

Dentists' perceived stress and its relation to perceptions about anxious patients

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Abstract – Dentists' perceptions about the stressfulness of dental practice, their perceptions about dental anxiety and its management were surveyed in a descriptive study. A mailed questionnaire was completed by 216 randomly selected Danish private dentists. Of these, nearly 60% perceived dentistry as more stressful than other professions. Dentist perceptions of the most intense stressors were (ranked): 1) running behind schedule, 2) causing pain, 3) heavy work load, 4) late patients and 5) anxious patients. Bivariate odds ratio (OR) analyses were undertaken to check for associations of perceived stress and other dentist variables with perceptual outcomes about anxious patients. Signs of dental anxiety were reported to be less often spotted by older (≥ 52 yr) dentists (OR=3.1) who perceived their job stress to be greater than that of other professionals (OR=3.2). Perceived causes of dental anxiety (1st, 2nd or 3rd choices tallied and then ranked) were 1) fear of pain, 2) trauma in dental treatment, 3) general psychological problems, 4) shame about dental status and 5) economic excuses. Dentists who reported that dental anxiety was primarily the result of general psychological problems in patients, usually had solo (OR=2.4) practices older than 18 years (OR=2.6) and reported high perceived stress (OR=2.2). Adjusted odds ratios for these two dentist perception outcomes about anxious patients generally improved strength of associations and confidence intervals. There were no meaningful differences by practice location or perceived public image. Also, there was no significant association between the use of pharmacological strategies for anxiety and the perceived stress of dentists. Nearly all dentists talked with anxious patients as their main treatment strategy. It was concluded that psychosocial aspects of dental practice have meaningful and often adverse associations with dentist perceptions about anxious patients. Some dentists appeared to require more knowledge about dental anxiety and managing their own stress.

Key words: anxiety; dental care; dentist-patient relations; epidemiology; occupational stress

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Most investigations of psychosocial environments in dental practice have described perceived stress or stressors among dentists (1–5) and variables that may be effected by or associated with stress, such as career satisfaction (1, 4, 6) or role image (7). Two studies also related stress to dentist health problems (5, 6) and three studied stress in relation to marital or other social or psychological outcomes (4–6). Only one study has investigated interactive effects of dentist behaviors on normative patient beliefs (8). This study notably did not address den-

tist stress or patient anxiety or pain. There have, however, been studies that looked at dentists' or dental students' assessments of problematic patient behaviors including anxiety (1, 9–12) and typical management strategies for anxious patients (9–11). But there have been no investigations studying possible associations between dentists' perceived stress levels and how they perceive anxious patients and their treatment.

In studying possible associations between dentist stress and perceptions of anxious patients, one is-

sue is whether dentists even notice patient anxiety. Some studies have indicated that dentists have sometimes had difficulty spotting anxiety (9–11), but the studies did not try to examine why. Lack of sensitivity would be detrimental for anxious patients, since they require extra time and special strategies for successful treatment (11, 13, 14). Dentists who feel highly stressed could potentially be less sensitive or responsive to anxious patients' need for special attention.

Another issue could be if dentist stress might play some role in whether dentists can accurately differentiate dental anxiety from general anxiety and if they provide appropriate management. Only a minority of patients who are anxious about dental treatment have been reported to exhibit complicating general anxiety traits (13–17) as primary cause. Dentists who would incorrectly assume general psychological traits as the main cause of dental anxiety, could be prone to adverse labeling of anxious patients who are not suffering from such general symptoms. Such dentist beliefs could lead to e.g. avoidance of treatment or provision of over-treatment with general anesthesia or sedation, where most would require only extra time, personal attention and patience (1, 11, 13, 14).

Thus, the present investigation had two primary aims: 1) to study stress that Danish private dentists perceive, identifying major practice stressors including patient anxiety and 2) to study the relationship of perceived stress on dentists' perceptions of anxious patients and their management. This second aim was designed to emphasize exploration of dentists' self-reported sensitivity in spotting anxiety, their attribution of cause, especially related to

any potential adverse labeling of patients, and dentist use of behavioral or pharmacological aids in fighting anxiety. The model (Fig. 1) that was used to explore aims of dentists' perceived stress and its relation to their perceptions of patient anxiety was adapted from Hendrix's model (18) of stress in dentistry in which job-related factors, external factors and personal characteristics contribute to work stress, which in turn has psychological and behavioral consequences. Other related aims were to study dentist beliefs about communication skills and economics that would improve anxiety treatment.

