Vol. 5 No. 1 January - June 2016

UERM
Memorial Medical Center, Inc.
Research Institute for Health Sciences

Health Sciences Journal

ISSN 2244-4378

From the desk. To the bench. To the bedside.

The HEALTH SCIENCES JOURNAL

is published by the
University of the East Ramon Magsaysay Memorial Medical Center, Inc.
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The efficacy of Dunstan baby language in decreasing the parenting stress levels of housewives with 0-2 month old infants: A quasi-experimental study

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Abstract

Introduction Literature shows that infant distress and care-giving can be sources of stress of primary care givers, especially for first-time mothers. This study aimed to determine the efficacy of Dunstan baby Language in decreasing parenting stress among first time mothers compared with those receiving standard newborn care alone.

Methods This research utilized a quasi-experimental approach, where 18 first-time mothers with babies 0-2 months old were allocated to receive standard care plus Dunstan baby language training or standard care alone. Maternal stress was measured at baseline and after the intervention period with the Parental Stress Scale. The scores were compared within and between the two study arms. A repeated measures mixed model was used for the Parental Stress Scale (PSS) results.

Results A total of 27 participants were enrolled in the study. The Dunstan baby language group had 18 participants, while the control group had 9 participants. An apparent decrease was noted in the week 1 to week 2 and the week 2 to week 3 Parental Stress Scale scores in the Dunstan baby language group compared with the control group which had minimal changes in their mean scores. The mean difference between the two groups was not significant.

Conclusion The use of Dunstan baby language in addition to standard care may decrease stress among first time mothers with 0-2 month old babies.

Key words: Dunstan baby language, parenting stress

A new baby brings so much joy to the family but parents cannot deny that caring for their babies involves frustration as well. As every new parent discovers, a newborn can sometimes spend hours crying every day and night. A study found out that 20% of all babies are classified as "colicky babies," defined as an infant crying for at least three hours per day, three days a week for three weeks.[1] Another study showed that persistent crying in infancy frequently occurs at 2-3 weeks of age, continuing for up to 3 months and peaking at 1-2 months.[2] This may cause emotional distress, especially to first-time mothers and may lead to loss of self-confidence in their parenting skills. Caregivers experience exhaustion and sleepless nights as they strive to meet their baby's needs. Moreover, a study showed that

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Presented in the 18th Annual Research Forum, February 24, 2016, University of the East Ramon Magsaysay Memorial Medical Center, Quezon City

the quality of the baby's sleep significantly influences the quality of maternal sleep which predicts maternal mood, stress and fatigue.[3] To reduce distress brought about by unrelenting infant crying, supportive interventions can help the mothers understand the causes so as to be able to give appropriate responses.[2] Support from significant others also contributes to the mother-infant bonding.[4] If the mother has a positive environment and greater self-esteem, she would be able to foster a positive environment for her infant.[4] A study devised a prevention program about normal infant sleep and cry patterns, settling techniques, medical causes of crying, and parent self-care.[5] This prevention program taught mothers via booklet and video, telephone consultation and parent support group, leading to the conclusion that it reduced postnatal depression symptoms, as well as sleep and cry problems in infants.

If the demands of the infant are not appropriately addressed, this may cause mothers to develop emotional distress and resulting in low self-confidence in their parenting skills. In addition, mothers experience exhaustion as they strive to meet their baby's needs. This can further affect the quality of the mood, concentration, planning, decision-making and functional efficiency of the mother. Persistent crying of the infant may increase the chances of the mother having a higher level of depression and anger, affecting the maternal-infant bonding. The investigators felt a need to address this problem by finding a method that would ease this kind of stress.

Dunstan baby language (DBL) is an innovative discovery that focused on understanding the language of babies, particularly those from 0-3 months and changed the lives of over a hundred mothers.[1,6] Based on the idea that language is a form of communication and that all language has meaning, the investigators analyzed the pre-cries, or the sounds babies make before they actually cry and identified five sounds distinctive of each need: "NEH" for hunger, "EH" - for upper wind (burp), "EAIRH" - for lower wind (gas), "HEH" - for discomfort (hot, cold, wet) and"OWH" for sleepiness.[6]

The Maternal Self Esteem and Parenting Stress Index in both studies yielded consistent results.[5,6] Key findings include: 90% of mothers found DBL valuable and recommendable, 70% of mothers settled their child faster after using DBL, 70% felt more confident as a mother, 50% of the mothers slept better. Meanwhile, 2 out of 3 fathers had reduced levels of stress, greater involvement in the care of the infant, and more positive relationships with their wives. Researches that used DBL as a tool[1-6] have found out that 100% of first-time mothers reported that it was valuable and would recommend it to other mothers. DBL significantly decreased parenting stress, increased maternal self-esteem, and made mothers feel more relaxed and in control. Mothers who experienced and practiced DBL reported to have bonded more with their babies. Correctly interpreting a baby's language leads to appropriate responses and better communication, which further leads to a closer mother-infant bonding. A stronger bond promotes decreased maternal stress, lesser crying and increased maternal self-esteem. Caregivers other than the mother could also benefit from this not only by improving their caregiving skills, but also by decreasing levels of stress. This led the researchers to come up with a study to determine if DBL is indeed efficacious in lowering parenting stress levels, especially among those without previous experience in child care. In this study, the researchers determined the efficacy of DBL in decreasing parenting stress levels of primiparous housewives with 0-2 month old infants over standard care alone, as measured by the Parenting Stress Scale (PSS). This study fills in a gap since no research has been done on teaching DBL to parents living in a community with low socioeconomic status. This study also serves as a springboard for future researches, especially those concerning infantile care and DBL.

Methods

This research utilized a quasi-experimental approach, where 18 first-time mothers with babies 0-2 months old, coming from two communities in Manila, were allocated to receive standard care plus Dunstan baby language training or standard care alone. Maternal stress was measured at baseline and after the four-week intervention period with the Parental Stress Scale. The scores were compared within and between the two study arms. A repeated measures mixed model was used for the Parental Stress Scale (PSS) results.

Primiparous Filipino mothers from two barangays in Manila who were at least 18 years old and a high school graduate and the sole caregivers

of their 0-2 month old infants were recruited. Mothers with significant hearing and visual problems, a history of hospitalization due to psychiatric causes and/or a current psychiatric illness were excluded. Infants of the study subjects should have been born full term, with normal birth weight, and not possessing any genetic condition or medical problems and no postnatal hospitalization.

The demographic profile, non-parenting stress and baseline parental stress of eligible mothers who consented to join the study were determined with the use of a data collection form, Holmes and Rahe Stress Scale, and Parenting Stress Scale, respectively. Mothers from one barangay were allocated to the intervention group and were instructed on standard care and the use of DBL while mothers from the other barangay were allocated to the control group and instructed on standard care alone. Treatment was assigned at the community level to avoid contamination and to facilitate the training of the mothers on the DBL at designated places conducive for such training. Mothers were instructed to follow up at their respective health centers after the first, second and fourth weeks. Mothers from the DBL group were asked to maintain a diary of their experiences; the researchers checked the diaries at each visit. The study ran for four weeks after which a post-intervention PSS was administered to both groups.

Both groups were taught standard care for their infants, but DBL was taught only to the experimental group. Standard care is usual care given by primiparous mothers to their 0-2 month old infants. It was taught using a pamphlet showing pictures on how to feed their baby through breastfeeding and bottle feeding, put their baby to sleep, burp their baby, relieve infant colic, and make their baby comfortable. The DBL was taught using a video and oral explanation in the Filipino language. The video showed all the five baby sounds, including a variety of babies from other races vocalizing the baby sounds. Only one researcher facilitated the DBL lessons to ensure consistency and repetitiveness. The researchers held the teaching sessions in a place in every community conducive for learning because environmental factors could affect the results of this study: the activity room in the barangay hall in Brgy. San Perfecto and Brgy. Progreso, and the reception area of Santana-Basilio Lying-In Clinic and Maria Clara Lying-In and Health Center. The venue in all communities was an enclosed area which offered privacy, had adequate lighting, chairs and tables for all the participants, a microphone and speakers for good audio quality, and adequate ventilation. The participants were made to repeat each sound for reinforcement of learning. The experimental group was also given mini pamphlets that contained the baby sounds and their meanings for additional reinforcement. Diaries were distributed to the mothers in the experimental group for them to write down their experiences with their babies every day, i.e., what sound they heard and what intervention they did as they practiced what the researchers have taught them.

This study considered alpha error only having a 95% confidence level. Parenting stress is defined as stress experienced by the primiparous mother in the care of her first-born child measured via the Parental Stress Scale.[7]

The stress experienced by the participants from non-parental causes was measured through the Holmes-Rahe Scale,[8] a list of 43 stressful life events that can contribute to illness. Each event, called a Life Change Unit (LCU), had a different "weight" for stress. The more events the respondent checks on the list, the higher the score. The higher the score, and the larger the "weight" of each event, the more likely the patient was to become ill; in this case, the more the caregiving abilities of the mother will be affected. The reliability and validity of the Holmes-Rahe Scale has been improved over the years.

The Parental Stress Scale[7] is an 18-item measure appropriate for parents of children with and without clinical problems representing pleasure or positive themes of parenthood (emotional benefits, self-enrichment, personal development) and negative components (demands on resources, opportunity costs and restrictions). Respondents are asked to agree or disagree with items in terms of their typical relationship with their child or children and to rate each item on a five-point Likert scale: strongly disagree [1], disagree [2], undecided [3], agree [4], and strongly agree [5]. The 8 positive items are reverse scored so that possible scores on the scale can range from 18-90. To compute the parental stress score, items 1, 2, 5, 6, 7, 8, 17, and 18 should be reverse scored as follows: (1=5) (2=4) (3=3) (4=2) (5=1). The item scores are then summed. Higher scores on the scale indicate greater stress. The Parental Stress

Scale demonstrated satisfactory levels of internal reliability (.83), and test-retest reliability (.81). The scale demonstrated satisfactory convergent validity with various measures of stress, emotion, and role satisfaction, including perceived stress, work/family stress, loneliness, anxiety, guilt, marital satisfaction, marital commitment, job satisfaction, and social support. Discriminant analyses demonstrated the ability of the scale to discriminate between parents of typically developing children and parents of children with both developmental and behavioral problems.[9,10,11]

Priscilla Dunstan discovered the Dunstan Baby Language (DBL).[6] These are infantile vocal reflexes that serve as signals for caregivers. It is composed of the five main sounds that babies make when they need something. These are as follows:

- "Owh"- I'm sleepy
- "Heh"- Change me
- "Eh"- Burp me
- "Neh"- I'm hungry
- "Eairh"- I have gas

The data were encoded using the STATA 12. Intent to treat analysis using multilevel mixed-effects linear regression was used for the analysis of the PSS scores.

