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Assessment of Healing Environment in Paediatric Wards

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Abstract

Malaysian paediatric wards were assessed on their quality status and design trends towards creation of the healing environment. The objective was to promote best practices. Post-Occupancy Evaluation (POE) studies were conducted upon paediatric wards in eight hospitals in the Klang Valley. Methodology adopted UK's NHS AEDET and ASPECT Evaluation toolkits, which evaluated the physical qualities and staff & patients' satisfaction levels respectively. Those involved 215 nurses and 217 patient's questionnaires respondents, personal on-site observations, and photographic documentations as supplementary evidences. Results seemed to show the disparity between the positivity of the physical design in relation to users' satisfaction. Implications of the findings are discussed.

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Keywords: Healing environment; paediatric wards; methodology; evaluation

1. Introduction

Interest on healing environment backdated since about 2,300 years ago, but was in different approaches, such as holistic and spiritual, whereby it was more commonly termed as Complementary or Alternative Medicine (Huelat, 2003). Currently, there has been a sudden increase in global interest towards creation of the healing environment (Ananth, 2008). In Malaysia, the initiatives had been

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envisioned by the Health Ministry since the 1990s for a more child-friendly, cheerful and safe hospital (Mathews, 1999).

“Healing environment” can be described simply as the overall environment (both physical and non-physical) created to aid the recovery process. In contrast to curing, healing is a psychological and spiritual concept of health. Since perception is also psychological, there is a likelihood of a relationship between healing and the physical environment. Also, as the paediatric population tended to be more sensitive than adults in the perception of the environment (Ozcan, 2006), this paper posits that the quality of paediatric wards could greatly influence the recovery process of the paediatric population.

Has the 1990’s vision of the Malaysian Health Ministry been transformed into reality? The present study assessed the design trend towards creation of the healing environment in Malaysian paediatric wards. The purpose was to identify whether factors, facilities and provisions in terms of the physical qualities towards the creation of such environment were given due to considerations in relation to users’ satisfaction levels in the design of those wards. It also attempted to identify possible problems that might have impeded towards achieving such environment.

The objective of the study was to promote best practices as a guideline for designer to enhance further the creation of a more conducive healing environment, not only for the design of new wards, but also in improving existing wards.

2. Literature Review

The literatures reviewed concerned the healing environment framework and supporting evidences of the role of the physical environment towards the creation of healing environment.

2.1. *Healing Environment Framework*

In the United States, the Samuelli Institute, a medical research organization exploring the science of healing has developed the “Optimal Healing Environment” (OHE) which it described as “the social, psychological, physical, spiritual, and behavioral components of healthcare support and stimulate the body’s innate capacity to heal itself” (Ananth, 2008, p. 273). The approach involved both the Inner and Outer Environment comprising of seven components as shown in Figure 1. The Inner Environment comprised three components - Developing Healing Intention, Experiencing Personal Wholeness and Cultivating Healing Relationship, while the Outer Environment comprised the other four components - Practicing Healthy Lifestyles, Applying Collaborative Medicine, Creating Healing Organization, and Building Healing Spaces.

The OHE framework provided a wholesome and inclusive approach towards the healing process. However, both the present authors (of architectural background) opined that the ‘Building Healing Spaces’ component, the focus of the present study required further modification and refinement. The OHE modified version framework proposed, which also formed the framework of the present study is as shown in Figure 2. In the modified model, Architecture comprises both Interior and Exterior Environments, with the various influencing factors towards healing being sub-categorised accordingly under those environments.

Those previously identified elements not only contributed towards the healing process but also helped the pediatric patients to cope with pain and aggression. This was concurred by the National Association of Children’s Hospitals and Related Institutions (NACHRI) where it revealed that the physical environment of healthcare settings affected the clinical, physiological, psychosocial, and safety outcomes among child patients and families (Oberlin, 2008).

