



# Quality of Life and General Well-being in People Receiving Hemodialysis Treatment: A Cross-sectional Study

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### ARTICLE INFO

#### Article History:

Received: May 22, 2022

Accepted: November 29, 2022

### ABSTRACT

**Background:** End-stage renal disease and hemodialysis treatment are debilitating and progressive and can significantly impact patients' general well-being and quality of life. Understanding the impact of end-stage renal disease and hemodialysis on Jordanian patients may help healthcare providers improve the type of care delivered. **Purpose:** This study aimed to examine the quality of life and general well-being of patients undergoing hemodialysis treatment and to examine the differences in quality of life and general well-being scores based on participant age and gender. **Methods:** This was a cross-sectional study in which 203 patients were recruited from different dialysis units across Jordan. Valid questionnaires were used to collect data on quality of life and general well-being, along with a demographic data sheet. **Results:** Participants scored moderately low on general well-being, with the highest mean for the social dysfunction and the depression sub-scales, respectively. The highest reported score was on the social relationships domain of quality of life, while the lowest was for the physical domain. Age groups significantly differed in their scores of general well-being and all domains of quality of life apart from the environmental domain. Female participants had significantly higher (worse) scores than males in terms of the total scores on general well-being and on somatic symptoms and depression sub-scales of general well-being. **Conclusion:** It was shown that hemodialysis treatment negatively influences patients' quality of life and general well-being and interferes with their day-to-day lives. **Implications for Nursing:** Dialysis nurses play a vital role in monitoring and supporting their patients and might provide an avenue by which they can optimize patients' quality of life and general well-being. Hence, working with patients to find the best possible care plan may positively impact patients' lives and health outcomes.

**Keywords:** Cross-sectional study, Hemodialysis, Quality of life, General well-being.

### What does this paper add?

1. ESRD and HD are overwhelming and demanding and may negatively impact patients' quality of life.
2. Little is known about the QOL and general well-

- being of patients diagnosed with ESRD and undergoing HD treatment in Jordan.
3. Jordanian patients receiving HD treatment had diminished QOL, particularly in their physical and

psychological abilities, but better social relationships.

4. More focus on improving QOL and psychological well-being of this group of patients is required.
5. Dialysis nurses should receive further training on the assessment of QOL and psychological status of patients receiving HD and how to implement the best possible care for them.

### **Introduction and Background**

Chronic kidney disease is one of the most prevalent chronic health conditions worldwide that further progress to end-stage renal disease [ESRD] (Alshraifeen et al., 2014). In a developing country like Jordan, the chronic renal disease can further progress to ESRD even more rapidly due to limited healthcare services and a high prevalence of comorbid problems, such as hypertension and diabetes mellitus [DM] (Alramly et al., 2013). ESRD is associated with many adverse physical, psychosocial and financial outcomes, increasing morbidity and mortality risk (Hornik & Duława, 2019). Due to advanced technology in medical modalities (e.g. dialysis and kidney transplant) used for patients with ESRD, their life expectancy has been prolonged (Alshraifeen et al., 2014). However, because of the increase in the life span of patients with ESRD receiving hemodialysis (HD), their quality of life (QOL) and general well-being (GWB) have deteriorated because of the iatrogenic events of HD (Ahmad & Al Nazly, 2015). A recent systemic review has revealed that the QOL and GWB in patients with ESRD receiving HD are worse than in kidney transplant and peritoneal dialysis (PD) patients (Ho & Li, 2016). Due to limited donor availability in Jordan, patients with ESRD are mainly treated by HD (Ahmad & Al Nazly, 2015).

Hemodialysis is a time-consuming and ongoing treatment associated with massive lifestyle restrictions, distressing side effects and life-threatening complications (Hornik & Duława, 2019). Patients with ESRD receiving HD experience multiple adverse physiological outcomes, including food-and fluid-intake restrictions, nausea and vomiting, anorexia, insomnia and lethargy, as well various comorbidities, including heart diseases, hepatitis, DM and hypertension (Ahmadmehrabi & Tang, 2018; Ho and Li, 2016, Ahmad & Al Nazly, 2015). Also, they experience adverse psychosocial outcomes, including depression, stress, anxiety, despair, exhaustion, body-image

disturbances, low self-esteem and self-confidence, decreased level of independence, sense of worthlessness and feeling guilty, job loss or insecurity, marital problems, family-role conflict and caregiving strain (Ho & Li, 2016; Ahmad & Al Nazly, 2015).