Material and methods

Sampling protocol

Subjects were 275 private dentists drawn randomly from the Danish Dental Association list of all private dentists ($n=425$) within the boundaries of Aarhus, Denmark. Considering demographics and a unique mix of urban and rural areas within its limits, Aarhus is considered quite similar to Denmark as a whole (16, 19). In Denmark, private dentists almost exclusively treat adults. Dentists in the Public Dental Health Services treat almost exclusively children. Since present aims pertained to adult dental anxiety, no public dentists were surveyed.

Survey instrument and protocol

The mailed questionnaire survey of dental practice, stress and dental anxiety consisted of 20 items. Some items were derived from results of a qualitative study of 42 randomly selected Aarhus dentists regarding beliefs about anxious patients (14). Other items about dentist perceptions of stress in practice, patient problem behaviors, public image and anxiety management were taken from other surveys of dentists (1, 3, 4, 7, 11) for comparisons.

Besides standard demographic items about dentists, such as gender, age and years of practice, four items covered type of dental practice: location, solo or group practice, number of dental chairs, total number of patients (see Table 1) and number of anxious patients.

Three items referred directly to dentist perceptions of stress in practice. The main independent variable was translated from an item covalidated in a survey of 977 US dentists by O'Shea, Corah & Ayer (3): "Compared with other professions, do you think that being a dentist is more, less or about the same amount of stress?" (1="more", 2="less",

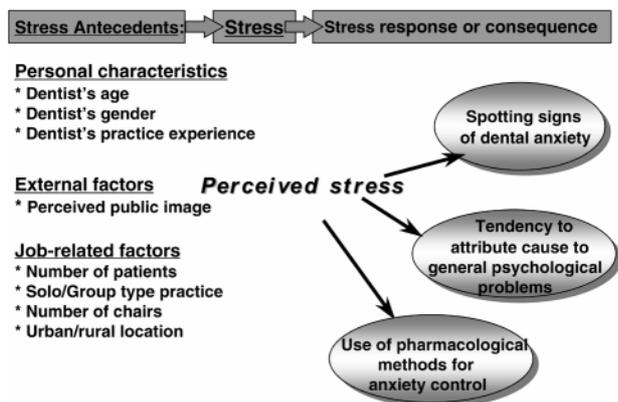


Fig. 1. Conceptual model adapted from Hendrix's Stress in Dentistry Model, 1986 (18) regarding possible associations between dentist's perceived stress and other variables with dentist perceptions of anxious patients.

Table 1. Sample characteristics* ($n=216$ dentists)

Personal characteristics											
Gender		Age (years old) ($n=212$)				Years in practice ($n=214$)					
Men	Women	22–37	38–44	45–51	52–75	1–10	11–18	19–25	26–46		
$n=$	133 (61.6%) ($\bar{x}=47.5$ yr; SD=9.4)	83 (38.4%) ($\bar{x}=41.3$ yr; SD=8.3)	51 (24.1%)	51 (24.1%)	54 (25.4%)	56 (26.4%)	55 (25.7%)	53 (24.8%)	56 (26.1%)	50 (23.4%)	
		(t=4.9; $P<0.001$)				(t=18.5 yr; SD=9.9)					
Practice characteristics											
Size (Number of patients) ($n=210$)				Type Practice ($n=215$)		No. of Chairs		Location			
0–799	800–999	1000–1273	1274–3300	Group	Solo	One	≥ 2	County	Town	City	
$n=$	44 (21%)	39 (18.6%)	75 (35.7%)	52 (24.7%)	156 (72.6%)	59 (27.4%)	25 (11.6%)	191 (88.4%)	52 (24.1%)	37 (17.1%)	127 (58.8%)
(t=1058 patients; SD=529)											

* Some frequencies are lower, as marked, due to missing data for that item.