Results

Of 56 mothers screened, 27 were randomized to either DBL or control group. There were 9 dropouts in the DBL group, leaving nine particpants and another nine in the control group. The age of the mothers included in the study ranged from 18 to 27 years old, and the age of the infants from a few days old to 2 months old. Majority of the participants were high school graduates. The Holmes-Rahe Scale scoring of the participants showed a range of scores from 79 until 430. There was no significant difference between the means of the Holmes-Rahe scores of the DBL and control groups as seen in Table 1.

The PSS scores of the DBL group showed an initial increase at week 1 followed by decreases in the subsequent weeks. The control group showed a consistent but smaller decrease from baseline through week 4. At the end of the observation period, the DBL group had a lower mean PSS score compared with the control group. The difference was not significant (Table 2) but as seen in Figure 1, the downward slope of the DBL group was steeper than that of the control. Table 3 shows a larger mean decrease in the PSS scores of the DBL group compared with the control (4.7 vs 1.6); however, the difference was not significant.

Table 2. Comparison of Parental Stress Scale Scores between the DBL and control groups.

DBL vs control at each follow-up	Mean score DBL (n=18)	Control (n=9)	Z	p
Baseline	30.4	37.8	-1.67	0.09
Week 1	33.8	37.6	-0.82	0.42
Week 2	31.0	36.9	-1.02	0.31
Week 4	25.7	36.2	-1.93	0.05

Table 1. Demographic profile of the DBL and control groups.

Characteristics	DBL (n=18)	Control (n=9)	p-value
Age of Participants (mean)			
Mother (yr)	25.8	22.6	-
Infant (mo)	1	2	-
Educational attainment Frequency (%)			
High school graduate	14 (77.8)	7 (77.8)	-
College undergraduate	2 (11.1)	1 (11.1)	-
College graduate	1 (5.6)	1 (11.1)	-
Postgraduate	0	0	-
Vocational	1 (5.6)	0 (0)	-
Non-parenting stress (mean)	242.9	188.3	0.27

Table 3. Comparison of Parental Stress Scale scores within groups (Week 4 vs. Baseline).

	Mean score		Z	p
	Baseline	Week 4		
DBL (n=18)	30.4	25.7	-1.28	0.20
Control (n=9)	37.8	36.2	-0.48	0.63

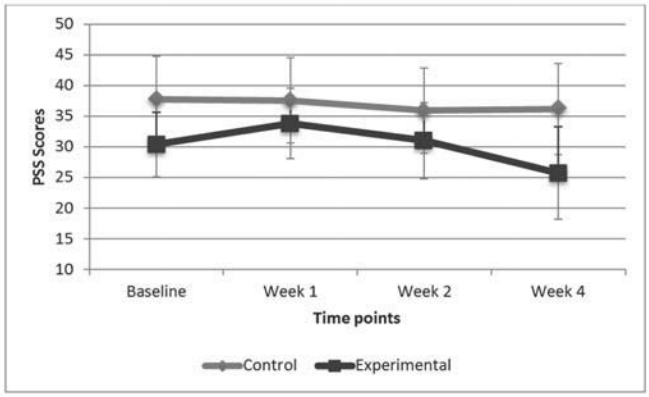

Figure 1. Comparison of the PSS scores of DBL and control groups through time.

Diaries given out to the mothers in the experimental group in order for them to write down their day-to-day experiences with their baby while practicing their learnings on DBL contained reports of mothers about their observation of the sounds produced by their babies like EAIRH, HEH, NEH and EH, depending on the needs of the baby during a specific point in time, the condition of the baby while the sound was heard, and the solutions they applied and the response of the baby to their solution. Some of them applied the correct solution to the sound heard and noted a good response of the baby. The mothers also included the associated meaning of the sound heard. The reports, which included that the mothers were able to observe the sounds and do the appropriate interventions implied that the health teachings during the implementation had helped them identify clues and provided appropriate solution to the problem or need of their babies. Since the clues were identified, proper solutions were provided and the needs of the baby were addressed immediately. Immediate interventions for the needs of the baby had a good impact on the child's well-being and also to the mother's confidence in their motherhood.

Discussion

Parenting stress was measured using the Parental Stress Scale (PSS), and results showed that mean PSS scores were comparable in all 4 PSS determinations through time. It is interesting to note, however, a steeper downward slope is observed with the DBL group at times 1 and 2 and 2 and 3 compared with that of the control. This could be due to decreasing parenting stress levels, although conclusions could not be made due to a lot of factors such as a small sample size and short duration of the implementation. These findings correlate with the findings of the researchers of the Dunstan Baby Language[1-6] that DBL is indeed effective in decreasing parenting stress measured using the Parental Stress Index (PSI), the expanded version of the PSS.

Music therapy was proven in a study abroad[10] to have decreased parenting stress of both parents to preterm babies in the intensive care unit. Preterm infants have more needs than full term infants, especially those admitted in an intensive care unit, and it would be stressful for parents to care for them. Identifying the signs of infant stresses, then providing music therapy during those times relieved the infant of his stresses and improved parent-child bonding and decreased parenting stress as well. The results are similar to this current study in the sense that an intervention, i.e., DBL, was used to identify infant needs through his cries and further decrease parenting stress by appropriately responding to his needs.

Between baseline and week 1, there was an increase in the PSS scores of the DBL group. This may be attributed to the adjustment of the mothers while incorporating their learnings from the DBL teachings to their daily infant caregiving. Between week 1 and week 4, a significant difference was noted in the PSS scores of the DBL group. This could mean that the DBL was effective in decreasing parental stress as evidenced by the decrease in PSS scores after the said adjustment period between baseline and week 1.

Despite lack of significant difference in the mean PSS scores between the primiparous housewives with 0-2 month old infants who practiced the use of Dunstan Baby Language and those who practiced standard care alone, the researchers concluded that there is a trend towards attaining a significant difference in the mean PSS scores. Difficulties in the

implementation of the protocol had led the group to recommend that better recruitment process should be employed to attain desired sample size. A bigger scale of participants and longer duration of follow-ups are needed to better appreciate a more significant difference in trends. A more efficient follow-up protocol must be used to avoid respondents from dropping out of the study. Follow-up protocols such as making phone calls, sending SMS, and going from house to house are suggested. Diaries may be replaced by questionnaires that document the sound heard, interventions done, and response of the baby, and that they are to be collected daily instead of weekly. Mothers must have at least one companion during the implementation to attend to the needs of the baby to ensure the mother's full attention. To obtain a quantitative evaluation of their learning about the teachings, individual return demonstrations and posttests may be given. This study focused on decreasing the parenting stress levels of primiparous mothers living in the community, but may be done using other sample populations such as fathers and other caregivers of the baby, other settings, and to prove other benefits determined by the researchers of the Dunstan Baby Language. Furthermore, this study can be used as a springboard for future studies that will utilize DBL, PSS, and/or Holmes Rahe Stress Scale as tools.

Acknowledgements

The authors would like to express their utmost gratitude to their research adviser Dra. Grace E. Brizuela for her continuous support, patience and guidance with their research; their content adviser Dr. Jose Salazar for his valuable input and immense knowledge; Mead Johnson Philippines for giving them the idea for this research and for giving them a copy of the DBL video; the Department of Preventive Medicine, especially Dr. Ramon Jason Javier and Dr. Jose Ronilo Juangco for the utmost support and permission to gather respondents in Brgy. San Perfecto; Brgy. Captain Dennis Pardiñez and Kagawad Natividad Gruta of Brgy. San Perfecto and Brgy. Progreso who helped them gather respondents in their respective barangays; Ma'am Shiela of Manila City Hall and Maria Clara Lying-in and Health Center and Dr. Malou Basilio of Santana-Basilio Lying in Clinic for their warmest accommodations and assistance in gathering respondents in their respective areas; Mrs. Grace Capulong and Ms. Kathleen Sanchez (language professors) in translating the data collection tools; fellow classmates for assisting, enlightening and influencing then for the betterment of this research paper; Mr. Marlon Peralta, and the College of Medicine of the University of the East Ramon Magsaysay Memorial Medical Center for approving this paper for implementation and financing the expenses needed to accomplish this study.

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Perspectives of male family planning acceptors on failed vasectomy and the meaning of contraception

Annabelle P. Fajardo, MD, MSPH

Abstract

Introduction This study ventured into understanding the dynamics of contraception using the lens of the male end user. It aimed to examine more fully the experience of male acceptors to elucidate why vasectomy failed as a contraceptive modality.

Methods This was a multiple case study which elucidated the in-depth experiences of six participants on failed vasectomy and how they perceived contraception. The analyses of interview transcripts and field notes were based on the inductive approach of identifying data by means of thematic codes which emerged in a four-level process.

Results Subthemes were 1) failure of health education to correct misconceptions, 2) failure in compliance, 3) failure in cognition and understanding, 4) failure in shared decision making, and 5) failure in contraceptive intentions. Themes that emerged as causes of failure in vasectomy were 1) failure of partnership, and 2) failure caused by low level of health literacy.

Conclusion Failure of vasectomy was laden with antecedents that greatly influenced the manner by which the male acceptors behaved. The participants' perceptions of contraception were either changed or remained steadfast depending on how they had believed vasectomy to be of worth to them as a husband, father and male acceptor. In all but one participant, vasectomy became of no use to them thereafter.

Key words: Failed vasectomy, contraception, health education, health literacy, multiple case studies

Bilateral vasectomy is a family planning method that requires direct participation of the male in decision-making processes involved in contraception. It gained popularity in 1991 with the no-scalpel modification introduced by Li Shunquiang in China. Since then, 60 million men were reported to have undergone no-scalpel vasectomy (NSV).[1] Vasectomy remained to be a highly effective permanent method of contraception but as with all other family planning methods, had causes of failure.

In the past, failure rates for vasectomy had been reported to be from 1% to 5%. Technical failure of the procedure had been attributed to specific surgical techniques. In the standard technique, a short piece of vas deferens is cut and removed, and the remaining

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Presented in the 17th Annual Research Forum, February 17, 2015, University of the East Ramon Magsaysay Memorial Medical Center, Quezon City

two ends are tied. Fascial interposition, added to the standard technique increases the success of the procedure.

Failure of contraception during the post-operative period of waiting for azoospermia can be attributed to client's engagement in unprotected sex prior to sperm clearance during this crucial period. Program protocol dictates that sperm analysis can be done after three months post-operatively or after at least 20 ejaculations. If the final examination shows azoospermia, the client is given clearance to have unprotected intercourse. Both clients and service providers must be aware though, that vasectomy is not a procedure guaranteed to achieve 100% sterility, and emphasis of this fact is as important as close follow up of clients for sperm count and analysis.

