



**Universiteit Utrecht**



# The effect of hospital clown visits on hospitalized children

A study into the effects and its measures



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## **Abstract**

*The Cliniclowns are hospital clowns that have been doing their work in the Netherlands for years, but the effect of their work has not been investigated scientifically before. This study was aimed at the development and evaluation of measures to examine the effects of the work of the clowns. The measures contained stress, positive mood and illness experience questionnaires and behavioral observations, which were made by filming the visit. 31 Hospitalized children, their parent/guardian and five hospital clowns participated in this research. Reliability of the measures appeared to be acceptable. The results showed that the visits of the hospital clowns led to a decrease in stress and illness experience, and an increase in positive mood. The concept magical room was also examined, but evidence was not found. The observations showed that the children were positively involved in the visit. Types of interventions that the hospital clowns used in their play showed some positive results with regard to their effectiveness. The study had limitations like small sample size, a skewed distribution in age and gender and difficulties with the observations. Future research could focus on developing measures that include physiological responses, and on differences between the effectiveness of hospital clowns in different countries. Also an attempt could be made to increase the reliability of the measures.*

## **Samenvatting**

*De Cliniclowns zijn ziekenhuisclowns die hun werk in Nederland al jaren doen. Er is echter nog geen wetenschappelijk onderzoek gedaan naar de effecten van hun werk. Dit onderzoek was gericht op het ontwikkelen en evalueren van meetinstrumenten om de effecten van het werk van de clowns te kunnen onderzoeken. De meetinstrumenten bestonden uit vragenlijsten om stress, positieve stemming en ziektebeleving te meten en uit gedragsobservaties, die gemaakt werden aan de hand van opnames tijdens het bezoek van de ziekenhuisclowns. 31 Kinderen die opgenomen waren in het ziekenhuis, hun ouder/voogd en vijf ziekenhuisclowns deden mee aan dit onderzoek. De betrouwbaarheid van de meetinstrumenten bleek acceptabel. De resultaten lieten zien dat een bezoek van de ziekenhuisclowns leidde tot een afname in stress en ziektebeleving, en een toename in positieve stemming. Het concept magische kamer werd ook onderzocht, hiervoor werd echter geen bewijs gevonden. De observaties lieten zien dat de kinderen positief betrokken waren bij het bezoek. Verschillende soorten interventies lieten positieve resultaten zien met betrekking tot hun effectiviteit. Het onderzoek had te maken met beperkingen als een kleine steekproef, een scheve verdeling in leeftijd en geslacht en problemen met de observaties. Toekomstig onderzoek zou zich kunnen richten op meetinstrumenten die ook fysiologische responsen bevatten, en op verschillen tussen de effecten van ziekenhuisclowns in verschillende landen. Ook zou gepoogd kunnen worden de betrouwbaarheid van de meetinstrumenten te vergroten.*

## **Introduction**

The Cliniclowns are hospital clowns that have been visiting hospitalized children in the Netherlands for years, but the effects of their work on those children has not been investigated scientifically before. Every year many children are hospitalized in the Netherlands. In VU (Free University, Amsterdam) medical center alone, 4287 children were hospitalized in 2009 (Roord, 2009). Illness and hospitalization often have great impact on children and can be very stressful (Kaminski, Pellino & Wish, 2002). It is known that prolonged stress has a negative impact on health and the immune system, and it delays recovery from illness (Gazzaniga & Heatherton, 2006; Rozanski & Kubzansky, 2005, in Hendon & Bohon, 2007).

While being hospitalized, children have to deal with various stressors like having to miss their home environment, daily routines and possibly (one of) their parents (Petrillo & Sanger, 1980, in Kaminski, Pellino & Wish, 2002; Kurz, 1987, in Kaminski, Pellino & Wish 2002). This leads to stress in the form of various negative emotions, like anxiety, tension, anger and depressed feelings. A stressor is an event that evokes stress in an individual (Barlow & Durand, 2005). Other important stressors are visits of the doctor and restrained activity (Bossier, 1994, in Hendon & Bohon, 2007). In Spirito, Stark and Tyc (1994) children were asked to describe a problem they had been suffering from throughout their hospitalization, in order to look how they coped with these problems. More than half of them indicated pain as a problem, which was accompanied by a higher level of stress than other problems. Stressors like pain and missing home affect the behavior and emotional state of a child. Consequences are emotional pain, crying, a decrease in communication and insomnia, amongst others. Regression in growth and development are also consequences of these stressors following hospitalization. Stress evoked by these stressors may have a negative effect on health and wellbeing, and can also negatively affect prognosis (Lepore, Miles & Levy, 1997, in Hendon & Bohon, 2007).

