韓國心理學會誌：健康
Korean Journal of Health Psychology
1998, Vol. 3, No. 1, 33 ~ 48

Mode of Anger Expression, Standard of Anger Expression, and Marital Satisfaction in Patients with CHD and Their Spouses[1)]

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The present study was designed to resolve the inconsistent findings on the role of anger expression (anger-in vs. anger-out) on cardiovascular diseases in general and coronary heart disease (CHD) in particular. In order to do this, the present study explored the role of the standard of anger expression (intrapersonal factor) and marital satisfaction (interpersonal factor) beyond the mode of anger expression to CHD. The participants were 124 CHD patients and their spouses. They responded with the Korean adaptation of the State-Trait Anger Expression Inventory (Chon, Hahn, & Lee, in press), the standard of anger expression questionnaire, and the marital satisfaction scale (Lee, 1998). In a logistic regression analysis, including the mode of anger expression as predictor variable and the presence of CHD as a criterion variable, anger-out was shown to be the significant predictor on CHD. However, this pattern was changed in further analyses in consideration with either standard of anger expression or marital satisfaction. When analyzed with the standard of anger expression (high vs. low group based on median split), anger-out appeared to be a significant predictor on CHD; however, these effects revealed only when the mode of anger expression was mismatched with the standard of anger expression. In a similar fashion, the mode of anger expression doesn't matter in the higher group in marital satisfaction, while it was the case in the lower group in marital satisfaction. The present findings suggest the dire need to include important intrapersonal and/or interpersonal moderators or mediators in the relation between anger and CHD in future studies.

Coronary Heart Diseases (CHD) has been the leading cause of death in the US since 1940 (Stroebe & Stroebe, 1995). In Korea, although it was ranked as the fourth leading cause of death in 1990, the morbidity of CHD has dramatically

1 "This paper was supported by NON DIRECTED RESEARCH FUND, Korea Research Foundation, 1996"

increased, almost four times over the past decade, suggesting that it will be one of the major causes of death in Korea.

Recent studies attest that anger is the most critical psychological factor in cardiovascular diseases (Spielberger, 1988). In fact, the relation between anger and cardiovascular diseases was reported in ancient times; "fear and anger and any other state of the mind may often be apt to excite the pulse" (Celsus, 30 A.D.; Dembroski, MacDougall, Eliot, & Buell, 1983). This relation was also reported in modern times. For example, Sir Osler (1910) observed that characteristics of coronary patients are "the vigorous in mind and body, the keen and ambitious man, the indicator of whose engine is always at full speed ahead" (p. 840). Alexander (1939), one of the most influential figures in psychosomatic medicine, also proposed that anger suppression could lead to hypertension: When a person can not express his or her anger and suppress it, it could result in chronic activation of the autonomic nervous system and cardiovascular system, which in turn leads to hypertension.

The recent resurgence of interest in anger is related to Type A Behavior Pattern (TABP). Friedman and Rosenman (1974) proposed that TABP could be one of the risk factors to CHD. Basically, the characteristics of Type A are aggression, time urgency, and competition (Glass, 1977), or "more and more in less and less time" (Friedman & Rosenman, 1974). According to Friedman and Rosenman, it is not sufficient to understand and explain the development and/or the progress of CHD with traditional risk factors such as smoking, hypertension, hypercholesterol, food, lack of exercise, diabetes mellitus, age, and family history. When observed TABP with traditional risk factors, TABP predicted the development of CHD similar to the level of traditional risk factors. For example, a large scale study with 3524 people (35-59 in age) was conducted during 1960-1961 in a Western Collaborative Group Study (WCGS). When a followed up study was conducted, with newly developed CHD in eight and a half years later, Type A showed 2.37 times higher rate of CHD than Type B. More importantly, Type A showed almost two times higher than Type B even after controlling other traditional risk factors.