Studies on failed vasectomy have looked into the technical causes of failure. A review of literature reveals numerous studies that extensively discuss advantages of the no-scalpel vasectomy over the traditional vasectomy, as well as differences in the surgical procedures as reasons for vasectomy failures. In 2005, a systematic review of 28 studies described a total of 183 failures or recanalization from approximately 43,642 vasectomy patients at 0.4%, and 20 studies in the same review described 60 pregnancies after 92,184 vasectomies with failures of 0.07%.[2] Most physicians and surgeons who perform vasectomies recommend one (sometimes two) post-procedural semen specimens to verify a successful vasectomy. Unfortunately, 34-36% of patients never return for verification tests citing inconvenience, embarrassment, or death or change in partner.[3]

However, studies that purposely addressed failed vasectomy cases in the context of the real-life situation as experienced by the male or such that explored the phenomenon of failed vasectomy from the point of view of the subjects other than those pertaining to the technicalities of the procedure itself are scant and limited. The dynamics involved in failed vasectomy cases is worth studying. As a public health program concern, there seems to be a gap in counseling and advocacy with failed vasectomy cases.

Knowing what the participants of this research believed and associated vasectomy with became a rich source of information to make one realize why a family planning method as definite as vasectomy, can be a cause of program concern. There were reasons for vasectomy failure beyond what were known and had been studied and this research sought to generate explanations as to the meanings these participants gave to their failed vasectomy and their mean-ings of contraception.

The study aimed to examine in-depth, the experience of male acceptors to elucidate why vasectomy failed as a contraceptive modality. Specifically, the study addressed the following questions:

1. What is the male acceptor's motivation to use vasectomy?
2. How did vasectomy fail as a contraceptive?
3. How has failed vasectomy affected their perception of contraception?

Methods

This was a qualitative research using case study as a methodology. The evidence from multiple cases was often considered more compelling, and the over-all study was therefore regarded as being more robust.[4] The use of the multiple case studies in this research emanated from the logic underlying the use of such, which was replication that either predicted similar results or predicted contrasting results but for predictable reasons.[5] Methodologically, this approach helped retain the holistic and meaningful characteristics of real-life events while understanding a complex social phenomenon such as failed vasectomy cases in the perspective of male family planning acceptors.

Purposive sampling was done for the selection of the six cases chosen for this research. The six men voluntarily underwent no-scalpel vasectomy under the family planning program initiatives of Valenzuela City from 2004 to 2008 and whose wives got pregnant unintentionally at various periods of time. All six participants were counseled by the researcher upon initial knowledge of their respective wives' pregnancies from 2004 to 2010. Follow-ups were done periodically by the health workers who recruited them for the voluntary vasectomy procedure.

For the definitive purpose of this research, the participants were sought individually. Upon obtaining verbal and written consents, a key informant interview session was scheduled by the respective health workers who served as point persons since the time of recruitment of the subjects for the voluntary vasectomy procedure. These same health workers accompanied the researcher to the residences of the subjects for the interview as well as for the follow-up sessions.

The researcher had always been available for the participants to assist them in the provision of laboratory services and counseling. Medical consultations were provided as adjuncts when the need arose. Confidentiality was kept at all times to protect the interest and rights of the participants and their families. The researcher ensured that no harm was inflicted on the participants and their families during and immediately after the study, minimizing the effects of issues that were related to the course of the undertakings of this research. At the end of the study, the researcher presented to the participants the results and validated the findings. Gratitude towards their participation and cooperation was expressed with a simple token or gift.

The interview was the primary means of accessing the experience and subjective views of the actors. The purpose of the interview was to elicit answers pertinent to the research questions: What was the male acceptor's motivation to use vasectomy? What were the consequences experienced with failed vasectomy by the male acceptors? How had failed vasectomy changed their perception of contraception?

The questions that were asked during the key informant interviews were classified to specific main topics under three categories. The initial set of questions pertained to decisions and considerations prior to vasectomy as well as those questions eliciting information after the procedure and reasons for non-compliance with the semen analysis protocol. The second category of questions were in reference to the impact of the failed vasectomy on the lives and decisions of the man as an individual, as a couple, as a family, and as an integral part of the community. The third category of questions drew insights on the male's perspective on contraception despite the failure of the method on himself and the impact of his wife's pregnancy on their marital relationship.

Besides in-depth interviews and focus interviews, field notes also included transcripts of the interviews, materials relating to intentions and reactions, documented personal notes about motivations and experiences with the participants. Observations of the participant's home environment and community were done to gather additional information.

Coding was an interpretive technique that both organized the data and provided a means to introduce the interpretations into certain quantitative methods. The data were segmented and labeled with a "code" that suggested how the segment was related to the research objectives. Thereafter, they were coded to arrive at categories and themes. Coding of the interviews for analysis of the six cases was aggregated based on these levels: 1) that of the six male participants' riposte and the researcher's observations; and, 2) reflexive journals of the face-to-face interviews and field notes. Each case was treated separately, using the same data collection technique of interviewing, document analysis, using data from participant observation, site observation and field notes. Individual case reports were prepared using the pyramidal qualitative coding technique of Hahn[6] (Figure 1) which involved a process of focusing a mass amount of free-form data with the goal of empirically illuminating answers to the research problem posted. The codes progressed from unsorted data towards more refined categories, themes, and concepts in a step-ladder fashion.

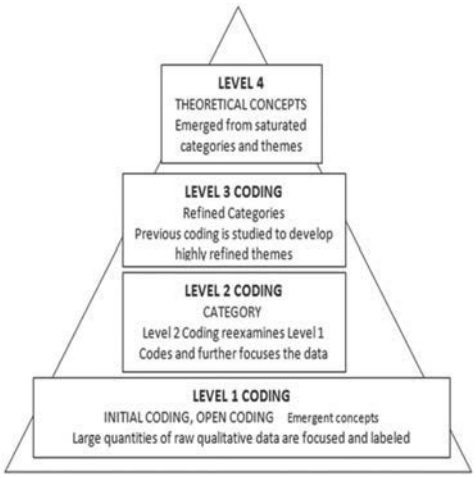

Figure 1. Pyramidal qualitative coding technique by Hahn (2008).

Each case emerged with individual patterns on how the failure occurred and how they perceived contraception after the discovery of the failure of vasectomy. These responses were clustered to generate emergent concepts, categories, refined categories and conceptual meanings. Once these were organized, the individual framework of each case was drawn to link antecedents for acceptance of vasectomy to the reason of the failure of each respondent's vasectomy and to the outcome behaviors due to failed vasectomy.

For each case, the core categories were classified as either reasons for wanting vasectomy (antecedents

to acceptance of vasectomy) or actions taken when failure of vasectomy happened (outcome behaviors). The more dominant core category that emerged based on the observations of the researcher as to the major reason for acceptance of vasectomy became the final antecedent. The same was done with the final outcome behavior. The reasons for failure of vasectomy were derived from the coding done, which emerged as subthemes and themes.

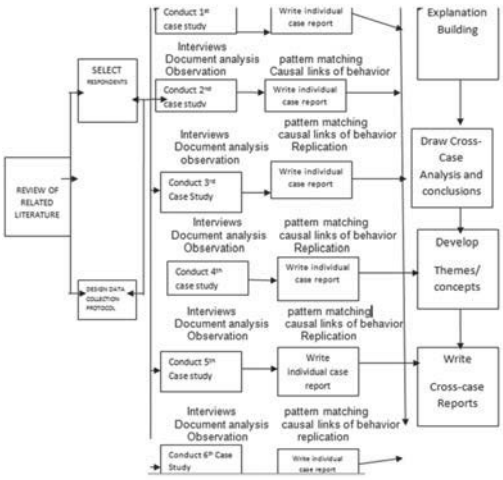

Figure 2. Procedural framework for the multiple case study method of male acceptors of failed vasectomy, adapted and modified from case study method of Robert Yin (1989, p.6).

Results

The characteristics of six men included in this study are shown in Tables 1 and 2. They had a mean age of 43.5 years, reached at least high school level and were employed except for Case 3. They had three to six children each. They had their respective procedures between 2003 and 2008 and their wives got pregnant within a year to six years after the procedure, with three pregnancies resulting in the birth of a child. None of the six male participants had semen analysis prior to the post-vasectomy pregnancy despite instructions and follow-up for them to do so.

Case 1. Deal or no deal The failure of vasectomy for Case 1 emanated from the participant's failure to understand what was taught. He knew that success rate for vasectomy was at 99% but he failed to understand the implication of the 1% failure rate and did not think that such could happen to him. He was bent on believing that 99% being a measure in estimation of 100%, was perfectly 100%. This led him further to believe that he had no reason to confirm the status of his vasectomy. The outcome behavior of Case 1 derived as codes from the answers of the participant which consisted of trust mitigating failure, rationalizing contraception, and adoption of frugal behavior. The failure was mitigated by the participant's trust in his wife. His wife though, opted

Table 1. Demographic profile of six participants.

Case no.	Code	Age (yr)	No. of children	Educational attainment	Occupation
1	VO1	38	4	High school	Employee
2	LO2	38	4	1st yr college	Employee
3	ET3	40	6	High school	None
4	OD4	44	3	High school	Taxi driver
5	PL5	48	4	High school	Tricycle driver
6	LB6	53	3	High school	Handyman

Table 2. History of vasectomy procedure and wife's pregnancy.

Case no.	Code	Year of NSV	Year of wife's pregnancy	Outcome of pregnancy
1	VO1	2005	2011	Aborted
2	LO2	2003	2003	Birth of child
3	ET3	2006	2009	Aborted
4	OD4	2004	2009	Birth of child
5	PL5	2004	2006	Birth of child
				Fetal death
6	LB6	2008	2009	Infant mortality
			2010	(multiple de-formities)

to abort the child while he refused to undergo sperm analysis.

For Case 1, the dominant antecedent was failure to understand what was taught by the provider about vasectomy. The concept of a 1% failure rate had been interpreted as a zero failure rate. His failure to understand that vital information also influenced him not to undergo a sperm count. His outcome behavior of rationalizing his poor cognition was a way of coping. He was quick to rationalize his poor cognition of contraception with his being a good provider to his children. Even though vasectomy failed on him, he remained undaunted because he knew he was a responsible provider anyway - with or without vasectomy.