To offer children a way out of the medical world with its focus on illness and the stressors accompanying it, the Cliniclowns Foundation was founded in the Netherlands in 1992 (Stichting Cliniclowns, 2012). The purpose of the Foundation is to offer pleasure and distraction to sick children. Although it seems plausible that the visits of the hospital clowns will lead to a decrease of stress and an increase of positive emotions, there has not been any scientific research on the effect of hospital clowning yet. However, it is important to know what the effects are, because a decrease in stress may accelerate the recovery process

(Rozanski & Kubzansky, 2005, in Hendon & Bohon, 2007) and make the stay in the hospital more pleasant. In addition, positive emotions may have a positive influence on the body and the recovery process. E.g. Frederickson and Levenson (1998) showed that participants in whom positive emotions were aroused, showed faster recovery to baseline with regard to cardiovascular activity than those with negative or neutral emotions. Also, a meta-analysis of Lamers, Bolier, Westerhof, Smit and Bohlmeijer (2011) showed that positive emotions are related to a better prognosis of physical diseases. Patients with a higher baseline of positive emotions have a better recovery and survival rate than patients with a low baseline. Positive emotions may also have a positive influence on the immune system and cardiovascular system through the activation of the Hypothalamic-Pituitary-Adrenal axis, which buffers the impact of stress (Lamers et al., 2011). Whether these positive effects also follow the work of the hospital clowns is not known yet.

Some research on hospital clowns in countries other than the Netherlands has been conducted, but this research must be interpreted with caution because the purpose and methods of those hospital clowns may differ from the hospital clowns in the Netherlands. In a randomized controlled trial conducted by Bertini, Isola, Paolone and Cursio (2011), there was one clowns visit per child since the children were hospitalized for a short time. In the control group there was no clowns visit. The children were visited by the clowns for three hours, in groups consisting of seven or eight children. When they were leaving the clowns left things like balloons and drawings for the children in the experimental group. The study showed clinical improvement with children in the experimental group healing faster. There was also a decrease in respiratory frequency, body temperature, diastolic blood pressure and experienced pain sensation for the children in the experimental group. Despite the fact that the clown intervention seemed to have a positive influence on the children, hospital clowns in the Netherlands pay only short visits besides the child's bed, while in this research the visit lasted for three hours in a group of children.

Apart from the study by Bertini et al. (2011), Slater, Gorfinkle, Bagiella, Tager and Labinsky (1998, in Koller & Gryska, 2008) performed research in which clowns were present during the catheterization of the heart of a child. Both observations, self-reports of the child and parent reports about their child showed that there was a decrease in the child's stress. As a consequence the physician found it easier to perform the clinical procedure while the clowns were present. Since this was only a pilot study, more research is needed. The results found by

Vagnoli, Caprille, Robiglio and Messeri (2005) are in line with the discussed results of Bertini et al. (2011) and Slater et al. (1998, in Koller & Gryska, 2008). The study focused at the influence of clowns on preoperative stress in children. The clowns were present in the experimental group in the waiting room and in the induction room during induction of anesthesia. In the control group there were no clowns present. In the experimental group the level of stress did not change between the waiting room and the induction room, whereas the control group showed an increase in stress in the induction room. The children in the experimental group were also less stressed during the induction of anesthesia. Despite the fact that most of the employers saw the effectiveness of the clowns, only a minority of them liked the idea of having clowns in their daily routine, because they thought the clowns disturbed their daily routine and slowed down the procedure.

When looking at the appreciation and the effects of the hospital clowns, a quantitative survey of Koller and Gryska (2004, in Koller & Gryska, 2008), that surveyed 51 parents, showed that 80% of the parents liked the clown visits and they believed their children did as well. 94% of the parents reported an increase in positive emotions in their children after a clown visit. Although the studies that have been discussed here show a positive influence of hospital clowns, it is difficult to generalize these results to the hospital clowns in the Netherlands. Most studies did research on therapeutic clowns or doctor clowns, which have a (slightly) different approach than the Dutch hospital clowns. Also, they were present at other moments, for example during medical procedures or in the operation room, or with a longer or shorter duration than the Dutch hospital clowns.

Besides the fact that it is difficult to draw conclusions about the efficacy of the hospital clowns, there is also uncertainty about which parts of the visits of the clowns are probably efficacious. Visser (1995, in Langemeijer, 2011) mentioned that play gives children the opportunity to process (intense) events of daily life and to put being ill on the background. They get the chance to create a world that differs from the hospital world and it gives them a sense of control. Moreover, it offers them distraction and pleasure and it can be a way to express emotions. Kaminski, Pellino and Wish (2002) also mention that play can serve to distract attention from stressors and give some sense of control. Play also allows children to express, control and cope with the stress caused by the hospitalization. So play may be the effective factor.

Another possibility is that especially the contact between the clown and the child is important. Langemeijer (2011) states that in many cases contact between the clown and the child is being emphasized more than for example humor. If one looks at the Cliniclowns Approach (Stichting Cliniclowns Nederland, 2006, in Langemeijer, 2011) it is mentioned that clowns make contact with the healthy side of a child and that the clowns investigate in a playful way if a child is into making contact. Van Troostwijk (2006) also mentions that not the joking part is important, but building up a relationship with a sick child. Linge (2008) conceptualizes this as the magical room. In a magical room the optimal encounter unfolds between the clowns and a child, in which the child is being acknowledged en gets the chance to express all the feelings he or she has in the interaction. So not only the feelings that the environment expects from the child, but especially feelings like anger or irritation. A possible explanation for this magical room is synchronization (Stern, 2005, in Linge, 2008). By synchronization some kind of balance between the movement and verbal expression of the child and the clowns is implied. This form of synchronized contact evolves unconsciously and is partly dependent on empathy. According to this perspective, contact is the efficacious factor of the work of the hospital clowns.

