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Hospital Designs for Patients of Different Ages: Preferences of Hospitalized Adolescents, Nonhospitalized Adolescents, Parents and Clinical Staff

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Abstract

The design of hospitals should consider the needs and preferences of the patients, but the preferences of adolescents have received little attention. This investigation analyzed adolescents' preferences for diverse hospital designs and compared them to those of the adults in charge of their care. Participants were 345 adolescents —88 of them hospitalized— 76 parents, and 46 health professionals. They all assessed three pairs of photographs of different hospital settings. Quantitative analyses were performed of the choices, and qualitative analyses of their justifications. The results indicated high agreement among the groups about which atmosphere was preferable for children and for adults, and also—with nuances—about the suitability of the nonchild-like atmosphere for adolescents. No important differences were found between hospitalized and nonhospitalized adolescents' responses. The qualitative analyses revealed significant differences between the adolescents' and the adults' response models in their ratings of the hospital setting design. The adolescents' perspective seemed more sensitive than that of the adults towards symbolic aspects and the needs, experiences, and emotions of hospital users. Our work reveals the need to consider adolescents' perspective of hospital design, which cannot be substituted by that of their parents or of the clinical staff.

Keywords: *hospital design, patients' preferences, hospitalized adolescents, health care architecture*

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The development of models of patient-focused care is considered an important change in the area of health care in recent years (Schattner, Bronstein, & Jellin, 2006). These models are defined as respectful and aware of patients' preferences, needs, and individual values and they require efforts to improve sensitivity towards the needs and experiences of people with regard to their health care (Britto et al., 2007; Grol et al., 2000). An essential point for the development of these models is the incorporation of the patients' perspective in the planning, organization, and implementation of health care systems (Boswell, Finlay, Jones, & Hill, 2000; Christenson et al., 2010; Coad & Coad, 2008; Moules, 2009; Wensing & Elwyn, 2002).

The design of hospital settings is an aspect in which the patients' needs and preferences play an important role in the quality of health care (Lawson, 2010). The topic has received considerable attention from investigators, especially concerning the preferences and needs of adult patients (Devlin & Arneill, 2003; Dijkstra, Pieterse, & Pruyn, 2006) and, to a lesser degree, of pediatric patients (Boswell et al., 2000; Eisen, Ulrich, Shepley, Varni, & Sherman, 2008; Rollins, 2009). Adolescents, however, have barely been consulted as consumers of health services (Jedeloo, Staa, Latour, & Exel, 2010). But the life expectancy of children with severe diseases has improved significantly, and the increase in the longevity of children with chronic diseases has led to an increase in the number of adolescents who suffer from such diseases and, consequently, an increase in the demand of hospital services for this sector of the population (Alderman, Rieder, & Cohen, 2003). Despite this, adolescents represent a

very small proportion of the total number of hospitalized patients and they are under-represented in the research on the quality of these services (Blumberg & Devlin, 2006; Jedeloo et al., 2010). Some studies conclude that the first step to improve adolescents' health-care experience is to ask them about their preferences (Britto et al., 2007).

From a developmental perspective, adolescence is considered the period of transition from childhood to adulthood, involving important biological, psychological, and social changes that should be taken into account when providing health services to this population group (Hidalgo, González, & Montón, 2006). The experience of hospitalization has special characteristics for adolescents (Gusella, Ward, & Butler, 1998). In hospital, adolescents depend very much on the adults, they must endure frequent tests, they are sometimes asked embarrassing questions about their bodies, and their relationships with their friends and families are quite restricted (Miller, Friedman, & Coupey, 1998). However, neither the experience of hospitalization nor all its diverse aspects are always negative for adolescents. Some adolescents' positive opinions about their hospitalization have been documented, mentioning the amiability of the health staff, the care they received, and having learned from the experience, or having been able to make new friends (Denholm, 1988; Stevens, 1988; Ullán, Serrano, Badía, & Delgado, 2010).

Despite the low representation of adolescents in studies of health care quality, there are some works that address these patients' preferences in diverse aspects of health care (Britto et al., 2007; Farrant & Watson, 2004; Jedeloo et al., 2010; Joffe, Radius, & Gall, 1998; Ullán, Belver, Serrano, Delgado, & Badía, 2010; Zimmer-Gembeck, Alexander, & Nystrom, 1997). Two recent works have dealt with the concrete topic of adolescents' preferences in various aspects of the environmental design of hospitals. Coad and Coad (2008) explored young people and children's

preferences in color and thematic design for a new children's hospital unit. The participants in this study expressed very clear color preferences. It was expected that the children and young people might chose the brighter colors on the color selection and thematic charts offered but, without any prompts at interviews and questionnaires, they chose the mid and paler range of colors, with blue-green colors being the most popular. Blumberg and Devlin (2006) carried out a qualitative study to examine the preferences of 100 junior high school students ranging in age from 12 and 14 years with regard to the physical design of the hospital. The participants compared and appraised color photos of hallways and lobbies for units with adult-oriented decoration versus child-oriented decoration. Responses were analyzed to explore adolescents' criteria for hospital design. The results of this study revealed that the adolescents preferred colors associated with photographs of children's designs but they rejected the emblems of childhood such as teddy bears or balloons. The adolescents who participated in this investigation were not hospitalized and only 30% of them said they had spent a night in hospital.