Quality of life and GWB, as perceived by patients with ESRD, are significant indicators of clinical outcomes (Nissenson, 2014). Quality of life and GWB assessment in patients with ESRD receiving HD is crucial for their treatment plan, because their assessment can inform healthcare providers of the effectiveness of HD treatment by tailoring the frequency of dialysis to the healthcare needs of these patients (Chen et al., 2016). In addition, it is essential for healthcare improvement, healthcare needs' assessment, treatment goals' planning and disease-progress evaluation (Chen et al., 2016). However, evidence from the literature has confirmed poor QOL and GWB among HD patients in the last decade (Nissenson, 2014).

Quality of life and GWB were investigated among patients with ESRD receiving HD in Western and Eastern countries (Chen et al., 2016; Nissenson, 2014). Also, the association of demographic variables with QOL and GWB in patients with ESRD is well-documented in the Western and Eastern nursing literature (Hornik & Duława, 2019; Ho & Li, 2016). To our knowledge, no studies have examined the impact of HD treatment on QOL and GWB of patients with ESRD in Jordan. Hence, this study aimed to examine patients' health status (QOL and GWB) currently undergoing HD treatment. Also, the study aimed to examine the differences in QOL and GWB scores in patients currently undergoing HD treatment based on their age and gender.

### **Methods**

#### **Design, Sample and Setting**

A descriptive cross-sectional study was carried out over a period of 6 months from December 2018 to May 2019. A total sample of 203 patients receiving HD treatment was recruited from six hospitals offering HD services covering 75 working dialysis units across Jordan. All people receiving HD treatment in these hospitals were considered eligible to participate. Participants were recruited if they met the following inclusion criteria: (1) being regular patients currently receiving HD treatment; (2) having been on HD for three or more months; (3) being aged 18 years or more and (4) being able to give consent. Those having any psychological, neurological or

communication problems that prevented them from giving consent were excluded.

### **Procedure for Data Collection and Ethical Considerations**

The study was approved by the Institutional Review Board (IRB) committees at the primary researcher's institution, the Royal Medical Services, a university teaching hospital and the Ministry of Health (MOH). Potential participants were approached by a trained research assistant for initial screening according to the inclusion criteria. Then, they were given a letter of invitation and an information sheet about the study. After obtaining the written informed consent, they were given the study packs, including the study measures. Then, they were asked to return the completed study questionnaires to the research assistant. Confidentiality was guaranteed and participants were informed that their participation was voluntary and that they could withdraw at any time during the study without any consequences. Data was collected by a trained research assistant using validated measures, while patients were connected to the dialysis machine during the first hour of their dialysis session.

### **Measures**

The following patient demographic data was collected: age, gender, level of education, marital status, health insurance, employment status and illnesses other than ESRD, in addition to the following measures.

**Quality of Life:** The Arabic version of the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF) was used. It consists of 26 items rated on a 5-point Likert-type scale (The WHOQOL Group, 1998). Four domains were calculated for these items: Physical health, Psychological health, Social Relationships and Environment (The WHOQOL Group, 1998). The score of each domain is calculated by summing specific items and then scores were transformed on a scale ranging from 0 to 100, in which 100 is the highest score (high QOL) and 0 is the lowest score (low QOL) (World Health Organization: WHO, 1996). Those who scored lower than 60 on any domain are considered to have poor QOL (Silva et al., 2014). The questionnaire demonstrated good internal consistency (Cronbach's alpha ranged between 0.66 for domain 3 and 0.84 for domain 1) and discriminant validity (The WHOQOL Group, 1998). The Arabic version of

WHOQOL-BREF has been previously used with different Arabic-speaking populations and demonstrated good internal consistency, reliability and validity (Al Sayah et al., 2013). In our study, Cronbach's alpha values were 0.86, 0.83, 0.79 and 0.83 for the physical, psychological, social relationships and environmental domains, respectively. Cronbach's alpha coefficient for the whole WHOQOL-BREF scale was 0.941.

