed (SMART) goals (S). A manualized treatment

workbook and a patient workbook were used throughout the program to ensure the treatment fidelity and encourage patients’ self-mastery to learn the knowledge and skills. Five core elements were included: (1) providing knowledge about BP, (2) managing mood symptoms and stabilizing circadian and social rhythms, (3) learning how to effectively take medication, (4) dealing with the interpersonal conflicts and life stressors, and (5) establishing short-term recovery goals toward a meaningful life (the intervention materials in Chinese are available by e-mail from the corresponding author) (Table 1).

#### Assessments

Baseline assessments of sociodemographic data, medication adherence, and mood symptoms were compiled. Post-intervention assessments for the BMS program were done after the intervention had been completed, and, for the TAU group, 10 weeks after the baseline assessment.

Each participant was first asked to report their sociodemographic data: sex, age, education, marital status, and employment. Participants’ clinical data including how long they had had psychiatrist-diagnosed BP-II, and how many times they had been hospitalized were obtained from medical records.

Two primary outcome indicators, medication adherence and mood symptoms, were assessed at baseline and post-intervention. Medication adherence was assessed using the 10-item Medication Adherence Rating Scale (MARS) [19] in Chinese, which has satisfactory reliability and validity [20]. Each item was scored as “0” for a non-adherent attitude and behavior or “1” for an adherent attitude and behavior. The MARS total scores range from 0 to 10. Higher scores indicate better medication adherence. These self-reported questionnaires were returned in a sealed envelope to a location separate from personnel involved in the intervention to maintain blindness.

Participants’ mood symptoms were assessed using the 11-item Young Mania Rating Scale (YMRS) [21] and 17-item Hamilton Depression Rating Scale (HDRS) [22] by independent raters who were blinded to the participants’ groups. The YMRS, which has satisfactory reliability and validity [21], was used to evaluate manic symptoms (total score range: 0-60). Four items were rated on a 0-8 Likert scale (irritability, speech, thought content, and disruptive/aggressive behavior); these scores were doubled

**Table 1: The nurse-led BalancingMySwing (BMS) program: 10-session content.**

Intervention topic	Goals
1. My swing experience	<ul style="list-style-type: none"> <li>To review and share emotional swing experience in the past illness trajectory</li> </ul>
2. What is bipolar disorder?	<ul style="list-style-type: none"> <li>To provide scientific knowledge of BP: etiology, course of symptoms, treatments, and outcomes</li> </ul>
3. When manic	<ul style="list-style-type: none"> <li>To recognize the signs of mania, and review the specific consequences from past episodes</li> </ul>
4. When depressed	<ul style="list-style-type: none"> <li>To recognize the signs of depression, and review the specific consequences from past episodes</li> </ul>
5. Tracing back my swing	<ul style="list-style-type: none"> <li>To discuss stressors and specific triggers of mood episodes, e.g., life events (role changes, conflictual or deficient interpersonal relationships, loss, or grief), unstable circadian and social rhythms, cognitive errors, and medication problems</li> <li>To identify their own stressors and specific triggers of mood episodes, and to develop an individualized plan to prevent triggers and attenuate stressors</li> </ul>
6. Balancing my mood swing	<ul style="list-style-type: none"> <li>To introduce strategies to manage mood symptoms</li> <li>To develop individualized coping strategies for mood symptoms, e.g., keep bored and set safe limits while being manic; maintain sleep hygiene</li> </ul>
7. Stabilizing my circadian and social rhythms	<ul style="list-style-type: none"> <li>To understand the importance of stabilized and healthy social rhythms</li> <li>To develop a realistic short-term healthy daily and weekly schedule circadian rhythm, working, and social activities (exercise and leisure)</li> </ul>
8. Handling my interpersonal relationships and life stressors	<ul style="list-style-type: none"> <li>To identify their own interpersonal conflicts and life stressors</li> <li>To learn and practice new skills for solving interpersonal conflicts and ameliorating life stressors through role play</li> </ul>
9. Why meds?	<ul style="list-style-type: none"> <li>To recognize the specific benefits and side effects of medication treatment</li> <li>To share the experience of medication nonadherence or cessation and its consequences</li> <li>To effectively take medication and manage side effects in the long run</li> </ul>
10. Toward recovery and establishing a meaningful life	<ul style="list-style-type: none"> <li>To integratively review the concepts of biological and social rhythms in BP: circadian rhythms, medication, cognitive functions, and interpersonal relationships</li> <li>To develop a realistic short-term healthy daily and weekly schedule for recovery</li> </ul>