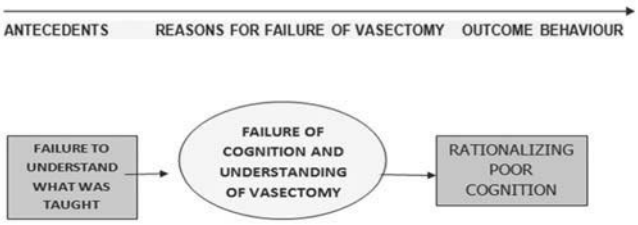

Figure 3. Emerging concept for case 1

Case 2: The sex bomb For Case 2, the failure of his vasectomy was rooted on his inability to translate knowledge into action. The prevailing attitude of "bahala na", deeply rooted in the Filipino culture, made LO2 forsake whatever information he obtained. This also enhanced his tendency to comply poorly with the restrictions of vasectomy. Failure of health education to correct his misconceptions harnessed LO2's idea of the consistency of his ejaculate on the 8th time represented success of his vasectomy. His willingness to initiate control of contraception as well as his perception of the absolute effect of vasectomy also contributed to his not being able to translate whatever he knew of the method into actions that could have averted the failure. The values of LO2 hindered his actions towards a positive outcome, since his sexual pleasures dictated the consequences of his decisions. LO2's cognition of vasectomy resulted to outcome behaviors such as: 1) defining positive reactions of others towards his acceptance of vasectomy as a positive reward, 2) trusting his spouse to mask the impact of the failure by rationalizing his love and trust in her, as well as 3) claiming the child as his. Once LO2 rationalized his poor compliance to the protocol of vasectomy, he had in part, accepted that it had failed indeed.

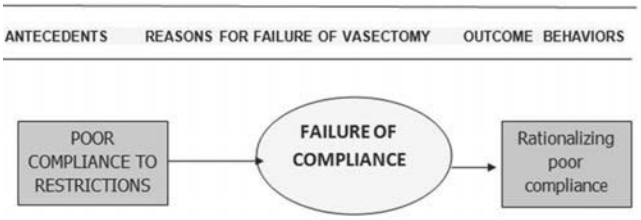

Figure 4. Emerging concept for case 2

Case 3: "Ang bulong" (The Whisper) Case 3 was a story of misconceptions. Health education failed to correct ET3's wrong beliefs regarding vasectomy in particular and contraception in general. His learned experiences led him to fear almost all the contraceptive methods. The fact that his wife committed one mistake after another with the use of oral and injectable contraceptives due to misconceptions did not deter the couple from pursuing their contraceptive intent. However, unintended pregnancies resulted thereafter and led him to believe that family planning could ease his poverty if his wife adhered to the method. Misconceptions gave him comfort and relief from his fear of his wife getting sick or dying if she underwent ligation. He blamed other people, persisting with his beliefs despite the ready access to health education and services.

ET3 felt the impact of a large-sized family with all the economic, psychosocial, and emotional consequences weighing heavily on him. He regarded contraception as a means to ease his hardships and poverty. How he hoped to alleviate his family's poverty was another matter that continued to elude ET3. The failure of his vasectomy tested the partnership he had with his wife. For the moment, contraception had provided him with a respite from having yet to take care of another child. Thus, any family planning method was good enough for him.

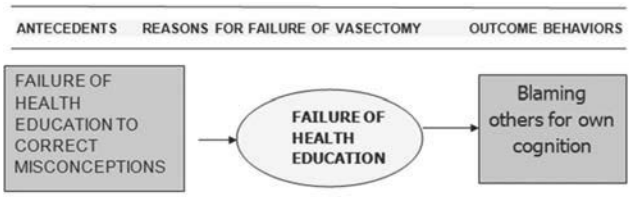

Figure 5. Emerging concept for case 3

Case 4: I love her, good-bye For OD4, his acceptance of vasectomy was not due to its contraceptive benefits but rather as proof of his wife's infidelity. Though he perceived family planning as a way to ease his poverty, the failure of his marriage led him to seek control over his chaotic situation. He was confident that his wife's adulterous ways would be punctuated with her pregnancy by another man.

Once it served its purpose, OD4 had no use for vasectomy, which for him was successful even without a sperm count. The unrequited love for his wife was the driver of his perception of his failed vasectomy. This was the root of his inappropriate rationalization for contraception. According to OD4, his wife was guilty beyond reasonable doubt, and that was all proven by his vasectomy. But at the end of the day, OD4 had his misgivings, both loving and hating at the same time. (After the initial interview session, OD4 had a sperm count; the result was zero.)

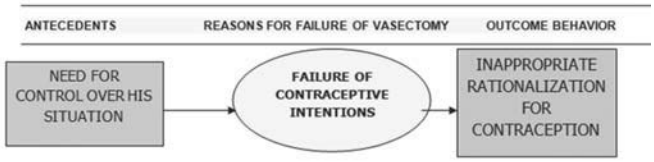

Figure 6. Emerging concept for case 4

Case 5: Unbroken vow Case 5 had all the antecedents of a successful contraception - shared responsibility, compatibility of contraceptive intention, positive contraceptive experiences, love for wife and willingness to assume responsibility. However, his vasectomy failed because of his failure to comply with program protocol of undergoing a sperm count. The husband and wife's relationship were marked by the following characteristics: 1) compatibility of their contraceptive intentions; 2) same aspirations regarding the number of children desired; and 3) agreement on the contraceptive method to be used. In accepting vasectomy, the burden of contraception was carried by PL5. His perceptions and decisions were borne out of his regard and love for his wife. Despite the failure of vasectomy, he accepted it while his wife shared in the consequences. Their participatory engagement in contraception led to strengthen their contraceptive intentions. For PL5, vasectomy was his best option, and had no qualms about a repeat procedure. It was a necessity rather than a choice and was a manifestation of their partnership as husband and wife. Despite the obvious failure of his vasectomy, the whole episode was a positive contraceptive experience for both of them as evidence by the love and joy brought about by the product of that contraceptive failure - a daughter they longed for.

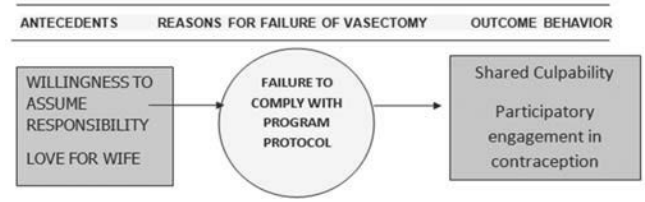

Figure 7. Emerging concept for case 5

Case 6: The fast and the furious For Case 6, inadequate contraceptive information led to a hasty decision-making. Inadequate client-provider interaction added to the burden of his poor understanding of vasectomy. His misconceptions were not addressed either. Once failure of the method occurred, he was naturally skeptical and blamed others for the way he understood the instructions given to him about the sperm analysis, which he did not pursue. He could have been spared of the unfortunate experience of the tragic death of his last two children, born with multiple congenital anomalies. The evidence of his failed vasectomy was enough for LB6 to remain skeptical regarding his perceptions of contraception. In the end, because he did not believe in vasectomy anymore, he decided not to undergo sperm analysis.

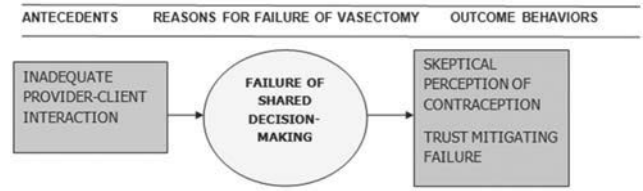

Figure 8. Emerging concept for case 6

Emerging frameworks to themes and subthemes From the emerging frameworks of the six cases, the reasons for failure of vasectomy of the participants were categorized into two themes: failure of partnerships and failure due to low levels of health literacy. Drawn to elucidate underlying factors for failure, from the following refined categories from each of the cases emerged the five subthemes: failure of health education to correct misconceptions; failure in compliance; failure in cognition and understanding; failure in shared decision-making; and failure in contraceptive intentions.

Discussion

Theme 1: Individual's low health literacy level

One's health seeking behavior is also related to the individual level of health literacy. Where there are adequate levels of health literacy, the population has sufficient knowledge and skills and where members of a community have the confidence to guide their own health, people are able to stay healthy, recover from illness and live with disease or disability.[7] With adequate levels of health literacy, family planning methods would have been understood by the participants enough to remember and seek ways to have a sperm analysis that could have determined the early failure of their vasectomy procedure. They could have discerned that vasectomy, being fallible, can present failure - their failure. A clear understanding of the details of the informed consent read before the acceptance of the procedure as well as the instructions for the other parts of the protocol for vasectomy was hinged on understanding the male acceptor and his level of health literacy.

For whatever meaning(s) corresponding to Case 2's response of "bahala na", the endpoint was an action that reflected his poor compliance with the restrictions of the protocol by having unprotected sex with his wife. The other participants had their own "bahala na" attitude when they decided not to pursue the recommended sperm count. Note that the participants then had nowhere to go for their sperm analysis. Their individual complacency - or self-confidence - was anchored in their belief that there was no way for their vasectomy to fail - until their wives got pregnant.

Theme 2: Failure of shared decision-making

To maximize provider-client interactions, it is necessary for clients to get as much correct information as a health provider can give. When there is not enough information, the decision will not be sound. The health provider could have inadvertently led the client to err into deciding what treatment option best suits him.

It is increasingly important to emphasize developing partnerships among patients, physicians, and other health professionals. Patient involvement in their own health care is likely to reduce errors, adverse events, and non-adherence to treatment.[8] Studies which had examined shared decision-making using qualitative and quantitative methods found it appropriate in any situation where there was more than one reasonable course of action and where a single option was not readily apparent.[9] The physician often provides initial information about available options, ensuring that patients understand the ramifications of their choices but patients must decide on their own course of treatment.[10] However, before provider and patient can engage in shared decision-making, there must be a shared understanding of each other's frame of reference.

When men were actively involved in and informed about family planning, the acceptance and continuation of contraception increased.[11] There was the sense of ownership that linked the male to the intention of the contraception. He was able to transcend the minor disadvantages associated with the contraceptive: the male was aware a condom could fail with typical use but persisted in its use because it brought him the emotional satisfaction of not being able to impregnate his wife when used perfectly. The same emotional stability of being free from anxieties of unintended pregnancy with vasectomy led the male to confer it with positive emotions that sustained his continued use. The contentment of having several pregnant-free years due to vasectomy drove the participants of this study to believe that the procedure was indeed successful.

Partnership calls for the acceptor and his wife to have the intention of shared responsibility in contraception. Couples must share responsibilities in procreation and in contraception. Increasing male involvement in family planning hopes to direct male participation towards the goals of partnership in order for the method to succeed. Partnership also

calls for service provider-client interaction that is grounded on an acceptable level of health literacy in order to maximize information passed during counseling and demand generation of acceptors. Such partnership is needed even after the acceptor has undergone the surgical procedure in order to motivate him to undergo the next step, which is sperm analysis. Whatever the result of the sperm analysis, the partnership needs to make ways so that client needs are addressed earlier and unintended pregnancies are averted, if possible.

Because of the failure of partnerships in this study, the acceptors were left with unintended pregnancies that resulted to extreme consequences: a cause for abortion, marital rift, and personal agony or a source of immense joy and blessing. When the partnership between acceptor and wife and between service provider and acceptor failed, vasectomy as a means of contraception was of no use to the acceptor. All participants saw the importance of contraception even in the face of its failure as a family planning method. The reasons they accepted vasectomy were still the very same reasons why they wanted their wives to continue with another contraceptive after a failed vasectomy.