The investigation presented below addressed two questions. Does being hospitalized or not affect young people's preferences for certain types of hospital design? In the above-mentioned work (Blumberg & Devlin, 2006), the authors proposed to verify whether the adolescents' view of the hospital differed as a function of their previous hospitalization experiences. For this purpose, they compared the responses of the adolescents who participated in their investigation who reported having been hospitalized overnight and those reporting no overnight hospitalization experience. The authors concluded that the two groups gave very similar responses. Out of the more than 100 possible comparisons, only 7 were significant at the $p < .05$ level. Five of the seven initially significant contrasts dealt with the color photo comparison task; the

remaining two contrasts involved the kinds of spaces outside the hospital room judged important to the adolescent. The authors, however, suggested that future studies consider the need to focus specifically on participants who have had overnight and more extended stays as adolescents.

Second, are the hospital design preferences of adolescents similar to those of the adults in charge of their care? Adults usually make the decisions about most of aspects of hospital designs. With regard to diverse aspects of health and quality of life, the coincidences or discrepancies between the adults' preferences and appraisals and those of the young people, especially children, are analyzed (Farrant & Watson, 2004; Jozefiak, Larsson, Wichstrom, Mattejat, & Ravens-Sieberer, 2008; Marino et al., 2009; Waters, Stewart-Brown, & Fitzpatrick, 2003). We also test the differences between the perspectives of the youngsters and the adults when rating their preferences in diverse aspects of health care (Britto et al., 2007), hospital services in general (Ullán et al., 2010), their satisfaction, and the use of some specific hospital space such as a garden (Whitehouse et al., 2001).

The goal of the present work was to compare the viewpoint of hospitalized and nonhospitalized adolescents of the atmosphere of diverse hospital areas that they considered preferable for patients of different ages (children, adults, adolescents) and for themselves. We also wished to determine why they considered some settings preferable for the different types of patients and for themselves, and what they valued as the best and the worst aspect of each one of the settings judged. Likewise, we wished to compare the adolescents' responses to the above-mentioned questions with those of two groups of adults, a group of parents of hospitalized patients and a group of clinical staff.

Method

Participants

Two groups of adolescents and two groups of adults participated in this study. The first group of adolescents was made up of patients between 14 and 17 years of age who were hospitalized in the University Hospital of Salamanca (Spain). Inclusion criteria for this group were being a patient between 14 and 17 years of age who was admitted in that hospital between the months of April and September of 2009 in any unit except for Psychiatry and Gynecology. We excluded the patients from these units because we considered that, due to the specific pathologies attended in them, these patients' problems were quite different from those of the adolescents hospitalized in other units. Of them, 126 patients met the criteria to be considered eligible, and 88 (70% of the eligible) agreed to participate (41 girls and 47 boys). Of them, 14 (16%) were hospitalized in a Pediatric unit and 74 (84%) in adult units. They all signed an informed consent form before participation. A preliminary analysis showed that illness severity was not related to preferences, although these children were not gravely ill. The second group of adolescents was an incidental sample comprising 257 students (132 girls and 125 boys) from two secondary education institutes whose teachers agreed to collaborate in the investigation. The students participated voluntarily. In the group of nonhospitalized adolescents, 118 (46%) reported having been hospitalized at some time, and 239 (93%) said they had visited someone at the hospital at some time. There were no significant sex differences in any of these aspects.

The first group of adults was made up of 76 adults who accompanied the patients who met the above-mentioned inclusion criteria. Of these 76 adults, 42 (55%) were the mothers of hospitalized patients, 23 (30%) were fathers, and 11 (15%) were relatives or legal representatives of the minors. The second group of adults comprised

46 health professionals from the services of the above-mentioned hospital where adolescent patients were cared for and who agreed to complete the questionnaire they received from the nursing supervision of their corresponding unit. Of the 46 health professionals who participated, 31 (67%) reported having more than 10 of years experience at their job, and 11 (24%) reported having a lot of experience working with adolescents in the hospital.

Materials and Procedure

The participants were asked to perform a photographic comparison task similar to that used by Blumberg and Devlin (2006). Each participant was presented with 3 pairs of color photographs, all unretouched photographs of pediatric areas taken in different hospitals. The photographs were selected based on the data of photographs that the research team had elaborated in a previous field work of children's hospitalization (Ullán & Belver, 2005) and to do so, we followed the criterion of seeking photographs of admittance rooms, surgeries, and hallways of pediatric hospital areas. Each pair of photographs should correspond to two different atmospheres, one typically child-like and the other that could correspond to an adult atmosphere (despite the fact that all the photographs were of pediatric areas). The three pairs of photographs we used can be seen in black and white in Figure 1, and in color in the on-line appendix. The perspective of each pair of photographs used was as similar as possible, and the elements included in them (furniture, equipment, etc.) were equivalent. As the hospital settings photographed were real, they are not completely comparable in all their elements (windows, people who appear in the photograph, etc.).

The three pairs of approximately 10 x 15 cm. photographs were printed in color on 21 x 30-cm pieces of paper and presented to the participants with accompanying closed-ended questions. These included: which photographed facilities (A or B) they

thought was preferable for: a) children, b) adult patients, c) adolescents, and d) themselves (if they were adolescents) or for their own adolescent children (for the group of parents of hospitalized adolescents). In each case, they were also asked an open question about the reasons for their choice. The participants were also requested to indicate three positive and three negative aspects of each photograph. In the case of the photographs of hallways, (second pair), they only indicated the positive and negative aspects for each photograph.

A descriptive analysis was conducted of the responses to the closed questions in each one of the four groups of participants, and for the open questions, an analysis of the thematic contents of the participants' responses was performed. The categories and subcategories were established inductively, and we subsequently elaborated a thematic map of topics and dimensions to organize and analyze the categories from a bidimensional model described below.

