RESEARCH ARTICLE

Validity and Reliability of a Localized Nursing Assessment Guide for Symptoms of Anxiety and Depression Among Admitted Adult Cardiac Filipino Patients

Paolo Christian G. Bautista, MA(Nursing), RN[1], Bethel Buena P. Villarta, DrPH, RN[2],
Ma. Rita V. Tamse, MN, RN[3], Tomas D. Bautista, MD, Msc[4],
Wilfredo II Francis T. Mina, ND, Msc[5], Maria Angela A. Mabale, MA, RN[6]

Abstract

One of the most commonly used tools by clinicians to identify cases of anxiety and depression in medically ill patients is the Hospital Anxiety and Depression Scale, or the HADS Filipino version. However, there were some "gray areas" with its use, particularly for those who are in the non-psychiatric setting. Some translated items may pertain to something else which could influence patients' responses. Furthermore, local studies showed differences in the conception, understanding, and expression of depression unique to Filipino culture and could be potentially missed during the assessment. This paper determined the validity and reliability of the Anxiety and Depression Symptom Assessment Guide or ADSA to a sample of 91 adult cardiac Filipino patients in the in-patient setting.

In addition to the 29-item ADSA tool that was generated from HADS, the review of literature and other sources was also reviewed by experts from two rounds of Delphi Survey. It was written in a yes-or-no format and available in both English and Filipino versions. The tool was tested for internal consistency, intra-class and inter-item reliability. Another test used was criterion-based validity utilizing HADS to identify cases of anxiety and depression. The results showed that ADSA is highly reliable with Cronbach's alpha of 0.97, poor-to-moderate intra-class correlation (0.670 for anxiety, 0.440 for depression), and consistent/acceptable inter-item correlation (0.528 for anxiety, 0.382). Both HADS and ADSA were positively correlated with correlation coefficients of 0.667 and 0.391 (p-value<0.5) for anxiety and depression respectively. Using a cut-off score of 5, ADSA has moderate sensitivity and specificity of 72.5% and 78.4% for anxiety, and 66.7% and 64.3% for depression. Further research is needed to strengthen ADSA's validity by increasing the sample size and the multi-center sites.

Keywords: *anxiety, depression, cardiac patients, tool development, reliability, validity*

Introduction

Several cohort and meta-analysis studies showed that cardiovascular diseases or having a cardiovascular event, in combination with either anxiety or depression, or both, are often linked together (Batelaan et. al., 2016; Emdin et. al. 2016; Soleimani et. al., 2018; Burell 2019, Karlsen et. al., 2020; Desche⬜nes, Burns, and Schmitz, 2020). These comorbidities could lead to series of complications affecting a person's recovery, coping, and quality of life (Schulman-Green et. al., 2016; Trivedi et. al, 2019; Meng et. al., 2020, Song et. al., 2020; Eisele et. al., 2020). Despite the existence of the problem, it is often undetected because of limited trained staff in mental health (Haws, Ramjeet & Gray, 2011; Mitchell, & Kakkadasam,

[1] Corresponding author; Primary Investigator, University of the Philippines-Manila, College of Nursing, Sotejo Hall, University of the Philippines-Manila, Pedro Gil St., Ermita, Metro Manila, 1000 Philippines, +639568890275, Email: pgbautista@up.edu.ph
[2] Professorial Lecturer, University of the Philippines-Manila, College of Nursing, Sotejo Hall, University of the Philippines-Manila, Pedro Gil St., Ermita, Metro Manila, 1000 Philippines.
[3] Faculty, University of the Philippines-Manila, College of Nursing, Sotejo Hall, University of the Philippines-Manila, Pedro Gil St., Ermita, Metro Manila, 1000 Philippines.
[4] Associate Professor. University of the Philippines-Manila, College of Medicine, Calderon Hall, University of the Philippines-Manila, Pedro Gil St., Ermita, Metro Manila, 1000 Philippines
[5] Guidance Services Specialist, University of the Philippines-Manila, Office of Student Affairs, UP Manila, Padre Faura cor. Ma. Orosa Sts., Ermita, Metro Manila 1000, Philippines
[6] Faculty, University of the Philippines-Manila, College of Nursing, Sotejo Hall, University of the Philippines-Manila, Pedro Gil St., Ermita, Metro Manila, 1000 Philippines

2011), low priority for psychosocial problems (Mitchell, & Kakkadasam, 2011), lack of protocols (Picardi et. al., 2015), and the absence of formal screening (Ziegelstein et. al., 2005) to facilitate a proper diagnostic inquiry.