Subsequent studies showed, however, that the critical factor to atherosclerosis is not TABP itself, but subcomponents of TABP, such as anger or hostility (Friedman & Booth-Kewley, 1987; Dembroski & MacDougall, 1985; Rosenman, 1985). Although there are exceptional studies (e.g., Leon, Finn, Murray, & Bailey, 1988), anger or hostility has been associated with cardiovascular diseases such as atherosclerosis or hypertension (Dembroski, MacDougall, Costa, & Grandits, 1989; Haynes, Feinleib, & Kannel, 1980; Harburg, Erfurt, Hauensteing, Chape, Schull, & Schork, 1973; Williams & Barefoot, 1988).

Recently, the relation between anger and cardiovascular diseases has been profoundly explored by many researchers. The relation between anger and cardiovascular diseases leads into two different directions. First, there has been experimental evidence showing that anger-in (anger is held in or suppressed) may increase blood pressure (Harburg, Blakelock, & Roeper, 1979; Spielberger, Johnson, Russell, Crane, Jacobs, & Worden, 1985) or pulse rate (Funkenstein, King, & Drolette, 1954). There is also clinical evidence suggesting that anger-in leads to cardiovascular diseases (Haynes, Feinleib, & Kannel, 1980).

On the other hand, a group of researchers

claim that anger-out (anger is outwardly expressed) instead of anger-in leads to cardiovascular diseases. For example, Siegman (1994) claims that, based on his series of experimental studies, anger-out rather than anger-in increases cardiovascular reactivity, which in turn leads to cardiovascular diseases. In fact, there are also numerous empirical findings supporting anger-out as a risk factor to either cardiovascular activity or cardiovascular diseases (e.g., Hecker, Chesney, Black & Frautchi, 1988).

In short, regarding the relation between anger and cardiovascular diseases, there are two camps, each claiming their position and providing evidence, adding to confusion in this field supporting anger-in (Bear, Collins, Bourianoff, & Ketchel, 1979; Esler, Julius, Zweifiere, Randall, Hauburg, Gardiner, & DeQuattro, 1977; Gentry, Chesney, Gary, Hall, & Harburg, 1982; Harburg, Blakelock, & Roeper, 1979; Johnson, Spielberger, Worden, & Jacobs, 1987; Mattson, 1975; Schalling, 1985; Spielberger, Johnson, Russell, Crane, Jacobs, & Worden, 1985; Spielberger, Krasner, & Solomon, 1988), or anger-out (Engebretson, Matthews, & Scheier, 1989; Holmes, 1966; Siegel, 1985, 1986; Taylor, 1967, Siegman, 1984; see Keinan, Ben-Zur, Zilka, & Carel, 1992).

There may be two fundamental confounding factors. First, there hasn't been an agreed conceptual definition of anger-in vs. anger-out. For example, anger-out in Siegman (1994) is drastically different from anger-out in Spielberger's framework (1985). Thus, it can be pointed out that different researchers have referred the same word, anger-out, with different meanings.

Second, there has been methodological differences. For example, a line of researchers used a self-rating questionnaire (e.g., Spielberger, 1988), probably for its simplicity, efficiency and convenience. Even in the self-rating methodology, there have been several different self-rating scales for measuring anger (Spielberger, 1988; Siegel, 1985, 1986; and Muller & Elbert, 1994 among others). Meanwhile, there are other researchers who prefer a more rigorous experimental method by providing a loud and fast speech (e.g., Siegman, 1984). Thus both conceptual and methodological differences are likely to increase the confusion in this field.

It is not our intention to deal with the above mentioned fundamental confounding factors. Instead, our primary purpose is to explore and identify additional confounding factors. From our perspectives, there are at least two possible confounding factors; intrapersonal or internal factors and interpersonal or external factors. For example, one important internal factor would be the standard of anger expression against which people may judge their mode of anger expression's (i.e., anger-in vs. anger-out) appropriateness. To put it differently, if a person was raised in a culture where suppression of anger is desirable, and adapted this norm as his or her standard of anger expression, he or she may feel uncomfortable after expressing his or her anger (anger-out). However, if a person has adapted a different standard of anger expression, he or she may not feel uncomfortable in the same circumstances. In fact, when a person's preference of anger expression is mismatched to his mode of anger expression, it was likely to raise blood pressure; on the other hand, when there was a match between these two variables, it was likely to lower blood pressure (see Engebretson, Matthews, & Scheier, 1989; Keinan, Ben-Zur, Zilka, & Carel, 1992).