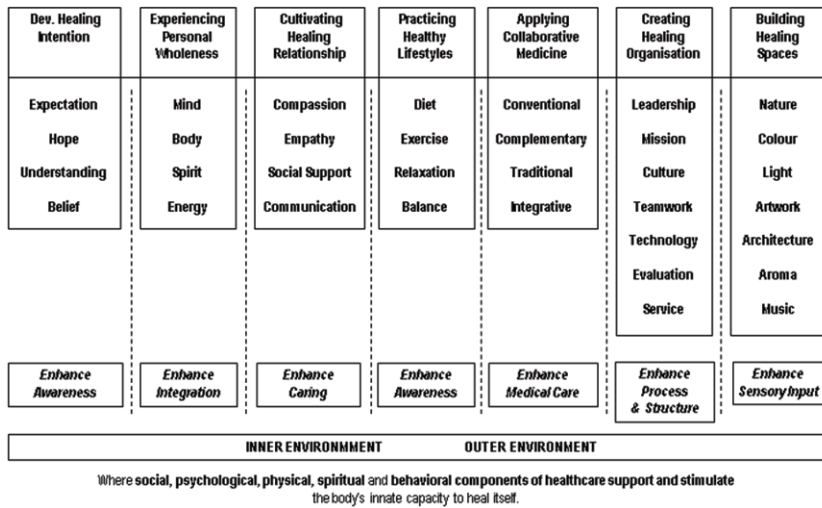


Fig. 1. The Optimal Healing Environment (OHE) Framework. Source: Sita Ananth, *Healing Environments: the next natural step, Explore*, Vol. 4, No. 4, p. 274, (2008)

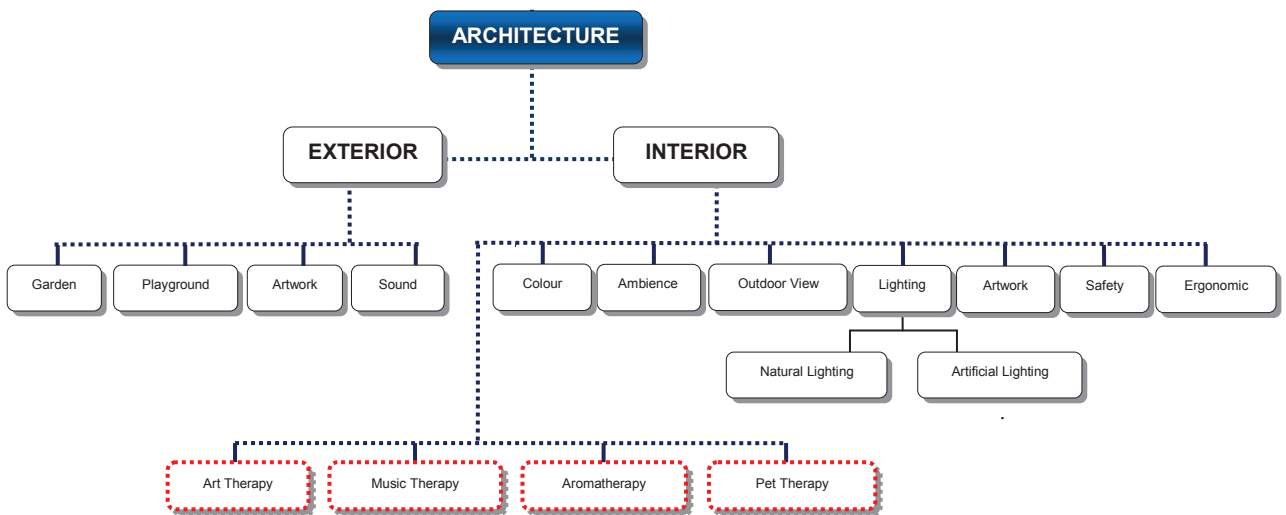


Fig. 2. Modification from Ananth's (2008) Optimal Healing Environment

2.1.1. Interior Environment

Elements within the Interior Environment towards the creation of a healing environment include safety, ergonomics, colour, artwork, lighting, view to outside, furniture and furnishings, ambience and therapies.