The dictum is "an ounce of prevention is worth a pound of cure." The use of a tool would help properly document changes in mood. Most importantly, the assessment of anxiety and depression particularly in the non-psychiatric setting helps bring awareness of the healthcare providers in mental health and psychosocial needs of patients, which can greatly improve the overall-hospital experience of patients with cardiovascular disease. In fact, studies by Worall-Carter et. al., (2012), and Ski, et al., (2015), showed that screening and referral instruments helped nurses in their practical and verbal skills. By doing so, staff nurses were better equipped to identify symptoms of depression and instigate referral procedures.

In the Philippines, there are already existing tools to measure anxiety and depression. One of which is the Hospital Anxiety and Depression Scale or HADS. The HADS is a 14 -item likert scale tool that is available in both English and Filipino versions. The original tool was developed by Zigmond and Snaith (1983) as cited in De Guzman (2013) and underwent translation and back-translation under Pfizer Pharmaceuticals. The translated tool was validated to medically-ill patients and found to have a cutoff score of 11, with a sensitivity of 75%, specificity of 70%, and Positive Predictive Value of 75% (De Guzman, 2013). The HADS is primarily used by clinicians to identify cases of anxiety and depression in medically-ill patients.

In several non-English speaking countries, the common reasons for the development of indigenous tools were: (1) the language itself; (2) translation (literally or figuratively); and (3) expressions of emotional distress (Kim, 2002; Wong et. al., 2012; Rassmusen et.al., 2015; Lee et. al., 2000; Mimura et. al., 2011; Abeyasinghe et. al., 2012; Hwang et. al., 2011; & Widiana et. al., 2018). Although the HADS/HADS-P have been validated and used locally, administrators of this tool should use it with caution particularly among nurses in the non-psychiatric setting due to the tendency that it may create disagreement between what is "general" over what is "unique" in a particular population, or simply the etic-emic of psychopathology. In a study by Ty, et. al., (2019) the translation of instruments across cultures and languages can be problematic because of factors such as the construct may not be equivalent across cultures, or the construct may exist across cultures but may have unique features in a particular group.

For instance, the Filipino version of HADS pertaining to anxiety: *"Naliligalig at punong-puno na ako"* may mean differently to the rater. The word *"Naliligalig"* can be too deep to understand for some individuals. While, *"punong-puno"* may mean anger,

impatience, or perhaps too overwhelming feeling. Another item that pertains to depression, *"Kaya kong maaliw sa isang magandang libro o programa sa radio o TV,"* may limit the options of the person taking the test from the examples provided in the questionnaire who could have other preferred recreational activities and hobbies. Authors Maters et. al. (2013), and Vijver and Tanzer (2004) raised caution in relying on translated tools particularly HADS since it may measure something else than the original version, and some instruments may become unrealistic to assume that the translated items convey the same construct in a target group.

In addition, studies found locally showed differences in conception, understanding, and expression of symptoms of depression that are unique in Filipino culture. (Lara, 1973; Crittenden et. al., 1992; Tompar-Tiu & Sustento-Seneriches, 1995; Nadal, 2011, Fernandez, Seyle & Simon, 2018). This can create a "gray area" particularly among nurses who may not have refined knowledge and skills about mental illness. Such can serve as a barrier for them to correctly identify the symptoms of anxiety and depression, unlike most clinicians who rely on HADS to guide them in the assessment and who are known experts in the case. Hence, it is imperative to develop a psychometrically sound nursing assessment guide that is culturally appropriate for use by nurses in the assessment of symptoms of anxiety and depression among admitted adult cardiac Filipino patients.