It is hard to deny that humans are social

beings. Especially, we seldom experience or express anger in a vacuum. Rather, anger normally occurs in the context of interpersonal relationships (Averill, 1982). As Smith and Christensen (1992) has aptly pointed out, however, social aspects of anger/hostility have been neglected in studies regarding the role of anger/hostility on cardiovascular diseases, suggesting the dire need of examining the role of anger/hostility in the social context. In fact, given limited studies, hostile individuals are likely to inhabit a more taxing interpersonal world (Smith & Frohm, 1985), which, according to the "psychosocial vulnerability" hypothesis, in turn may causes CHD (Smith, 1992).

One important social context would be the family context where most adult people interact with each other. Of course, if we could approach both the family and the work contexts, two major arenas where most adults interact in industrialized societies, we would get much more information on the role of social contexts on ill health such as cardiovascular diseases. However, as a preliminary exploration on this subject, we will only focus on the marital satisfaction in the present study.

In short, the present study is designed to resolve contradictory arguments and inconsistent findings regarding anger-in vs. anger-out on cardiovascular diseases in general and CHD in particular. In doing so, we will employ two possible confounds in our study; standard of anger expression and marital satisfaction. We assume that when there is a mismatch between the mode of anger expression and the standard of anger expression, there will be deleterious effects on health. On the other hand, if there is a match between the standard of anger expression and the mode of anger expression, there won't be any ill effect on health. We also assume that the mode of anger expression will be moderated by marital satisfaction. In other words, cardiovascular diseases will be influenced by the quality of one's marital relationship. More specifically, the role of anger expression on cardiovascular diseases would be salient in the context of lower marital satisfaction. On the other hand, the ill effects of anger expression on cardiovascular diseases would be reduced in the context of higher marital satisfaction.

METHOD

Participants and procedure

Participants were 124 CHD patients and their spouses. More specifically, we included consecutive CHD patients hospitalized in one of the largest hospitals in Taegu. CHD patients were invited for participation if they were under 65 in age. The diagnosis of MI (Myocardial Infarction) was based on (1) the clinical history taken by a cardiologist; and (2) standard EEG readings. The control group consisted of the spouses of CHD patients. Controls were included only if they had no history of MI. Altogether, a total of 248 CHD patients and their spouses participated in this study. Both cases and controls completed a set of questionnaires. A more extensive description of the procedure will be presented elsewhere

Instruments

STAXI-K: Anger was assessed by the Korean

adaptation of STAXI (State-Trait Anger Expression Inventory, Chon, Hahn, & Lee, in press). STAXI-K consists of state anger and trait anger for anger experience dimension, in combination with anger-in, anger-out, and anger-control for anger expression dimension. STAXI-K revealed the same factor structures as the original STAXI, although four items were replaced by newly constructed items for the STAXI-K (see Chon, Hahn, & Lee, in press for details). The STAXI-K has a good internal consistency, with Cronbach alphas over .70, except anger-in for female participants (.69). Test-retest reliability over a 3 week period were .65 to .82, except state anger (.14). The finding indicates that the STAXI-K scores are reasonably stable over time, except state anger (Meeters et al, 1996), which are consistent with the conceptual framework (Spielberger, 1988).

Standard of anger expression: Standards of anger expression were assessed by six items. Half of the items was assessing anger-in standard and the other half for anger-out standard. More specifically, the standard of anger-in items include: "anger-in is good for health," "Anger-in is good for interpersonal relationship," and "Anger-in is a sign of matured character." In a similar fashion, the standard of anger-out items include: "anger-out is good for health," "Anger-out is good for interpersonal relationship," and "Anger-out is a sign of matured character." These items were rated on a five-point scale.