Results

Which Room is Considered Preferable?

The results showed a high degree of agreement in the choice of the preferred room for children and for adult patients (see Table 1). Predominantly, Room B was indicated as preferable for children, and Room A for adults. The degree of agreement was lower when the participants had to choose which facilities shown in the photographs they considered preferable for adolescents. Likewise, agreement was lower in the question about which facilities they considered preferable for themselves (if they were adolescent children) or for their own adolescent children (in the group of parents of adolescent patients). In both cases, although the predominant response was to choose the same room as the one that had been chosen as preferable for adult patients (Room A), a significant percentage of people chose Room B as preferable for adolescents. We

also observed that the percentage of people who chose Room B for adolescents was higher in the groups of hospitalized adolescents and parents of hospitalized adolescents than in the group of nonhospitalized adolescents and the clinical staff. This effect was also observed when the question referred to room preferences for themselves or for their own adolescent children.

What Makes a Room Preferable?

A thematic analysis was conducted on the participants' responses to the open questions about why they considered the chosen room preferable for children, for adults, for adolescents, or for themselves. The participants' responses were coded in diverse categories or nodes, using for this purpose the qualitative analysis program NVivo version 8. With the series of categories into which the participants' responses were coded, we elaborated a thematic map that allows us to synthesize the more general topics and dimensions used by the participants as a reason to justify each choice. The following topics were defined: a) physical aspects of the photographed settings, in which are included participants' responses referring to things like the amount of light in the room, cleanliness, spaciousness, outdoor views, etc.; b) symbolic aspects of the settings, which grouped the participants' responses referring to the color of the rooms, the decoration in general, or some of its elements; c) needs, preferences, experiences, and behaviors of the users of the hospital settings; d) emotional processes related to the hospital setting, such as fear, anxiety, or the reduction of these emotions, relaxation, or happiness; and e) cognitions related to the hospital setting, such as familiarity or aesthetic judgment. In the first phase, each node or category into which the participants' responses had been encoded was linked to at least one topic, eight nodes were linked to two topics, and two nodes were linked to three topics. In a second phase of the qualitative analysis, we used a bi-dimensional place-person model as a heuristic to

arrange and systematize the topics. In order to articulate the final thematic map, we considered two dimensions: the person, in reference to the users of the hospital settings—in this case, patients—and the place, in reference to the physical or symbolic characteristics of the hospital settings appraised. Each one of the topics with which the nodes or categories had been associated in the previous phase was linked to one of the dimensions of the model. Figure 2 shows the final thematic map. This thematic map was used to organize the analysis of the participants' responses to the four open questions about why they considered the room they chose to be preferable for children, for adults, for adolescents, and for themselves (or their own adolescent children). We observed that the frequency with which the participants mentioned aspects that were coded in different nodes, topics, and dimensions differed as a function of the groups and depending on their judgments of preferable facilities for different patients. Table 2 shows the coding references for each topic and dimension in each one of the groups of participants.

We also compared the differences between the percentages of coding references in the dimensions place and person. As shown in Table 3, these differences were nonsignificant in both of the two groups of adolescents, except when the nonhospitalized adolescents had to justify why they preferred the room they chose for themselves. In the adults' responses, in contrast, the percentage of coding references in the dimension place was higher than the proportion of references in the dimension person in all the questions.

Considering the series of references grouped into the dimension place, the distribution of these references is different depending on whether they involve the physical or the symbolic characteristics of the space. Table 4 shows that, when considering the participants' justifications for their choice of preferable room for

children, in all cases, except for the group of parents, the percentages of coding references to symbolic aspects were significantly higher than the percentages of coding references to physical aspects. The same cannot be said for the justification of the suitability of the room chosen for adults. In this case, the physical aspects were significantly more important than the symbolic aspects in all the groups, except for the group of nonhospitalized adolescents. The difference in percentages was more pronounced in the groups of adults, especially in that of the clinical staff. When the participants had to justify their choice of the preferred room for adolescents, the response pattern changed. In the case of the hospitalized adolescents, the percentages of coding references to the topics of physical and symbolic aspects were equal. In the case of the nonhospitalized adolescents, the percentage of references to symbolic aspects was significantly higher than that of references to physical aspects. When the adults justified their choice of the preferable room for adolescents, the percentage of references to symbolic aspects increased slightly, but the importance granted to physical aspects continued to be significantly higher, both in the case of the parents and of the clinical staff. When the adolescents justified their choice of preferred room for themselves, in both groups of adolescents, the percentage of coding references to the physical aspects of the setting was statistically equal to the percentage of coding references to symbolic aspects.

Which Surgery is Considered Preferable?

The responses to this question were similar to those about which room was preferred for children, for adults, for adolescent patients, and for themselves, or the parents' own children. We observed (see Table 5) a high degree of agreement between the groups in the first two questions (preferred surgery for children, B, and for adults, A). We also observed a lower degree of agreement when asked which surgery was

preferable for adolescents. Surgery A was predominantly chosen as preferable for adolescents, the same as had been chosen as preferable for adult patients, but a significant percentage of people chose B as the more preferable. Moreover, this percentage was higher in the group of parents of adolescent patients than in the rest of the groups. The same was observed when having to choose the preferred surgery for themselves, or for their own adolescent children, in the case of the parents.

What Makes a Surgery Preferable?

