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# Feasibility and preliminary effectiveness of a drum circle activity to improve affect in patients, families and staff of a pediatric hospital

Kim Archambault <sup>a</sup>, Élyse Porter-Vignola<sup>a</sup>, Frédéric N. Brière<sup>b</sup> and Patricia Garel<sup>c</sup>

<sup>a</sup>Ste-Justine University Hospital Research Center, Montreal, Canada; <sup>b</sup>School of Psychoeducation, Université de Montréal, Montreal, Canada; <sup>c</sup>Department of Psychiatry, Ste-Justine University Hospital Center, Montreal, Canada

## ABSTRACT

**Background:** Children, families and staff in pediatric hospitals often experience elevated psychological distress. Art-based initiatives, such as group drumming, have been proposed as strategies to support well-being in this context.

**Methods:** This study evaluated the feasibility and potential benefits of a drum circle activity designed to improve the affective experience of patients, families and staff in a large pediatric hospital. A total of 48 patients, 16 employees and 15 visitors completed questionnaires before and after up to 12 joint drum circle sessions. A total of 12 respondents took part in semi-structured interviews.

**Results:** Quantitative analyses showed significant pre-post-session increases in positive affect ( $\beta = .48$ ;  $p < .001$ ) and decreases in negative affect ( $\beta = -.29$ ;  $p < .001$ ). Qualitative results corroborated these findings, in addition to suggesting the safety of the activity as well as other potential benefits.

**Conclusions:** This preliminary study supports the usefulness of group drumming to enhance the well-being of pediatric hospital patients, families and staff.

## ARTICLE HISTORY

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## KEYWORDS

Pediatric hospitalisation; drum circle; affect improvement; feasibility; mixed methods

## Introduction

Illness and hospitalisation are known to be associated with significant psychological distress in both patients and their family (Bosk, 2011; Catalano et al., 2003; Quittner et al., 2014; Rollins & Wallace, 2017). Hospitalisation is especially stressful for children who may be more sensitive to the separation from family and friends, as well as the disruption of regular activities and routines (Coyne, 2006; Kaminski, Pellino, & Wish, 2002; Povah, 2009; Rollins & Wallace, 2017; Thurber, Patterson, & Mount, 2007; Wallace et al., 2014; Wilson, Megel, Enenbach, & Carlson, 2010). For parents and siblings of hospitalised children, the constant worrying about the child's health and well-being is often coupled with financial and time-management stressors related to the hospital stay (Malchiodi, 2012; Wallace et al., 2014). Although it is widely acknowledged that hospitalisation is generally distressful to children and their family, there is a paucity of recent research in this area and

few studies have tested strategies to address the affective dimensions of the pediatric hospitalisation experience (Coyne, 2006).

More research has focused on the well-being of hospital employees. This research shows that hospital staff often experience high levels of stress and are at high-risk of work-related psychological disorders (Fields et al., 1995; Fogaça, Carvalho, Cítero, & Nogueira-Martins, 2010; Italia, Favara-Scacco, Di Cataldo, & Russo, 2008; Sonke et al., 2015; Sonke, Rollins, Brandman, & Graham-Pole, 2009). Moreover, it has been suggested that improving health workers' well-being, in addition to being beneficial to them, is likely to enhance their attention and dedication to patients (Italia et al., 2008; Sonke et al., 2015). Inclusive strategies that promote the well being of children, families and staff thus seem highly indicated.

Initiatives involving arts and creativity have demonstrated promising benefits in a variety of populations and contexts and the pleasurable, accessible, distractive and mood-enhancing qualities of art-based activities are now well recognised (Tesch & Hansen, 2013; Van Lith, Schofield, & Fenner, 2013). In hospitals specifically, artistic activities have been found to distract patients from their illness and re-introduce a sense of normalcy in their life (Mogos, Angard, Goldstein, & Beckstead, 2013; Styles-Turbyfill, Rogers, Zink, & Kwiatkowski, 2017). Such activities have also been shown to promote the well-being of siblings of hospitalised children (Wallace et al., 2014), and reduce psychological distress in medical staff (Italia et al., 2008; Repar & Patton, 2007).