Methodology

This study tested the validity and reliability of the Anxiety and Depression Symptoms Assessment Guide for Nurses or ADSA which was developed and refined through two rounds of Delphi Survey among 22 experts in mental health, psychiatry and cardiovascular care. The items of the tool were generated from the Hospital Anxiety and Depression Scale and from the literature and other sources. Overall, there were 8 items for anxiety, 9 for depression, and 12 for nursing observation for a total of 29 items for validation. It was written in a yes-or-no format, as well as, an interview script was provided and are available in English and Filipino versions.

After approval from the PHC-IERB (OR.R.004.21), the final tool was validated to a sample of admitted adult cardiac patients in non-covid units in the hospital. Simple random sampling and screening for patients were employed despite the high turnover rate. Patients were enrolled if they satisfied the following criteria: adult (19 years of age), admitted after 48 hours upon admission due to any cardiovascular-related event in non-Covid units, diagnosed with any cardiovascular disease, conscious and coherent enough to answer questions, obtain pertinent health history and follow instructions in

English and Filipino, and willing to participate. Those with unstable health condition, Do Not Resuscitate order, and history of depression or any psychiatric illness were excluded. Overall, 91 patients were successfully enrolled in the study.

Prior to the data collection, unit orientation was conducted among nurses with the use of the new tool. The data collection was conducted for two consecutive days by the patients' primary nurse. Nurses who were not able to perform the assessment were done by the research assistants trained by the investigator. Nurses were instructed to administer the HADS questionnaire first followed by the ADSA. After two days, the results of the HADS were discussed to the patient and a psychoeducational material was provided.

The data were analyzed using SPSS version 22. Quantitative variables were summarized through Mean, and Standard Deviation values, while qualitative variables were tabulated as Frequencies and Percentages. Reliability of the tool was analyzed using Cronbach's alpha test for dependent t-test, intra-class, and inter-item reliability. Criterion-based validity and cut-off values were analyzed using Pearson Product Moment Correlation, Sensitivity, Specificity Positive Predictive Value, Negative Predictive Value, and Area Under Curve Receiver Operating Characteristics. The level of significance was set at 5%.

Findings

The output of the study is called the Anxiety and Depression Symptoms Assessment Guide for Nurses (ADSA). The overall assessment is divided into four phases of the therapeutic nurse-patient working relationship. All questions were answerable by Yes or No. Every observed symptom corresponds to a point and the higher number of symptoms in each subtest indicates that the patient has probable anxiety or depression. The mean time spent for answering the questions is 7.23 minutes (SD±5.37, range of 2–34). The median and mode is 5 minutes. To properly score the tool, one must obtain the cumulative scores in both parts of the test. The results of anxiety or depression subtest is added to the results of part 2. The highest score for anxiety is 20 whereas for depression subtest is 21.

Reliability

Internal and external reliability tests were done to identify the consistency and stability of the new tool. First, internal consistency was calculated by computing for the Cronbach's alpha for each assessment method and the combined methods (interview and observation) in each subtests. For the anxiety subtest, the Cronbach's alpha are 0.808 (interview) and 0.965(combined). Whereas for depression, is 0.544 (interview)

and 0.963 (both). The observation method which consists of 12 items has a Cronbach's alpha of only 0.274. Table 1 shows the results of Cronbach's alpha test.

Table 1. *Internal consistency of the Anxiety and Depression Symptoms Assessment Guide*

Assessment Method	Number of items	Cronbach's alpha
Interview		
Anxiety	8 items	0.808
Depression	9 items	0.544
Observation	12 items	0.274
Both		
Anxiety	20 items	0.965
Depression	21 items	0.963

Next, the intra-class and inter-item correlation were computed to determine the consistency of the tool between independent raters. The intra-class correlation for anxiety subtest is 0.792, and for depression is 0.538. For the observation method, the intra-class correlation is 0.245. For both methods of assessment, the intra-class correlations are 0.670 for anxiety, and 0.440 for depression. The findings imply that the interview has a good-to-moderate reliability. Whereas, the observation method has poor reliability, and if both methods are combined, there is a poor-to-moderate reliability.