The creation of a much safer environment in paediatric wards had been raised by many authors. For example, Scanlon et. al., (2006) stressed that due to their nature, children during the pediatric age range

were more dynamic than the adults and hence characterised many different features which resulted in more potential risks for harm amongst paediatric patients during medical care. Similarly, Woods, et. al. (2005) cautioned that patient-specific setting increased vulnerabilities and as such patient safety risks must be accounted for in the design and improvement interventions. Earlier, Miller and Zhan (2004) revealed that events affecting patients' safety frequently involved the very young with substantial increase in their duration of stay.

Directly related to safety is the ergonomic considerations for the paediatric patients. The related implications had concerned many because the requirements of the children were not the same as the adults as detailed out by Lueder (2003) in the many differences of the physical built of children as compared to adults. Furthermore, children were in continuous development - physically, perceptually, cognitively and socially (Lueder and Rice, 2007). Croasmun (2004) argued that often products or services might have been designed without sufficient knowledge of the end users. As such, improved ergonomics by designing out potential flaws before the occurrence would make a safer setting for the paediatric patients and better environment for the medical carers. As such, France, et al. (2005) opined that human factors expertises were needed to be involved early in the design process.

Park (2007) investigated the value of colour in real contexts by measuring preferences amongst healthy children, paediatric patients and design professionals. He found that the use of more eventually created better environments for children and their families.

Colours and artwork in children's hospital also provided a more cheerful environment hence, contributed towards the paediatric patients' healing process as revealed by several other studies conducted for example by Eisen (2006). Daykin (2008) also found that exposure to art in healthcare environments reduce anxiety and depression

Beauchemin and Hays (1996) revealed that a bright light is an effective therapy used as treatment of depressive illness. He also found that patients warded in bright and sunny rooms experienced shorter period of stay compared to those in dull rooms. Dutro (2007) found that patients experienced less stress and exhibited less anxiety in the room with the backlit light image mounted in the ceiling containing nature art. In addition, Ulrich, (1984) revealed that patients with windows heal faster than patients without outside view.

Moran (1993) discovered that hotel-like elements that emphasize hospitality and comfort could reduce anxiety and promote healing. The ambience should be as personal as possible such as homelike environment. Similarly, the effect of furniture arrangements in the activity room could promote improvements in the wards' psychosocial atmosphere, as reported by Baldwin (1985).

Various therapies have proven to aid healing. Those include Art Therapy, Music Therapy, Aroma Therapy and Pet Therapy.

The Art Therapy as a healing psychotherapeutic demonstrates the impact on the well-being of patients and staff in mental healthcare settings. Research done such as by Malley (2002) proved to be an effective intervention in coping with ongoing physical, social, cognitive, emotional and psychological sequel of the accident/trauma.

Several studies done such as by Evans (2002) and Cooke, et al (2005) found that music is a simple and cost effective intervention in the hospital which decreased anxiety experienced while patients undergo their invasive investigation, treatment, procedures or surgery. Other effects included on positive behavioural effect amongst hospitalized children (Robb , 2000), helped paediatric patients to heal faster (Kennelly, 2000), reduced stress levels and benefited not only paediatric patients but also others in the wards (Stewart (2009). Meanwhile, Stouffer, et al. (2007) suggested the use of music as therapy in the paediatric practice guidelines in order to promote in the healing process.

Studies such as by Bonadies (2009) found that pleasant aroma in the hospital can improve health and enhance well-being, particularly to decrease stress and anxiety levels of parents who accompany their children in waiting area of an emergency department.