One specific approach that appears well-suited to the goal of enhancing the well-being of the entire hospital community is the drum circle. Inspired by traditional group drumming, a drum circle involves a group of people who gather to create and share a musical experience using percussions. Sound and rhythm are put at the service of exploration, self-expression and communion with others. Inclusion is a basic principle of the drum circle, which relies on the conception that the production of rhythms is natural and intrinsically motivating, which may make it accessible to all, regardless of culture, musical preferences, age and ability (Povah, 2009; Reuer, Crowe, & Bernstein, 1999).

Studies conducted in various clinical and non-clinical populations suggest that drum circle activities have the potential to enhance mood and produce other psychological benefits, such as improved self-esteem, self-expression and sense of empowerment (Bittman, Bruhn, Stevens, Westengard, & Umbach, 2003; Bittman, Dickson, & Coddington, 2009; Blackett & Payne, 2005; Fidyk, 2009; Friedman, 2000; Hakvoort & Bogaerts, 2013; Kirschner & Tomasello, 2009; Mungas & Silverman, 2014; Newman, Maggott, & Alexander, 2015; Povah, 2012; Snow & D'Amico, 2010). However, few studies evaluated drum circle initiatives implemented in hospitals specifically (Kelsi, 2016; Newman et al., 2015; Povah, 2012). Little is thus known about their feasibility, safety, and usefulness in this setting. The present study reports on the preliminary evaluation of a drum circle activity offered to the entire community of a large pediatric University Hospital Center in Montreal, Canada.

### ***A drum circle activity at the hospital***

A drum circle activity was implemented in the spring of 2015 at Ste-Justine University Hospital Center (SJUHC), a large pediatric hospital located in Montreal, Canada. The activity was initiated by *Espace Transition*, a SJUHC project that promotes the development and

validation of programs that use arts and creativity to improve health, well-being and psychosocial adjustment in youth. The activity was co-developed with, and lead by, the *Jeunesses Musicales Canada (JMC)*, a non profit organisation with a dual mission to promote classical music in young audiences and help young musicians develop their careers at the national and international levels. The activity was funded by private and corporate donations administered through the CHU Ste-Justine Foundation.

The drum circle activity was intended to offer an open and accessible musical experience to the entire hospital community. It was open to all hospitalised children, their family, and the hospital staff. In total twelve 55-minutes weekly sessions took place on Monday evenings from 6 to 7 pm in a spacious and cozy conference room located on the top (9<sup>th</sup>) floor of the hospital. Participants could take part in as many drop-in sessions as they pleased. No registration or qualification was required and each session welcomed up to 30 participants. Two experienced percussionists from *JMC* conducted the activity. Each session started with a brief explanation of the basic techniques required to manipulate the instruments and of the few non-verbal signs that instructors would use to conduct the music *ensemble*. Participants were then rapidly put into action. They were introduced to percussion instruments from all over the world and proposed a variety of musical games involving questions and answers, imitation, and improvisation. Participants were lead to produce collective rhythms that grew in richness and complexity throughout the session, to sing along vocal patterns added to the rhythmic parts, and to eventually conduct the rest of the group if they wished.

A preliminary evaluation of the drum circle activity was conducted at this very first stage of implementation in order to assess its feasibility and potential to improve the affective experience of children, families and staff in a pediatric hospital. Two sets of objectives were followed:

### ***Feasibility***

- (1) To document attendance to the activity;
- (2) to document participants' characteristics and response to the activity.

### ***Preliminary effectiveness***

- (3) To test if participation in the drum circle activity improves short-term affect;
- (4) to test if short-term affect changes vary depending on sessions or individual characteristics;
- (5) to explore the other outcomes attributed to drum circle participation, including potential undesirable ones.