A thematic analysis was conducted of the participants' justifications for choosing the preferred surgery for children, adults, adolescents, for themselves, or for their own children. The responses were coded in the same nodes or categories as for the previous thematic analysis, adding a node for the topic "Emotions," which refers to whether or not the surgery was frightening, and a node for the topic "Symbolic aspects," which refers to whether or not there was a lot of medical equipment in sight. Following the system described above, we used the thematic map from Figure 2 to organize the analysis of the participants' reasons for choosing the preferred surgery for different patients.

In this case, the differences between the percentages of coding references in the dimensions place and person were nonsignificant in both groups of adolescents, and in the group of parents (see Table 3). All the participants gave the same coding references in both dimensions in the four open questions analyzed. In contrast, the difference was significant in the case of the clinical staff, which made more coding references to the dimension place than to the dimension person when justifying their choice of preferred surgery for children and for adults.

If we consider the set of coding references conjointly, grouped into the dimension place (see Table 4), in all the groups and in all the questions, the percentage

of coding references to physical aspects was lower than the percentage of coding references to symbolic aspects. These differences were always significant in the case of the adolescents. In the group of parents, the differences also reached the level of significance in all the questions, except for the justification of their choice of the surgery for adults. In the group of the clinical staff, the differences were significant only in the case of their justification for choosing the surgery for children.

What is Pleasant and Unpleasant about each Atmosphere?

With the participants' responses to the questions about what they liked and what they disliked of each one of the photographs, we conducted a thematic analysis as described above. In addition to the above-mentioned nodes, we added three new ones. The first referred to privacy of the settings, and was linked to the topics of "Needs, preferences, experiences, and behaviors" and "Emotions." In another new node were coded the responses that referred to whether or not the settings of the photographs looked like a hospital, and it was linked to the topic "Symbolic aspects." In the third new node, we coded the responses referring to the lack of TVs or computers in the hospital settings. This node was linked to the topics "Needs, preferences, experiences, and behaviors" and to "Physical aspects."

Table 6 shows the coding references for each group of responses to the question of what they liked and what they disliked about the photographs of rooms, hallways, and surgeries with a child-like (Room B, Hallway A, and Surgery B) and a nonchild-like atmosphere (Room A, Hallway B, and Surgery A). Table 6 also includes the coding references of the responses to the questions of what they disliked about the photographs with a child-like and a nonchild-like atmosphere.

In all the groups and all the blocks of questions (what they liked and disliked about the child-like and the nonchild-like atmosphere), the dimension place obtained a

significantly higher percentage of coding references than the dimension person, in all cases with $p < .01$. Regarding the two topics, physical and symbolic aspects, included in the dimension place, the two groups of adolescent participants gave the same percentage of coding references to the physical aspects (p1) and to the symbolic aspects (p2) in the question of what they liked about the child-like atmospheres, as p1 - p2 = 3 (95% CI [-3, 5], $z = 0.49$, $p = .461$) and p1 - p2 = 1 (95% CI [-5, 10], $z = 0.49$, $p = .618$), respectively, for the group of hospitalized adolescents and that of nonhospitalized adolescents. The two groups of adults, however, gave a significantly higher percentage of coding references to the topic of physical aspects than to symbolic aspects, p1 - p2=11 (95% CI = [4, 18], $z = 3.01$, $p = .003$) and p1 - p2 = 24 (95% CI = [16, 31], $z = 5.64$, $p < .001$), respectively, for the group of parents and of clinical staff. In the three remaining questions, what they liked about the nonchild-like atmosphere, what they disliked about both the child-like and nonchild-like atmospheres, the four groups gave higher percentages of coding references to the topic place than to the symbolic topic, in all cases with $p < .01$.

Discussion and Conclusions

The goal of this work was to determine and compare the viewpoints of adolescents (hospitalized and nonhospitalized) and adults (parents and clinical staff) about the atmosphere of diverse hospital settings that they considered preferable for patients of different ages, and why they considered certain atmospheres preferable.

We would like to emphasize various aspects of our results. Firstly, the degree of agreement about which atmosphere was considered preferable for children and for adult patients is noteworthy. Also notable was the high agreement in choosing the nonchild-like atmosphere as preferable for adolescents. This result is highly relevant to the design of hospital environments for adolescents, which should avoid excessively child-like

atmospheres; however, our results present important nuances in these aspects. Firstly, although the choice of the nonchild-like atmosphere was predominant, a significant percentage of participants chose the child-like atmosphere as preferable for adolescents. Moreover, it was the groups of participants who were more personally affected by hospitalization—hospitalized adolescents and parents of hospitalized adolescents—who contributed the most to this disagreement by choosing the child-like atmosphere as preferable for adolescent patients, more so than the other groups (nonhospitalized adolescents and clinical staff).

The second notable aspect of our results is the high level of coincidence in the responses of the two groups of adolescent participants. The results of our investigation reveal an important coincidence in the way that hospitalized and nonhospitalized adolescents answer the issues addressed. In other aspects of adolescents' preferences concerning the improvement of hospital services, no significant differences were observed between hospitalized and nonhospitalized adolescents, finding instead important coincidences and a high correlation between the responses of these two groups (Ullán et al., 2010). In this sense, our results coincide with those found by Park (2009) with regard to color preferences in healthy and sick children. To a certain extent, they also agree with those of other authors (Jedeloo et al., 2010) that show the value of a non-disease-specific approach when assessing preferences for health care systems among adolescents with chronic conditions, and they reveal the need to understand the diverse treatment- and health-related subjectivities of adolescents living with a chronic condition. Our work shows that being hospitalized, having had previous hospitalization experience, or the adolescents' chronic conditions do not seem to be determinant factors of their attitudes or preferences about health care systems, including general aspects of the design of hospital settings.