Marital satisfaction: Marital satisfaction was assessed by five items, which were selected from Lee (1998). Lee (1998) found that the Cronbach's alpha was .95 with ten items. As will be seen in Table 2, the Cronbach's alpha for marital satisfaction was .69 in the present study. Both CHD patients and their spouses were asked to rate their marital satisfaction on a five-point scale.

RESULTS

Major demographic characteristics of cases and controls are presented in Table 1. As can be seen in Table 1, there is a significant difference in sex, $x^2 = 54.26$, $p < .001$. However, there were no group differences in terms of age, religion, or education level.

Before further analyses were performed, internal consistencies for each scale were calculated, and displayed in Table 2. Interestingly enough, Cronbach Alpha for the standard of anger-in with three items revealed .40, while two out of three items--item 5 and item 6--revealed .85. In a similar fashion, Cronbach Alpha for the standard of anger-out with three items revealed .40, while two out of three items--item 2 and item 3--revealed .86. Thus, in what follows, the standards of anger expression will be analyzed with two items instead of three items. As can be seen in Table 2, all scales except marital satisfaction scale revealed Cronbach alphas higher than .70. On the other hand, the internal consistency of marital satisfaction scale was .69, suggesting further sophistication of the scale in the future.

In order to understand the group differences between CHD patients and controls, a series of t-test were performed. As was shown in Table 3,

Table 1
Demographic Characteristics

Variable	CHD Patients		Spouses			
Age(in years)	M	SD	M	SD	t	p
	52.97	8.36	51.74	8.73	1.13	.260
	N	%	N	%	χ^2	p
Sex					54.26	.001
Male	91	73.4	33	26.6		
Female	33	26.6	91	73.4		
Religion					2.52	.472
Protestant	10	14.5	19	15.3		
Catholic	10	8.1	9	7.3		
Buddhist	60	48.4	70	56.5		
Miscellaneous	36	29.0	26	21.0		
Atheist						
Education Level					4.49	.343
Primary	40	32.3	44	35.5		
Junior High	20	16.1	23	18.5		
High	40	32.3	44	35.5		
College or Higher	24	19.5	13	10.5		

Table 2
Mean Scores, Standard Deviations, Number of Items, and Internal Alpha Reliabilities for the Scales

Scale	M	SD	Number of Items	Alpha
Experience of anger				
State anger	10.81	2.18	10	.86
Trait anger	18.25	5.79	10	.92
Trait Anger-Temperament	9.85	3.47	5	.90
Trait Anger-Reaction	8.43	2.76	5	.87
Expression of anger				
Anger-In	13.57	3.96	8	.78
Anger-Out	19.00	4.48	8	.89
Anger-Control	20.96	4.88	8	.86
Standard of anger				
Standard of anger-in	4.42	1.65	2	.85
Standard of anger-out	2.92	1.75	2	.86
Marital satisfaction	14.33	2.33	5	.69

there were significant differences in all measure of emotional stress. CHD patients compared to controls showed higher score in state anger, t = 2.96, p <.004, trait anger, t = 5.48, p <.000, trait anger-temperament, t = 5.15, p <.001, trait anger-reaction, t = 4.88, p <.001, and anger-out, t = 4..02, p <.001. On the other hand, CHD patients compared to controls showed a lower score in anger-in, t = -2.78, p <.001, and anger-control, t = -2.91, p <.001.

Given that CHD patients, as chronic patients, were suffering from a variety of stress, it is natural to show higher emotional stress, such as anger. What is interesting in the present finding is that CHD patients showed lower anger-in scores compared to controls. As was described earlier, there have been numerous conceptual frameworks and empirical findings supporting that anger-in may lead to cardiovascular diseases including CHD. Thus, the present finding is contrary to the anger-in hypothesis, but supports the anger-out hypothesis.