## **Methods**

### ***Participants***

Questionnaire data were collected from all drum circle participants aged 10 years and older. Minimal age was established with regards to the level of ability required to complete questionnaires. Participants aged 14 years and older provided autonomous

consent. Parental and child consent was obtained for participants aged 10 to 13 years. A total of 79 participants took part in the study. Of these, 82% were female and mean age was 24 years ( $SD = 15$  years, median = 17 years). The sample included 61% of hospitalised youths, 20% of hospital staff and 19% of visitors (mostly family members).

Available participants who were still hospitalised during the two weeks following the end of the activity and who provided appropriate written consent (including parental if needed) took part in qualitative interviews ( $N = 6$ ). This sub-sample was composed of one male and five female patients aged between 13 and 17 years. Two employee participants were also interviewed, one special educator and one recreational technician who had been accompanying groups of patients. Additionally, two clinicians (one chief nurse and one psychiatrist) who did not take part in the activity but were responsible for patients who did were interviewed, as well as the two group conductors.

### ***Instruments and procedures***

Quantitative (objectives 1 and 4) and qualitative (objective 5) methods were used to examine different study objectives. In the case of objectives 2 and 3, they were mixed according to a Convergent Parallel design so that quantitative and qualitative data on the same dimensions were collected and analysed separately before integrating both types of results in order to yield optimally rich and valid conclusions (Creswell & Clark, 2007; Johnson & Turner, 2003).

In line with a naturalistic approach, research procedures were chosen to minimise interference with the normal course of the activity (McGorry, Edwards, Mihalopoulos, Harrigan, & Jackson, 1996). Brief questionnaires were administered to participants before and after each drum circle session. The pre-activity questionnaire recorded information on demographic characteristics (e.g. gender, date of birth, status (i.e. hospitalised patient, visitor or employee) and current affect using the *Positive Affect and Negative Affect Scales* (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS includes words describing 10 positive and 10 negative emotions. Respondents were asked to rate the extent to which each word corresponded to their current emotional state on a scale of 1 (very little or not at all) to 5 (extremely). The positive and the negative subscales have been shown to be relatively independent from each other ( $r = -0.15$ ; Watson et al., 1988), to have high internal consistency (respective Cronbach  $\alpha$  in present study sample = 0.91 and 0.89), and to be sensitive to mood fluctuations and circumstantial factors (Molloy, Pallant, & Kantas, 2001).

The post-activity questionnaire included a re-administration of the PANAS, as well as a brief questionnaire probing different aspects of participants' response to the activity (i.e. "During today's activity...1- I participated actively, 2- I had fun, 3- I appreciated the conductors' attitude, 4- Participating in this activity made me forget about daily hassles, 5- Participating in this activity made me relax, and 6- I appreciated this activity"). Participants were asked to rate each of the six items on a scale of 1 (not at all) to 5 (extremely) and a global positive response index was obtained by averaging the scores of the six items together (Cronbach  $\alpha = 0.92$ ).

Participants who took part in semi-structured interviews were asked open-ended questions about their experience of the drum circle activity, their perception of its effects, and their judgments and attitudes towards the activity (including eventual

suggestions for improvement). They were also directly questioned about potential undesirable outcomes of the activity. Interviews were all audio-recorded and lasted between 2 and 14 min ( $M = 5$  min, 30 s,  $ET = 4$  min).

The IRB of SJUHC approved all research procedures.

## **Analyses**

Descriptive statistics were computed in order to quantify participants' attendance, characteristics and response to the activity. Effects on affect were analysed using multi-level mixed models in SPSS, version 24 (IBM Statistics). These models allowed testing average changes in positive and negative affect before and after sessions, while taking into account the non-independence of observations (due to the fact that many participants answered questionnaires more than once). Time (pre-post) was modelled as a within-individual factor (repeated measure) and a random effect was derived for participants. Multilevel standardised regression coefficients (*beta*) were computed as indicators of effect size and were interpreted following Cohen's convention (small  $\geq .10$ , medium  $\geq .30$ , large  $\geq .50$ ; Cohen, 1988). Cross-level moderation analyses were also performed in order to identify whether changes in affect varied as a function of participant characteristics or activity sessions. These analyses tested interactions between Level 1 Time (i.e. Pre-Post; within-individual factor) and level 3 Moderators, such as gender or age (between-individual factors).