**General Well-being:** The General Health Questionnaire (GHQ-28) developed by (Goldberg & Hillier, 1979) was used. It incorporates four sub-scales: somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. Although it is not an absolute cut-off point, the GHQ-28 can be scored using the values of 0 to 3 for each response yielding a threshold score of 23/24, which indicates the presence of stress and anxiety (Hjelle et al., 2019). The total possible score ranges from 0 to 84 (the highest score indicates psychological distress). The GHQ-28 has been translated into 38 languages and many studies have examined its validity (Goldberg & Williams, 1988; Jackson, 2007). Reliability coefficients ranging from 0.78 to 0.95 has been reported (Jackson, 2007). In our study, the Cronbach's reliability alpha values for the GHQ-28 total and its sub-scales were: total (0.95), somatic sub-scale (0.88), anxiety and insomnia sub-scale (0.89), social dysfunction sub-scale (0.89) and severe depression sub-scale (0.90).

### **Data Analysis**

Data was analyzed using the Statistical Package for Social Sciences, version 24 (IBM SPSS, Armonk, NY, USA). Descriptive statistics, including frequencies, percentages or means and standard deviations, were calculated as appropriate. Quality of life and GWB were examined by describing the participants' levels on these variables using the means, standard deviations and actual possible ranges. To examine the differences in the patients' scores on QOL and GWB based on their age; first, participants were classified into 3 groups based on their developmental stage (i.e., group 1= 18-40 years; group 2= 41-60 years and group 3= >60 years). Then, one-way ANOVA and Scheffe's *post hoc* test have been used for this purpose. An independent-sample t-test was used to examine differences based on patients' gender (male or female). The significance level was set at ( $\alpha \leq 0.05$ ).

## Results

### Socio-demographic Characteristics

The mean age of the participants was 47.51 (SD =15.15). About one-third of the participants were aged 18-40 years, unmarried females, had a high-school

level of education, employed full- or part-time and had a history of diabetes. Two-thirds had chronic illnesses other than ESRD, with hypertension as the most common chronic illness (49.3%). A detailed description of the sample is presented in Table 1.

**Table 1. Characteristics of the patients with ESRD receiving HD (N=203)**

Characteristic	Mean $\pm$ SD* or n (%)
Age, years	47.51 $\pm$ 15.15
Age, years	
18-40	71 (35)
41-60	86 (42.35)
>60	46 (22.65)
Gender	
Female	76 (37.4)
Male	127 (62.6)
Marital status	
Married	137 (67.5)
Single	58 (28.6)
Widowed or divorced	8 (3.9)
Level of Education	
< high school	91 (44.8)
High school	73 (36)
> high school	39 (19.2)
Employment **	
Full or part-time	61 (30)
Not employed	138 (68)
Health insurance, yes	176 (86.7)
History of chronic illnesses other than ESRD	
Yes	140 (69)
1 chronic illness	53 (26.1)
2 chronic illnesses	44 (21.7)
$\geq$ 3 chronic illnesses	43 (21.2)
History of hypertension	100 (49.3)
History of diabetes	58 (28.6)

\* SD = Standard deviation; \*\* Data was missing for 4 participants.

### Quality of Life and General Well-being Levels

As shown in Table 2, the participants had moderately low scores (below the median of the scale) on GWB total scores (M = 31.24, SD = 15.54). The highest and the lowest scores among the GHQ-28 sub-scales were for

the social dysfunction and the depression sub-scales, respectively. Almost all respondents had around the mean of 50 on all domains of QOL. The highest reported score was on the social relationships domain and the lowest reported score was on the physical domain.

**Table 2. Participants' level of quality of life and general well-being (N=203)**

Measure	Possible Range	Actual Range	Mean $\pm$ SD*
<b>General Well-being</b>			
Somatic symptoms sub-scale	0-21	0-19	8.40 $\pm$ 4.80
Anxiety and insomnia sub-scale	0-21	0-19	8.01 $\pm$ 4.96
Social dysfunction sub-scale	0-21	0-21	10.95 $\pm$ 3.96
Depression sub-scale	0-21	0-20	3.86 $\pm$ 4.71
Total GHQ-28 scores	0-84	3-76	31.24 $\pm$ 15.54
<b>Quality of Life</b>			
Physical domain	0-100	0 – 94	48.03 $\pm$ 20.82
Psychological domain	0-100	0 – 94	50.97 $\pm$ 18.78
Social relationships domain	0-100	0-100	54.30 $\pm$ 22.47
Environment domain	0-100	6-88	49.30 $\pm$ 17.41

GHQ: General Health Questionnaire.