Lastly, a third aspect of our results that we consider especially significant concerns the comparisons of the response models observed in the adolescent and adult participants. As mentioned, the two groups of adolescents expressed an important degree of agreement, and practically the same can be said about the adults. However, when comparing the percentages of coding references in the diverse topics and dimensions of the adolescents' and adults' responses, the differences are very significant. In general, when justifying their preferences, the adults gave more coding references to physical aspects than the adolescents. In many cases, the adolescents gave proportionately more coding references to the symbolic aspects of the settings. Although to a lesser extent, there is also a tendency in the adults to assign a larger percentage of coding references to the dimension place and, in the adolescents, to give more coding references to the dimension person. Summing up, when justifying their preferences, the adolescents seem to refer more to the symbolic aspects of the settings than the adults, whereas the adults refer more to the physical characteristics of the settings. Moreover, the adolescents use more arguments referring to the users of the hospital settings (their needs, their preferences, their experiences or behaviors, and emotions) than the adults. These results reveal the different perspectives of adolescents and adults when appraising the suitability of hospital settings, just as different perspectives were observed in adults and young people in other aspects regarding health-care preferences (Britto et al., 2007). With regard to the appraisal of the design of hospital settings, the perspective of the adults—parents and clinical staff—could be described as much more focused on physical aspects and less sensitive to the symbolic aspects of the settings and to the needs, experiences, and emotions of the people who use hospital settings. The adolescents' perspective could be described as more sensitive to the symbolic aspects of the hospital settings and to the needs, experiences, and

emotions of the users of these settings. We think that this result is also relevant with a view to improving adolescents' hospitalization conditions, as it underlines the need of taking the adolescents' perspective into account also in issues that involve the design of health care settings.

The scientific advances of medicine and the social changes of the past decades have increased our awareness of the need to protect and promote the health of adolescents, considered a specific population group, that is, with particular health characteristics and needs (Alderman et al., 2003). However, the degree of adjustment of the hospital services to the needs of adolescent patients is very limited and, as mentioned, adolescents are under-represented in the research on hospitalization and health services, to the point that, one could sometimes allude to the "invisibility" of the adolescents in them (Ullán, González Celador, & Manzanera, 2010). Adolescents are treated either as children or as adults in the hospital. These two models of health care represent different care cultures and they differ in basic aspects (McDonaugh, 2006; Rosen, 1995). The best way to effect the transition from one model to the other, which must take place during adolescence, is under discussion (Bryon & Madge, 2001; Kennedy & Sawyer, 2008; Reiss & Gibson, 2002). From our work, we observe the need to take into consideration adolescents' perspective, which cannot be substituted either by the viewpoint of their parents or of the clinical staff. Adolescents may not only appraise care-related aspects differently from adults, but they are, in fact, sensitive to dimensions and nuances that adults may disregard. We think that the adolescents' perspective, more attentive than that of the adults to the symbolic aspects of hospital settings and to issues related to people's experiences with them, could enrich the analysis of these settings and contribute to the elaboration of design guidelines for hospitals. Despite the considerable advances in the field (Devlin & Arneill, 2003; Ulrich

& Zimring, 2004), whether or not there is sufficient research to formulate evidence-based guidelines for the design of health-care environments is an object of discussion (Dijkstra et al., 2006). Evidenced-based design, understood as the scientific justification that can support the importance of aspects of the physical setting for health and curing (Hamilton, 2004), requires an accepted taxonomy of the relevant dimensions (Berg, 2005). Among the dimensions to consider, the symbolic dimension space has been proposed, with reference to the interpretation and meaning that users give to health care settings and to the repercussions of such interpretations and meanings on people's well-being (Belver & Ullán, 2010). The results obtained in this work support this proposal of considering the symbolic dimension of hospital settings as a particularly relevant dimension for young people, emphasizing that a model of adolescent patient-centered care must be aware of these patients' viewpoint, also with regard to the design of hospital settings.

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Figure 1. Three pairs of photographs used in this investigation.

First pair of photographs

Room A

Room B

Second pair of photographs

Hallway A

Hallway B

Third pair of photographs

Surgery A

Surgery B

Figure 2. Second phase of elaboration of the thematic map: topics and their link with the dimensions of the model.

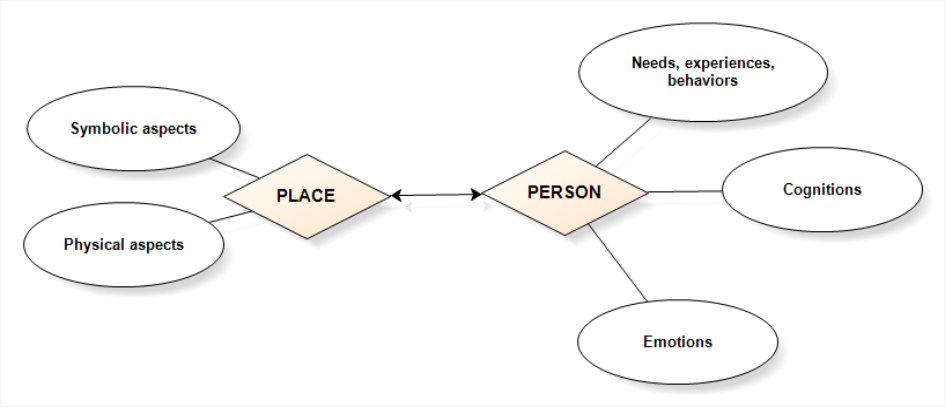

Table 1
Which Room (A or B) do they Consider Preferable for Children, for Adults, for Adolescents, or for Themselves (or for their own Children)