Concluding, Dutch hospital clowns may cause a decrease in stress and an increase in positive emotions, which leads to faster recovery, better prognosis and a more pleasant stay at the hospital as mentioned earlier. However, little scientific research substantiates this. In the current study the main attempt is to examine the reliability and validity of measures. In addition the data will be examined exploratively to look for possible effects of the hospital clowns. Based on the positive effects reported in previous studies, it is expected that there will be a decrease in stress and an increase in positive emotions after the visit of the hospital clowns. This study also looks at the concepts of synchronization and the magical room. We examined this by comparing the satisfaction of the clowns about their play and the appreciation of the child. In addition the research will also look which interventions the clowns use during their visits, to examine which interventions the children appreciate most.

## **Methods**

### *Participants*

In the VU medical center (VUmc) in Amsterdam and the Wilhelmina Children's Hospital (WKZ) in Utrecht, children between the age of 4 and 11 and their parent/guardian were asked to participate in the research. This age group was chosen because children of this age are reasonably well to good at expressing themselves verbally (Pot, 2011; Reijnen, 2011; Van Roij, 2011). Efforts have been made to vary age, gender and disease in the research sample. The data in the WKZ was collected between February and September in 2011 by Pot, Reijnen en Van Roij. The methods of selection can be found in their studies (Pot, 2011; Reijnen, 2011; Van Roij, 2011). Selection of children in the VUmc was based on consultation with the ward leaders of children's wards 9 B and 9 C. Of the selected children four children dropped out because they were too ill to participate in the research, their parents did not want their children to be filmed because of religious belief, or because they 'did not feel the urge to participate'.

Altogether, 31 children and their parent/guardian participated. 20 participants were boys and 11 girls ( $M = 7.6$  year;  $SD = 2.1$ ). During the research there were only a few girls in the right age group on the wards, which made it harder to spread gender. Besides the children and their parent/guardian, 3 hospital clowns in the WKZ and 2 hospital clowns in the VUmc participated in the research.

The research has been evaluated and approved by the medical ethics committee of the VU medical center (protocol number: ABR32022, version 4). The ethical conditions that were required for all participant were giving informed consent, guarding their privacy and giving the opportunity to be reported about the results. Informed consent meant that the children, the parent/guardian and the hospital clowns received information about the research a few days (3 days was preferred, but at least one day) before the research was performed. Privacy was also important in the research. The questionnaires and the film recordings that have been made will be stored for one year by the researchers and destroyed afterwards. The data will not be used for any other purposes than the current research and will only be viewed by the researchers. Concerning the opportunity to be reported about the results, the parent/guardian was asked whether he/she was interested in the results. If this was the case, the e-mail address was written down to be able to send a report via e-mail.

## *Design*

Questionnaires and behavioral observations were used in this descriptive research.

Questionnaires were used for repeatedly measuring stress, positive mood and illness experience of a child, before the visit of the hospital clowns (t0), directly after the visit (t1) and a day after the visit (t2). Observations were made out of filmed footage, to see to what extent the children were involved in the visit.

## *Measures*

### *Questionnaires*

The Child Questionnaire was used to measure mood/stress and illness experience by the child. The questionnaire measures stress, by asking for emotions like tension, anxiety, anger and depression, as well as positive mood by asking for happiness. A 5-point scale was used, which ranged from e.g. not at all, not, average, much to very much. The scales were illustrated by smileys, which can be useful for young children to differentiate between the gradations of emotions. At both scales there was some free space left to ask for additional qualitative information about possible things that may have influenced the current mood. De questionnaires were administered at t0, t1 and t2.

At t1 some additional questions were added, about the opinion of the child about the clowns visit. At t2 there were also additional questions about the opinion of the child on the play, along with a question about what the child remembered about the visit and if the child remembered that there was a colored card hanging on the camera. If the child had seen and remembered the card the child was asked about its color. The reason of the last question was to see if the clowns distracted the child enough and that the cameras were not distracting.

Another question that was not asked in the WKZ but was added for the research in the VUmc at t1, was a question about the appreciation of the visit. A 3-point scale was used which ranged from not nice, nice, to very nice. This question was added to be able to investigate the magical room (Linge, 2008).

The Parent/Guardian Questionnaire contained the same questions about stress, positive mood and illness experience with smileys as the Child Questionnaire and was administered at t0 and t1. At t1 there was an additional question about what kind of impact the parent/guardian thought the hospital clowns had on their child.

The Hospital Clown Questionnaires also contained the same questions about stress, positive mood and illness experience, but they were only administered at t1. Additional were questions about the responses the clowns had seen with the child, what they thought their impact was on the child en what kind of play techniques they had been using. There was also a question added that concerns the magical room, but this question was added later so it has only been examined in the VUmc. The question was about how satisfied they were with their visit. A 7-point scale was used, ranging from not at all satisfied to very satisfied.

Because the constructs mood/stress and illness experience have been measured in three different groups (the children, the parent/guardian and the hospital clowns), and additional, qualitative information is collected, there is triangulation. This method enables the comparison of information stemming from different sources, thus increasing reliability and validity (Patton, 1999).

