

## The efficacy of playing video games versus anti-depressants in reducing treatment resistant symptoms of depression

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### Abstract

**Statement of the Problem:** Approximately, 332 million people are living with depression in the world and only 25% receive any treatment. Thus, there is a need for inexpensive, readily accessible, non-pharmacological, efficacious interventions. The goal of this month-long controlled study was to compare the efficacy of a second antidepressant (sAD) medication with a prescribed regimen of Plants vs. Zombies (PvZ), a casual videogame, in reducing treatment-resistant depression symptoms (TRDS) and improving heart rate variability (HRV).

**Methods:** Approximately \*8 weeks after beginning antidepressant therapy, participants returned to psychiatrists for evaluation and complained of TRDS. The psychiatrist gave them a choice of self-selecting a sAD medication or playing a prescribed regimen of PvZ as part of a research study. Those who agreed were referred to researchers who then screened them for major depression, the criteria for inclusion. PvZ was prescribed four times per week for 30–45 minutes over 4 weeks. Self-reported data were collected at four different times utilizing the Patient Health Questionnaire-9. HRV, an indicator of autonomic nervous system (ANS) functioning, was also recorded each time.

**Findings:** The sAD group's TRDS significantly improved. Remarkably, the PvZ group's TRDS improved significantly beyond the control group at all measurement times except for time 1 or baseline. In addition, a single 30-minute session of playing PvZ was significantly more effective in acutely reducing TRDS when compared with the sAD group that surfed the NIHM website on depression. Changes in HRV parameters indicated increased parasympathetic engagement and ANS balance in the PvZ group compared with the sAD group.

**Conclusion and Significance:** The findings illustrate the potential of PvZ as an acute and chronic intervention for reducing TRDS. Health care practitioners such as physicians and recreational therapists can consider prescribing a regimen of PvZ as a method to ameliorate TRDS for those clients who self-select this option. Finally, a psychophysiological method for measuring the efficacy of videogames in reducing TRDS and a means to quantify ANS changes during gameplay are presented.

	AD (n = 23)		PvZ™ (n = 26)		MD	SS	F	p	eta
	M	SE	M	SE					
T1	12.8	.8	11	.7	1.5	18	1.7	.202	.04
T2	10	1	4	1	6	314	14.4	.000***	.24
T3	10	1	6	1	3.8	129	5.7	.022*	.11
T4	7.6	1	2	.9	5.1	230	13.6	.001**	.23

M=Mean; n = Number; SE=Standard Error; MD = Mean Difference; SS = Sum of the Squares; F = Test result; p = Level of Significance: <.05\* <.01\*\* <.001\*\*\*. Degrees of Freedom for Contrast = 1; Error = 46. Covariates appearing in this model are evaluated at the following values: QIDS at Time 1 = 12.45.



### Biography:

Carmen Russoniello, PhD has more than thirty years of experience as a therapist/counselor educator and researcher and is currently Professor and Director of ECU's Center for Applied Psychophysiology and its Wounded Warrior training program. He was the principal investigator on several Department of Defense grants awarded to develop physiological measuring and biofeedback products for improving Wounded Warrior and Warfighter functioning. He is a past-president of the American Therapeutic Recreation Association and the Association for Applied Psychophysiology. His research focuses on heart rate variability as a measurement of human function and performance and as a biofeedback intervention. His research is published in a broad spectrum of journals including, Behavioral Medicine, Military Behavioral Health, Applied Psychophysiology and Biofeedback, Cleveland Clinic Journal, Cyberpsychology, Behavior and Social Networking, and Games for Health. His work has been featured in ArsTechnica, CNN, BBC, New York Times, Washington Post, Web MD, Wired Magazine

***Speaker Publications:***

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