Qualitative interview data were analysed using thematic analysis. The themes mentioned by responders were coded inductively and horizontally (Denzin & Lincoln, 2000), within pre-defined rubrics corresponding to interview questions. Only the themes pertaining to the rubrics relevant to the study objectives, that is "response to the activity" and "effects attributed to activity participation", are presented.

## **Results**

### **Activity attendance**

A total of 111 individuals<sup>1</sup> participated in at least one of the 12 activity sessions that took place between March and June of 2015. There were 20 participants per session on average, with attendance ranging between 11 and 28 participants. A majority of participants took part in a single activity session ( $N = 68$ ), nearly 40 % participated at least twice ( $N = 43$ ), and slightly more than 20% ( $N = 24$ ) took part in three or more sessions. One participant attended all 12 sessions.

### **Participant characteristics**

Participants aged 2 to 72 years attended the drum circle activity, a great majority of which were females (79%). Out of the 111 participants in total, 65% ( $N = 72$ ) were hospital patients, 14% ( $N = 16$ ) were hospital employees, and 21% ( $N = 23$ ) were visitors, that is patients' or employees' relatives. Table 1 presents a declination of the total group of participants to the activity by age, gender, and status.

**Table 1.** Characteristics of participants to the drum circle activity at SJUHC during the Spring 2015 ( $N = 111$ ).

Age	
<10 years	16 (14%)
10–18 years	63 (57%)
≥19 years	32 (29%)
Gender	
♀	88 (79%)
♂	23 (21%)
Status	
Patient	72 (65%)
Employee	16 (14%)
Visitor	23 (21%)

Virtually all participants came from two hospitalisation units: the adolescent internal medicine unit (68%) and the psychiatry unit (29%). Approximately half of the patients who took part in the study reported being hospitalised for an eating disorder (52%) and a third of them (33%) for another mental health or behaviour problem. Four other reasons for hospitalisation were documented, including bone disease and uncontrolled diabetes. On average, patients had been hospitalised for 19 days ( $SD = 26$ ,  $Median = 7$ ) when they first participated in the drum circle activity ( $N = 44$ ).

Hospital employees who took part in the activity identified to nine different titles (i.e. psychologist, special educator, pharmacist, recreational technician, nurse, administrative agent, planning agent, assistant coordinator and retired) and came from 10 different service departments (i.e. adolescent internal medicine, psychiatry, development, emergency, pathology, psychology, pharmacy, cardiology, library and rotation team), with the greatest concentration coming from the psychiatry unit ( $N = 6$ ; 38%). Most visitors were a parent or sibling of a hospitalised youth (56%). Others were a staff member's child, spouse or acquaintance (44%).