In relation to Pet therapy or the use of animal-assisted interventions, Braun, et al. (2009) revealed that the improved blood pressure, heart rate, and salivary immunoglobulin benefited less depression and anxiety, decreased in tension, fatigue and inertia, and also improved the overall mood.

2.1.2. Exterior Environment

Exterior or outdoor environment that could contribute towards the healing environment involved nature and the outdoor children's playground. The role of nature or the creation of therapeutic gardens towards the healing process had been reported by several studies.

For example, Whitehouse, et al. (2001) revealed that garden features in order of users' preferences included the sound of running water, followed by presence of bright colours, flowers, artwork, and the opportunity for multisensory stimulation. They also found that very young paediatric patients who were hospitalized for a longer duration or those with physical or developmental disabilities were responsive and appreciative to such gardens. They recommended in the creation of potential activities that could be done in the gardens by the different users, such as outpatient or the patients' healthier siblings. Similarly, Sherman, et al. (2005) observed the gardens were used differently according to the category of users or their age group. While the most used was the largest garden with direct patient access, children more than adults interacted with the garden features. They also found that emotional distress and pain were lower for all groups when in the garden as compared to in the hospital. Similar findings were also reported locally by Said (2009). In addition, NACHRI (2008) concluded that those gardens could help reduce patients' anxiety.

In a survey which involved hospital staff, parents and visitors, about perceptions and their experience of a playgarden - an integration of playgrounds and healing gardens located in a pediatric hospital - Turner (2009) revealed that children who played in the playground strongly benefited health wise. He recommended that the physical environment between indoor and outdoor activity be accessible at all times. Also, the play garden should not only provide space for patients and their families, but also for staff to interact with each other in a park. He also suggested that the play garden should include a variety of approaches. Annunziato (2002) emphasized on features like a river that flows along the window wall which included trees, native plants, and whimsical animal sculptures could help ease the fear of children and provide a space for siblings to play, as well. The evidence by Annunziato is to ensure that a sense of welcoming and playful environment appeared in the children's hospital somehow could reduce patients and staff stress, improved patient safety and improved overall healthcare quality.

3. Research Design

3.1. Strategy

The strategy involved Post-Occupancy Evaluation (POE) upon paediatric wards in eight hospitals located in the Klang Valley in Malaysia. The hospitals involved were strategically identified in terms of the year it was built which represented the design of the last three decades - the 1980s, 1990s and 2000s. Eight hospitals located both in urban and non-urban areas in the Klang Valley were chosen as the setting for the study as shown in Table 1. It was envisaged that samples for such purposeful selection could depict the design trend of such building type through those previous decades.

Table 1. Hospitals involved based on the year built

	HOSPITALS	YEAR	AREA	NO OF BEDS
1	KG	1985	Urban	36
2	IP	1991	Urban	32
3	KJ	1999	Urban	40
4	PA	1999	Urban	28
5	SG	1999	Non-Urban	28
6	SD	2005	Non-Urban	28
7	AG	2006	Non-Urban	28
8	SB	2007	Non-Urban	28

3.2. Methodology

Methodology for data collection adopted UK's NHS *AEDET Evolution* and *ASPECT* Evaluation Toolkits (DH Estates and Facilities, 2008,a, b). Questionnaires, personal site observation and photographic documentation supplemented the toolkits' evaluations.

The *AEDET* (Achieving Excellence Design Evaluation Toolkit) *Evolution* is part of a benchmarking tool which assisted in measuring and managing the design quality in the healthcare facilities. In terms of reliability, the *AEDET Evolution* includes references to evidence based design literature and this is related to the criteria used in the evaluation. In terms of validity, its use is mandatory in business case submissions for major capital development. It evaluates a design through a series of statements which encompassed the three areas. The Impact Area deals with the degree to which the building created a sense of place and contributed positively to the lives of the users and its neighbours. It involves four sections - Character and Innovation, Form and Materials, Staff and Patient Environment, and Urban and Social Integration. The Build Quality Area deals with the physical components of the building rather than the spaces and involves three sections – Performance, Construction, and Engineering. The Functionality Area deals with issues on the primary purpose of the building and involves three sections – Use, Access, and Space.