#### Differences in Quality of Life and General Well-being Scores among Age Groups

The results of one-way ANOVA tests indicated that there were significant differences among age groups on 3 sub-scales of GWB and the total score as well as on three domains of QOL scores (Table 3). The results of the *post hoc* test indicated that older respondents (aged >60years) had significantly higher scores (worse) than younger respondents (aged 18-40) on sub-scales of somatic symptoms (10.43 $\pm$ 4.5 vs. 7.14 $\pm$ 4.9,  $p=0.001$ ), anxiety and insomnia ( $M=8.41$ ,  $SD=4.8$  vs.  $M=6.72$ ,  $SD=5.1$ ,  $p=0.002$ ), social dysfunction ( $M=12.4$ ,  $SD=4$  vs.  $M=9.83$ ,  $SD=3.7$ ,  $p=0.002$ ) and on the total score of GWB ( $M=36.78$ ,  $SD=15$  vs.  $M=28$ ,  $SD=16$ ,  $p=0.011$ ). There were no significant differences among age groups concerning the depression sub-scale of GWB.

Regarding QOL scores, there were significant differences among age groups in all domains, except for the environment domain. In the physical domain, respondents in group 1 (younger respondents) had significantly higher (better) scores than respondents in group 2 ( $M=54$ ,  $SD=21.7$  vs.  $M=49.5$ ,  $SD=18.9$ ,  $p<0.001$ ) and group 3 ( $M=54$ ,  $SD=21.7$  vs.  $M=36$ ,

$SD=18.2$ ,  $p<0.001$ ). Respondents in group 1 (younger respondents) had significantly higher (better) scores than respondents in group 3 on the psychological ( $M=55.5$ ,  $SD=19.5$  vs.  $M=44.3$ ,  $SD=18.8$ ,  $p=0.007$ ) and social relationships domain ( $M=61.3$ ,  $SD=19.9$  vs.  $M=44.7$ ,  $SD=21.9$ ,  $p<0.001$ ).

#### Differences in Quality of Life and General Well-being Scores based on Gender

Based on gender, there were significant differences between male and female respondents in the total scores of GWB and on the somatic symptoms and depression sub-scales only (Table 3). The differences indicated that female respondents had higher scores (worse) than male respondents on somatic symptoms ( $M=9.5$ ,  $SD=4.8$  vs.  $M=7.76$ ,  $SD=4.7$ ,  $t(1,201)=-2.539$ ,  $p=0.012$ ), depression ( $M=4.88$ ,  $SD=5.4$  vs.  $M=3.25$ ,  $SD=4$ ,  $t(1,201)=-2.398$ ,  $p=0.017$ ) and on the total score of GWB ( $M=34.5$ ,  $SD=15.6$  vs.  $M=29.29$ ,  $SD=15.2$ ,  $t(1,201)=-2.346$ ,  $p=0.020$ ). However, there were no significant differences between male and female respondents in all domains of QOL and the other sub-scales of GWB (Table 3).

**Table 3. Differences in scores on quality of life and general well-being based on age and gender (N=203)**

Measure *	Age, Years **				Significant differences	Gender ***		
	G1: 18-40 (n=71)	G2: 41-60 (n=86)	G3: >60 (n=46)	P		Female (n=76)	Male (n=127)	P & (t-test) values
<b>General Well-being</b>								
Somatic symptoms	7.14±4.9	8.37±4.5	10.43±4.5	0.001	G1>G3	9.5±4.8	7.76±4.7	0.012 (-2.539)
Anxiety & insomnia	6.72±5.1	8.02±4.7	8.41±4.8	0.002	G1>G3	8.74±4.7	7.58±5.1	0.109 (-1.609)
Social dysfunction	9.83±3.7	11.1±3.9	12.4±4	0.002	G1>G3	11.4±4.0	10.68±3.9	0.218 (-1.237)
Depression	4.34±5.2	3.43±4.5	3.96±4.36	0.484	----	4.88±5.4	3.25±4.1	0.017 (-2.398)
Total of GHQ-28	28±16	30.9±14.8	36.78±15	0.011	G1>G3	34.5±15.6	29.29±15.2	0.020 (-2.346)
<b>Quality of Life</b>								
Physical	54±21.7	49.5±18.9	36±18.2	0.000	G1>G3,	45.2±22.2	49.7±19.8	0.137 (1.492)
Psychological	55.5±19.5	50.8±17.2	44.3±18.8	0.007	G2>G3	48.4±20.1	52.5±17.8	0.131 (1.561)
Social relationships	61.3±19.9	53.7±23	44.7±21.9	0.000	G1>G3	51.5±24.1	55.9±21.3	0.180 (1.344)
Environment	52±15.9	48.7±17.6	46.3±19	0.204	G1>G3	46.5±18.3	51.1±16.7	0.063 (1.87)
					----			