Finally, the inter-item correlation for anxiety subtest is 0.528 (for both) to 0.662 (for interview only). The findings suggest there is minimal difference between raters and this indicates that there is consistency in the anxiety subtest. The inter-item correlation of depression subtest ranges from 0.314 (for both) to 0.382 (for interview only) which is ideal but at par from anxiety subtest suggesting less agreement between raters. For the observation method, the findings are low (inter-item correlation=0.174), which implies poor inter-rater reliability because of wide variation of responses between two raters.

Criterion-based Validity

Criterion validity was computed by Pearson Product Moment correlation. The correlation coefficient for ADSA-Anxiety is 0.667, whereas for depression is 0.391. Both are statistically significant (*p*-value<0.05). The findings suggest that both HADS and ADSA are positively correlated and the strength of correlation for ADSA-A has moderate correlation and ADSA-D has weak correlation. Table 2 illustrates the correlation between ADSA and HADS.

Table 2. *Correlation between HADS and ADSA*

Correlation	HADS-Anxiety	HADS-Depression
ADSA-Anxiety Pearson Correlation *p*-value (2-tailed) N	.667** .000 91	
ADSA- Depression Pearson Correlation *p*-value (2-tailed) N		0.391** .000 91

** Correlation is significant at the 0.01 level (2-tailed)

Cut-off scores

The cut-off scores for each subtests were computed by plotting the scores obtained in new tool and obtaining the Area Under Receiver Operating Characteristic (AUROC). The area under the curve for ADSA anxiety is 0.809 (95% CI= 0.719-0.899), and ADSA depression is 0.766 (95%= CI, 0.667- 0.865), which are both above 0.5 that indicates a good test. Figure 1 shows the AUROC.

Table 3 shows the cut-off values and their corresponding sensitivity and specificity based from the actual cross-tabulation. For cut-off scores ranging from 3 to 6, the sensitivity and specificity of ADSA-Anxiety range from 67.5 to 90 percent and 43.1 to 84.3 percent. For ADSA-Depression, the sensitivity and specificity range from 52.4 to 76.2 percent and 30.0 to 72.9 percent.

Figure 1. *Area Under the Receiver Operating Curve*

Diagonal segments are produced by ties.

Discussions

This study developed a new tool based from HADS and incorporated other symptoms of anxiety and depression that manifests among Filipino culture found from the literature.
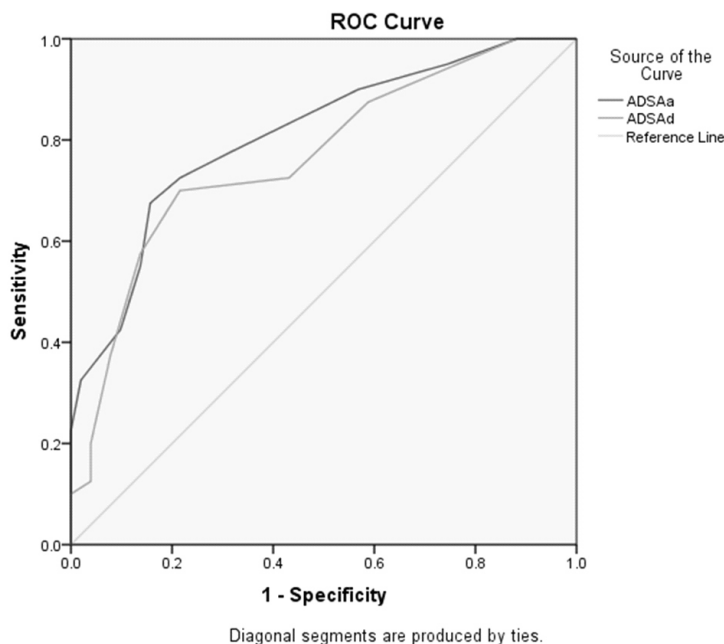
Moreover, this study sought expert's recommendation to refine the pool of items used for validation. The final product is called the Anxiety and Depression Guide for Nurses or ADSA. The ADSA is a 29-item available in English and Filipino versions. The ADSA is divided into two parts: Interview and Observation and both parts are answerable by yes-or-no.