to compensate for the difficult participation of patients with severe mood symptoms. The remaining 7 items were rated on a 0-4 Likert scale [21]. A score  $\leq 12$  normally indicates a remission of symptoms, 13-19 indicates minimal mania, 20-25 indicates mild mania, 26-37 indicates moderate mania, and  $\geq 38$  indicates severe mania [23].

The HDRS, which has satisfactory reliability and validity [22], is among the most widely used depression-assessment scales. It includes 9 items rated on a 0-4 Likert scale and 8 items on a 0-2 Likert scale (total score range: 0-52). A score of 7 or less indicates remission, 8-13 indicates mild depression, and 23 indicate severe depression [23].

**Statistical Analysis**

Descriptive statistics of sociodemographic and clinical variables of all participants are presented and group differences in demographic and baseline clinical variables between the BMS and TAU groups were examined using  $\chi^2$  tests or Mann-Whitney U tests. Differences in changes between baseline and post-treatment MARS, HDRS, and YMRS scores were evaluated using generalized estimating equations (GEEs) after controlling for employment, marital status, and anxiety, which might affect outcome variables [24]. The baseline and post-treatment scores were the repeated dependent variables, and the group

was the independent variable. The “time effect” tests whether both groups improved between baseline and post-treatment assessments. The group  $\times$  time interaction is a test of whether patients in the BMS group differed significantly over time from those in the TAU group, and thus was the primary effect of interest. Significance was set at  $p < 0.05$ . SPSS 18.0 for Windows was used to analyze all data (SPSS Inc., Chicago, IL, USA).

**Results**

**Patient characteristics**

Of 52 screened patients, 14 did not meet the inclusion criteria and 10 declined to participate; thus, we enrolled 28 participants: 14 assigned to the BMS group and 14 to the TAU group. Patients were invited to attend the BMS group according to their feasibility; relatively, a sex- and age-matched counterpart was selected for the TAU group from the pool of eligible patients. By adhering to this selection process, baseline differences between the two groups were substantially eliminated, and the groups were not significantly different. Two participants in the BMS group did not keep their appointments; thus, they discontinued the intervention. Two participants in the TAU group were lost to post-treatment assessment because their symptoms worsened and they did not keep

their appointments. Finally, 12 participants in the BMS group and 12 in the TAU group were analyzed.

Most of the participants were female, single, employed, had a 4-year college or junior high school degree, had never been hospitalized, and had comorbid anxiety (Table 2). Their mean age was  $31.92 \pm 13.35$  years, age at onset was  $17.13 \pm 6.56$  did not, and length of illness was  $15.09 \pm 10.64$  years. There were no significant demographic or clinical differences between the 2 groups (Table 2).

### ■ Effect on medication adherence and mood symptoms

The baseline assessment showed no significant differences in MARS, HDRS, or YMRS scores between the 2 groups. The time  $\times$  group effects for the MARS scores that show improvements in medication adherence were higher in the BMS group than in the TAU group (Table 3). However, there were no significant time effects or group differences for the HDRS or the YMRS scores in either group.

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## Discussion

We found that the BMS program improved medication adherence among Taiwanese Han-Chinese with BP-II. Medication adherence is crucial for long-term illness management, and nonadherence is considered one of the most challenging problems when treating patients with BP [25,26]. Of the interventions for improving adherence, psychoeducation has shown long-lasting prophylactic effects in patients with BP [27,28]. Parker (2012) highlighted the importance of psychoeducation for treating BP-II patients, particularly because most of them might have been untreated or inappropriately treated for many years [29].