Note. \* Data presented as mean ± standard deviation, \*\* One-way ANOVA with Scheffe's *post hoc* test, \*\*\*=independent-sample t-test with df of 201, G1= group 1; G2= group 2, G3= group 3.

## Discussion

This study aimed to examine the health status (QOL and GWB) of patients currently undergoing HD treatment. Also, the study aimed to examine differences in QOL and GWB scores in patients undergoing HD treatment based on age and gender. This study showed moderately low scores of the patients on the GWB. This finding is consistent with previous studies showing poor levels of and deterioration of all dimensions of GWB among patients undergoing HD treatment (Rahimimoghadam et al., 2017; Alshraifeen et al., 2014; Boostani & Ghorbani, 2014). The moderately low scores of our patients on the GWB could be related to the high comorbid burden, which impedes their social role as a spouse, father or mother. Also, as most of participants were unemployed and below the secondary educational level, they might be more susceptible to developing psychological and physical health disturbances. Our findings suggest that healthcare providers may need to pay more attention to planning and implementing efficient interventional programs to optimize the GWB in patients receiving HD treatment.

Consistent with previous studies, the participants in our study reported higher scores on the social dysfunction dimension than on the other dimensions of the GHQ-28 (Hmwe et al., 2015; Theofilou, 2012). According to Hmwe et al. (2015), HD patients reported poor social support from their family and community due to everyday restrictions that may influence their levels of independence, leading to social withdrawal. The high prevalence of social dysfunction in our study

may highlight the feeling that patients on HD may have related this high prevalence to their social impairment rather than to the lack of social-support services.

We also found that HD patients reported lower scores on the depression dimension of the GH-28 compared to the findings from previous Western studies using the same tool (Hmwe et al., 2015; Theofilou, 2012). These studies revealed that high levels of depression were reported by HD patients who experienced high caregiving burdens, low self-esteem, disturbed self-image and a sense of helplessness and hopelessness, which may negatively impact patients' QOL and GWB. This inconsistent finding could be explained by the high prevalence of religious practices in a Middle Eastern country like Jordan. Islamic traditions emphasize practicing spiritual relieving rituals daily and prohibit suicidal thoughts and attempts (Malek et al., 2018). Most of our participants were Muslims who believe that everything that happens to them in this life is God willing and will be rewarded hereafter (Alradaydeh & Khalil, 2018). This belief gives the patients the feelings of security, support and strength to mediate depression and anxiety caused by HD dialysis. Also, our study recruited younger and fewer female participants than those recruited in the studies of Hmwe et al. (2015) and Theofilou (2012).

Our findings that participants had poor levels of QOL are consistent with previous studies reporting impaired QOL in HD patients with ESRD (Alshraifeen et al., 2014; Yarlal et al., 2019). Hemodialysis patients have various comorbidities, including many physical

and psychosocial conditions that may interfere with treatment and their well-being, which, in turn, might influence their QOL (Yarlas et al., 2019). Further studies exploring possible ways to improve the QOL of HD patients might be required.

Participants in our study scored the highest on the social relationships domain and the lowest on the physical domain, which is consistent with scores identified by previous studies using the SF-36 (Pan et al., 2019; Wu et al., 2013). Patients with ESRD experience a significant deterioration in the physical domain of QOL while receiving HD treatment. Poorer physical QOL was associated with prolonged HD, because patients with ESRD become bored with their routine life and have annoying treatment-related complications (Pan et al., 2019). Wu et al. (2013) suggested that improvement of HD and prevention of its related complications could improve patients' perception of illness and physical QOL. Hence, more studies incorporating interventional measures that could improve HD patients' self-management skills, decision-making and problem-solving may improve their QOL.