The current study showed higher reliability when both methods of assessment were combined and this finding is higher than other published literatures in Asia which developed their own assessment tools. Surprisingly, the internal consistency of the ADSA is 0.97 for anxiety and 0.96 for depression. The current study was different because of combined methods of assessment versus the self-report scales. Self-report questionnaires in Korea, China, Taiwan, Japan and Indonesia

Cut off values (Anxiety)	% Sensitivity	% Specificity	Youden's Index= (Sensi+ Speci-1)	Cut off values (Depression)	% Sensitivity	% Specificity	Youden's Index (Sensi+ Speci-1)
3	90.0	43.1	0.33	3	76.2	30.0	0.06
4	77.5	68.6	0.46	4	71.4	48.6	0.20
5*	72.5	78.4	0.51	5*	66.7	64.3	0.31
6	67.5	84.3	0.52	6	52.4	72.9	0.25

*Note. As the cut-off scores increase by 1, the sensitivity decreases, and the specificity increases in both subtests. Noticeably, a cut-off score of 6 in ADSA-Anxiety obtained the highest value of Youden's index (0.52). With this score, the sensitivity and specificity of the tool are 67.5 and 84.3 percent. Whereas for ADSA-Depression, the optimal cut-off score is 5 (Youden's Index=0.31) which gives a sensitivity of 66.7 and 64.3 percent. *optimal cut-off score.*

showed a reliability coefficient of 0.94 (Kim 2002), 0.95 (Hwang et. al., 2011), 0.90 (Wong et. al., 2012; Lee et. al., 2000), 0.851-0.867 (Mimura et al., 2011), and 0.84 (Widiana et. al., 2018). Compared with HADS, the current result is higher with ranges from 0.78 to 0.93 for Anxiety and 0.82 to 0.90 for Depression (Smarr and Keefer, 2011).

The current result is also comparable to an unpublished indigenous tool known as the Filipino Adolescent Depression scale or FADS developed by Flogencio (2011), which has a reliability coefficient of 0.9751. For locally validated tools, the reliability coefficient of ADSA was higher. The Patient Health Questionnaire-Filipino version showed a reliability coefficient of 0.78 to 0.89 (Garabiles et. al., 2019). The General Anxiety Disorder scale- Filipino version demonstrated a reliability of 0.82 to 0.92 (Ty et. al., 2019). Lastly, the reliability of Geriatric Depression Scale- Filipino version was 0.87 (Melgar et. al. 2010 as cited in Ty et. al., 2019). The finding suggests that ADSA is highly reliable and falls within the scope of other assessment tools such as HADS.

The current study also determined consistency or stability of the test between two or three independent raters. Inter rater reliability is crucial to prevent subjectivity of the rater since part of the tool utilizes observation. In the current study, the intra-class correlations are 0.670 for anxiety and 0.440 for depression. In reference to the study by Koo et. al., (2016), the findings suggest poor-to-moderate intra-class correlation. Whereas, the inter-item correlations are 0.528 for anxiety and 0.382 for depression. As cited in Piedmont et. al., (2014), when the values are lower than 0.20, the items may not be representative of the same content domain. If values are higher than 0.40, the items may be capturing a small bandwidth of the construct being measured. The current findings suggest consistency between raters.

The findings of the current study may be attributed to the fact that the heterogeneity of the observation method can possibly pull down the homogeneity of the interview method when combined. Authors Saliba et. al., (2012) highlighted that the observational methods solely for mood assessment should not be central in the assessment of quality of life. Furthermore, in utilizing the observer-rated scales, one must be skilled and knowledgeable in assessing for symptoms of depression (Moller, 2000). This is evident in the study by Lightbody et. al., (2007), which showed that primary carers of post-stroke patients were more sensitive to identifying depression than nurses. Hence, this is when self-rating scales have the advantage because it eliminates the possible biases brought about by an objective point of view (Mimura et. al., 2011). Furthermore, very few nurses attended the orientation, which resulted to overestimation or underestimation of patients' symptoms. According to Middleton (2019), one way of

improving inter-rater reliability is to ensure that all researchers have the same exact information and training.