The *ASPECT* (A Staff and Patient Environment Calibration Toolkit) measures the manner the healthcare environment can impact both on the satisfaction levels to patients, and provision of facilities to staffs. It evaluates eight sections - Privacy, Company and Dignity; Views; Nature and Outdoors; Comfort and Control; Legibility of Place; Interior Appearance; Facilities; and Staff. In terms of reliability and

validity, the ASPECT is based on a database of over 600 pieces of research. The ASPECT Evaluation, in the form of questionnaires assessed users' satisfaction of both nurses and patients. An overall total of 215 nurses and 217 patients (aided by parents) responded to the questionnaires.

Personal site observation and photographic documentation of the wards' ambience supplemented the information required to be filled in the AEDET forms. In addition to the evaluation which used both the AEDET and ASPECT toolkits, the personal site observation also made notations on the existence of the other therapies mentioned earlier.

3.2.1. Procedure

Prior to the site visits, consents were first obtained from the Malaysian Ministry of Health and the directors of the hospitals identified through formal applications. Preceded by initial briefings about the setup of the hospitals, representatives from the hospitals accompanied the site visits and provided responses to spontaneous general enquiries about the physical environment of the wards. Data collected involved personal observations made with notations and photographic documentations about the facilities provided and on the overall ambience. The *AEDET Evolution* toolkits forms were then filled. Visits to the hospitals were done once and lasted about 4 hours per hospital. Evaluation of *ASPECT* involved questionnaires distributed to staffs and patients' carers in the wards. The staffs aided with the questionnaires distribution. Questionnaires filled were collected later after duration of about four weeks.

3.2.2. Delimitations

The study was delimited to 30-40 beded paediatric wards, so that comparison could be made with the newer wards built which were limited to those number of beds due to current hospital policy. Patients focussed were those ages between 3-6 years old. Overall, eight public hospitals located in both urban and non-urban areas within the Klang Valley in the state of Selangor were identified for the study.

3.2.3. Limitations

Limitations of the research involved time constrains and questionnaires feedbacks from patients' cooperation. Prior to the data collection stage, time was constrained in getting approval from the Health Ministry due to having to meet the procedural compliances as set by the Malaysian National Medical Research Institute. Questionnaires feedbacks from patients involved co-operation from the parents involved. While some of the parents were not interested with the questionnaires, others were not focused in giving their feedbacks.

4. Findings and Discussions

The aim of the study was to assess the quality status and design trends of Malaysian paediatric wards towards the creation of the healing environment.

4.1. UK's NHS Evaluation Toolkits

4.1.1. AEDET Evolution Evaluation

Based on the AEDET Evolution evaluation upon the physical qualities of the eight wards, overall the findings seemed to reveal a positive trend towards the creation of a healing environment as shown in Figure 3. Amongst the most marked positive trends from the sections analysed were the Staff & Patient Environment, and Space sections. However, those that initially showed a positive trend but somehow declined were from 2005 the Urban & Social Integration, and the Access sections, while from 1999 were, the Character & Innovation, and Form & Materials sections. The Performance section seemed to have

improved only from 2006 after being idled over the previous decades. Not much change in trend was recorded in the Use section.