		Adolescents				Adults			
		Hospitalized		Nonhospitalized		Parents		Clinical Staff	
		n	(%)	*n*	(%)	*n*	%	*n*	%
For children $\chi^2(3, N = 467) = 24.3$, $p < .01$	A	7	(8.0)[b]	5	(1.9)	12	(15.8)[b]	1	(2.2)
	B	81	(92.0)	252	(98.1)[a, c]	64	(84.2)	45	(97.8
For adults $\chi^2(3, N = 460) = 3.6$, $p = .34$	A	82	(94.3)	245	(95.3)	65	(92.9)	46	(100)
	B	5	(5.7)	12	(4.7)	5	(7.1)	0	(0)
For adolescents $\chi^2(3, N = 447) = 11.3$, $p = .01$	A	62	(71.3)	213	(83.9)[c]	52	(71.2)	38	(82.6)
	B	20	(23.0)	33	(13.0)	21	(28.8)[b]	8	(17.4)
For themselves of for their own adolescent children $\chi^2(2, N = 400) = 10.1$, $p < .01$	A	62	(72.9)	212	(83.5)[c]	50	(70.4)		
	B	21	(20.2)	35	(13.8)	20	(28.6)[b]		

Note. When χ^2 was significant at the $p \leq .05$ level, paired comparisons of the proportions of the columns were conducted with a z test. The results are based on bilateral tests with a .05 level of significance. Using Bonferroni's correction, we adapted the tests for all the pairwise comparisons within a row for each subtable situated to the right.

a = this percentage is significantly different from that of the column of hospitalized adolescents of the same row; b = this percentage is significantly different from that of the column of nonhospitalized adolescents of the same row; c = this percentage is significantly different from that of the column of parents of hospitalized adolescents of the same row.

Table 2

Number and Percentage of Coding References in the Diverse Dimensions and Topics in the Participants' Justifications of their Choice of Preferred Room for Different Patients (Children, Adults, Adolescents, Themselves, their own Adolescent Children)

	Adolescents				Adults						
	Hospitalized		Nonhospitalized		Parents		Clinical staff				
	n	%	*n*	%	*n*	%	*n*	%	χ^2	*df*	*p*
For children (*N* = 494)											
Place	49	68.1	188	61.2[d]	55	77.5	36	81.8[b]	12.33	3	.006
Physical aspects	28	38.9[c]	101	32.9[c]	45	63.4[a, b]	23	52.3	25.44	3	< .001
Symbolic aspects	42	58.3	179	58.3	37	52.1[d]	34	77.3[c]	7.54	3	.056
Person	39	54.2[c]	179	58.3[c, d]	19	26.8[a, b]	13	29.5[b]	31.60	3	< .001
Needs, experiences, and behaviors	27	37.5[c]	114	37.1[c]	11	15.5[a, b]	10	22.7	15.01	3	.002
Emotions	12	16.7	59	19.2	7	9.9	2	4.5	8.58	3	.035
Cognitive processes	0	0.0	18	5.9	1	1.4	1	2.3	7.27	3	.064
Total	72		307		71		44				
For adults (*N* = 380)											
Place	31	54.4[d]	133	57.3[d]	35	67.3	32	82.1[a, b]	10.47	3	.015
Physical aspects	24	42.1[d]	85	36.6[c, d]	34	65.4[b]	30	76.9[a, b]	31.43	3	< .001
Symbolic aspects	14	24.6	75	32.3[c, d]	6	11.5[b]	3	7.7[b]	17.42	3	.001
Person	33	57.9[d]	147	63.4[c, d]	18	34.6[b]	9	23.1[a,b]	31.43	3	< .001
Needs, experiences, and behaviors	17	29.8	66	28.4[d]	8	15.4	3	7.7[b]	11.04	3	.012
Emotions	15	26.3	80	34.5	9	17.3	6	15.4	10.56	3	.014
Cognitive processes	2	3.5	24	10.3	1	1.9	2	5.1	6.55	3	.088
Total	57		232		52		39				
For adolescents (*N* = 360)											
Place	27	52.9	146	67.3	38	67.9	23	63.9	3.98	3	.264
Physical aspects	17	33.3[c]	64	29.5[c, d]	34	60.7[a, b]	20	55.6[b]	24.20	3	< .001
Symbolic aspects	15	29.4	103	47.5[c, d]	12	21.4[b]	5	13.9[b]	25.35	3	< .001
Person	34	66.7[c]	155	71.4[c, d]	22	39.3[a, b]	16	44.4[b]	25.75	3	< .001
Needs, experiences, and behaviors	18	35.3	106	48.8[c]	15	26.8[b]	13	36.1	10.93	3	.012
Emotions	16	31.4	56	25.8	10	17.9	9	25.0	2.67	3	.445
Cognitive processes	6	11.8	27	12.4	2	3.6	1	2.8	6.67	3	.099
Total	51		217		56		36				
For themselves or for their own adolescent children (*N* = 356)											
Place	35	59.3	145	58.2	34	70.8			2.68	2	.261
Physical aspects	25	42.4	82	32.9[c]	28	58.3[b]			11.63	2	.003
Symbolic aspects	17	28.8	78	31.3	13	27.1			0.42	2	.810
Person	34	57.6	170	68.3[c]	19	39.6[b]			14.91	2	.001
Needs, experiences, and behaviors	17	28.8	72	28.9	14	29.2			0.00	2	.999
Emotions	18	30.5	104	41.8[c]	7	14.6[b]			13.87	2	.001
Cognitive processes	10	16.9	64	25.7[c]	2	4.2[b]			11.93	2	.003
Total	59		249		48						

Note. When χ^2 was significant at the $p \leq .05$ level, paired comparisons of the proportions of the columns were conducted with a z test. The results are based on bilateral tests with a .05 level of significance. Using Bonferroni's correction, we adapted the tests for all the pairwise comparisons within a row for each subtable situated to the right.

a = this percentage is significantly different from that of the column of hospitalized adolescents of the same row; b = this percentage is significantly different from that of the column of nonhospitalized adolescents of the same row; c = this percentage is significantly different from that of the column of parents of hospitalized adolescents of the the same row; d = this percentage is significantly different from that of the column of hospitalized adolescents of the same row.