The current study showed a weak-to-moderate correlation between ADSA and HADS, but still, the developing tool showed a good diagnostic capacity based from the AUROC (0.809 for anxiety and 0.766 for depression). According to the AUROC analysis, the lowest possible score for both anxiety and depression is 3 which gives 76.2 to 90.0% sensitivity that is good for screening purposes. However, the specificity is very low and ranges from only 30 to 43.1%.

Although the main purpose of the study is to develop a psychometrically sound assessment tool that nurses can use to detect cases of anxiety and depression among admitted patients, selecting a score of 3 creates more venue to commit Type I error or false positives which can be impractical in the clinical setting and can potentially bring future problems that the healthcare system may not be well prepared or equipped to handle. Some of which are the stigma associated with mental health problem (Martinez et. al.,2020), more healthcare costs, additional burden to cardiac patients, and limited mental health personnel, logistical support (Lally, Tully, & Samaniego, 2018; Picardi et. al., 2015); & Dphil et. al., 2008).

Furthermore, the decision to reject the cut-off score of 3 as the optimal cut-off score of ADSA is primarily because of the low confidence that the items in the new tool intend to measure true cases of anxiety and depression. The study showed the preliminary findings of the tool and still need to be interpreted with caution, particularly with the tool's validity. In criterion-based validation, the set criterion should be a gold standard approach (Middleton, 2019). The gold standard for the diagnosis of anxiety and depression is still the examination of a psychiatrist or a clinical psychologist. Similar to the study by De Guzman (2013), the criterion used was the diagnosis of a psychiatrist following a structured clinical interview.

With all of the considerations, a cut-off score of 5 is the safest for a developing tool. A cut-off score of 5 on each sub-test gives sensitivity and specificity of 72.5 and 78.4 percent for anxiety and 66.7 and 64.3 percent for depression. The PPV/NPV for anxiety are 72.5% and 78.4%. While for depression, the PPV/NPV are 58.4% and 72%. A score of 5 has a moderate sensitivity which was well within the scope of the following published literature such as Hwang et. al., (2011) and Torres et. al., (2005), and De Guzman (2013) that also demonstrated moderate sensitivity (77.7%, 71.4%, & 75%).

This study has several limitations. First, the only criterion utilized to identify cases of anxiety and depression was limited to HADS. According to De Guzman (2013), the cut-off score for Filipinos should be 11. However, the cut-off score used in this

study is 8. Aside from this, there could be other alternative tools that could be used to identify cases of anxiety and depression. Second, there are very few samples which could have influenced the statistical power and the data collection was limited to a single-center site. Lastly, very few nurses attended the orientation for the new tool which might influence the proper utilization of the tool.

Despite these limitations, the current study has important implications in future research and nursing clinical practice. Future research could be done by increasing the sample size, and including multi-center sites. Furthermore, the developed tool served as a guide for nurses to facilitate the assessment of patients' mental health in the in-patient setting. This created awareness of nurses with their patient's state of mind. It is imperative to address the concerns of patients that are often taken for granted, and to provide support and psychosocial care at their level. This, in turn, can provide optimum overall-hospital experience and patient-centered care.

Conclusion

In summary, the ADSA is highly reliable tool that can be considered for use in clinical setting as part of nurse's routine assessment of the symptoms of anxiety and depression and to facilitate referral of patients for a proper diagnostic evaluation, as well as, for research purposes. Meanwhile, there is a need to further strengthen its validity and correlation with HADS by increasing the sample size and including multi-center sites. According to AUROC analysis, it has a moderate diagnostic ability of 66.7 to 72.5 % for anxiety and depression which could be improved by future research.