The way the participants understood, processed, and acted upon the knowledge given to them when they accepted vasectomy was a product of the level of their individual health literacy. Sadly, there were no provisions for the program to address this factor as provider-client interactions were minimal and sometimes a one-shot deal. There was no in-depth assessment of how the acceptors understood the instructions given to them. There were no follow-up sessions done to monitor the status of acceptors post-vasectomy and to emphasize the need for a sperm analysis. The level of health literacy of the acceptors was not addressed nor improved even with the failure of their vasectomy. The participants continued with their misconceptions, fears, and fallacies that eventually became a burden to the program in general.

The reality bites of failed vasectomy led these acceptors to realize the truth that despite all that has been said and done, no method is ever perfect and infallible. In a sense, males undergoing vasectomy have no emotional support from service providers who have been trained in the program to be pro-woman, dispensing contraceptive commodities for women.

When vasectomy fails as a method, there are a lot of issues service providers and program managers can never address. Until vasectomy is demystified to be fallible given the failure rate, the male acceptor will be burdened beyond imagination, far beyond the intentions and meanings of contraception. The service providers will be unable to reach out and help them because by that time they do so, contraception in its whole perspective, would be of no use to the clients.

Funding

The funding of this paper was part of the scholarship awarded to the author by the Philippine Council for Health Research and Development-Department of Science and Technology in 2009-2012.

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A comparison of stretching with ice vs stretching with heat on hamstring flexibility among physical therapy students

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Abstract

Introduction This study aimed to compare the effectiveness of stretching with ice and stretching with heat and their long term effect on the hamstring muscle flexibility among college students.

Methods This was a quasi-experimental study where students who were determined to have tightness of the hamstring muscle were randomized to receive hot or cold packs thrice weekly for four weeks prior to stretching the muscle. The range of motion of knee extension with 90° hip flexion (active knee extension) was measured at baseline, week 1, week 2 and at the end of the treatment period. The post-treatment range of motion was compared with the baseline within and between the two study groups.

Results Both modalities resulted in an increase in the range of motion from the initial to the week 4 determination. The final range of motion assessment was similar for the cold and hot groups. The difference between the final and initial assessment was larger in the cold group compared with the heat group (13.5° vs 9.5°) but when the mean difference was compared between the two groups, an unpaired t-test showed that the difference was significant.

Conclusion Cold therapy prior to stretching appears to be a more effective option than heat in addressing hamstring muscle extensibility problems.

Key words: Cryotherapy, hamstring flexibility, heating modality, physical therapy, static stretching

Physical therapy is a profession that deals with different modalities and manual techniques as interventions, such as stretching, for different conditions. Stretching is a technique to lengthen muscles prior to exercise or to different therapies. There are certain modalities that can help increase the lengthening of muscles. In this study, the researchers used heating and cooling modalities. The effect of a heating modality prior to stretching has already been proven to have a significant effect to the muscles, however, a cooling modality before stretching is yet to be proven whether it has a significant effect to the muscle prior to stretching. The effect of cryotherapy prior to stretching has received considerable attention. Cryotherapy is the application of cold to soft tissue for therapeutic purposes. It is an established method of treating acute soft tissue injuries. Cryotherapy is also used for post-exercise recovery.[1]

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Presented in the 18th Annual Research Forum, February 24, 2016, University of the East Ramon Magsaysay Memorial Medical Center, Quezon City

Increasing soft tissue temperature prior to exercise is an accepted practice.[2] This may be through warm up or local application of heat. However, there is a growing trend of recent use of cryotherapy for stretching prior to exercise. Pre-cooling has gained widespread acceptance as a method of offsetting thermal strain and fatigue and increasing aerobic and anaerobic capacity.[3,4] In spite of these early observations there is still an uncertainty whether cooling modality helps the muscle lengthen. One study suggests that supine hamstring flexibility after stretching with ice was greater than stretching with heat.[5] This study, however, only showed short term results. Hence, additional studies of the effectiveness of stretching with heating modality and stretching with cooling modality are needed to help compare which has the better effect to the lengthening of the muscles.

The purpose of this paper was to determine which modality has a better long term effect in increasing hamstring flexibility. The researchers took note of the effect of heat and ice to the muscle length. This paper hoped to show that the long term effects of stretching with ice compared to stretching with heat.

Methods

This was a quasi-experimental study[6] where students from a physical therapy school in Quezon City who were determined to have tightness of the hamstring muscle were randomized to receive hot or cold packs thrice weekly for four weeks prior to stretching the muscle. The range of motion of knee extension with 90º hip flexion (active knee extension) was measured at baseline, weekly and at the end of the treatment period. The post-treatment range of motion was compared with the baseline within and between the two study groups. The study was approved by the Ethics Review Committee.

First year BS Physical Therapy students during school year 2014-2015 were invited to participate in the study. Those who agreed were evaluated by a licensed physical therapist for hamstring muscle tightness through an active knee extension (AKE) test.[7,8] The range of motion of the knee joint was measured with a small plastic goniometer.[9,10,11] Informed consent was obtained from those with hamstring muscle tightness who agreed to join the study. The baseline range of motion was determined by a licensed physical therapist and recorded. The subjects were randomly assigned to receive a cold pack (intervention) or a hot pack (control) prior to stretching.

Ice wrapped in two layers of towel or ice towel was applied for 20 minutes to the muscle belly of the posterior thigh of the cold group. A hot moist pack wrapped in a towel with seven layers was applied for 20 minutes to the muscle belly of the posterior thigh of the heat group.[12] Stretching of the hamstring muscle was performed on both groups immediately after the application of the modalities. A 15-second stretch with 10 repetitions at 3-5 second intervals[13,14] was done by the physical therapist. The sessions were conducted three times a week for four weeks.[15-18] The range of motion of the subjects was measured right after stretching every third day of treatment of the week by another licensed physical therapist blind to the modality of treatment and was recorded by the researchers.

The subjects were given a seven day rest after the last day of treatment. No specific instructions given to the subjects for the seven day rest. After seventh day, the range of motion of knee extension with 90° of hip flexion was again measured by a licensed physical therapist to evaluate whether the subjects sustained the effect of the four week stretching intervention.

A paired t-test was used to compare the ROM of the subject's hamstrings before and after the treatment.[19] An unpaired t-test was used to compare the ROM of the hamstrings of the hot and cold groups.[20]

Results

Out of 196 students invited, 26 students agreed to be screened. Twenty-one of them fulfilled the criteria for participation and 20 students completed all sessions required.

As seen in Table 1, both modalities resulted in an increase in the range of motion from the initial to the week 4 determination. The final range of motion assessment was similar for the cold and hot groups. Interestingly, both groups showed a decrease at week 3. The difference between the final and initial assessment was larger in the cold group compared with the heat group (13.5º vs 9.5º) but when the mean difference was compared between the two groups, an unpaired t-test showed that the difference was significant (Table 2).

Table 1. Range of motion (ROM) of the subjects in the cold and hot groups per week.

	Cold	Hot	p value*
Initial assessment	65.0±5.77°	67.5±7.17°	0.21
Week 1	67.8±4.41°	69.0±11.01°	0.65
Week 2	77.0±6.75°	82.0±6.33°	0.10
Week 3	73.1±7.96°	71.9±7.56°	0.68
Week 4	81.0±7.38°	85.6±5.27°	0.20
Final assessment	78.5±7.09°	77.0±9.19°	0.59

* Unpaired t-test

Table 2. Comparative effect of hamstring flexibility with cooling modality and hamstring flexibility with heating modality.

	Cold	Hot	p value*
Initial ROM assessment	65.0±5.77	67.5±7.17	
Final ROM assessment	78.5±7.09	77.0±9.19	
Difference	13.5	9.5	0.04**
p-value	0.01*	0.07*	

* Paired t-test
** Unpaired t-test

Discussion

The physiologic effects and clinical application of heating and cooling modalities are well-documented in literature regarding their use as physical agents used in PT rehabilitation. While both modalities cause thermal sensory reactions with an initial period of thermal shock, beyond this sensory experience, heat and cold cause very different physiologic reactions. Superficial heating modalities cause localized sweating and erythema from vasodilation of the underlying vessels due to axonal reflexes and the release of dilating hormones such as histamine and bradykinin. Cold on the other hand causes blanching with piloerection, with vasoconstriction stemming from the inhibition of histamine release as an autonomic response causing a localized restriction in blood flow in an attempt to preserve heat. Heat also causes analgesia, local muscle relaxation and an increase in metabolic activity. Cryotherapy alters synaptic activity, slowing nerve conduction such that it also causes a reduction in muscle activity and analgesic effects, it conversely lowers metabolic activity in the area being treated, the complete opposite to the effect of heat.[21]

As such, both modalities have been used in increasing muscle flexibility as an adjunct to stretching or other flexibility exercises. Heat, with its properties of relaxing muscle and improving blood flow allows a muscle to lengthen more easily in addition to its analgesic properties. Cold, with its ability to inhibit stretch reflex and pain, inhibiting the protective responses of muscle spindles and golgi tendon organs, also promotes increased flexibility.[22] While decreasing spindle afferent reflex mechanism and subsequently, skeletal muscle activity may seem to predispose muscle to injury, the use of gentle passive stretching instead of high intensity flexibility exercises modulates this risk. In fact, protocols exist for improving muscle flexibility using cold as an adjunct have been shown to be safe with minimal risk of injury.[23]

Studies show conflicting results of to the efficacy of each modality in its ability to effectively increase muscle flexibility. Several studies, such as a systematic review of 36 different studies rule in favor of heat in combination with stretching as the most effective intervention.[24] As such, heat is still the modality of choice to combine with stretching, relegating cold to the treatment of acute injury. It is most useful for facilitating a reduction of pain and inflammation, resulting in a faster recovery and return to activity for both acute and chronic conditions.[25] Still other studies see no significant difference between heat and cold application, but are in agreement that either modality used in combination with stretching is more effective than stretching alone in improving muscle extensibility.[26] A 2014 study by Park, Kwon, Weon, Choung and Kim however found that the application of local cryotherapy improved both passive and active ROM in subjects with tight muscles by reducing stretch sensitivity and increasing pressure pain threshold, even without stretching maneuvers.[27]

From the results of the study, both groups showed a gradual increase in the post-intervention range of motion over a period of 4 weeks. Subjects sustained some degree of increased extensibility even after a one week washout period where no intervention was applied. There was however a slight drop-off during the week 3 post intervention assessment where a replacement conducted the assessment as the regular assessor was unavailable. This change can be attributed to human error as the return of the regular assessor a week later resumed the upward trend of

improved hamstring ROM. While the inter-rater and intra-rater reliability of goniometry is strong and well-documented, these findings are true for assessors with a certain threshold of experience.[12] Given that the replacement assessor had less than a year of work experience as a licensed PT, the lack of experience in utilizing goniometry may have caused some inter-rater error between measurements.

