

ORIGINAL RESEARCH

The effects of intervention on the quality of life, sense of coherence and daily activities of frequent attenders

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Received: July 31, 2017

Accepted: October 8, 2017

Online Published: October 18, 2017

DOI: 10.5430/jnep.v8n2p63

URL: <https://doi.org/10.5430/jnep.v8n2p63>

ABSTRACT

Background and objective: When FAs with chronic disease and various needs are able to keep up their psychological and physical wellbeing, perform daily activities and maintain control of their life, they are able to live an active life and take care of themselves longer, and this has an impact on their quality of life. The role of community matron is to assess an individual's problems and needs for health services and improve the self-care of FAs by providing a needs-based education. The goal of this study is to evaluate the effectiveness of nurse-led intervention on the quality of life, sense of coherence and daily activities of frequent attenders (FAs).

Methods: This study is an intervention trial, with a two-year follow-up, including intervention and control groups. The intervention group received nurse-led intervention that included the assessment of FAs care needs, an individualized care plan, support for self-management and service coordination. The FAs in the control group received traditional care, including patient education and support. Self-reported instruments were used to collect data from adult frequent attenders, including the Frenchay Activities Index (FAI), Sense of Coherence (SOC) and 15D, to assess the health-related quality of life (HRQoL). Follow-ups measurements were taken after one year and after two years between 2008 and 2011.

Results: The study shows a significant correlation between sense of coherence and quality of life ($p < .0005$) and quality of life and amount of daily activities performed ($p < .0005$) in both groups. The intervention group had statistically significantly better sense of coherence at every stage of the study. The activities of daily living statistically significantly weakened in the intervention group ($p = .001$) from baseline to two years despite intervention, whereas in the control group it remained unchanged. In the control group, a statistically significant correlation was found between sense of coherence and FAs feeling satisfaction with their current life ($p = .019$). The HRQoL did not differ between the groups during the study.

Conclusions: These results indicate a correlation between sense of coherence and quality of life and also between quality of life and amount of daily activities among FAs. Intervention did not improve the quality of life of FAs or their daily functioning. More research is needed to demonstrate the effects of community matron model on FAs care, the role of ehealth needs to be strongly involved.

Key Words: Frequent attender, Nurse-led case management, Chronic disease, Intervention

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1. INTRODUCTION

There is a small segment of patients with chronic diseases who have unusually large amount of contact with general practitioners (GPs); they are called frequent attenders (FAs). Their psychological, physical, and social morbidity are high, and they have high degrees of psychological distress, mental disorders, physical disease, poor health beliefs and social difficulties.^[1-3] Their sense of coherence is weaker compared with average patients.^[4] The need that FAs have for support and information on health care professionals is more than that of the general population. In this study, an FA is defined as a patient who has at least eight visits per year to the GP, according to previous studies in Finland,^[1,3,5-7] or at least four visits per year to the university hospital.^[6-8]

The care of FAs should be considered as a comprehensive approach rather than GPs just helping in acute situations. It is necessary to take into account FAs' need for holistic care.^[7] Case management is used to describe different approaches with the goal to improve the coordination and organization of services for patients with complex care needs.^[9] Nurses play an important role in the care to improve and maintain the health of FAs.^[10]

Case management is a nurse-led model where community matrons care for patients, such as FAs, who have complex needs and long-term conditions. These nurses act as facilitators between the client, the health team, the families and the community.^[11,12] The role of a community matron is to ensure continuity of care, support patients in bettering their self-care and provide needs-based education.^[13] Proactive care recognizes that patients have many issues in addition to medical needs that effect their health and wellbeing. Personalized and integrated care planning that addresses individual needs can be seen as holistic care that empowers FAs with confidence and the ability to handle and manage their condition.^[14]

Matrons' patients are usually older people with a chronic disease and degenerative conditions. They need intensive care because they have several medications and complex needs. One matron takes care of 50-80 patients and provide a link to other healthcare services, such as acute care, GP and social services.^[13,15] A previous study has shown that matrons decrease the need for psychological and social care and improve complicated long-term health conditions among older people.^[16] The community matron's knowledge of individual patients' health problems greatly contributes to the perception of continuity of care. In addition, the community matron, because of additional training in prescribing and other medical assessment skills, is seen as giving holistic care, which encompasses aspects of care previously provided

by the GP.^[13]