### **Response to the activity**

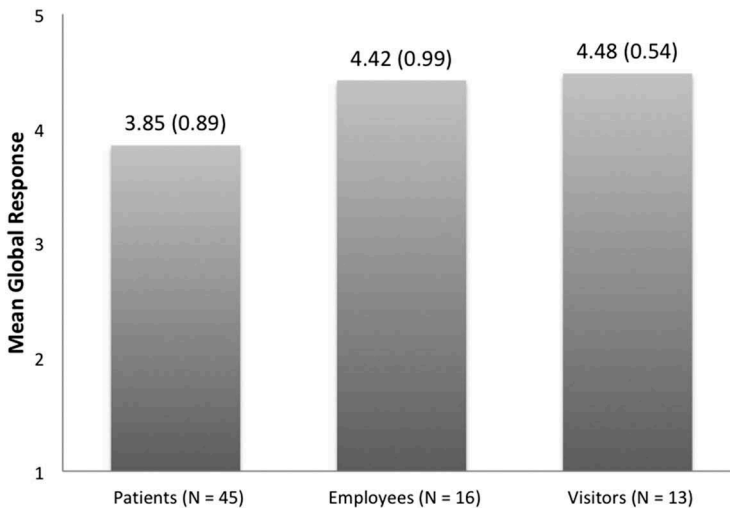
Figure 1 presents the mean scores reflecting global response (i.e. average of the six response items) to the drum circle activity by participant status. Scores were high in all three groups, indicating largely positive response, although they were somewhat inferior in hospitalised patients ( $M = 3.85$ ,  $SE = 0.12$ ) compared to participants from other categories ( $M_{\text{employees \& visitors}} = 4.45$ ,  $SE = 0.20$ ;  $beta = .60$ ,  $p = .004$ ). Participant response did not change across sessions ( $beta = .02$ ,  $p = .14$ ) and did not vary by age ( $beta = -.0008$ ,  $p = .95$ ) or gender ( $beta = .30$ ,  $p = .30$ ) when status was taken into account.

Questionnaire results on participants' response to the activity were largely echoed by comments gathered during the interviews.

**Positive response.** The large majority of interviewed participants reported having greatly appreciated the activity and most of them estimated having participated actively.

*"I went to every [drum circle] sessions [during my hospitalisation] and I would do all the activities."*

(13-year-old patient)



**Figure 1.** Mean scores (*SD*) reflecting global response to drum circle activity by participant status.

**Mitigated response.** While no purely negative remarks were gathered about activity participation, a few participants reported appreciation comments indicative of a mitigated experience.

*"It was interesting, but I would not feel very at ease sometimes. I like making music but not that type of music."*

*(16-year-old patient)*

### **Improvements in affect**

Figure 2 shows the mean change in affect before and after each drum circle session. Mixed models, with a random effect accounting for repeated participation by the same participants, showed a significant increase in positive affect during sessions ( $\beta = .48$ ;  $p < .001$ ), as well as a significant decrease in negative affect ( $\beta = -.29$ ;  $p < .001$ ). These represent medium-to-large effect sizes (Cohen, 1988).

Qualitative interview material largely corroborated results from the PANAS. In fact, participants mostly reported perceived activity effects corresponding to a form of mood improvement.

**Positive mood "boosting".** Some of them reported feeling more enthusiastic, energetic, animated, creative, attentive, or happy following the activity.

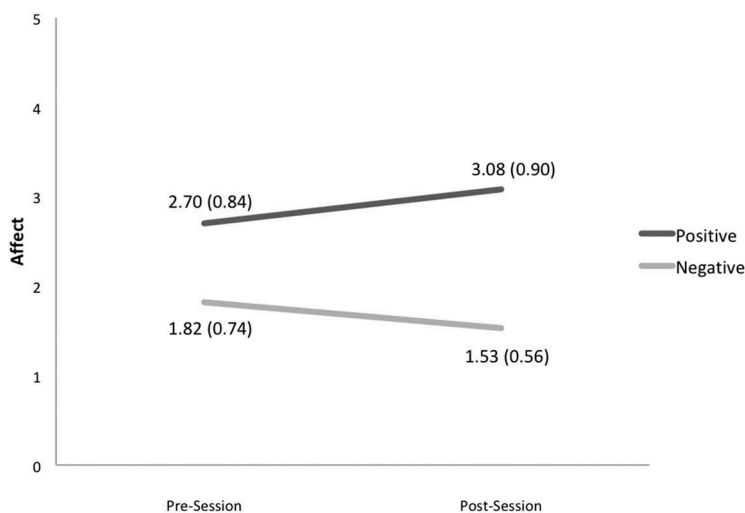
*"I felt more energetic than usual, more "pumped", like happy."*

*(13-year-old patient)*

*"I perceived some [benefits] for myself in terms of attention, enthusiasm, creativity a lot (...) I was more animated after the activity."*

*(Special educator)*





**Figure 2.** Mean levels (*SD*) of positive and negative affect reported by participants immediately before and after drum circle activity sessions.

