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Technology During Pandemics: Ecological Momentary Assessment as an Assessment Tool for Real Time Monitoring

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PUBLISHED ABSTRACT

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ABSTRACT

Background: Ecological Momentary Assessment (EMA), a term coined in 1994 by Stone and Schiffman, is a modality by which participants can record their symptoms, triggers and thoughts in real time. This data is recorded electronically through the use of smartphones, tablets, and smartwatches as subjects live their daily lives. EMA can be thought of as an electronic diary by which a subject can respond to alerts by entering their observations several times throughout the day. These assessments involve different discrete methodologies such as interpersonal interaction diaries, ambulatory physiological monitoring, and collection of medication compliance data. EMA was developed to counteract the recall bias and inter-evaluator discrepancies that can occur during regularly scheduled outpatient appointments.

Methods: A literature review was done using EMA as the search criteria.

Results: Davidson et al discussed the use of EMA in suicidality through the use of paper journals, personal digital assistants and cellphones. The paper outlined two sampling schemes; event-based sampling which asks participants to respond to questions each time they experienced a behavior and time-based sampling which asks for responses at a set period of time. Bell et al, 2017 reviewed the application of EMA in treatment of psychotic disorders and reviewed current literature. Schueller et al, 2017 analyzed the use of EMA for depression and anxiety providing mechanisms, study designs and therapeutic measures that can be incorporated for design of an EMA for depression and anxiety. Smith et al 2019 reviewed EMA in the assessment of eating disorders (ED) by looking at realms of type, frequency and temporal sequencing of ED symptoms in natural environment. The use of EMA for child and adolescent patients using mobile based utilization was researched by Heron et al., 2017. Using these modalities children and adolescents may have improved reporting of pain, treatment adherence, sleep and disease symptoms. Raugh et al 2019 studied EMA for psychophysiological assessments. EMA was used for monitoring of EKG, Blood pressure, EEG, electroculography, electromyography and other variables.

Conclusions: There are multiple advantages and disadvantages to EMA. Advantages include participants avoiding recall bias and providing real time assessments. Treatment is not dependent on respondent's bias and immediate interventions can

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be enacted. EMA also allows a remote alert to providers and can be used for research. Disadvantages of EMA include it being dependent on equipment, technology and network connectivity. There is a risk of attrition as well as possible redundancy. There is a need for detailed study modeling. EMA requires motivation on the part of the participant to respond and participate regularly. Additionally, encryption is necessary to safeguard such sensitive data. More research is required investigating the benefits of this method.

COMPETING INTERESTS

The authors have no competing interests to declare.

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