Studies have shown that patients' experiences of community matrons are positive. Matrons' often have the skills to sort out and explain medication and to organize services. Patients feel that they are receiving support, which means they experience feelings of security, aspects of reassurance and also social support. Community matrons are easier to access reliably and quickly, compared to contacting a GP, and patient advocacy is an important integral part of nursing.^[13,17]

There is evidence that case management may have positive effects on the health status and functional status of patients, and it may also improve or prevent their general deterioration.^[9] In another study, patients experienced that their quality of life had improved, which means that they could self-manage their medication and conditions better when the matron had helped them. Patients felt that matrons kept them from needing to go to the hospital or residential care and that the matrons reduced their need for psychological and social support. Patients also felt their GP's workload was decreased.^[17] Studies have shown that nurse case management has a positive impact on patient self-care and adherence to treatment, quality of life and functionality, and satisfaction and service use.^[18-20] Also, patients with peritoneal dialysis have experienced a positive effect on their wellbeing when the nurse case management model is used. These patients have been shown to demonstrate a higher quality of life and feel more energetic after nurse-led intervention.^[21] Further, empowerment-based psychosocial intervention has been shown to improve the quality of life for type 2 diabetic patients.^[22]

One study has shown that there is a positive correlation between quality of life and physical activity in older persons.^[23] There is evidence that sense of coherence is a resource that, either by directly enhancing quality of life or simply conveying good perceived health it is a health promoting resource. Persons with a high score in sense of coherence are associated with perceived good health, particularly mental health.^[24]

The hypothesis of the study is, based on previous research, that nurse-led intervention has a positive effect on the quality of life, sense of coherence and performance of daily activities of FAs.

Aim of the study

The aim of this study is to evaluate the effects of nurse-led case management on the quality of life, sense of coherence and performance of daily activities of FAs. Our research question asks whether this type of intervention has a better effect than usual care on improving these aspects of FAs.

2. METHOD

2.1 Design

This was an intervention trial with frequent attenders, executed with a prospective two-year follow-up assessment.

2.2 Settings and sample

The study was carried out in northern Finland at seven municipal health centers. Four health centers formed an intervention group and three health centers formed a control group. In rural areas, distances to health centers are often long and services are not widely available. Sometimes there is a shortage of professionals (social workers, doctors, and psychologists). Taking into consideration regional circumstances and FAs with disease, nurse-led case management may achieve good results with FAs.

Seven primary municipal healthcare centers provided data for this study. The data was collected retrospectively from the electronic medical records of health centers and Oulu University Hospital for the period 2006-2008. The basic data was collected by the persons who answered the electronic medical records at each health center. In the intervention health centers nurses checked the research population and selected the patients invited to the research based on the criteria. The researchers selected patients in the control group on the basis of the same criteria by studying the patients' electronic medical records in their health centers. Following previous Finnish studies, frequent attenders were defined as those who had eight or more outpatient visits per year to a GP.^[1,3,5-7]

Visits to the university hospital were also considered, and patients who had made four or more outpatient visits to the university hospital per year were also defined as FAs.^[6-8] In order to develop healthcare services, the aim was to study the use of health services as a whole, and that is why we also included specialized care in our study.

In the intervention group, patients had an average of 10.5 visits to a GP per year from 2006 to 2008. The proportion of FAs in the municipal population was 3.5%, with a variation of 0.79%-6.88%. In the control group, FAs averaged 10.9 visits per patient for the same time period, and FAs made up 3.1% of the municipal population, with a variation of 1.47%-5.23%.

Participant inclusion criteria stipulated that patients be at least 18 years old and that they had had outpatient visits with face-to-face contact. Patients with visits for serial treatment of the same illness, pregnancy or delivery, mental retardation, psychotic illness, dementia, cancer palliative care, terminal hospice care, and patients involved in other study intervention at the same time, and those unable to give informed

consent, were excluded.

A total of 720 patients met the inclusion criteria and were enrolled in the study: 107 FAs of specialized care and 613 FAs of primary care. A semi-structured postal questionnaire and an invitation letter to participate in the study were sent three times between fall 2008 and spring 2011. Written informed consent to participate in the study was requested. The final study groups consisted of 285 FAs in the intervention group and 177 FAs in the control group. The data does not allow for an analysis of the difference between those who were receiving specialized care and those who were receiving primary care. Research groups were of varying sizes, and the number of patients in specialized care was relatively small.