***Stress and preoccupation reduction.*** Several participants mentioned that participating in the drum circle activity allowed them to “blow off some steam” and many reported that it made them put their thoughts aside (“on hold”), distract them from daily hassles, which brought them to relax.

*“On the spot, when I was there and a little after, (...) I would think less about the thoughts that I had – because I am anorexic so I find myself fat and all- I would think less about that (...).”*

(15-year-old patient)

***Time-limited affective improvements.*** However, most participants specified that the positive affective changes they had felt were circumscribed to the few minutes or hours following the activity and none of them held the possibility that they could last in the longer term.

*“I could say that I was still in that mood during a good hour after the activity, after what it would fade away.”*

(Special educator)

*“(..), but it was more in the short term, it wasn’t very much in the long term (...) neither really much during the evening.”*

(15-year-old patient)

### ***Variations in affect changes***

Moderation analyses were conducted in order to assess whether pre-post activity changes in affect varied across sessions and participant characteristics. These analyses showed that pre-post reductions in negative affect diminished over sessions (*Interaction* pre-post\*session = .02,  $p = .029$ ). The mean reduction in negative affect was more than twice

as large at week 1 ( $beta = -.42, p < .001$ ) compared to week 12 ( $beta = -.15, p = .049$ ), when it was nevertheless still significant. Pre-post changes in negative affect also varied by gender ( $Interaction_{pre-post*gender} = .22, p = .04$ ), with reductions observed in females ( $beta = -.33, p < .001$ ) but not males ( $beta = -.11, p = .287$ ). Finally, changes in negative affect also varied according to participant status ( $Interaction_{pre-post*status} = .21, p = .014$ ), with reductions twice as large in hospitalised youths ( $beta = -.36, p < .001$ ) compared to other participants (employees or visitors;  $beta = -.15, p < .02$ ). However, it should be noted that there appeared to be limited room for negative affect reduction in males and non-patient participants as their pre-session mean levels were relatively low ( $M_{males} = 1.57, ET = 0.69$ ;  $M_{employees} = 1.30, ET = 0.65$ ;  $M_{visitors} = 1.49, ET = 0.52$ ) compared to those of females ( $M = 1.87, ET = 0.75$ ) and patients ( $M = 2.10, ET = 0.70$ ).

Moderation analyses showed no variation of positive or negative affect changes by age, frequency of participation or length of hospitalisation.

### **Other perceived benefits**

The interviews conducted with a sub-sample of participants and clinicians allowed exploration of other potential benefits of the drum circle activity at the hospital. Four main themes emerged.

**A valuable and accessible distraction.** Respondents reported that the activity offered a welcomed distraction to hospitalised patients that brightened up or made easier their otherwise monotonous or difficult stay. The fact that it took place outside the units of care, yet inside the hospital, allowed patients to be “taken out” without actually leaving the hospital premises and, therefore, did not require too much organisational complexity (e.g. transportation issues) nor did it limit the participation of patients requiring constant care (e.g. under perfusion).

*“I think it made time pass. For sure sometimes days are long here so this is maybe an effect that it had, it’s been something fun to do (...).”*

(17-year-old patient)

*“One of the youths really liked music a lot (...) For him, I think that it’s been extremely interesting to be able to participate because it ‘kept him in the hospitalisation’. It was not a youth who was favourable [to hospitalisation].”*

(Psychiatrist)

**An interesting context for clinical assessment.** Moreover, respondents noted that the activity offered an interesting assessment context since it allowed clinicians to see patients function and evolve in a more natural environment and in the face of demands or challenges that are hard to replicate inside the units of care.