One of the important issues in delving into the relation between emotional stress and chronic disease is whether emotional stress may predict the onset or the development of disease. Thus, in what follows, a series of logistic regression analyses were performed. In the logistic regression, we designated 1 for CHD patients and 0 for controls. Two separate logistic regression analyses were performed. In the first series of logistic regression, we included three modes of anger expression as predictors. In the second series of logistic regression, we included all five subscales of STAXI-K as predictors; namely, we included anger experience as well as anger expression as predictors in the regression equation. The criterion for the analyses was the presence of CHD.

The first logistic regression was performed with the total sample. As can be seen in Table 4, when three modes of anger expression were included as predictors, only anger-out was shown to be the significant predictor on the presence of CHD; however, when anger experience as well as anger expression were included in the equation, trait anger was the only significant predictor on the presence of CHD.

Mode of anger expression and standard of anger expression

As mentioned earlier, one of the intriguing issues is whether the mode of anger expression will be effective regardless of other internal (i.e., standard of anger expression) or external factors (i.e., marital satisfaction). In this section, we first explored the effect of the standard of anger expression beyond the mode of anger expression. Then, in the next section, we will explore the effect of marital satisfaction. More specifically, it is our hypothesis that, if the standard of anger expression is matched with the mode of anger expression, there will be little harmful effect on health. On the other hand, if there is a mismatch between the standard of anger expression and the mode of anger expression, there may be deleterious effects on health.

To begin with, we calculated the median score of the standard of anger-in with CHD patient's, and it was found to be 4. Thus, two groups were formed; one group over 5, and the other group less than 3. With this median split, two analyses were performed; the first with those who obtained higher scores in the standard of anger-in expression (higher than 5), and the second with lower scores in the standard of anger-in

Table 3

Comparisons Between CHD Patients with Their Spouses for Emotional Stress

Variable	CHD Patients		Controls		t	$p \leq$
	M	SD	M	SD		
State anger	11.21	2.69	10.40	1.41	2.96	.004
Trait anger	20.16	5.93	16.32	4.97	5.48	.000
Trait Anger-temperament	10.92	3.58	8.75	2.98	5.15	.000
Trait Anger-reaction	9.25	2.88	7.61	2.38	4.88	.000
Anger-In	12.87	3.91	14.26	3.91	-2.78	.000
Anger-out	16.11	4.84	13.88	3.80	4.02	.000
Anger-Control	20.07	5.14	21.87	4.47	-2.91	000

Table 4

Results From Logistic Regression Model Predicting CHD in Total Sample

Variable	B	SE	Odds radio	$p \leq$
Expression of anger				
Anger-In	-.039	.038	.961	.299
Anger-Out	.130	.047	1.139	.006
Anger-Control	.010	.041	1.010	.814
Expression/Experience				
State anger	.136	.104	1.145	.191
Trait anger	.135	.046	1.145	.003
Anger-In	-.043	.040	.958	.280
Anger-Out	.042	.062	1.043	.495
Anger-Control	.085	.049	1.088	.083

Table 5

Results From Logistic Regression Model Predicting CHD Based on Standard of Anger-In

Variable	B	SE	Odds radio	$p \leq$
Higher group				
Anger-In	-.038	.060	.963	.533
Anger-Out	.154	.076	1.167	.044
Anger-Control	.024	.078	1.025	.755
Lower group				
Anger-In	.181	.124	1.198	.144
Anger-Out	.119	.105	1.127	.254
Anger-Con	-.091	.095	.913	.340

expression (lower than 3). As can be seen in Table 5, anger-out was significant predictor on CHD in the higher group, while there was no significant predictor on CHD in the lower group. It appears that, if a person highly regards on the suppression of anger, but somehow expresses anger outwardly, there was deleterious effect on health ($p < .044$). On the other hand, if a person doesn't regard high values on the suppression of anger, and expresses anger out, there wasn't any harmful effects on health.