Table 1. The number of participants in the study

	Intervention group	Control group
	n	n
Baseline	285	177
One year	200	166
Two years	161	153

2.3 Data collection

Our study, made use of self-reported instruments. The Frenchay Activities Index (FAI) instrument developed by Holbrook & Skillbeck was used for measuring activities of daily living among FAs with chronic illness.^[25] It is 15-item instrument with 4-point Likert scale that reflects the FAs behavior in the areas of leisure/work, domestic chores, and outdoor activities, with sum score ranges from 0-45 ($\alpha = 0.80$ in baseline, $n = 452$). For measuring the health-related quality of life (HRQoL) we used 15D, an instrument developed by Sintonen.^[26] It consists of 15-item with a 5-point Likert scale concerning each health dimension, and the patient chooses the one best describing her/his view. The single index level values are on a 0-1 scale ($\alpha = 0.84$ in baseline, $n = 457$). The sense of coherence was measured with Antonovsky's short 13-item scale.^[27] It is a 7-point semantic differential scale with two opposite anchoring phrases and a total sum score ranging from 13 (low SOC) to 91 (high SOC) ($\alpha = 0.88$ in baseline, $n = 459$). All instruments had been tested in earlier studies and were considered valid and reliable.

2.4 Intervention

There were seven health centers in the study. Interventions were carried out in four health centers and three health centers acted as a control group.

An experienced public health nurse as a community matron was implemented in the intervention at each of the four health centers. Nurses received five days of theoretical and practical training before the intervention. This training included

information on self-management support and case management as well medical and treatment components of chronic diseases. Oulu University Hospital and the University of Oulu provided the training. The division of labor and cooperation between primary and specialized care divisions was discussed with doctors and community matrons. Doctors from the university hospital and health center provided actual patients' cases as examples in the training, with the aim to benefit the community matrons' work with FAs.

The intervention group consisted of 285 patients. Each community matron had 50-90 FAs, whose service coordination and care she was responsible for. The community matron's intervention included the following: FAs individualized care plans, assessment of FAs care needs and resources, coordination of multi-professional services and supporting of FAs in self-management. The role of the community matrons was to maintain regular contact to ensure continuity of care and to build a confidential care relationship. The patient-oriented education, active self-management support and patient's capabilities were supported by the community matron. It was important that a community matron carefully reviewed each FAs medical history before counseling. The suitability and willingness of the FAs to participate in the study was determined by matrons after inviting the FAs to the health center. A care plan was made with various professional groups by a community matron, and as a result, FAs received an individual, customer-oriented plan. In a period of two years, FAs visited with their own matron concerning all of their health-related issues.

Community matrons received support from their leaders, co-workers and from each other throughout the intervention period. They discussed ways of working and problems. In this way their working methods were harmonized, thus guaranteeing the quality and reliability of the intervention.

The control group consisted of 177 patients. They received as usual at the health center when needed without the support of a community matron. Care as usual involves traditional patient support and education during patient visits.

2.5 Data analysis

SPSS 22.0 was used for statistical analyses. Results were expressed as frequencies, percentages, the chi-square test and p -values. Statistical comparison between the groups was performed by an independent samples-test, a paired samples T -test and a mean test.

2.6 Ethical considerations

The Finnish Advisory Board on Research Integrity (2012) defines ethical research guidelines, which we have taken into

account in carrying out this study. Finnish law (2010/794, 2015/143) exempts this type of study from needing approval from an official research ethics committee. The municipalities that were included in the study gave their administrative approval.

Participation in the study was voluntary and free of cost, and the FAs were informed about the study in a cover letter. Participants had the possibility to leave study at any point. All persons involved in the study gave written informed consent before participating.

3. RESULTS

According to the results, no statistically significant differences in the gender, age or education level of FAs were found between the intervention and control group. Of the FAs in the intervention group, 47% had used private healthcare services in the previous 12 months; the corresponding percentage in the control group was 53%. There was no statistically significant difference found in adherence to health regimens between the groups. Participants in the intervention group adhered to health regimens slightly better (85%) than those in the control group (78%). In the intervention group, 94% of FAs reported having one or more chronic diagnosed disease, whereas in the control group, 89% had a chronic disease. The two most commonly reported types of chronic diseases by ICD-10 were diseases of the musculoskeletal system and connective tissue and diseases of the circulatory system. There was a statistically significant difference in both diseases between intervention and control groups ($p = .002$, $p = .009$). Both diseases were more common in intervention group.