*“The staff informed me that they were participating very well (...) and that they had a certain ease. It helped me assess their functioning.”*

(Psychiatrist)

**A relevant and more acceptable social exposure context.** The drum circle activity was seen as offering therapeutic challenges of great relevance to participants with high

levels of social anxiety or fear of others' negative judgment. The fact that they were exposed, in some cases repeatedly, to these challenges and that they were able to overcome them with varying levels of clinical support allowed some youths to realise observable functional gains, mostly in the social sphere.

*"In other cases we noticed that it allowed mobilising their ability to go towards the outside, to tolerate the judgement of others and all that (...)."*

(Nurse)

Moreover, in spite of its therapeutic potential, the "non-clinical" and ludic character of the activity was seen as making it more acceptable to young patients, who are often refractory to conventional therapeutic approaches.

*"It's not organised as a clinical activity, like a therapy would be, which always raises worries or anxiety or reservations from their part so (...) it's not perceived as a therapy, rather as a leisure, whereas the leisure can be therapeutic."*

(Psychiatrist)

**A stimulating experience.** Finally, clinicians also underlined the engaging character of the drum circle and its potential to stimulate socialisation and behavioural activation in young participants.

*"(...) to stimulate socialisation and to reduce anxiety, mostly social anxiety, and to participate, to mobilise oneself behaviourally. (...)"*

(Psychiatrist)

### **Undesirable outcomes**

One very important objective of this preliminary evaluation was to verify the safety of the drum circle activity at the hospital. All interviewed respondents were therefore directly questioned on their perception of negative or undesirable effects. Around half of respondents denied any such impacts. The remaining portion rose mild or transitory negative effects, which were categorised under two main themes.

**Exposure-related stress, anxiety or self-perception undermining.** Some participants reported that having to expose oneself in front of a new group of people, to compare one's musical performance to that of others or to execute solo exercises in front of others could induce stress. In some participants, this could lead to more significant anxiety or undermine a fragile self-esteem. However, these consequences were perceived as transitory and no important or lasting degradation was reported.

*"Of course at the beginning, it stressed me out a little, but after that I felt a bit more like myself and it helped me to relax."*

(13-year-old patient)

*"Yes, mostly for our psychotic-type patients for whom it was more difficult, not necessarily in terms of noise but more in terms of people: other youths present who could make them uncomfortable, (...) more difficult to sustain the gaze with the disease (...). [But] it was manageable and easily named by the adolescent."*

(Nurse)

***Fatigue and aching hands.*** The only other type of negative impact that was reported was fatigue or aching hands following participation in a drum circle session.

*"After a while, you start to feel pain in your hands but apart from that, not really [any negative impacts]."*

(13-year-old patient)

## Discussion

This evaluation aimed to assess the feasibility and preliminary effectiveness of a weekly drop-in drum circle activity offered to the entire community of a large pediatric hospital in order to improve affect in patients, families and staff. Our findings show that the drum circle reached more than a hundred participants from all three targeted groups, with a fair proportion of participants attending two or more sessions. The quasi totality of patients came from the psychiatry and the adolescent medicine units, despite hospital-wide promotion. Limited reach in other units may have been due to ineffective communication strategies, scheduling conflicts, the unavailability of staff to accompany patients or low perceived relevance of art-based adjuncts to treatment by medical staff. Patients, family, and staff all responded well to the activity, with high levels of appreciation documented by quantitative and qualitative analyses in the three groups.

Our preliminary effectiveness evaluation supports the immediate mood-enhancing potential of drum circle participation in patients, families and staff. We observed a rather large systematic increase in positive affect and a medium systematic decrease in negative affect immediately following the activity, while accounting for multiple sessions in the same participants. These changes were corroborated by convergent qualitative results, which showed that respondents predominantly attributed mood enhancement effects to their participation in the drum circle activity. They are also consistent with findings from prior studies supporting the mood-enhancing properties of group drumming activities in health-care settings (Bittman et al., 2009; Blackett & Payne, 2005; Newman et al., 2015; Povah, 2012). However, qualitative results suggested that these affective changes were limited in time. The long-term clinical significance of the activity thus remains unclear, although it has been shown that short-term affective changes have the potential to translate into longer-term improvements in coping and health (Tugade, Fredrickson, & Feldman Barrett, 2004).