We also calculated the median score of the anger-out standard with CHD patient's, and it was 3. Thus, two groups were formed; one group over 4, and the other group less than 2. As can be seen in Table 6, two separate analyses revealed that anger-out was significant predictor on CHD in the lower group in terms of anger-out standard, while there was no significant predictor on CHD in the higher group. It appears that, if a person highly regards on the expression of anger, and expresses anger outwardly, there wasn't any harmful effects on health. On the other hand, if a person doesn't regard high values on the expression of anger, but somehow expresses anger outwardly, there may be deleterious effects on health ($p < .050$). Thus, the present findings support the mismatch hypothesis; if the mode of anger expression is mismatched with the standard of anger expression, there were deleterious effects, while if the mode of anger expression is matched with the standard of anger expression, there was no harmful effect on health. Parenthetically, when analyzed with both experience of anger and expression of anger as predictors in the equation, there was no significant effect on CHD in any of the analyses in terms of the standard of anger-in or anger-out.

Mode of anger expression and marital satisfaction

In previous analyses, we explored the role of internal factors (i.e., standard of anger expression) on the presence of CHD beyond the expression of anger. In this section, we will explore the role of external factors. As with standard of anger expression, we calculated the median score of CHD patient's marital satisfaction, then we divided CHD patients into two groups based on median split; higher group over 14, and the lower group less than 12. Thus, two separate analyses were performed with the higher group and then with the lower group. When analyzed with the higher group in marital satisfaction, mode of anger expression is not influential on the presence of CHD (see Table 7). However, trait anger still appears to be an effective predictor on the presence of CHD, suggesting that trait anger may be one of the risk factors to CHD in most situations.

The most interesting result in the present study was the analysis with the lower marital satisfaction group (see Table 8). In this particular group, both anger-in and anger-out revealed significant effects on the presence of CHD, when analyzed with three modes of anger expression. Furthermore, when both experience of anger and expression of anger were entered as predictors in the equation, only anger-in emerged as a significant predictor on the presence of CHD. Thus, although further studies are needed in the future, the present findings seemed to suggest that in the context of good marital relationship, the mode of anger expression, whether anger-in or anger-out, doesn't matter, except continuous and chronic anger. On the other hand, in the context of bad

Table 6

Results From Logistic Regression Model Predicting CHD Based on Standard of Anger-Out

Variable	B	SE	Odds radio	$p \leq$
Higher group				
Anger-In	.071	.054	.932	.188
Anger-Out	.106	.073	1.112	.145
Anger-Control	-.010	.068	.990	.887
Lower group				
Anger-In	-.009	.054	.991	.869
Anger-Out	.127	.065	1.136	.050
Anger-Con	.007	.056	1.007	.896

Table 7

Results From Logistic Regression Model Predicting CHD in the Higher Marital Satisfaction Group

Variable	B	SE	Odds radio	$p \leq$
Expression of Anger				
Anger-In	.039	.056	1.040	.986
Anger-Out	.096	.075	1.101	.198
Anger-Control	-.052	.071	.949	.461
Expression/Experience				
State anger	.139	.149	1.149	.351
Trait anger	.183	.069	1.201	.008
Anger-In	.036	.060	1.036	.552
Anger-Out	.011	.094	1.011	.908
Anger-Control	.055	.083	1.057	.503

Table 8

Results From Logistic Regression Model Predicting CHD in the Lower Marital Satisfaction Group

Variable	B	SE	Odds radio	$p \leq$
Expression of Anger				
Anger-In	-.116	.055	.890	.036
Anger-Out	.146	.066	1.157	.027
Anger-Control	.042	.055	1.043	.446
Expression/Experience				
State anger	.146	.152	1.157	.338
Trait anger	.091	.067	1.096	.176
Anger-In	-.116	.057	.891	.043
Anger-Out	.075	.092	1.078	.420
Anger-Control	.108	.066	1.114	.101

marital relationship, both anger-in and anger-out matter. Particularly, anger-in appears to be detrimental to the development of CHD in a bad marital relationship.