3.1 Satisfaction with current life

From the Pearson Chi-Square test, it was seen that there were no differences in satisfaction with current life between groups ($p = .709$) at baseline. From the Independent Samples-Test there were no differences between at baseline and after two years in the intervention or control group ($p = .340$). Both groups had patients who had improved and those who had deteriorated, but on average, progress in this area remained at zero.

3.2 Performance of daily activities

Performance of daily activities was similar in both groups (intervention mean 30.45, SD = 7.9 and control mean 29.12, SD = 7.7). From the Paired Samples T -test, performance of daily activities was observed to weaken statistically significantly in the intervention group (-1.538 unit, $p = .001$) from at baseline to measurement after two years. The control group did not experience any deterioration; performance of

daily activities remained unchanged. From the Independent Samples-Test, it was seen that the changes differed between the intervention group and the control group ($p = .033$). The change was most significant ($p = .002$) in the oldest age group, ≥ 65 years.

Table 2. The characteristics of the FAs in the intervention and the control group at baseline

Characteristics	Intervention		Control		χ^2	p-Value
	n	%	n	%		
Sex					0.114	
Female	184	65	117	66		.736
Male	101	35	60	34		
Total	285		177			
Age					0.151	
18-39	37	13	21	12		
40-64	134	47	83	47		.927
≥ 65	114	40	73	41		
Total	285		177			
Education level					3.311	
Elementary education	153	55	79	46		.069
Vocational education	125	45	92	54		
Total	278		171			
The use of private healthcare					1.459	
Yes	130	47	90	53		.227
No	148	53	81	47		
Total	278		171			
Adherence to health regimens					3.216	
Good	239	85	129	78		.073
Poor	44	15	37	22		
Total	283		166			
Chronic disease					3.742	
Yes	268	94	154	89		.053
No	17	6	19	11		
Total	285		173			
The most common chronic diseases of FAs by ICD-10						
Diseases of the musculoskeletal system and connective tissue	138	48	60	34	9.403	.002
Diseases of the circulatory system	125	44	56	32	6.844	.009
Diseases of the eye	70	25	49	28	0.557	.456
Diseases of the respiratory system	67	24	40	23	0.051	.822
Diseases of the genitourinary system	56	20	47	27	3.005	.083

3.3 Sense of coherence

Sense of coherence was better in intervention group (mean 71.02) than in control group (mean 62.84), $t = 6.19$, $p < .0005$, at baseline. From the Independent Samples-Test, it was seen that sense of coherence weakened about 5.5 points in the intervention group, and in the control group 1.3 points at the two-year measurement. However, sense of coherence

in the intervention group was better (65.56 points) than in the control group (61.55 points) at two years, $p = .010$. According to Paired Samples *T*-test the change in intervention group was -8.2 points ($t = 7.28$, $p < .0005$) and in control group -0.4 points ($t = 0.34$, $p = .732$) at two years. The average age of FAs did not differ between groups. In all age groups, the deterioration of sense of coherence was similar.

If sense of coherence improved in the control group, so did satisfaction with life; if sense of coherence got worse, satisfaction with life also deteriorated. The result was statistically significant, with a Spearman’s correlation coefficient 0.238, $p = .027$. There was no such correlation found in the intervention group.

3.4 Health-related quality of life

Independent Samples-Test showed, that the intervention had no statistically significant effect on quality of life at baseline, or after one year or two years in intervention group. The changes were not different in the various age groups.

In the intervention group, for 40% of the FAs, quality of life remained at the same level from at baseline and after two years in the intervention, and in the control group, the corresponding portion was 36%. Quality of life got worse in both groups, almost as much 33%-34%. Quality of life improved slightly more in the control group (30%) than in intervention group (27%) over two years.