The finding that younger HD patients reported fewer somatic symptoms and experienced less anxiety, insomnia and social dysfunction as measured by the GHQ-28 than other age groups is consistent with previous findings (Hall et al., 2019; Iani et al., 2018). According to Iani et al. (2018), younger age significantly predicted fewer reports of psychological factors and their associated somatic symptoms. Also, older HD patients reported significantly worse sleep quality than younger ones. These findings might be because younger HD patients may have a better perception of their physical and psychosocial health than older patients, suggesting that older patients might have worse health status (Iani et al., 2018). Consistent with Hall et al. (2019), the younger participants in our study reported better levels of GWB than other age groups. Younger HD patients tend to have less comorbid burdens and a higher prevalence of functional and cognitive disabilities than older HD patients (Hall et al., 2019).

The finding that younger HD patients reported fewer physical symptoms than other age groups is consistent with previous findings that revealed that physical capabilities decline as age advances (Gonçalves et al., 2015; Lemos et al., 2015). Consistently, the younger

participants reported fewer psychological symptoms than other age groups. Gonçalves et al. (2015) found a significant association between older age and suicidal thoughts and attempts, as older HD patients are less likely to be employed and live longer. Older HD patients tend to suffer from physical degeneration more than younger ones. Therefore, our findings agree with the findings of previous studies, which found that older age has been associated with worse physical functioning (Lemos et al., 2015). Hence, our findings suggest that improving HD patients' level of knowledge about ESRD might make it more physically and emotionally tolerable for its negative consequences.

Our findings support the results of previous studies that female HD patients had worse GWB as measured by the GHQ-28 than male patients. Likewise, Martinez and Custodio (2014) found that better GWB was associated with male gender and the highest levels of psychological stress were observed among female patients. In our study, male participants did not have significantly different scores in all domains of QOL compared to their female counterparts. This finding is inconsistent with previous studies that found that female patients had significantly lower QOL scores than male patients in all domains of QOL, particularly in the domain of emotional wellness (Oliveira et al., 2016; Gonçalves et al., 2015). Previous studies have found that socio-demographic characteristics, including female gender, were associated with worse QOL as measured by the SF-36 (Garcia et al., 2010). Evidence from the literature has shown that women receiving HD were more susceptible to depression and anxiety than men and undertake greater responsibility to cope with their challenging lives (Oliveira et al., 2016; Gonçalves et al., 2015).

In conclusion, this study has provided evidence that QOL and GWB were poor in a sample of patients currently undergoing HD treatment. It was shown that HD treatment negatively influences patients and interferes with their daily lives. Most participants scored moderately low on GWB, with the highest means for the social dysfunction and the depression sub-scales. In terms of QOL, the social relationships domain had the highest score compared to the lowest score on the physical domain. Females reported higher (worse) differences than males in terms of the somatic symptoms and depression sub-scales of GWB.

### Limitations

Although the study sample was recruited from different dialysis units across different geographical areas in Jordan, the study may be limited by the cross-sectional design, convenience sampling strategy and a relatively small sample size, which may limit the generalizability of the study findings. Therefore, using different research methods, such as longitudinal design, is recommended to assess changes over time.

### Implications for Nursing

Dialysis nurses play a vital role while caring for their patients. Results from this study suggest that patients' QOL and GWB might be highlights affected by their strict treatment regimen. However, nurses could carry out an ongoing assessment of the QOL and well-being of their patients, by which they can develop individualized care plans by which they can improve patients' QOL and GWB. The lack of available information about services available for this group of patients highlights the importance of conducting further research studies by researchers, policy makers and healthcare planners to

identify and improve areas lacking, which might improve these patients' health in general. In addition, further research using longitudinal and qualitative approaches at the time of diagnosis and throughout the journey with the disease is recommended.

### Acknowledgements

The authors would like to thank all the participants who willingly shared their personal experiences and knowledge for the benefit of other HD patients. The authors would also like to thank the administrators, managers and nursing staff within the dialysis centres for their support and help in recruiting participants.

### Conflict of Interest

The authors have no conflict of interest to report.

### Funding or Sources of Financial Support

The authors disclose that this study was supported by the primary investigator's University (grant number 1700899/15/29/MA, dated 27/07/2017).

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