#### *Behavioral observations*

Besides the questionnaires, behavioral observations have also been made. The observations were made using film footage that has been recorded during the interaction between the child and the hospital clowns. Positive involvement was observed, by looking at pleasure and involvement. Pleasure involved smiling, grinning and vocal laughter. Passive and active watching, as well as bodily movement were part of involvement. How the behavior was observed can be seen in table 1.

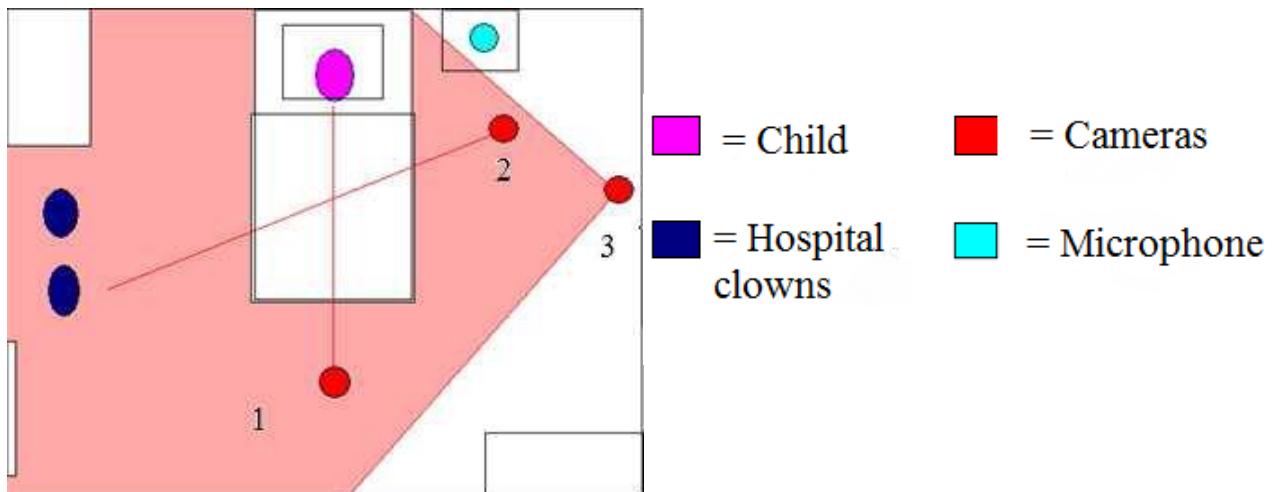
Table 1.  
*Constructs, behaviors and measurements observations*

Construct	Behavior	Measurement
Pleasure	Laughing	- Smiling (mouth closed) - Grinning (mouth open/teeth can be seen) - Vocal laughter
Involvement	Passive watching	- Looking at the clowns
	Active watching	- Looking at the clowns and talking
	Bodily movement	- Movement in the direction of the play

The footage was provided by a professional cameraman. He installed the cameras in a way, focusing one camera at the face of the child, to record the fine and gross body movements. The second camera was aimed at the hospital clowns to film the play of the clowns. The third camera was an overview camera which captured the whole play and room. For the camera setup see figure 1.

After the recordings the footage has been edited by employees of the Cliniclowns Foundation. The recordings of the three cameras have been integrated into a triptych that shows the child, the clowns and the overview in a synchronized fashion.

The triptychs have been observed by two researchers to increase the reliability of the observations by inter-observer reliability (Goodwin, 2008). When there were differences between the observations of the researchers, the footage was watched together and discussed.



*Figure 1.* Camera setup

#### *Clown interventions*

Besides the behaviors the child showed during the visit, the researchers also looked at the type of interventions the hospital clowns used during their visit to see which type of intervention affects the child the most. The types of interventions that were looked at where fantasy stimulation, empowerment, giving an active role to the child and making a joke (Pot, 2011; Reijnen, 2011; Van Rij, 2011).

Fantasy stimulation: When the clowns let the child imagine something that does not exist or was unrealistic. For example the clowns pretend that the kid's toy lives and talks.

Empowerment: The status of the child is increased because the clowns decrease their own status. The clowns pretend to not know anything about something, so the child can for

example explain everything about his or her hobby or can show how to do things.

Giving the child an active role: The child is being challenged to participate actively in the play. For example the clown asks a child to help to make his hair look decent again.

Making a joke: The clown makes a (word) joke. For example the clown makes jokes with the people that work in the hospital.

#### *Procedure*

Three days before the investigation day the researchers consulted the ward leaders of the children's wards which children in the right age group would be able to participate in the research. Children and their parent/guardian were approached based on this selection. The researchers introduced themselves and gave short information about the research, leaving an information package, consisting of an information letter, the informed consents for the parent/guardian and the child and a folder explaining medical scientific research.

At the day of the actual investigation the researchers approached the children and their parent/guardian again to ask if there were questions about the research and if they were willing to participate. When they decided to participate the parent/guardian was asked to fill in the informed consent forms.

Subsequently the cameraman installed the cameras and microphone in the child's room and the researchers administered the t0 part of the Child and Parent/Guardian Questionnaires to the child and the parent/guardian. The cameras and microphone were installed a while before the visit of the hospital clowns, so the child could get used to the cameras in his or her room. After installing the cameras the cameraman left the room so he would not distract the child during the hospital clowns visit.