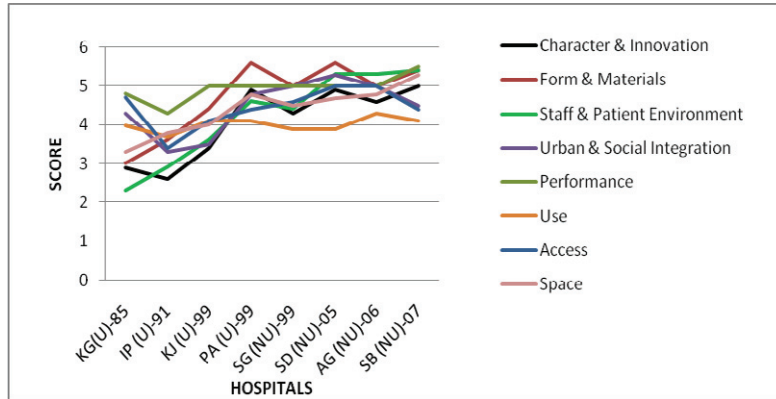


Fig. 3. The AEDET (Achieving Excellence Design Evaluation Toolkit) Evaluation- Summary of Findings

4.1.2. ASPECT Evaluation

Feedbacks of satisfaction levels on provisions and facilities available from the questionnaire respondents involved in the eight wards were received from an overall total of 215 staffs (nurses) and 217 patients. Feedbacks requested from staffs involved four main categories (with several criteria per category) - View to Outside; Nature & Outdoor; Comfort & Control; and Staff Facilities. Feedbacks requested from patients involved the first three categories, with the addition of four more categories – Privacy, Company & Dignity; Legibility of Place; Interior Appearance; and Facilities for Users. Results of the findings in the form of colour patterns to indicate their satisfaction levels for the staffs and patients are as shown in Figure 4 (a) and Figure 4(b) respectively.

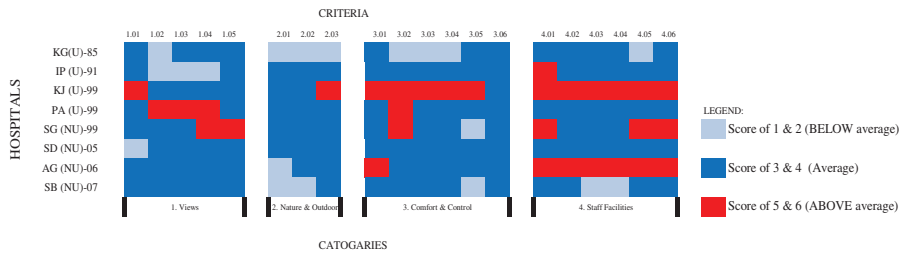


Fig. 4 (a). The ASPECT (A Staff and Patient Environment Calibration Toolkit) - Summary of Findings (Staffs, N=215)

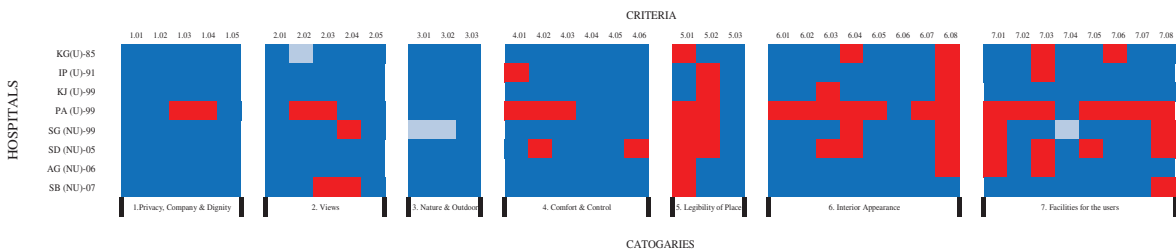


Fig. 4(b).The ASPECT (A Staff and Patient Environment Calibration Toolkit) - Summary of Findings (Patients, N=217)

From the findings shown in Figure 4 (a), it seemed that the overall staffs’ satisfactory level were highest for the older KJ(U)-1999 hospital and followed by the newer AG(NU)-2006 hospital. While it was not surprising for the oldest KG(U)-1985 hospital to be rated the lowest, most surprising was the newest SB(NU)-2007 hospital given below average rating in three categories – Nature & Outdoor, Comfort & Control and Staff Facilities.