Table 2. Perceived stressful situations in practice – dentists' evaluations ($n=216$) by intensity and frequency of either 1st, 2nd or 3rd rank choices

Perceived stressful situations	Intensity		Frequency	
	Rank	%	Rank	%
Running behind schedule/emergencies	1	74.5	1	69.4
Causing pain/unpleasantness	2	41.2	3	32.0
Too heavy work load	3	29.7	2	37.0
Late patients	4	26.8	4	28.7
Anxious patients	5	26.4	8	22.7
Inadequate assistance	6	23.7	9	12.0
Talkative/uncooperative patients	7	22.3	7	23.1
Broken or canceled appointments	8	17.6	6	24.0
Technical demands for perfection	9	15.3	5	24.1
Patients not opting for ideal treatment	10	10.2	11	7.9
Regulations and governmental control	11	4.7	10	9.3

3="same"). Two other items were used to describe and clarify stress perceptions for comparison with the literature (1, 3, 4, 6). Dentists responded to a list of 11 commonly named stressors in practice, ranking them by both intensity and frequency of occurrence from 1 (most stress) to 11 (least) (Table 2). All 1st, 2nd, or 3rd choices were tallied and entered as combined scores in the cells for overall ranking. These "top three" intermediate variables were used here and in "cause of anxiety" to gauge the strongest perceptions that dentists had, in order to improve confidence in measuring dentists' knowledge or beliefs compared with the literature.

Dentists' perceived role image among the public as a possible source of perceived stress was an item translated from a survey of over 2081 US dentists

(7). This was an "external stress factor" from the conceptual model.: "The mass media's and public's image of dentists is (1="very good", 2="good", 3="less than good" and 4="poor"). Another item was used to aid in describing and clarifying image: "Patients evaluate a dentist more by personal style or behavior than by perceived technical competence." (1="strongly disagree" to 4 = "strongly agree").

Five items assessed dentists' experiences and beliefs about dental anxiety and its treatment. Two of these were the main dependent variables of interest. The first dependent variable was dentists' self-reported sensitivity in spotting anxiety. It was translated from an item covalidated in a survey of 746 US dentists by Corah, O'Shea & Ayer (11): "I

can tell if a patient is anxious.” (1=“always”, 2=“usually”, 3=“sometimes”, 4=“not so often” and 5=“never”). Another variable studied how these dentists attributed cause of dental anxiety: “What are the main reasons that people are anxious about dentistry?” a) “general psychological problems”, b) “distrust of dentists due to harsh treatment” c) “afraid of pain”, d) “a cover for economic priorities” and e) “shame over their dental status”. These were ranked from 1=“most likely” to 5=“least likely” where dentists were asked to skip items not considered relevant. Dentists’ perceptions about anxious patients were also described with: 1) “Which of the following behaviors are characteristic for anxious patients?” (Table 3). 2) “Your opinion or experience in treating anxious patients is (check one) a) “.. not enough time (economics), b) “I treat them despite the extra time ...”, c) “.. have an older practice; no new patients.”, d) “The time is an investment in reputation and new patients.” and e) “I can build a practice on anxious patients.” 3) “Which procedures do you use for treatment of anxiety?” (Table 4). The variable “use of pharmacological solutions” was a dichotomous

variable in which any dentist using nitrous oxide, conscious or general sedation was entered as a case vs. the controls, those dentists who reported only using behavioral strategies (Table 5).

Finally, two items assessed dentists’ educational or political/economic needs related to treatment of anxious patients (1=“strongly disagree” to 4=“strongly agree”): 1) “Therapeutic conversations with seriously anxious patients should be covered by the National Health Insurance.” 2) “Do you think communication skills with such patients can be learned in coursework?”.

Data analysis

Besides description of response frequencies and ranking as in aim 1, associations between selected variables were assessed using bivariate odds ratios (OR), χ^2 , Fisher’s Exact or *t*-tests. For aim 2, associations between each dependent variable relative to independent variables were calculated according to the conceptual model in Figure 1 (20). In order to avoid loss of information, representation of continuous variables such as age, years of practice and numbers of patients as dichotomies were thoroughly investigated using continuous or quartile versions (Table 1) before determining cut-offs for the values chosen in Table 5. The cut-off points listed were the result of either a meaningful, natural occurring dichotomous pattern in the data or the need to improve statistical power due to small subsample size where cells could be combined and the cut-offs were meaningful. Use of logistic regression adjusted odds ratios (OR_L) was limited to checking effects on strength of associations among key variables 2 or 3 at a time, since some cell sizes prohibited adequate power. Exploration of associations between variables was not limited exclusively to theorized directions of relationships in the conceptual model, although this was the main thrust of aim 2. Other relationships related to dentist perceptions of anxious patients, dentist stress and dentists’ self-reported behavior provided details about these constructs and potential solutions to problems facing dentists. The level of 0.05 was used to determine statistical significance of associations by means of two-sided *P*-values and 95% confidence intervals (CI).