Table 3. Changes in quality of life at baseline, one and two years after intervention

		15D Score		Difference*
		n	Mean	
Baseline	Intervention	282	0.8111	.0029
	Control	175	0.8082	
1 year	Intervention	202	0.8015	-.0007
	Control	163	0.8022	
2 years	Intervention	163	0.8180	.0173
	Control	145	0.8007	

*A difference of $\geq |0.03|$ is clinically important in the sense that patients can, on average, feel the difference.

The results showed a correlation between sense of coherence and quality of life in the intervention and control groups at baseline, at one year and at two years, and the correlation was statistically significant ($p < .0005$). There was also a statistically significant correlation between performance of daily activities and quality of life for the same time period ($p < .0005$) in both groups.

Table 4. Improving and worsening quality of life in different groups

	Changes in the 15D score at baseline and after 2 years					
	n ≤ -0.03	%	n -0.031-0.029	%	n ≥ 0.03	%
Intervention	54	33	65	40	43	27
Control	37	34	39	36	32	30

4. DISCUSSION

This study presents for the first time the effects of a nurse-led case management-based intervention on quality of life, sense of coherence and performance of daily activities of FAs in primary care in Finland.

According to the results, intervention did not increase FAs’ satisfaction with current life. Even though FAs received personal counseling and coordination regarding health and illness issues, it did not increase satisfaction of life. This could perhaps be because patient satisfaction with life produces other things, or they did not consider that a nursing-based approach and its passing alongside everyday life would have a separate content of satisfaction.

Despite the intervention, performance of daily activities weakened statistically significantly in the intervention group ($p = .001$) from at baseline to after two years, whereas in the control group, it remained unchanged. Patients in the intervention group had statistically significantly more chronic diseases according to ICD-10 than those in the control group. Diseases included diseases of the musculoskeletal system and connective tissue ($p = .002$) and diseases of the circulatory

system ($p = .009$). Weakness in performance of daily activities may be associated with chronic diseases. This result is supported by previous research by Hung et al. (2012), in which researchers surveyed, inter alia, performance of daily activities among older adults with chronic disease, including their bathing, dressing, eating, managing medications, grocery shopping and preparation of meals. Chronic diseases were found to be strongly associated with disability in this study. By managing chronic diseases, we can achieve an important goal: to maximize longevity with less disability.^[28] There was no difference between groups in adherence to health regimens, which could explain the difference in performance of daily activities. There was no difference in the use of private healthcare services either.

The intervention did not improve FAs the sense of coherence. Sense of coherence was statistically significantly better in the intervention group at every stage of the study, even though it deteriorated in the intervention group. It can be assumed that without a matron’s support, collaboration and care coordination, the result could have been worse. The matron’s function is to help FAs recognize and utilize their own resources to

treat the disease and survive in daily life. The matron should be aware of ways to strengthen the sense of coherence of FAs through communication with, evaluating and treating patients.^[29]

Intervention did not improve the quality of life for the intervention patients. The health-related quality of life did not differ between the groups at the measurement periods. Both groups experienced improvement in quality of life and deterioration, but it was not statistically significant. This result contrasts with those from previous studies, in which intervention has had a positive impact on quality of life.^[17, 20-22] It might be that, without the intervention, quality of life for FAs would have worsened, but here it remained unchanged due to the fact that the matron took care of complex needs and provided support. Chronic diseases reported in the intervention group could also be a reason for quality of life not improving.

The findings of this study showed that there was a significant correlation between sense of coherence and quality of life in both groups at baseline, at one year and two years after intervention: the stronger the sense of coherence, the better the quality of life. An individual's orientation to life is reflected by their sense of coherence. This study supports previous research that has, either directly or indirectly, indicated an association between sense of coherence and quality of life. High scores in sense of coherence are especially associated with mental health.^[24] A strong sense of coherence means that an individual sees life as meaningful and that their environment is comprehensible and manageable.^[30] Based on our understanding, in this study, nurses had an important role to play in supporting chronic disease patients with complex needs, ensuring that patients had the ability to deal with situations and manage their life well. This supports independent living at home and reduces hospital visits. Patients know that there is a person to contact, if necessary, and it offers a sense of security.^[13]