Table 3

Percentual Differences (D) among the Coding References in the Dimensions, Place and Person in the Participants' Justifications of their Choice of Preferred Room and Surgery for Different Patients

	Adolescents								Adults							
	Hospitalized				Nonhospitalized				Parents				Clinical staff			
	D	95% CI	*z*	*p*	*D*	95% CI	*z*	*p*	*D*	95% CI	*z*	*p*	*D*	95% CI	*z*	*p*
Justification of the room for																
Children	14	[-2, 30]	1.71	.087	3	[-5, 10]	0.74	.458	51	[37, 65]	6.04	< .001	52	[35, 70]	4.93	< .001
Adults	-3	[-21, -15]	-1.41	.157	-6	[-15, 3]	-1.32	.184	33	[14, 51]	3.33	< .001	59	[41, 77]	5.21	< .001
Adolescents	-14	[-32, 5]	-1.41	.157	-4	[-13, 5]	-0.94	.394	29	[10, 46]	3.03	.002	20	[-3, 42]	1.65	.098
Themselves or for their own adolescent children	2	[-16, 19]	0.18	.852	-10	[-18, -1]	-2.32	.020	31	[12, 50]	3.08	.002				
Justification of the surgery for																
Children	6	[-13, 25]	0.61	.541	9	[0, 18]	1.86	.062	9	[-9, 27]	0.97	.332	53	[31, 76]	4.01	< .001
Adults	-6	[-31,18]	-0.54	.592	-6	[-18, 5]	-1.12	.260	0	[-24, 24]	0	1	42	[10, 76]	2.29	.022
Adolescents	0	[-25, 25]	0	1	-9	[-20, 2]	-1.64	.101	16	[-6, 38]	1.38	.166	0	[-33, 33]	0	1
Themselves or for their own adolescent children	-4	[-30, 22]	-0.29	.765	-9	[-21, 3]	-1.46	.143	18	[-3, 40]	1.63	.102				

Table 4

Percentual Differences (D) among the Coding References in the Topics Physical Aspects and Symbolic Aspects in the Participants' Justifications of their Choice of Preferred Room and Surgery for Different Patients

	Adolescents								Adults							
	Hospitalized				Nonhospitalized				Parents				Clinical staff			
	D	95% CI	*z*	*p*	*D*	95% CI	*z*	*p*	*D*	95% CI	*z*	*p*	*D*	95% CI	*z*	*p*
Justification of the room for																
Children	-19	[-35, -3]	-2.33	.019	-25	[-33, -17]	-6.32	< .001	11	[-4, 27]	1.35	.174	-25	[-44, -5]	-2.45	.014
Adults	18	[0, 35]	1.98	.047	5	[-4, 13]	0.97	.328	54	[38, 69]	5.64	< .001	71	[53, 85]	6.18	< .001
Adolescents	4	[-14, 22]	0.42	.669	-18	[-26, -8]	-3.84	< .001	39	[22, 56]	4.22	< .001	41	[22, 61]	3.71	<.001
Themselves or for their own adolescent children	14	[-3, 30]	1.54	.124	2	[-6, 9]	0.38	.701	31	[12, 50]	3.09	.002				
Justification of the surgery for																
Children	-41	[-58, -23]	-4.14	< .001	-43	[-51, -34]	-9.12	< .001	-31	[-49, -14]	-3.34	< .001	-33	[-56, -7]	-2.44	.014
Adults	-46	[-67, -25]	-3.83	< .001	-33	[-43, -22]	-5.85	< .001	-15	[-37, 6]	-1.36	.174	-36	[-70, -1]	-1.89	.058
Adolescents	-44	[-67, -21]	-3.38	< .001	-42	[-51, -32]	-7.53	< .001	-26	[-46, -5]	-2.42	.016	-29	[-60, 2]	-1.76	.077
Themselves or for their own adolescent children	-52	[-74, -30]	-3.88	< .001	-30	[-40, -19]	-5.06	< .001	-24	[-44, -2]	-2.12	.033				

Table 5

Which Surgery (A or B) do they Consider Preferable for Children, for Adults, for Adolescents, and for Themselves (or for their own Adolescent Children)

		Adolescents				Adults			
		Hospitalized		Nonhospitalized		Parents		Clinical Staff	
		n	(%)	*n*	(%)	*n*	(%)	*n*	(%)
For children									
$\chi^2(3, N = 458) = 5.3, p = .15$	A	2	(2.5)	10	(3.9)	6	(7.8)	0	(0)
	B	79	(97.5)	246	(96.1)	71	(92.2)	44	(100)
For adults									
$\chi^2(3, N = 449) = 8.8, p = .03$	A	80	(100)	238	(92.6)	64	(90.1)	40	(97.6)
	B	0	(0)	19	(7.4)	7	(9.9)	1	(2.4)
For adolescents									
$\chi^2(3, N = 426) = 6.7, p = .08$	A	58	(72.5)	190	(76.3)	44	(62)	31	(73.8)
	B	18	(22.5)	52	(20.9)	25	(35.2)	8	(19)
For themselves of for their own adolescent children									
$\chi^2(2, N = 386) = 6.3, p = .04$	A	56	(70)	189	(75.3)[a]	42	(61.8)		
	B	20	(25)	54	(21.5)	25	(36.8)[b]		