Results

Response rate was 83% (228/275). Of these, 3 were specialists, 3 were employed in the children’s public health service, 5 returned the survey but refused to answer on principle and one was retired from

Table 3. Anxious behaviors – Dentists’ (n=216) responses to “Which behaviors are characteristic for anxious patients?”

Behavior	Rank	Frequency	%
Late cancellations	1	192	88.9
Time consuming	2	162	75.0
Skipping appointments	3	156	72.2
Show only for emergencies	4	155	71.8
Drop out often times	5	124	57.4
Bad payers	6	34	15.7
Often ungrateful	7	15	6.9

Table 4. Preferred anxiety treatments – Dentists’ (n=216) responses: “Which do you usually use for treatment of anxious patients?”

Treatment strategy	Rank	Frequency	%
Conversations/build up trust	1	211	97.7
Assure good local anesthesia	2	206	95.4
Gradual habituation to procedures	3	130	60.2
Nitrous oxide	4	69	31.9
Oral premedication	5	64	29.6
Controlled breathing	6	52	24.1
Relaxation training	7	13	6.0
Refer to psychotherapist	9	3	1.4
Hypnosis	9	3	1.4
Refer for general anesthesia	9	3	1.4
“I don’t treat them”	11	1	0.5

Table 5. Bivariate analysis results re. model in Fig. 1: reactions and consequences associated with perceived dentist stress and possible antecedents ($n=214$)

	Not spotting anxiety			Cause #1: General psychological problems			Use of pharmacological remedies		
	<i>n</i>	OR	95%CI	<i>n</i>	OR	95%CI	<i>n</i>	OR	95%CI
Dentists' personal characteristics									
Age ≥ 52 yr	8/56*	3.1	1.1–8.7	8/56	2.0	0.8–5.3	33/56	1.6	0.9–2.9
Men	12/132	2.0	0.6–6.3	15/133	2.0	0.7–5.7	74/133	1.7	1.0–3.0
≥ 18 yr practice	11/106	2.4	0.8–7.1	14/106*	2.6	1.0–7.1	58/106	1.4	0.8–2.4
Practice factors									
No. patients >1000	9/127	0.8	0.3–2.3	9/127	1.9	0.7–5.5	74/127**	2.1	1.8–3.7
Solo practice	6/59	1.6	0.6–4.7	9/59	2.4	0.9–6.1	32/59	1.2	0.7–2.2
No. chairs ≥ 2	15/189	2.1	0.3–16.4	17/191	0.7	0.2–2.6	96/191	0.9	0.4–2.1
Location=City	8/126	0.7	0.2–1.9	12/127	1.1	0.4–2.7	66/127	1.2	0.7–2.0
External factor									
Public image (low)	4/67	0.8	0.2–2.3	8/67	1.5	0.6–4.0	29/67	0.7	0.4–1.2
Perceived stress (high)	13/127 [†]	3.2	0.9–11.6	15/129	2.2	0.8–6.2	66/129	1.1	0.6–1.9

Chi-square significance:

* $P \leq 0.05$; No asterisk=not significant. ** $P \leq 0.01$. [†] Fisher's Exact test $P=0.052$.

practice, for a usable response rate of 79% (216/275) (see Table 1). Detailed analysis of non-responders was not possible since the local dental association, who coordinated the mailings, required anonymous coding. However, given the gender and age distributions of all practitioners in Aarhus, there appeared to be no meaningful differences with the sample.