When the cameraman had left the room, the researchers then told the hospital clowns, who were mostly playing for other children in the ward that did not fit into the age group, that they could visit the child when they were ready.

After the visit the cameraman removed the cameras and microphone from the child's room. A researcher administered the informed consent forms to the hospital clowns and the Hospital Clown Questionnaires. The other researcher administered the t1 part of the Child and Parent/Guardian Questionnaires to the child and parent/guardian.

The day after the clownsvisit, one of the researchers administered the t2 part of the Child Questionnaire to the child. After that, the child and parent/guardian were thanked for

their participation on the research. The parent/guardian was asked if he or she would like to be informed about the results of the research, and if that was the case the e-mail address was noted to send the results when the research was finished.

#### *Datamodification & data-analysis*

The Statistical Package for the Social Sciences (SPSS Inc., Chicago, VS) version 16.0 for Windows was used to analyze the data. Before putting the data of the behavioral observations into SPSS, percentages were calculated. The percentages were calculated by dividing the total number of seconds a child showed a certain kind of behavior (see table 1) by the total time of the recording, times 100. This number was entered into SPSS.

To measure reliability of the stress scale Cronbach's alpha was calculated at t0 for the child and the parent, and at t1 for the clowns. Cross-validation, measured with Pearson and Spearman correlations, was also used to measure reliability and validity.

For the Parent Questionnaire a paired sample T-test was used to measure differences in stress scale. A Wilcoxon test was used to measure differences in positive mood and illness experience.

For the stress scale of the Child Questionnaire a repeated measures Anova was used, with a Bonferroni as post-hoc test. A Wilcoxon test was used to measure differences in positive mood and illness experience.

For the question about the magical room that was added in this research, a Spearman correlation was used. For the correlations between the interventions and the Child Questionnaire, Parent Questionnaire and observations, Spearman rank correlations were used.

## Results

### *Reliability and validity*

The stress scale filled in by the children showed a questionable to acceptable reliability (Field, 2009), Cronbach's  $\alpha = .65$ , but because of the few items involved it is probably more acceptable than questionable (Field, 2009). The stress scale filled in by the parents also showed acceptable reliability, Cronbach's  $\alpha = .70$ , whereas the stress scale filled in by the hospital clowns showed an high reliability, Cronbach's  $\alpha = .92$ .

Cross-validation analyses on the stress scale showed that the Child Questionnaire correlated with the Parent Questionnaire,  $r = .47, p < .05$ . However, it did not correlate with the Hospital Clown Questionnaires  $r = .23, p = .25$ . The Parent and Hospital Clown Questionnaires did not correlate either,  $r = .23, p = .30$ .

Positive mood on the Child Questionnaire and Parent Questionnaire did not correlate,  $r_s = .05, p = .80$ . Neither did it correlate between the Child and Hospital Clown Questionnaires,  $r_s = .26, p = .16$ , and between the Parent and Hospital Clown Questionnaires,  $r_s = .12, p = .55$ .

Illness experience on the Child Questionnaire and Parent Questionnaire did not correlate,  $r_s = .35, p = .08$ . It did show a correlation between the Child and Hospital Clown Questionnaires,  $r_s = .58, p < .05$ . The Parent and Hospital Clown Questionnaires did not correlate,  $r_s = .29, p = .19$ .

### *Stress, positive mood and illness experience*

Stress measured by the Parent's Questionnaire decreased between t0 and t1 (see figure 2),  $t(25) = 6.82, p < 0.001$ . A similar pattern could be established for the Child Questionnaire (see figure 3),  $F(2, 60) = 9.00, p < 0.001$ . Post-hoc tests showed that stress decreased between t0 and t1, but not between t1 and t2, nor did it increase between t0 and t2.

Positive mood showed an increase between t0 and t1 on the Parent Questionnaire,  $z = -3.12, p < .05$ . A similar result between t0 and t1 was obtained from the Child Questionnaire,  $z = -2.84, p < .05$ . Also, positive mood decreased between t1 and t2,  $z = -2.25, p < .05$ . There was no increase in positive mood between t0 and t2,  $z = -.56, p = .57$ .

Illness experience decreased between t0 and t1 on the Parent Questionnaire,  $z = -2.49$ ,  $p < .05$ . The Child Questionnaire showed a similar pattern with between t0 and t1,  $z = -3.10$ ,  $p < .05$ . It did not increase between t1 and t2,  $z = -1.38$ ,  $p = .17$ , nor did it decrease between t0 and t2,  $z = -1.39$ ,  $p = .16$ .