Discussion

The present study was designed to resolve the inconsistent findings on the role of anger expression (anger-in vs. anger-out) on cardiovascular diseases in general and coronary heart disease (CHD) in particular. In order to do this, the present study explored the role of the standard of anger expression (intrapersonal factor) and marital satisfaction (interpersonal factor). The participants were 124 CHD patients and their spouses. They responded with the Korean adaptation of State-Trait Anger Expression Inventory (Chon, Hahn, & Lee, in press), the standard of anger expression questionnaire, and the marital satisfaction scale (Lee, 1998). In a logistic regression analysis, including the mode of anger expression as a predictor variable and the presence of CHD as a criterion variable, anger-out was shown to be the significant predictor on CHD. However, this pattern was changed in further analyses in consideration with either the standard of anger expression or the level of marital satisfaction. When analyzed with the standard of anger expression (high vs. low group based on a median split), anger-out appeared to be a significant predictor on CHD; however, these effects were revealed only when the mode of anger expression was mismatched with the standard of anger expression. In a similar fashion, the mode of anger expression doesn't matter in the higher group in marital satisfaction, while it was the case in the lower group in marital satisfaction.

The findings regarding the role of the standard of anger expression on CHD were in line with the mismatch hypothesis. Thus, if the mode of anger expression was mismatched with the standard of anger expression, there were deleterious effects, while if the mode of anger expression was matched with the standard of anger expression, there was no harmful effect on health. It was, however, partially confirmed only with regard to the anger-out mode of expression; there was no confirmation regarding the anger-in mode of expression. This partial confirmation deserves a clarification.

Three possible explanations could be offered. First, it can be assumed that Koreans are in general raised not to express anger to others, thus the salient standard of anger expression is the suppression of anger (anger-in) in Korean culture. As Triandis (1994) pointed out, collectivists such as Koreans are characterized by suppression of negative feelings in communication: "Because maintaining relationships is very important to them, they prefer to suppress negative communications and tell others what they want to hear, rather than tell the truth and create bad feelings." (p. 293). Consequently, the mode of anger-out expression (expression of anger outwardly) is likely to violate against the standard of anger (anger-in), which in turn may create stress to the extent of CHD in Korean culture. On the other hand, the mismatch between the mode of anger-in expression and the standard of anger-out seldomly occurs; further, even it happens, it may not be stressful in Korean culture.

Second, the standard of anger expression was described as a way of preference (e.g., "Anger-in

is good for interpersonal relationship") in the present study. However, if the standard of anger expression is described in a way of prohibition ("To make a good interpersonal relationship, we should not express anger"), the violation against the standard of anger expression, including anger-in mode of expression, would lead to more salient effects on health. Third, CHD patients were divided into two groups, based on a median split. However, if we select more extreme groups such as the upper 25% vs. the lower 25%, then the group differences may be more pronounced. Thus, although these three possibilities are not exclusive to each other, it is still worthwhile to examine each hypothesis in more detail in future studies.

Thus far, it is not well understood how and what social contexts moderate or mediate the relation between anger and CHD, although the importance of psychosocial factors to physical health is widely acknowledged (Zimmermann & Tansella, 1996). Given limited studies, however, higher marital satisfaction has been associated with fewer adjustment problems (Rodrigue & Park, 1996). On the other hand, low levels of marital satisfaction are often associated with high levels of anger during marital interactions (Gottman & Krokoff, 1989), which in turn leads to a significantly greater risk of CHD (Carmelli, Swan, & Rosenman, 1985; Davidson, Prkachin, Lefcourt, & Mills, 1996). Thus, the present findings are consistent with previous studies regarding the relation between marital quality and CHD.

Further, in addition to marital quality, other social context such as social support may also be important in the relation between anger and health outcomes (Cohen & Matthews, 1987; Houston & Vavak, 1991). Thus, it may be fruitful to explore the role of social contexts such as marital quality or social support in the relation between anger and ill healths in the future studies.