However, existing evidence of psychosocial treatments in BP comes primarily from mixed or undifferentiated samples with diagnostic subtypes or with BP-I. That might not be directly applicable for patients with BP-II, because an increasing number of studies reported distinctions in neurocognitive and psychosocial impairments between BP-I and BP-II and other treatment differences are also evident between these groups such as the potential value of antidepressants [30,31]. Transcultural applicability also needs to be clarified, including among Taiwanese Han-Chinese, as it cannot be assumed that Anglosphere optimized therapies will be

applicable across diverse cultures [32]. Colom, *et al.* reported in their subtype-sample analysis that a 6-month 21-session psychoeducation program plus medication benefitted patients with BP-II: they had fewer mood episodes that lasted for fewer days, and they had higher functional levels [33]. Parikh, *et al.* found that, compared with 20-week individual CBT, 6-week group psychoeducation had positive longitudinal effects on mania/hypomania and depression in BP-I and BP-II patients [8]. The effects of psychoeducation might develop over time or appear in follow-up evaluations.

Three essential components of psychoeducation for BP have commonly been included: increasing knowledge and positive attitudes about the illness, improving treatment adherence, and decreasing risks of relapses of manic and depressive episodes and hospitalization [29]. The knowledge content of the BMS program includes the cyclic nature of the illness, how to manage its affective symptoms, how to stabilize circadian and social rhythms, and how to improve treatment adherence.

We added “stabilizing circadian and social rhythms” to the three common components of psychoeducation because changes in biological rhythms are common features of BP and have long been strongly correlated with mood instability and functional impairment. A randomized controlled trial did not support the effect of regulating biological rhythms in pharmacologically treated BP-II patients also given 6 individual psychoeducation sessions compared with BP-II patients given only standard pharmacological treatment [34]. This might be because of the brevity of the psychoeducation and the follow-up period. Because of not including the sensitive outcome indicators of biological and social rhythms in the present study, the effect of the intervention component of biological and social rhythms cannot be clarified.

Our findings have some practical implications. First, Grande, *et al.* suggested that the optimum long-term management for these patients with BP is, from the first episode, a preventive strategy that combines pharmacological, psychological, and lifestyle approaches that aim to prevent the recurrence of mood episodes and to ensure functionality [1]. Rather than merely providing medication, these preliminary data support further study of the efficacy of offering the BMS to Taiwanese Han Chinese with BP-II at an early stage of the illness (onset or diagnosis). Second,

**Table 2: Participants' characteristics.**

Group	BMS	TAU	$\chi^2$	<i>p</i>
Variable	(n=12)	(n=12)		
	n (%)	n (%)		
Gender			0.000	1.00
Male	4 (33.30)	4 (33.30)		
Female	8 (66.70)	8 (66.70)		
Marital Status			0.028	0.867
Single	8 (66.70)	8 (66.70)		
Married	4 (33.30)	4 (33.30)		
Employment			0.068	0.795
Employed	7 (58.33)	8 (66.70)		
Unemployed	5 (41.67)	4 (33.30)		
With Anxiety	7 (58.33)	6 (50.00)	0.168	0.682
Without Anxiety	5 (41.67)	6 (50.00)		
Age	36.92 ± 14.01	26.92 ± 11.04	-1.763 <sup>a</sup>	0.078
Age at onset	19.42 ± 8.26	14.64 ± 2.54	-1.242 <sup>a</sup>	0.214
Illness (years)	17.50 ± 9.91	12.45 ± 11.25	-1.265 <sup>a</sup>	0.206
Times hospitalized	0.20 ± 0.42	0.56 ± 1.01	-0.743 <sup>a</sup>	0.458
Education (years)	17.67 ± 3.31	17.42 ± 3.99	-1.520 <sup>a</sup>	0.160

NOTE. aZ-score; Group differences were derived using Mann-Whitney U tests.