Similarly, the patients’ satisfactory level were highest for not the newest SB(NU)-2007 hospital but rather for the newer PA(U)-1999 hospital, and then with continuous positive trends for the other newer hospital over the decades in only the three categories – Legibility of Place, Interior Appearance, and Facilities for Users, as shown in Figure 4(b).

In comparing the satisfactory levels between the staffs’ and the patients’ in the three categories – View to Outside, Nature & Outdoor, and Comfort & Control, it seemed that overall, the patients were more satisfied than the staffs with the facilities and provisions, although not necessarily in correlations with the ascending years the hospitals were built.

Also, the findings evaluated in ASPECT (data collapsed for both staffs and patients) did not seem to tally with findings evaluated in AEDET, whereby the overall physical qualities of the hospitals revealed a more positive trend as shown in Figure 4(c). Meaning, if the quality status and design trend of the wards were truly positive towards the creation of the healing environment, the trend of end users’ satisfaction level should have shown one of the increments in the progression of the decades.

Could have the other therapies mentioned earlier, played a major role towards the end users’ satisfaction and thus influencing the healing process? Those were almost non-existent in all the newer wards, except for one of the older wards in the use of Art therapy, where patients’ together with the nurses painted murals along the corridor.

Also, this study just focused only on one of the seven components in The OHE Framework as shown in Figure 1. Hence, the other six components, which were not measured, could also have greatly influenced the satisfaction levels.

Interestingly, if both the AEDET and ASPECT evaluations indicated a similar positive trend, than it can be argued that the physical environment component would be the most significant component as compared to the other six components in the creation of the OHE. Since, that was not the case the findings further strengthened the contribution of the other six components in the creation of the OHE.

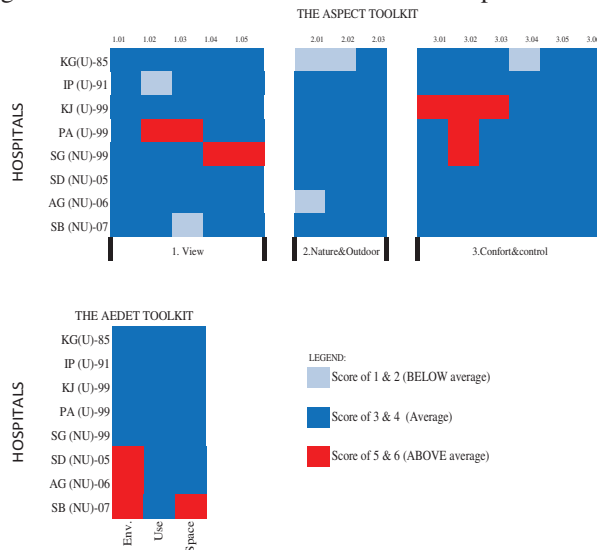


Fig. 4 (c). Correlation between the ASPECT and AEDET Evaluation Toolkit

5. Conclusion

From the analyses of the findings, based on AEDET, the overall physical qualities and design trend of the wards over the last three decades seemed to be positive towards the creation of the healing environment. The trend however, seemed not to correspond with the satisfaction levels of the end users as was shown in the analyses from ASPECT.

The AEDET evaluations seemed to reveal the positive trend in physical qualities and design of the wards towards the creation of healing environment. However those did not seemed to correspond with the ASPECT evaluation which concerned the users' satisfaction level. Perhaps, the users' satisfaction levels could have shown a more positive trend, if the other additional therapies - art, music, pet and aromatherapy – almost absent in all the wards, were provided in the newer wards. In addition, positive trends in the other six components shown in Figure 1, excluded from this study could also have major influences positively upon the users' satisfaction levels.

In terms of the physical design of newer wards, as best practice, it is suggested that apart from understanding the behavioural needs of the end users, there should be inclusion of the other additional therapies - art, music, pet and aromatherapy - in the design brief.

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Special Note

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