Clearly, one of the major limitations of the present study is the use of two-item measures for the standard of anger expression. Although a one-item scale has been shown to be reasonably reliable and valid elsewhere (Funder, 1980), and two-item measures in the present study revealed high internal consistencies, replication of these results employing a better measure would be useful in future studies.

Another limitation to this study is that there are more male CHD participants in the sample. One might, therefore, wonder if the relations found in the present study would generalize to CHD patients and their spouses. Rather it may reflect the relation of male CHD patients to their spouses. Thus, we might select the equal number of CHD patients and their spouses in terms of a sex ratio, or confine to male CHD patients in future studies.

The primary purpose of the study was to resolve the role of anger expression (anger-in vs. anger-out) to cardiovascular diseases in general and CHD in particular. These kinds of controversies and inconsistencies are in a large part due to a lack of a sound theory. In fact, one of the problems facing health psychology is that "heath psychology has shown relatively little theoretical development and this may be a more serious problem for its future development as a subject." (Johnston, 1995, p. 276). Thus, there is a dire need to comprehend and propose a sound theoretical framework in this field.

Due to the exploratory nature of the present study, it remains to be seen whether the present findings will be shown in future studies. However,

the present findings shed some lights on the controversy of anger-in vs. anger-out. Particularly, it may be more productive to explore major intrapersonal as well as interpersonal factors in understanding the role of anger in the onset and development of CHD, instead of too much emphasis on either anger-in or anger-out.

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韓國心理學會誌 : 健康
Korean Journal of Health Psychology
1998. Vol. 3, No. 33 ~ 48

관상동맥 질환 환자와 배우자의 분노 표현 양식, 분노 표현 기준, 및 결혼 만족

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분노와 질병간의 관계에서 가장 흥미로운 연구 주제 가운데 하나가 분노 표현 양식(분노-억제 대 분노-표출)의 역할이다. 이 주제에 관한 문헌 개관에 의하면 분노-억제가 심혈관계 질환에 대하여 중요한 심리적 요인으로 나타나고 있다. 하지만, 또 다른 연구들에 의하면 분노-표출이 심혈관계 질환에 대하여 역시 중요한 심리적 요인으로 나타나고 있다. 이러한 일관되지 못한 연구 결과는 부분적으로 중요한 개인적 또는 사회적 변인을 고려하지 않고, 단순히 분노-억제 대 분노-표출의 역할에만 초점을 맞춘 결과이다. 따라서 본 연구에서는 개인적 요인으로서 분노 표현 기준을 포함시키고 사회적 요인으로 결혼 만족을 포함시킨 후, 분노와 관상동맥 질환간의 관계성을 살펴보았다. 이 목적을 위하여 관상동맥 질환 환자 124명과 그들의 배우자 124명을 대상으로 한국판 상태-특성 분노 표현 척도(전겸구, 한덕웅, 이장호, 인쇄중), 분노 표현 기준 질문지, 및 결혼 만족도(이경성, 1998)를 실시하였다. 그 결과, 단순히 관상동맥 질환에 대한 분노 표현 양식의 logistic 회귀 분석에서는 분노-표출이 유의한 예언 변인으로 나타났다. 하지만, 분노 표현 기준과 결혼 만족을 고려해서 분석한 결과 다른 양상이 나타났다. 보다 구체적으로는 중앙치를 기준으로 분노 표현 기준을 상·하 집단으로 구분한 결과, 자신의 분노 표현 기준과 합치하지 않을 경우에만 분노-표출이 관상동맥 질환에 대하여 유의한 예언 변인으로 나타났다. 유사한 맥락에서 중앙치를 기준으로 결혼 만족을 상·하 집단으로 구분한 결과, 결혼 만족이 낮은 경우에만 분노 표현 양식이 관상동맥 질환에 대하여 유의한 예언 변인으로 나타났다. 이와 같은 연구 결과는 추후 연구에서 개인적 변인과 사회적 변인을 고려한 상태에서 분노와 관상동맥 질환간의 관계성을 살펴볼 필요성을 암시하고 있었다.