Between the application of superficial heat via hot moist packs and superficial cryotherapy via cold packs, it can be seen from the results that cold application in addition to gentle stretching maneuvers had a significant change in hamstring flexibility compared with heat application. In addition, a comparison between the overall changes in ROM between the two treatments yielded a statistically significant difference between cryotherapy and superficial heat application. From these results, it can be inferred that cryotherapy with stretching is more effective in improving hamstring flexibility.

These findings were consistent with a flexibility regimen that uses cold to improve ROM gains and recovery in acute and chronic pathologies, a technique called cryokinetics.[28] This method had been shown to be effective in regaining lost ROM early in the disease or injury process by using numbness to mask the pain and discomfort caused by the injury or pathology. The authors, however; warned that the exact nature and extent of the injury needed to be known first so as not to exacerbate the condition and to promote better patient safety. In other studies, a combination therapy has been shown to be effective. The application of a cold pack after hot moist pack application has been shown to be more effective than either heat or cold application alone in improving restricted passive knee ROM.[29] The technique, called cryostretch, uses the same principles of reducing muscular resistance to stretch by masking the pain and discomfort of the stretch by reducing the sensitivity of skeletal muscle to lengthening maneuvers.

The study showed that cold was the superior intervention. However application of cold modality and the techniques of cryokinetics and cryostretch carry with it a risk of injury if applied without caution. Due to the reduction of muscle activity and protective reflexes, there is a danger of further trauma and tissue damage. Prolonged application of cold also reduces skeletal muscle metabolism and force generating capacity, as well as a risk of frostbite and neural damage. Heat carries the same burden of causing burns and tissue damage with prolonged exposure, as well as hastening the effect of exercise fatigue and hyperthermia, its musculoskeletal and neuromuscular physiologic effects keep protective reflexes intact that prevent muscle overstretching or the muscle from generating too much tension.

Each modality comes with its own advantages and disadvantages, and based on the conflicting results of studies previously done regarding these physical agents, both can be considered equally effective. The result of thus current study indicates that the cold modality was the more effective intervention compared to heat when it comes to resolving ham-string muscle extensibility problems, although it is not without its risks and precautions. However, it should be noted that these results were drawn from subjects with no pathologic or underlying disease.

The researchers conclude that cryotherapy is more effective than thermotherapy prior to static stretching. They recommend its use on the involved muscle group prior to static stretching on non-pathologic clients between the ages of 16-18 years. This current study gives therapists and other professionals who use physical agents another different, yet effective modality to consider when treating clients who wish to regain or improve their muscle extensibility. This benefits both the professional practitioner as well as the end user of physical rehabilitation services.

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A comparative study of the effectiveness of tea tree oil and benzoyl peroxide in the treatment of acne vulgaris among Filipino teenagers and adults in Metro Manila

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Abstract

Introduction The researchers aimed to determine the efficacy of tea tree oil in comparison to benzoyl peroxide in treating mild acne. This study also aimed to identify the side effects of both treatment modalities.

Methods Using a randomized single blinded controlled clinical trial, teenagers and young adults with mild acne vulgaris were allocated to receive tea tree oil gel or benzoyl peroxide for four weeks. The effectiveness of the agents was measured using the Investigator's Global Assessment Scale. Post-treatment scores were compared with the baseline within groups. The difference was compared between the two study arms. Adverse reactions to the two agents were also noted.

Results Both tea tree oil and benzoyl peroxide groups showed a significant decrease in the post-treatment lesion counts compared to the baseline, however when the mean differences were compared between groups, the difference was not significant.

Conclusion Tea tree oil is comparable to benzoyl peroxide in treating mild acne vulgaris among teenagers and young adults.

Key words: Tea tree oil, benzoyl peroxide, mild acne vulgaris

Acne vulgaris is a common dermatological condition associated with psychological problems such as depression, anxiety and low self-esteem. Although acne is not life-threatening, it can be a contributory factor in the cutaneous and emotional scars that last a lifetime, causing physical, social and psychological suffering, as well as reducing self-esteem and creating emotional distress due to the perceived disfigurement.[1] Due to better understanding of the pathogenesis of acne, new therapeutic modalities have been designed to improve the tolerability of patients to treatments. Studies reported that topical treatments such as benzoyl peroxide, salicylic acid, and a low-dose retinoid are favored in the treatment of mild acne.[2,3] However, benzoyl peroxide can cause concentration-dependent cutaneous irritation or dryness, and bleaching of clothes, hair and bed linen. Both benzoyl peroxide and tretinoin can induce irritant dermatitis. Meanwhile, antibiotics cause bacterial resistance and

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Presented in the 18th Annual Research Forum, February 24, 2016, University of the East Ramon Magsaysay Memorial Medical Center, Quezon City

cross-resistance and, therefore, are advised not to be used as monotherapy.[2]

Tea tree oil has anti-inflammatory activity *in vitro*, which was the basis of its use in the treatment of various skin diseases such as cuts, insect bites, boils, and dermatophytosis. Previous studies have also suggested the efficacy of 5% tea tree oil in the treatment of acne vulgaris.[4] The researchers aimed to determine the efficacy of tea tree oil in treating mild acne in comparison to benzoyl peroxide. This study also aimed to identify the side effects of both treatment modalities.

Methods

This was a randomized single-blind trial among teenagers and young adults with mild acne vulgaris from Quezon City where eligible subjects were allocated to receive topical tea tree oil or benzoyl peroxide for four weeks. Efficacy was measured with the Investigator's Global Assessment Scale (IGA) by evaluators blind to the treatment. The study was approved by the Ethics Review Committee.

Men and women from a community in Barangay Doña Imelda, 18 to 29 years old, with acne problems and not under any treatment for acne were recruited. Pregnant women and those with comorbid diseases, allergy to treatments and participating in a similar study were excluded. A sample size of 25 per group in-clusive of a 20% dropout was computed based on the Z-value for alpha error of 1.96, difference of 1.2, and assumed standard deviation of 2.[4]

Those who agreed to join the study and gave their consent were brought to the Dermatology outpatient clinic. A dermatologist checked their acne condition using Combined Acne Severity Classification (CASC); scale this entailed counting the number of comedones and papules. The presence of fewer than 20 comedones, or fewer than 15 inflammatory lesions, or total lesion count fewer than 30 was considered as mild acne vulgaris. Those who qualified were randomized via random letter assignment using Microsoft Excel to receive the intervention tea tree oil (TTO) gel or the control benzoyl peroxide (BPO). The patient's acne condition was then described using the USFDA Investigator's Global Assessment (IGA) scale.

The subjects were taught how to apply the treatment, the frequency, amount, and duration of the treatment. The participants documented the frequency of the application of the treatment every night using a checklist; the participants underwent an initial trial for three days to check for adverse reactions to the assigned treatment. They were instructed to report any adverse reaction via text messaging. Any reported adverse reactions (referring to unwanted, uncomfortable, or dangerous effects that a drug may have, and can be considered a form of toxicity)[5] were to be referred to the Dermatology OPD. Participants who did not report any serious reactions proceeded to the 4-week clinical trial with their assigned treatments. Their IGA grade scores were determined after four weeks. Treatment was considered successful if there was at least a two-grade reduction from the baseline IGA score; reduced, if the lesion count decreased but did not reach a two-grade reduction, and; no reduction, if there was no decrease in the number of lesions from the baseline.

An independent T-test was used to determine if there was a significant difference between the age and baseline lesion count of the TTO and BPO group; a chi-square was used to determine if there was a significant difference between the sex distributions of the groups. A paired T-test was used to determine if there was a significant difference between the post-treatment and baseline lesion counts in each group. An independent T-test was used to determine if the difference in lesion count between the TTO and BPO groups was significant. A p-value of < 0.05 was considered significant.

Results

Out of the 70 participants of the study, only 58 subjects were able to complete the study (31 in the TTO and 27 in the BPO groups). There was an 11% drop out rate in the TTO group while dropout rate in the BPO was 22%, thus intention-to-treat analysis was done. Multiple imputation using SPSS 20 was used to handle the missing cases. As seen in Table 1, the TTO and BPO groups were comparable in terms of age, sex, and baseline lesion count.

Table 1. Demographic characteristics of the treatment (TTO) and control (BPO) groups.

	TTO	BPO	p-value
Mean age	23.7 (2.41)	24.1 (2.34)	0.55
Sex			
Female	17	18	0.81
Male	18	17	
Baseline lesion count	19.6 (6.26)	21.8 (6.37)	0.16

Both TTO and BPO groups showed a significant decrease in the post treatment lesion count compared with the baseline count as seen in Table 2. When the mean differences of the groups were compared, the difference of the means was not significant (Table 3).

Table 2. Effectiveness of TTO and BPO based on number of lesions.

	Baseline	Post Treatment	Difference	p-value
TTO	19.9	14.4	5.5	< 0.01
BPO	22.1	14.3	7.8	< 0.01

Table 3. Intergroup comparison of the mean difference in the number of lesions.

	TTO	BPO	p-value
Difference	5.5	7.8	0.24
% change	27.64	35.29	0.38

Although there was a difference noted between the results of the original and the imputed data, the interpretation of the results remained unchanged despite a 25% dropout (Table 4). The result indicates that that TTO is less likely to reduce acne lesion count compared to those treated with BPO although this is not statistically significant (p = 0.6). Those given TTO have a 1.38 chance of developing a side effect compared to those who were treated with BPO (Table 5).

Discussion

Acne vulgaris is a multifactorial inflammatory disease involving the pilosebaceous follicles.[6] The combination of keratin, sebum and microorganisms, particularly *Propionibacterium acnes* leads to the release of pro-inflammatory mediators and the accumulation of lymphocytes, neutrophils, and foreign body giant cells. This, in turn, causes the formation of inflammatory papules, pustules, and nodulocystic lesions.[7] Treatment is based on the severity of the acne. There is no standard treatment for acne but there are several treatment modalities that provide promising effects in treatment of acne in some patients. Benzoyl peroxide, retinoids, and antibiotics are usually used to treat mild to moderate acne.[8] For mild severity, comedones are usually treated with topical retinoids and physical extraction while papular and pustular are treated with antimicrobials, topical retinoids and benzoyl peroxide. A study revealed that despite scarcity of research on benzoyl peroxide, it is considered as standard treatment.[9] Benzoyl peroxide has mild keratolytic effect and antimicrobial activity which is attributed to its oxidative property. Tea tree oil has a broad spectrum of antimicrobial activity attributed to its composition of cyclic monoterpenes,

Table 4. Effectiveness of TTO in reduction of lesions.

	Without reduction in lesions	With reduction in lesions	RR	p-value
Original data				
TTO	8	23	0.91	0.51
BPO	5	22		
Imputed data				
TTO	11	24	0.89	0.60
BPO	8	27		

Table 5. Comparison of adverse reactions of TTO and BPO.