Moderation analyses revealed that reductions in negative affect were limited to females and were greater in hospitalised patients. A floor effect may account for smaller changes in males and in the sub-groups of visitors and employees, who reported low initial levels of negative affect compared to females and patients. Females and hospitalised patients may also be more reactive to social and ludic activities such as the drum circle, which is of interest since they are the groups that attended the most. Pre-post changes in negative affect also became weaker over the 12-week study period, although they remained significant. Habituation does not seem to be in cause here since affect modulations were not found to vary by frequency of participation. It is plausible that this gradual decline was due to changes in the delivery of the activity, such as the type of

exercises or conducting style. However, it should be reminded that global response scores, as well as the elevations in positive affect, remained fairly constant across time, suggesting that at least some of the ingredients underlying participants' involvement, satisfaction and mood enhancement were present at all times.

Qualitative analyses supported the safety of the drum circle activity at the hospital. Only a few light and transitory undesirable effects were documented and no significant or lasting degradation of patients' condition were reported. It cannot however be excluded that more important negative impacts were experienced by participants who were not interviewed or were not followed by interviewed clinicians. Moreover, our findings regarding safety only apply to the patients who attended the activity, amongst which almost all were hospitalised for a mental health condition. Future examinations will be necessary to establish safety in patients with physical health diseases or disabilities.

In addition, qualitative analyses suggested other benefits of the drum circle activity. Patients and their clinicians saw the activity as a valuable distraction and an effective means to counter the unpleasantness and monotony of hospitalisation. This finding is in line with conclusions from previous studies suggesting that access to positive distractions helps patients, visitors and staff to deal with stress and distress experienced in health care environments (Rollins & Wallace, 2017; Ulrich, 1991). Additionally, clinicians reported that the drum circle activity offered a rich context for clinical evaluation and intervention and could even bring some participants to achieve therapeutic gains. This is not surprising considering that most patients in this study were hospitalised for a mental health problem and were likely to have therapeutic goals largely related to social functioning and behavioural activation. For them, the drum circle may thus offer a meaningful clinical context. We believe that such a context could similarly benefit youths hospitalised for physical health motives, whose social rehabilitation needs after prolonged or repeated hospital stays and/or important medical interventions may be great and often overlooked.

### ***Strengths and limitations***

To our knowledge, this study is the first to report on a drum circle activity addressed to an entire hospital community. It expands the small evidence-base supporting the feasibility, safety, relevance, and potential benefits of this type of activity for patients, their family, and health care providers in hospitals. Triangulation of quantitative and qualitative results improves the richness and validity of findings. However, this study only focused on short-term changes in affect. This limits its contribution to the understanding of the long-term functional significance of drum circle participation. Generalisation of findings to other pediatric hospitals is limited by the fact that the activity only reached patients from two units, largely dealing with mental disorders. This also precludes drawing conclusions regarding the potential value of the drum circle activity for patients with other medical conditions.

## Conclusion

This study contributes to the emerging evidence base regarding the usefulness of group drumming to enhance the hospital therapeutic environment and improve the well-being of patients, families and staff. It suggests that drum circle activities can represent a feasible and valuable addition to standard care, from which more patients with varied conditions could benefit since they allow an effective distraction and change of scenery inside of the safe premises of the hospital. Future studies should focus on documenting broader and long-term benefits of the drum circle and examining ways to expand its reach.

## Note

1. In order to complete the portrait of activity attendance, researchers collected non-nominal notes on the age, gender and status of drum circle participants who were not involved in the study, either because they were too young or did not provide proper consent.

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## ORCID

Kim Archambault  <http://orcid.org/0000-0001-7716-7974>

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