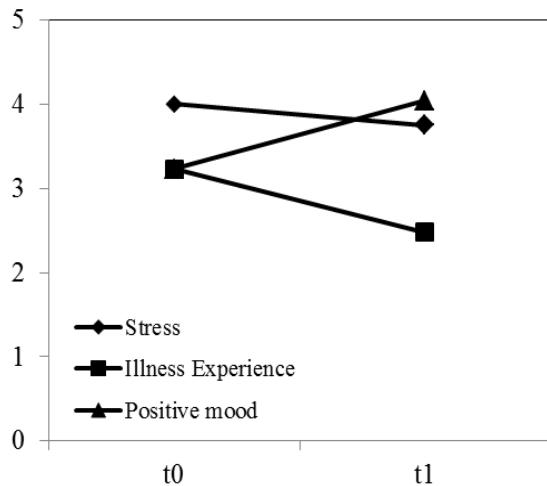


Figure 2. Parent Questionnaire averages at t0 and t1

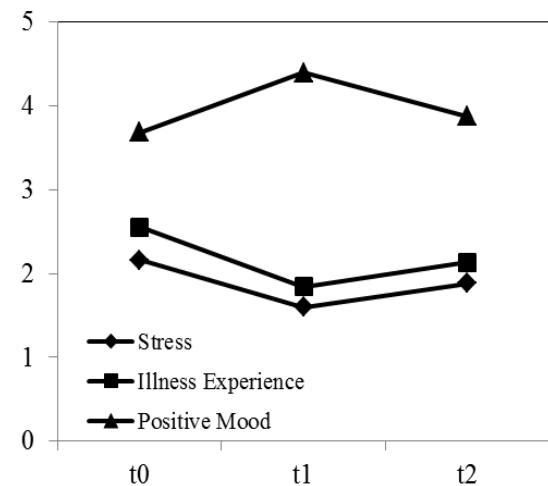


Figure 3. Child Questionnaire averages at t0, t1 and t2

### *Magical room*

Magical room was calculated by correlating the question on appreciation of the visit on the Child's Questionnaire and the satisfaction about the visit on the Hospital Clown Questionnaires. The correlation was not significant,  $r = -.03$ ,  $p = .92$ . Further, correlations between satisfaction of the clowns and behavior, stress, positive mood and illness experience have been calculated (see table 2). This was also done for appreciation of the child (see table 3).

Table 2.

### *Correlations between clown's satisfaction of the visit and stress, positive mood, illness and behavior*

	Stress	Positive mood	Illness experience	Smiling	Grinning	Vocal laughter	Passive watching	Active watching	Bodily movement
Clown's satisfaction of the visit	.06	-.16	-.18	-.08	.09	-.04	.26	.27	-.24

*Note.* Stress, positive mood and illness experience are  $\Delta t1-t0$

15

\*  $p < .05$

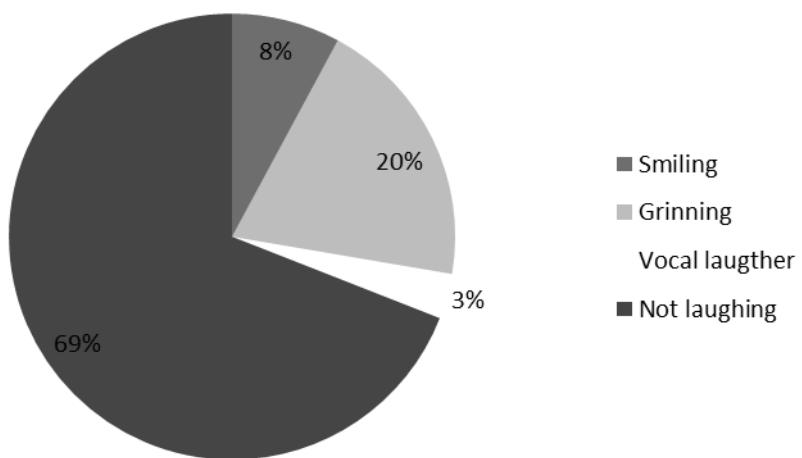
Table 3.

*Correlations between child's appreciation of the visit and stress, positive mood, illness and behavior*

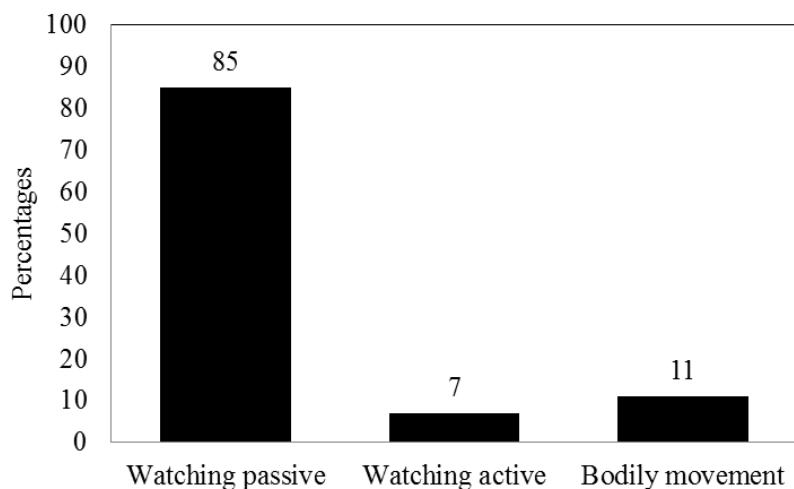
	Stress	Positive mood	Illness experience	Smiling	Grinning	Vocal laughter	Passive watching	Active watching	Bodily movement
Child's appreciation of the visit	.27	.39	-.15	-.42	-.18	-.23	-.13	.03	-.13

*Note.* Stress, positive mood and illness experience are  $\Delta t1-t0$ \*  $p < .05$ *Behavior*

Positive involvement during the visit was measured by observing pleasure and involvement. Pleasure was observed by measuring which amount of time the child was smiling, grinning and expressing vocal laughter. The percentages are presented in figure 4. Grinning was the most common type of laughing. On average the children were laughing 30.95 % of the time.