	TTO (n = 35)	BPO (n = 35)	RR	NNH	p-value
Drying of skin	11	8	1.38	7.5	0.27
Itchiness	11	8	1.38	7.5	0.27

specifically, terpinen-4-ol, the main antimicrobial component of tea tree oil.

Using the IGA scale, all participants were classified as Grade 2 at baseline but they remained at Grade 2 even after treatment. One possible reason is that the length of the treatment course might have been too short to incur a 2-Grade reduction from the baseline score. Both TTO and DPO showed a statistically significant decrease in the number of lesions and these results are consistent with previous studies.[10,11]

Tea tree oil is derived from the leaves of *Malaleuca alternifolia*. It has a broad spectrum of antimicrobial activity attributed to its composition of cyclic monoterpenes, specifically, terpinen-4-ol, the main antimicrobial component of tea tree oil. There is also the presence of other components, such as α-terpineol, which have antimicrobial activity similar to those of terpinen-4-ol. As a common ingredient of healthcare and cosmetic products, tea tree oil concentrations range from 2% to 5% in commercially available products.[12]

According to a study, tea tree oil is 3.5 times more effective than the placebo in the total acne lesion count, and 5.8 times more effective in the acne severity index of the study's participants.[13] Thus, there was a significant difference between 5% tea tree oil gel and placebo regarding improvement of the total acne lesion count. One study also concluded that tea tree oil is an effective treatment of mild to moderate acne vulgaris.[14] The study showed a significant reduction of propionibacterium and follicular casts on the skin surface after treatment of two days with only slight reductions in mean acne grade and mean inflamed lesion count. The non-specific antibacterial action of BPO therefore may be utilized in short course treatments to reduce carriage of antibiotic-resistant microorganisms and in turn, improve the long-term efficacy of antibiotic acne treatments. A similar study done showed that both TTO and BPO significantly reduce inflamed lesions. However, BPO performed better than TTO.[15]

The results of this current study showed that TTO has a 1.38 risk of developing a side effect compared to those who were treated with BPO which contrasts with a previous study.[15] There are several factors that may have affected the results of the study such as the preparation of the treatment modalities; TTO was given in a form of oil and BPO was prepared as a cream. The adjunct ingredients used in the previous studies and this current study may have differed.

Several studies also showed contradicting results on the side effects of tea tree oil. A clinical study on the toxicity effects of TTO from its leaves (TTO-L) were evaluated by a skin irritation assay and liver function evaluation. TTO-L and two major components terpinen-4-ol and 1,8-cienole were used to evaluate skin toxicity by a single topical application. The results revealed no significant erythema, irritation and very slight edema upon application of TTO.[15] However, tea tree oil was shown to cause both irritant and allergic reactions.

Since irritant reactions may frequently be avoided through the use of a lower concentration of the irritant, this bolsters the case for discouraging the neat oil in promoting the use of well-formulated products. The most definitive work indicates that allergic reactions are caused mainly by oxidation products that occur in aged or improperly stored oil.[16]

The investigators conclude that the efficacy of TTO and BPO in treating mild acne vulgaris is comparable, thus TTO can be considered as an effective alternative treatment to BPO. Post-treatment, the retained Grade 2 baseline IGA Grade of all participants may be due to the short duration of treatment (4 weeks), which did not allow for the maximum capacity of the treatment modalities to cure acne lesions. Other factors that may be considered are the stress level and hormonal changes of the participants. Likewise, the increased risk of side effects of TTO, which include dryness of skin and pruritus, must also be taken into consideration. Despite not having a reduction of at least 2 grades in the IGA classification of all participants, the results still revealed that there is significant reduction in the number of acne lesions when the efficacy of TTO ($p < 0.01$) and BPO ($p < 0.01$) are analyzed separately. Therefore, the researchers recommend TTO as an alternative treatment for mild acne.

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Accreditation of medical education: Perspectives of stakeholders

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Abstract

Introduction This study aimed to describe the perspectives of stakeholders on the impact of the accreditation process on the implementation of the medical curriculum. Furthermore, the study attempted to explore the quality of the impact of accreditation on the implementation of the curriculum.

Methods Survey questionnaires were administered to 140 faculty staff, 100 students and 50 graduates. The questionnaires were developed based on the self-survey instrument of the Philippine Accrediting Association of Schools, Colleges and Universities (PAASCU) covering five areas observed by the respondents: curriculum and instruction, faculty, students, resources and research. Review of PAASCU reports from 2002 to 2013 and survey questionnaires were likewise conducted.

Results The faculty, students and graduates rated as "very good" the areas of curriculum, instruction, student profile, and student performance, except "application of appropriate teaching-learning strategies" which the students gave a "good" rating. The students rated the resource driven areas (library, learning environment, research capability, research output) higher than the faculty. The respondents' self-survey ratings were consistently higher than the PAASCU ratings across four years evaluated.

Conclusion The respondents showed strong awareness of the benefits of accreditation on the faculty, students, curriculum and instruction. Resource-driven areas like research, library and learning environment and faculty benefits were deemed short of the expected excellent standard.

Accreditation serves as a tool to ensure quality in education. In the Philippines, medical schools' interest in accreditation started only recently. This endeavor among medical schools to seek external evaluation of the implementation of the medical curricula was seen among the 41 Philippine medical schools. Eleven schools have thus far been granted accreditation, three are candidates and eight are in the process of application. Accreditation is voluntary and conducted by the Philippine Accrediting Association of Schools, Colleges and Universities (PAASCU), one of several accrediting bodies in the country. Accreditation, as defined by the PAASCU, is a concept based on self-regulation which focuses on evaluation and the continuing improvement of educational quality. Accreditation is both a process and a status. It is the process of reviewing colleges,

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Presented in the Free Communication Category, 13th Asia Pacific Medical Education Conference (APMEC), January 13-17, 2016, National University of Singapore, Singapore.

universities, institutions and programs to judge their educational quality.[1] Furthermore, it is seen as a process by which institutions or programs continuously upgrade their educational quality and services through self-evaluation and the judgment of peers. In the end, a specific status is granted to an educational institution or program which meets commonly accepted standards of quality or excellence.[2]

The accreditation process provides an external perspective of the success of the implementation of a curriculum. It allows medical schools to monitor and evaluate the processes involved in education in the context of their own perceived standards. Medical education accreditation processes can encourage institutional improvement and promote appropriate learning environments.[3]

The survey forms developed by PAASCU identify principles and practices which are found in excellent institutions. The statements in the survey forms are more qualitative rather than quantitative. The criteria and survey instruments are merely tools to help the school measure educational quality. They are intended to serve as a guide for institutions as they strive for excellence. The standards reflect a realistic appraisal of the school's resources and their efficient utilization to help the institution achieve its goals.[2]

PAASCU judges an institution not by comparison with other institutions but primarily by the degree to which each institution's own avowed purposes are matched by actual practice in the various areas being evaluated. Thus, a school is judged on the basis of the "total pattern" it presents. For basic medical education programs, the areas evaluated are: faculty, curriculum and instruction, clinical training/service facilities, research, student, library, administration, and physical plant and other resources.[4]

One of 11 schools accredited by PAASCU is the UERMMMCI College of Medicine, a private, non-sectarian university. The College of Medicine first applied for voluntary accreditation in 2003 and subsequently received level 1 accreditation status. In 2004, level 2 accreditation status was conferred. Five years later in 2009, the school was granted level 3 accreditation status and consequently reaccredited the same level in 2012. In 2013, the College of Medicine has the distinction of being the first private medical school to achieve level 4 accreditation status.

Having obtained the highest level of accreditation it is expected that the evaluation process elevated the quality of medical education. A decade of accreditation should manifest as impact on the components of medical education. The primary beneficiary of the accreditation process is the student population trained in a learning environment of excellent quality. Van Zanten, Durante and Pijano found that Mexican and Filipino students who enrolled in accredited medical schools had better outcomes in the United States Medical Licensing Examination (USMLE) than those who came from non-accredited schools.[5] Van Zanten investigated the performance of foreign graduates in the USMLE based on the accreditation of the medical education programs and reported similar findings.[6]

While achievement of learning outcomes is the ultimate goal of accreditation, other measures can be used to validate the impact of the accreditation on the quality of education received by the students. The UERMMMCI has experienced a decade of accreditation undertaking and it is imperative that a study be conducted to determine whether or not the accreditation process has accomplished its goal: the improvement of medical education. Thus, the study aimed to describe the extent to which accreditation has influenced the quality of teaching in five areas that PAASCU evaluates: faculty, student, curriculum and instruction, resources and research. Specifically, the study determined the stakeholders' perspectives of the impact of the accreditation process on the aforementioned areas.

Methods

A survey was conducted to describe the perspectives of stakeholders on the contribution of the accreditation process on the implementation of the medical curriculum. The participants were selected based on their length of affiliation with the institution. Faculty who had been with the College of Medicine less than five years were excluded. The students who experienced the accreditation process longest were invited to join the survey. Thus, a sample from the fourth year and graduates having their postgraduate internship in the hospital were invited to participate. Survey questionnaires were distributed to 140 faculty staff, 100 students and 50 graduates. The survey was conducted from July to August 2015. Consent from the respondents was solicited prior to the administration of the questionnaires. PAASCU reports from 2002 to 2013 were reviewed.

The questionnaires were developed based on the self-survey instrument of the PAASCU. Five areas that could be observed by the stakeholders were included: curriculum and instruction, faculty, student, resources and research. The respondents were likewise surveyed on their perceptions on the quality of resources like learning environment, library and research. A review of the reports submitted to the accrediting body was likewise conducted. This was carried out to assess the value of the reports of the committees involved in the accreditation process.

Results

One hundred five (75.0%) faculty responded to the survey while 62 (68.9%) fourth year students and 27 (54%) graduates responded to the survey questionnaire.

As seen in Table 1 the faculty and students rated highly the areas of curriculum, instruction, student profile, and student performance. However, a contrast is observed as far as instruction is concerned. While the faculty rated instruction highly (very good), 69.6% of students rated "application of appropriate teaching-learning strategies" as good. The students and faculty agreed in terms of the quality and academic performance of the students. Specifically, both faculty and students find the selection of applicants highly acceptable. Similarly, majority of the respondents manifested approval of the improved method of promoting students to the next year level. More than 50% of the faculty and students indicated that accreditation had influenced improvement of the graduates' performance in the Physician Licensure Examination.

Table 1. Perceptions of stakeholders on influence of accreditation on curriculum implementation.