<sup>a</sup>*p*<0.05

**Table 3: Medication adherence and mood symptoms compared between the BMS and TAU groups.**

Group	BMS	TAU	Group Effect			Time Effect			Time × Group Effect		
			$\beta$	SE	<i>p</i>	$\beta$	SE	<i>p</i>	$\beta$	SE	<i>p</i>
Variables	(n=12)	(n=12)									
	mean ± SD	mean ± SD									
<b>MARS (0-10)</b>			3.27	1.32	0.013*	5.61	1.60	< 0.001*	-2.69	0.81	0.001*
Pretest	4.67 ± 2.27	4.70 ± 1.70									
Posttest	7.58 ± 1.78	4.90 ± 1.85									
<b>HDRS (0-50)</b>			5.94	3.99	0.138	3.55	3.56	0.319	-2.50	2.27	0.272
Pretest	8.17 ± 3.27	11.83 ± 4.46									
Posttest	8.17 ± 3.61	9.33 ± 3.75									
<b>YMRS (0-60)</b>			-2.12	2.41	0.379	-2.80	2.33	0.229	1.07	1.41	0.448
Pretest	9.42 ± 4.01	9.42 ± 5.21									
Posttest	7.42 ± 2.61	7.50 ± 3.06									

NOTE. BMS: BalancingMySwing; TAU: treatment-as-usual; SD: standard deviation; SE: standard error; MARS: Medication Adherence Rating Scale; HDRS: Hamilton Depression Rating Scale; YMRS: Young Mania Rating Scale.

\**p*<0.05

because psychiatric nurses are the most abundant providers of care in Taiwan's psychiatric mental health care delivery system-and many systems globally, the dissemination of a nurse-led psychoeducation program for patients with BP-II and providing related on-the-job training could be more easily scalable and translated into practice in order to improve the quality of care for these patients. Third, tailoring the BMS intervention content to the stage of illness should help patients at different stages of BP, including at-risk and newly diagnosed. Fourth, considering the limited resources and the wide use of new

technologies such as the Internet and mobile phones, integrating BMS psychoeducational intervention into user-friendly Internet-based approaches and smart-phone applications are suggested to increase its cost-effectiveness, accessibility, and availability [15,35].

Our study has some limitations. First, the BMS program was evaluated immediately after treatment had been completed, i.e., without any follow-up assessment, and thus the durability of the effectiveness of the program cannot have been detected. Long-term follow-up evaluation is needed for future research. Second, our findings

from the matched-pairs two-group design require additional investigations to examine the generalizability of our findings to different groups. For example, each participant in the experimental group was motivated to attend the BMS psychoeducation sessions. This might indicate that experimental group members had a greater than average need for professional help, or those they perceived greater difficulties in managing their symptoms, or that they could have more positive attitudes and better insight into the value of the treatment than did those unwilling to attend. Moreover, we excluded patients who required immediate hospitalization, who met the criteria for a DSM-IV current BP-I diagnosis, who had mixed mood episodes, who had depression not otherwise specified, who had any comorbidity with substance abuse, or who were of aboriginal ethnicity. Therefore, our findings might not be generalizable to a broad population.

Third, although knowledge- and attitude-related illness management and social rhythms are essential components of the BMS program, neither was measured in the present study. We suggest adding these sensitive outcome indicators to test the direct effects from the psychoeducation intervention. Fourth, the BMS program intervention was compared with TAU, and did not control for the nonspecific factors related to the intervention (e.g., clinician time and attention). It is known that TAU designs inflate effect sizes compared to active controls, risking type one errors. Fifth, the small sample limits the study’s statistical power and contributes to potential type two errors in detecting effects of the BMS program on attenuation of patients’

mood symptoms. Sixth, participants were not blinded to their intervention groups in this study, which might have biased their responses to subjective outcome measures [36].

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## Conclusion

The BMS program, a nurse-led psychoeducational intervention, tailored to Taiwanese Han-Chinese with BP-II in the community, suggested a tentative benefit for medication adherence. Future larger studies with randomized-control designs that contain assessments of patients’ knowledge about BP and their biological and social rhythms, and that have extended follow-ups to examine the long-term effects of BMS intervention are needed.

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## Authorship statement

All authors listed meet the authorship criteria of the latest guidelines of the International Committee of Medical Journal Editors, and all authors agree with the content of the manuscript.

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## Acknowledgements

*This study was funded in part by grant 103WFA0901134 and MOST 104-2314-B-006-047-MY3 from the Taiwan Ministry of Science and Technology. MB is supported by a NHMRC Senior Principal Research Fellowship 1059660.*

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## Disclosure statement

All authors have declared no potential conflicts of interest with respect to the research, authorship, or publication of this article.

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