Note. When χ^2 was significant at the $p \leq .05$ level, paired comparisons of the proportions of the columns were conducted with a z test. The results are based on bilateral tests with a .05 level of significance. Using Bonferroni's correction, we adapted the tests for all the pairwise comparisons within a row for each subtable situated to the right.

a = this percentage is significantly different from that of the column of hospitalized adolescents of the same row; b = this percentage is significantly different from that of the column of nonhospitalized adolescents of the same row.

Table 6

Number and Percentage of Coding References in the Diverse Dimensions and Topics in the Participants' Responses to the Question of what they Liked and Disliked about the Photographs with and without an Infantile Atmosphere, Respectively

	Adolescents				Adults						
	Hospitalized		Nonhospitalized		Parents		Clinical staff				
	n	%	*n*	%	*n*	%	*n*	%	χ^2	*df*	*p*
What they liked about photographs with an infantile atmosphere (*N* = 1912)											
Place	248	81.8[d]	795	80.4[d]	292	81.6[d]	237	90.46[a, b, c]	14.57	3	.002
Physical aspects	175	57.8[d]	561	56.7[d]	223	62.3[d]	199	75.95[a, b, c]	33.53	3	< .001
Symbolic aspects	166	54.8	550	55.6	183	51.1	137	52.29	2.59	3	.459
Person	75	24.8	264	26.7	96	26.8	42	16.03	13.41	3	.004
Needs, experiences, and behaviours	41	13.5	156	15.8[d]	52	14.5[d]	28	10.69[b, c]	4.60	3	.204
Emotions	34	11.2	140	14.2[d]	46	12.8	21	8.02[b]	7.71	3	.052
Cognitive processes	4	1.3	16	1.6	6	1.7	0	0.00	4.37	3	.224
Total	303		989		358		262				
What they liked about photographs with a non-infantile atmosphere (N = 1825)											
Place	268	93.7	885	91.7[c, d]	323	96.7[b]	233	97.1[b]	16.10	3	.001
Physical aspects	261	91.3	867	89.8[d]	313	93.7	231	96.3[b]	12.61	3	.006
Symbolic aspects	33	11.5	114	11.8	50	15.0	21	8.8	5.29	3	.151
Person	26	9.1	95	9.8[c, d]	17	5.1[b]	9	3.8[b]	14.56	3	.002
Needs, experiences, and behaviours	9	3.1	23	2.4	8	2.4	2	0.8	3.25	3	.354
Emotions	17	5.9	76	7.9[c, d]	10	3.0[b]	7	2.9[b]	15.35	3	.002
Cognitive processes	1	0.3	7	0.7	2	0.6	0	0.0	2.10	3	.551
Total	286		965		334		240				

What they disliked about photographs with an infantile atmosphere (*N* = 1025)											
Place	139	93.9[c]	559	96.2[c]	142	84.0[a, b, d]	122	96.1[c]	34.99	3	< .001
Physical aspects	94	63.5	389	67.0	104	61.5[d]	97	76.4[c]	8.08	3	.044
Symbolic aspects	61	41.2[d]	285	49.1[c, d]	55	32.5[b]	33	26.0[a, b]	31.36	3	< .001
Person	30	20.3[d]	103	17.7[d]	45	26.6[d]	10	7.9[a, b, c]	17.55	3	.001
Needs, experiences, and behaviours	27	18.2[d]	90	15.5[d]	38	22.5[d]	7	5.5[a, b, c]	16.48	3	.001
Emotions	8	5.4	15	2.6[c]	19	11.2[b]	5	3.9	22.80	3	< .001
Total	148		581		169		127				
What they disliked about photographs with a non-infantile atmosphere (*N* = 1011)											
Place	124	80.0	434	79.3[c]	117	68.8[b]	102	73.4	9.87	3	.020
Physical aspects	119	76.8	410	75.0	113	66.5	98	70.5	6.31	3	.098
Symbolic aspects	55	35.5[d]	219	40.0[c, d]	49	28.8[b, d]	22	15.8[a, b, c]	31.46	3	< .001
Person	48	31.0	180	32.9	68	40.0	52	37.4	4.27	3	.234
Needs, experiences, and behaviours	15	9.7[c, d]	70	12.8[c, d]	38	22.4[a, b]	33	23.7[a, b]	20.44	3	< .001
Emotions	42	27.1	150	27.4	59	34.7	47	33.8	5.03	3	.170
Cognitive processes	3	1.9	5	0.9	0	0.0	0	0.0	5.16	3	.161
Total	155		547		170		139				

Note. When χ^2 was significant at the p≤.05 level, paired comparisons of the proportions of the columns were conducted with a z test. The results are based on bilateral tests with a .05 level of significance. Using Bonferroni's correction, we adapted the tests for all the pairwise comparisons within a row for each subtable situated to the right.

a = this percentage is significantly different from that of the column of hospitalized adolescents of the same row; b = this percentage is significantly different from that of the column of nonhospitalized adolescents of the same row; c = this percentage is significantly different from that of the column of parents of hospitalized adolescents of the same row; d = this percentage is significantly different from that of the column of hospitalized adolescents of the same row.