A significant correlation was also seen between quality of life and performance of daily activities in both groups at the same time periods. This finding confirmed results of a previous study carried out by Rennemark Lindwall, Halling & Berglund (2009), where physical activity was seen to generate pleasure and relaxation in old age. For older persons with a chronic disease, it is important that their physical activity and performance of daily activities are maintained, as long as it brings the feeling of independence and survival, and enriches daily life. Therefore, a matron's holistic care enables the rehabilitation that maintains functional capacity according to the human condition. This study also showed a significant correlation between sense of coherence and

FAs feeling satisfied with their current life in the control group. However, the same correlation did not exist in intervention group. Jacobsson, Westerberg, Malec & Lexell (2011) showed that sense of coherence was strongly associated with life satisfaction among traumatic brain injury patients.^[31]

Based on this study, which was carried out in rural areas where health services are limited and distances are long and there are not always enough professionals available, the community matron model could be useful for FAs with long-term conditions. Patients would be able to contact the matron, a familiar person who meets their complex needs and helps improve their wellbeing. It is important for matrons to identify the patients who will benefit most from the community matron model. ehealth services serve as an increasingly important tool for cooperation between patients and community matrons. With ehealth services, patients are active players who uses digital technology to track their own health, perform self-measurements and record their own data. With electronic self-care services, patients can acquire the health information they need, make appointments for health care services, review their test results and medical records, and consult with healthcare professionals. The goal of eHealth is to improve not only the health of citizens, but also the efficiency and productivity in healthcare activities, while freeing up healthcare resources to those most in need.

This study does not include patients' experiences on the community matron model, but other studies have shown positive effects. Patients have described outcomes such as better quality of life, improved self-care with chronic diseases, better mental health and saved time with general practitioners.^[17] Based on our understanding, the same positive effects may be included in the results of this study, even though the results did not indicate that the intervention had a statistically positive effect on quality of life, life satisfaction and performance of daily activities. Without a community matron, the results could have been worse. It is noteworthy that there is a statistically significant correlation between sense of coherence and quality of life and between quality of life and performance of daily activities among FAs. Strengthening those areas can produce positive meaningful effects on the daily life and wellbeing of FAs, which can also be seen to promote adherence to health regimens.

4.1 Limitations

The instruments used in this study were self-reported, creating one limitation. When self-reported instruments are used, social desirable answers are always a possibility. Nevertheless, the study has several strengths. Compared to the previous studies carried out in Finland, this study has a new point

of view, and the research theme is timely. Secondly, in both study groups the response rates were quite high at baseline and at the times of measurement: 70.2% of the intervention group and 93.8% of the control group responded at one year, and 56.5% of the intervention group and 86.4% of the control group responded at two years. Thirdly, another strength is the well-selected research sample from medical records, as there is strong evidence that the examinees were in fact FAs. Lastly, the study used commonly used instruments that have been found to be of high validity and reliability.

4.2 Relevance to clinical practice

It is important to develop interventions to help FAs with chronic disease cope better in their day-to-day life and take more responsibility for the treatment of disease. The health care system in Finland faces a challenge in that the number of older persons is increasing, meaning an increasing number of FAs in health services. The extensive growth of use of services has led to a situation where we must think terms of needs-based allocation and supply and demand, and introduce effective models for the healthcare system.

It is crucial to realize that the availability of health services in sparsely populated areas with long distances may become even more challenging due to the scarcity of staff, and the community matron model is one worthy way to respond to this situation. One matron can care for about 70 FAs in cooperation with other professionals, and this reduces GPs' workloads so that they can focus on other appropriate tasks.

A technology-assisted approach to integrating the community matron model allows patients to interact with their nurse regardless of long distances. FAs with chronic disease and complex needs need more services due to their vulnerability and should be taken into account in the operation of the service system.

5. CONCLUSIONS

The findings of this research indicate that there is a significant correlation between sense of coherence and quality of life and between quality of life and performance of daily activities among FAs. Sense of coherence was significantly better in the intervention group at every stage. Further, in the control group a significant correlation was found between sense of coherence and FAs' feeling satisfied with their current life. However, the intervention had no positive effect on performance of daily activities, and this weakened statistically significantly from at baseline to the measurement at two years.

ACKNOWLEDGEMENTS

The authors thank the staff of health centers in northern Finland (in Ii, Pudasjärvi, Utajärvi, Vaala, Kiiminki, Muhos and Taivalkoski) for the data collection.

CONFLICTS OF INTEREST DISCLOSURE

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

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