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ABOUT THE AUTHORS

Paolo Christian Gutierrez Bautista, MAN, RN, received his Bachelor of Science in Nursing at San Juan De Dios Educational Foundation Inc. (College) and obtained his Master of Arts in Nursing, major in Mental Health and Psychiatric Nursing at University of the Philippines-Manila. As a researcher, he won his first achievement during the 3 rd SDCA International Virtual Multidisciplinary Research Conference in 2023 when he landed 1 st place as the best paper presenter. He used to work at St. Lukes Medical Center- Global City as an endoscopy nurse, and Philippine Heart Center in Medical-Surgical Unit and Coronary Care Unit. He was also a part-time faculty and clinical instructor. Currently, he is in Houston, Texas continuing his career in cardiovascular care. His research interests include mental health, tool development, and cardiovascular care.

Bethel Buena P. Villarta, DrPH, RN, is a professor at University of the Philippines-Manila. She is the founding member of the Gerontology Nurses Association of the Philippines. She is also a member of the peer-review committee of the Philippine Journal of Nursing. Her areas of interests include health education and promotion, population development, reproductive health, mental health, effective parenting, safe motherhood and child survival, adolescent and youth development, community and family health, and community mobilization. She earned her Bachelor of Science in Nursing at University of the Philippines and Master of Arts in Psychology at Pamantasan ng Lungsod ng Maynila. She obtained her Doctor of Public Health major in Health Education at University of the Philippines. Her research interests include mental health, health education, and reproductive health.

Ma. Rita Villanueva-Tamse, MAN, RN, obtained her bachelor's and master's degree in nursing at the University of Philippines-Manila. She was awarded as the most distinguished alumni in 2019. Currently, she is faculty member of the university and shares her knowledge and expertise in both undergraduate and graduate students. She was a former Deputy Director for the Division of Clinical Nursing Operations

at the Philippine General Hospital. She was a resource speaker in the following areas of interest: psychosocial care of psychiatric patients, psychiatric emergencies, stress management, conflict resolution, leadership, strategic planning, team dynamics, intrafamilial violence and violence against women, and occupational safety and health. Her research interests include mental health and psychosocial care, nursing administration, and patient safety.

Tomas D. Bautista, MD, MSc, is a psychiatrist with more than two decades of clinical practice. He affiliates in Philippine General Hospital, Medical Center Manila, St. Lukes Extension Clinic, and Metro-Psych facility. He shares his expertise as a professor at University of the Philippines College of Medicine and Emilio Aguinaldo College-School of Medicine. He studied Doctor of Medicine at West Visayas State University and completed his residency training in the Department of Psychiatry at the Philippine General Hospital. He obtained Master of Science in Clinical Epidemiology at University of the Philippines-Manila. He completed, published and participated in several research projects and clinical trials focusing on the improvement of psychiatric care across the nation. His research interests include mental health and psychiatry.

Wilfredo II Francis T. Mina, ND, PhD is a licensed Guidance Counselor and Psychometrician. He earned his Bachelor of Science in Psychology and Master of Science in Psychology and Guidance Counseling at Saint Louis University and was awarded Magna Cum Laude. He is also a board-certified fellow in Integrative Psychology. He is currently working as a Guidance Services Specialist at University of the Philippines Manila. He shared his expertise by publishing research articles, workbooks, modules, training and resource support in different local projects. He was awarded as one of the Gawad Chancellor Awardees in 2022 as an outstanding research, extension and professional staff. His research interests include clinical psychology, mental health, and guidance counseling.

Maria Angela A. Mabale, MA, RN is a professor at University of the Philippines College of Nursing. She was a former psychiatric nurse with more than five years of experience in bedside. She earned her Bachelor of Science in Nursing and Master of Arts in Nursing major in Mental Health and Psychiatric Nursing at University of the Philippines-Manila. Currently, she is the program coordinator for the Mental Health and Psychiatric Nursing specialty program of the institution at the graduate level. She was an experienced resource speaker, facilitator, and panelist in different seminars and workshops focusing on topics such as psychosocial care, psychiatric nursing, psychiatric emergencies, mental health, group and team dynamics. Her research interests include mental health and psychiatric nursing.

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"Too often we underestimate the power of a touch, a smile, a kind word, a listening ear, an honest compliment, or the smallest act of caring, all of which have the potential to turn a life around."

—Leo Buscaglia