Area	Faculty and department heads (n=107)	Students (n=87)
Curriculum		
Regular evaluation of the implementation of curriculum	Very good (39.2%)	
Monitoring of implementation of curriculum	Very good (40.5%)	
Feedback of evaluation results to stakeholders	Very good (39.2%)	
Student participation in curriculum evaluation		Very good (45.7%)
Instruction		
Application of appropriate teaching-learning strategies	Very good (48.1%)	Good (69.6%)
Updating of teaching resources	Very good (41.8%)	Very good (45.7%)
Use of multiple assessment methods	Very good (44.3%)	Very good (43.5%)
Availability of faculty for consultation		Very good (41.3%)
Student profile		
Improved selection process	Very good (50.6%)	Very good (43.5%)
Admission of students of quality academic preparation	Very good (49.4%)	
Student performance		
Improved promotion process	Very good (48.1%)	Very good (47.83%)
Higher board examination performance	Very good (51.9%)	Very good (54.4%)

The study revealed divergent perceptions of the faculty and students on the significance of accreditation on resources, as seen in Table 2. Generally, the students were highly satisfied with all resources-driven areas such as library, learning environment and research. This was not observed in the appraisal by the faculty who gave a lower rating for both learning environment and research capability. For the faculty, the clinical and laboratory materials and space were still inadequate to provide an environment conducive to learning. The faculty rated statements on research capability, including "advancement of faculty proficiency in research" and "accessibility of resources for research implementation," as good compared with the students' "very good."

The respondents had a high appreciation of the accreditation's influence in the enhancement of the library holdings. Accreditation recognized the contribution of library collections to the advancement of curriculum implementation. As seen in Figure 1, across the four years surveyed, two areas received consistently high ratings: faculty, and curriculum and instruction. The library was observed to consistently have the lowest ratings compared to the other areas in the four years surveyed. The self-survey ratings were consistently higher than those given by the accreditation teams that visited the school.

Table 2. Perceptions of stakeholders on influence of accreditation on the quality of resources.

Area	Faculty and department heads (n=107)	Students (n=87)
Library resource		
Enhancement of library collections	Very good (39.2%)	Very good (30.4%)
Adequate utilization of allocated funds for library acquisition	Good (36.7%)	
Adequacy of library space	Good (44.3%)	Very good (32.6%)
Learning environment		
Adequacy of space for laboratory procedures	Good (40.5%)	Very good (30.4%)
Adequacy of updated materials for laboratory procedures	Good (44.3%)	Very good (36.9%)
Sufficiency of materials for clinical skills acquisition	Good (36.7%)	Very good (41.3%)
Conducive space for lecture presentation	Good (35.4%)	Very good (47.8%)
Research capability		
Advancement of faculty proficiency in research	Good (48.1%)	
Accessible resource for research implementation	Good (45.6%)	Very good (34.8%)
Availability of avenue to present research output		Very good (39.1%)
Research output		
Increased number of completed research work	Good (32.9%)	
Increased number of published research reports	Good (40.5%)	

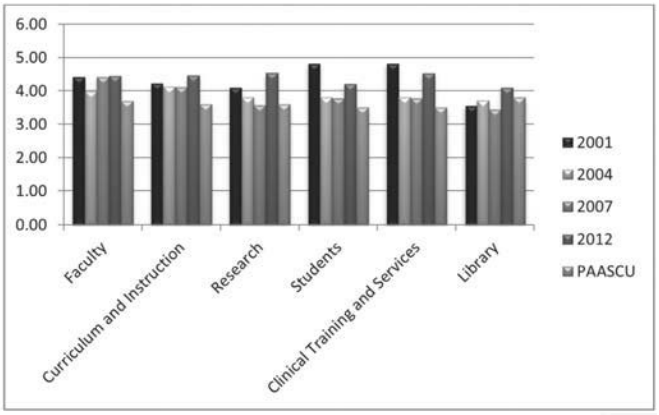

Figure 1. PAASCU self-survey ratings, 2001 - 2012.

Discussion

One of the goals of accreditation is the self-evaluation of the quality of the implementation of a program. The feedback of the stakeholders provides valuable information on how well the program is conducted. Secondly, in accreditation, the worth of the program is not prescriptive as the process allows the institution to determine the standards against which the program's value is measured.

In the Philippines, a measurable outcome of a medical institution's success is achievement of graduates in the Physician Licensure Examination. As such, accreditation has incorporated this criterion as a gauge of the quality of the curricular implementation. The UERMMMCI graduates' performance in the Physician Licensure Examination has been consistently higher than the national passing average, offering an indirect outcome measure of the impact of accreditation. However, performance in the licensure examination is not the sole indicator of the outcome of accreditation. As recommended by van Zanten, other measures of outcome need to be established as evidence.[5] Conversely, one can argue that successful implementation of the medical curriculum depends on a range of factors such as educational culture, leadership, student and faculty characteristics. Based on this argument, the current study was conducted to specifically investigate the perceived impact of accreditation among those who directly benefit from the undertaking.

The respondents representing the faculty, students and alumni expressed different perceptions on the worth of accreditation. The respondents' appraisal of the quality of the areas surveyed during the PAASCU accreditation was substantiated by qualitative analysis of the comments and recommendations derived from the PAASCU survey reports.

Successful implementation of a curriculum requires a well-planned instructional design, regular monitoring and evaluation, well selected-students, prudent student promotion and excellent performance of graduates in the licensure examination. The study findings have shown that the faculty, students and alumni similarly affirmed that accreditation has influenced the quality of curriculum implementation. The only area where a dissimilar opinion was observed was in the lower rating by the students on the application of teaching-learning strategies. This perception can be accounted for by the innate nature of this generation of students who are more adept at digital technology compared to most of their teachers.

An agreement of the students and faculty in terms of the quality and academic performance of the students was likewise noted. Such perspective can be related to the more judicious selection process practiced by the medical school as seen in more stringent requirements as higher National Medical Admissions Test (NMAT) percentile score, General Weighted Average (GWA) and interviews. Student performance, correspondingly perceived favorably by the respondents, could be attributed to the improved promotion process and the graduates' exemplary performance in the Physician Licensure Examination. The commendable rating on curriculum and instruction has proven that the efforts of the College of Medicine to regularly monitor and evaluate the implementation of the course goals have paid off. The students and faculty are the best evaluators of how well the program is being run and their responses provided evidence to such achievement. Corollary to this, curriculum implementation hinges on the capability of the institution to provide the physical and manpower resources to support the needs of both students and faculty. It could be gleaned from the data that these areas were measured to be of average standard. It could be surmised that the above average quality on curriculum could be elevated to excellent once the stakeholders agree that resources are par with their expectations.

All of these are observations emanating from the stakeholders' perspectives and opinions which can be influenced by their own standards and values. The consistency of the information was established through review of the reports by the accrediting body which showed that most of the respondents' views on the influences of accreditation were verified by the survey reports. The PAASCU as an independent body has recognized the faculty and the curriculum as strong points of the College. As mentioned in the report, the medical faculty represents a wide range of specialization to provide the expertise in both basic and clinical sciences. The expertise of the faculty is an essential resource from which the students can gain knowledge, skills and experiences.

The reports have identified areas that need further improvement. These areas include library and research which are fundamental in enhancing the learning of the students. The adequacy and quality of the library holdings is a basic condition to maximize learning. The evolving topography of education mandates that information must be made available to learners and faculty. Such information, whether in print or digital format, needs to be accessible to faculty and students. This has been emphasized by Rankin and Sayre who stated that the changing milieu of continuing education emphasizes bringing information to the practitioner and teaching to the point of need.[9] At the forefront of this development in the provision of information is the library.

Much has been mentioned on the area on research. Research in the academe is an essential component of medical education.[10] Furthermore, the authors stated that research experience is invaluable to the physician's evidence-based practice as it imparts skills such as literature search, collecting, and analyzing data and critical appraisal of evidence.[10] There is indeed value to research. However, the faculty, students and the PAASCU accreditors noted some deficiencies in the capability and output of the College as far as the area is concerned. The research output has not reached a high level of standard despite the regular capacity building and availability of funds to support faculty and student researches. These observations have been attributed to several factors as work priorities, time management and interest in the field.

In summary, standards set during accreditation have been the foundation improving medical education. The stakeholders have recognized the import of self-evaluation and external appraisal particularly in areas that matter to them.

Accreditation is a resource-intensive endeavor entailing long hours of gathering and reviewing evidence, preparing for visits and implementing the evaluators' recommendations. Despite this, the study has shown that faculty and students are of the same mind that accreditation inspires schools to continuously improve on the quality of medical education. The feedback of the stakeholders can provide valuable information on how well the program is conducted. Secondly, worth of the program is not prescriptive in accreditation as the process allows the institution to determine the standards against which the program's value is measured.

Medical schools that submit to accreditation are of a mindset to improve the quality of education and consequently expect to gain from accreditation that will translate into beneficial outcomes for the stakeholders. In the final analysis, outcomes of accreditation are valued differently by stakeholders in the context of their own vision and perspective.

The faculty, students and graduates possess indispensable perceptions of accreditation as they are the immediate beneficiaries of changes spurred by the process. The respondents, regardless of their role in the academe, have revealed strong awareness of the benefits of accreditation on the faculty, students and curriculum and instruction. Resource-driven areas like research, library and learning environment and faculty benefits were deemed short of the expected excellent standard.

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The UERMMMCI Health Sciences Journal is a peer-reviewed journal published twice a year by the University of the East Ramon Magsaysay Memorial Medical Center Research Institute for Health Sciences. It publishes original articles, reviews, and editorials written by the faculty, trainees, students and personnel of the Medical Center.

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A copy of the manuscript, including tables and figures, should be submitted to the editor. The manuscript should be typed on short bond paper, in a single column, double-spaced all throughout, using Times New Roman or Arial 12. Tables, figures and illustrations should be in separate sheets (not embedded in the text). This should be accompanied by a cover letter containing the following: (1) corresponding author with complete contact details; (2) signed declaration by all authors of their involvement and willingness to take public responsibility for the paper's contents; (3) ethics approval when applicable; (4) declaration that the paper has not been published and is not under consideration for publication in another journal; (5) declaration of support/funding when applicable; and (6) declaration of conflict of interest. To facilitate revision of the manuscript, the editor requires submission of an electronic copy in Microsoft Word.

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Only persons who have made genuine contributions and who endorse the data and conclusions should be acknowledged. Authors are responsible for obtaining written permission to utilize any copyrighted text and/or illustrations.

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Standard journal article
(List all authors when six or less; when seven or more, list only the first three then add et al.)

Francis D, Hadler SC, Thompson S, et al. The prevention of hepatitis B with vaccine: Report of the Centers for Disease Control multi-center efficacy trial among homosexual men. Ann Intern Med 1982; 97: 362-6.

Krugman S, Overby LR, Mushahwar IK, et al. Viral hepatitis type B: studies on the natural history and prevention reexamined. N Engl J Med 1979; 300: 101-6.

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Personal authors

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Chapter in a book

Corbett S. Systemic Response to Injury and Metabolic Support. In: Brunicardi FC (editor). Schwartz's Principles of Surgery. 10th ed. New York: McGraw-Hill; 2015: p13-50.

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