*Figure 4.* Mean percentages of smiling, grinning, vocal laughter and not laughing.

Involvement was also observed, by measuring what amount of time the child was looking at the clowns (passive watching), looking at the clowns and talking (active watching), and moving in the direction of the play (bodily movement). The percentages are presented in figure 5.



*Figure 5.* Mean percentages of passive watching, active watching and bodily movement.

In addition, correlations between behavior and stress, positive mood and illness experience were calculated, the results can be found in table 4.

Table 4.

*Correlations between behavior and stress, positive mood and illness experience\*\**

	Smiling	Grinning	Vocal laughter	Passive watching	Active Watching	Bodily movement
Stress	.03	-.04	.08	-.20	.01	-.12
Positive mood	-.39*	.04	.08	.15	-.31	-.33
Illness experience	.40*	.11	-.14	-.05	.17	.32

*Note.* Stress, positive mood and illness experience are  $\Delta t1-t0$

\*  $p < .05$

The table shows that smiling correlated with a smaller increase in positive mood. Smiling also correlated with a smaller decrease in illness experience. No other correlations were found.

### *Interventions*

The four types of interventions that were looked at for their effect on the observed behaviors, stress, positive mood and illness experience were: fantasy stimulation, empowerment, giving an active role to the child and joking. The correlations can be found in table 5.

Table 5.

*Correlations between the interventions and behavior, stress, positive mood and illness experience*

	Fantasy stimulation	Empowerment	Giving an active role to the child	Making a joke
<b><u>Child Questionnaire</u></b>				
Stress	.05	.12	-.56*	.15
Positive mood	.51*	-.62*	-.09	-.30
Illness experience	-.03	.12	-.51*	.17
<b><u>Parent Questionnaire</u></b>				
Stress	-.20	.04	-.56*	.51*
Positive mood	-.10	.14	.17	-.08
Illness experience	-.26	.11	-.16	.16
<b><u>Observations</u></b>				
Smiling	.12	.17	.23	.17
Grinning	.00	-.12	.18	.13
Vocal laughter	.12	.05	.16	.19
Passive watching	.41	-.44	-.11	.02
Active watching	-.14	.65*	.31	-.41
Bodily movement	-.07	.55*	.26	-.05

*Note.* Stress, positive mood and illness experience are  $\Delta t1-t0$

\*  $p < .05$

More fantasy stimulation correlated with a bigger increase in positive mood on the Child Questionnaire, while joking more correlated with a smaller decrease in stress on the Parent Questionnaire. Giving an active role to the child more often correlated both on the Child Questionnaire and on the Parent Questionnaire with a larger decrease in stress. Giving an active role to the child also correlated with a larger decrease in illness experience on the Child Questionnaire.

More empowerment correlated with a smaller increase in positive mood on the Child Questionnaire. More empowerment also correlated with more active watching and more bodily movement. No other correlations were found.

## **Discussion**

Hospital clowns have been doing their work in The Netherlands for years now, but the effect of their work has never been investigated scientifically before. Besides the fact that the effect is not known, there are no good (Dutch) questionnaires or other scientific measures available to investigate their work. This study tried to develop such measures and tested them. The developed measures showed an acceptable to high reliability and triangulation showed mixed results. The data was also examined exploratively to look for possible effects of the hospital clowns visits on hospitalized children. It was expected that the visits of the hospital clowns would have a positive effect on the children, and the results were consistent with this expectation.

Developing measures to be able to examine the effects of the work of the hospital clowns was the first aim of the study. The stress scale of the Child Questionnaire showed a questionable to acceptable reliability (Field, 2009). The stress scale of the Parent Questionnaire showed an acceptable reliability and the stress scale of the Hospital Clown Questionnaires showed a high reliability. Triangulation showed mixed results; the stress scale correlated between the Child and Parent Questionnaire, however, positive mood and illness experience did not. The Child and Hospital Clown Questionnaires only showed a correlation for illness experience, and the Parent and Hospital Clown questionnaires did not show any correlation at all. The questionnaires and observations were also correlated. Only smiling was correlated with a smaller increase in positive mood and a smaller decrease in illness experience.

The second aim of the study was to examine the data exploratively to draw careful conclusions about the effects of the hospital clowns visits. Expected was that the visit would lead to a decrease in stress and illness experience and an increase in positive mood. The results confirmed this hypotheses. The magical room (Linge, 2008) was also investigated in this research. Expected was that high satisfaction of the hospital clowns about their visit would correlate with a high appreciation of the visit by the child, however, this was not the case. Nor were there correlations between the questions about the magical room and stress, positive mood, illness experience and the observed behaviors.

Observations were made to examine positive involvement, by observing pleasure and involvement. The results showed that the children were quite involved; they were watching

the clowns actively or passively during almost the entire visit. There was also some movement in the direction of the play and the children also showed pleasure by laughing approximately one third of the visit.

