A Mathematical Model of Naturalistic Light's Effect on Diurnal Plasma Melatonin and Serum Cortisol Concentration Using the Exponential Distribution

A. Leema Rose[1*] and A. Manickam[2]

[1]Department of Mathematics, Auxilium College of Arts & Science for Women, India

[2]Mathematics Division, School of Advanced Sciences and Languages, VIT Bhopal University, India

[*]Corresponding author: anto.leema14@gamil.com, manickammaths2011@gamil.com

ABSTRACT

The Exponential-Exponential Distribution is proposed in this paper as a new distribution of the possibility of exhibiting increased circadian plasma concentrations and growing rhythmicity due to naturalistic illumination. The theory is that artificial light mimicking daylight would stabilise the circadian rhythms of plasma melatonin and serum cortisol levels in long-term hospitalised stroke patients. Circadian rhythm was determined using casino analysis and variance between time points, and its parameter was estimated using the maximum likelihood technique. The study finds that healthcare solutions have been established and evaluated through mathematical discoveries, with the application portion matching to a computation and the conclusion linked to the diagnostic report.

Keywords: exponential distribution, circadian rhythm, cortisol

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