Finally the interventions were investigated. Fantasy stimulation was related to a larger increase in positive mood and making a joke with a smaller decrease in stress. Giving an active role coincided with a larger decrease in stress and a larger decrease in illness experience. Further, empowerment was related to a smaller increase in positive mood, more active watching and more bodily movement.

The reliability of the Child Questionnaire was questionable to acceptable. According to Field (2009) however, reliability with a few items is often low, and it increases when you add items. This might explain why the reliability of the Child Questionnaire was questionable to acceptable. Also the small sample size may have led to the reliability not being higher. Another explanation could be that children in the age of the participants are still developing emotional understanding (Berk, 2009), so especially the youngest children might have had difficulties in reporting how they were feeling. Those two explanations would also explain why the reliability of the stress scale of the Parent Questionnaire was higher. Parents may be better at estimating how their (young) children are feeling, which makes the reliability of their mood ratings higher, but it might still not very high because of the few items. The Hospital Clown Questionnaires' reliability was high, but this is probably a result of methodological problems; reliability was difficult to measure because the scores of the five participating clowns had been averaged. Besides, the clowns may have consulted each other while filling in the questionnaires.

When looking at triangulation, mixed results were found. The reason that the Child and Parent Questionnaires did not correlate much with the Hospital Clowns Questionnaire could be that the hospital clowns only had a snapshot of the child, because they only saw the child for 5 till 15 minutes during their visit. The reason for the differences between the Child and Parent Questionnaire could be that especially the youngest children may have had a problem with reporting their emotions (Berk, 2009) while their parents may have been more accurate. Also, the stress scale, which consisted of more items, showed a correlation, while positive mood and illness experience, which consisted of just one item, did not. Maybe positive mood and illness experience would also have correlated if they existed of more than

one item. Although the Hospital Clown Questionnaire may need some additional research and triangulation showed limitations, overall the questionnaires had an acceptable reliability.

Furthermore, the data was also examined exploratively to look for possible effects of the hospital clown visits on hospitalized children, and the results seem to be consistent with previous research. An increase in positive mood as the result of a visit of hospital clowns was also shown in Koller and Gryska (2004, in Koller & Gryska, 2008). Slater et al. (1998, in Koller & Gryska, 2008) and Vagnoli et al. (2005) both showed a decrease in stress, as did the current study. Bertini et al. (2011) showed a decrease in experienced pain, which is to some extent comparable with the decrease in illness experience found in this study. Although the methods in the studies are somewhat different, the results are comparable to the results found in the current study, and it indicates that the work of the hospital clowns may have positive effects on hospitalized children. Evidence for the magical room (Linge, 2008), however, was not found in this study. Possibly the conceptualizations that were made in this research were not correct. Also, although most interventions, if any, showed positive effects, some interventions showed negative effects. What the reason for this is stays unclear, more research is needed to see if these findings were a coincident, or real effects.

Several limitations need to be acknowledged. Firstly, the study had a small sample size and a skewed gender distribution. The distribution in age improved compared to the results of the WKZ alone, but the distribution was still skewed. Further, to reduce noise it was preferable to film children that were alone in a room, and most of the time the study succeeded in this. Although it reduces noise, it might not be the best option, because in a normal situation in most hospitals children share rooms what might lead to a different effect of the visit.

The observations also showed limitations. The hospital clowns reported several times that the cameras were bothering them to some extent; they kept the clowns from moving freely around the room since they had to stay in front of the camera, and the cameras were also distracting them from their play. The researchers experienced difficulties while observing the footage: sometimes a clown, child or parent was in front of the cameras which made it hard to observe the child's expressions. It was also difficult to see when a child stopped grinning or smiling. Considering interventions the concepts could have been defined more detailed to make better observations. More research is needed to see if the findings are a coincident, or if they are real.

Future research could focus on further examining and improving reliability and validity of the measures. Future studies should include more participants and a control group. This is also needed to be able to draw firm conclusions out of the measures. The Child and Parent Questionnaire should be administered more than one day after the visit, to see how long it takes for stress, positive mood and illness experience to regress to baseline. Physiological measures like in the study by Bertini et al. (2011) could be included to measure the effects more objectively. Eventually, research could be done between different countries, to see if the hospital clowns have a different effect with different working methods or different costumes (clown clothes/doctor clothes). Also more specific measures could be used to measure the magical room (Linge, 2008), or maybe observations to see if there is for example synchronization (Stern, 2005, in Linge, 2008).

Altogether, despite the limitations, the conclusion seems to be that the questionnaires and observations are acceptable research instrument to continue doing research to the effects of the work of the hospital clowns. The results of their work that have been found here should be taken with caution because of the limitations, but it seems that the work of the hospital clowns leads to an overall improvement of positive mood and a decrease in stress and illness experience. Also the children were positively involved in the visits. This can have important implications, since previous research (Rozanski & Kubzansky, 2005, in Hendon & Bohon, 2007; Frederickson & Levenson, 1998; Lamers et al., 2011) showed that the changes in stress and positive mood may lead to a faster recovery process and a better prognosis and survival rate. No evidence was found for the magical room hypothesis, but this might have been the case because of wrong conceptualizations, so more research on this needs to be done, as well as on some interventions.

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