Perceived stress and image

Of the dentists surveyed, 59.7% perceived dentistry as more stressful than other professions, 37% perceived stress as "the same" and 3.3% as "less stressing". The most intense stressors in practice were ranked similarly to the most frequently occurring stressors in practice, but there were some differences, notably for anxious patients (Table 2). The dentists who perceived their image to be less than good (27.8%) or poor (3.2%) in the mass media or public at large, were nearly 2 times more likely to report comparatively high professional stress (OR=1.8, CI=0.9–3.2; $P=0.07$). Most dentists (91.2%) agreed that patients evaluate dentists on style or behaviors more than by technical skills.

Sensitivity of dentists in spotting dental anxiety and related items

Most dentists (91.7%) perceived that they were "usually" (83.7%) or "always" (8%) able to recognize dental anxiety. For dentists who reported less aptitude for spotting anxiety, the model (Table 5)

showed a high association with perceived stress and age over 51 years. Logistic regression analysis of these relationships ($n=212$) indicated increased strength of association for age ≥ 52 years. (OR_L=3.8; CI=1.3–11.0; $P=0.01$) and perceived high stress (OR_L=4.1; CI=1.1–15.3; $P=0.05$) when controlling for numbers of chairs. Also, in a related bivariate analysis, dentists reporting inability to spot anxiety were nearly three times as likely (10/83 vs. 6/131) (OR=2.9, CI=1.0–8.2; $P=0.08$) to attribute cause to general problems as 1st, 2nd, or 3rd choices.

Perceptions about anxious patients and causes of dental anxiety

Sampled dentists reported that about 14% of their patients were anxious. The dentists perceived anxious patients as unreliable and a poor economic risk (Table 3). According to 1st, 2nd or 3rd rankings, the most frequent cause of dental anxiety stated by dentists ($n=216$) was fear of pain (97.5%), followed by traumatic treatment (90.9%), general psychological problems (38.5%), embarrassment about the status of their teeth (32.3%) and patients making excuses for other economic priorities (14.9%). Only general psychological problems showed a significant relationship with the perceived stress variable (OR=1.9, CI=1.1–3.3; $\chi^2=3.91$, $P<0.05$). Looking only at first rankings attributed to dental anxiety ($n=216$), 9.3% attributed it to general psychological problems, 50.9% to previous treatment trauma, 44.4% to fear of

pain, 1.9% to a pretense for economic priorities and 0.9% to embarrassment. There were no significant relationships with perceived stress among these first choice cause variables, but general psychological problems indicated the highest association (OR=2.2; CI=0.8–6.2; $P=0.14$) compared with all others (OR<1.0) for each cause. In the model (Table 5), solo practitioners (OR=2.4) with practices over 18 yr (OR=2.6) and with high stress perceptions (OR=2.2) were identified as most likely to associate this cause as first choice. Logistic analysis indicated increased association and significance for solo practice (OR_L=2.7; CI=1.0–7.3; $P=0.05$) and perceived high stress (OR_L=3.2; CI=1.0–10.5; $P=0.05$), when controlling for years of practice and numbers of patients ($n=209$).

Management and treatment of anxiety

Regarding the dentists' attitudes about treating anxious patients, 3.7% felt they lacked the time or economics it takes to treat them, 89.4% treated them despite the extra time, 3.2% reported older practices accepting no new patients and 66% stated that the extra time is an investment in a good local reputation and more new patients. Finally, 16.2% felt that one can build up a whole practice on a good reputation with anxious patients. Talking with patients was the most frequently applied strategy, followed by assuring painless treatment (Table 4). Use of at least one pharmacological remedy was practiced by over half ($n=109/216$) of the dentists and it was neither significantly nor highly related to perceived stress (Table 5) nor reported inability to spot anxiety (OR<1.0). It was however, associated with tendency to attribute cause to general problems (OR=1.9; CI=0.7–5.1; $P=0.17$), dentists over 45 years of age (OR=1.8; CI=1.1–3.1; $P=0.03$), and males (OR=1.7; CI=1.0–3.0; $P=0.054$) with larger practices (>1000) (OR=2.1; CI=1.8–3.7; $P=0.01$ [Table 5]).

National Insurance coverage and coursework in communication

Most dentists (84.2%) were at least partly of the opinion that the cost of therapeutic conversations with anxious dental patients should be covered by the Danish National Health Insurance. Most (85.5%) believed at least in part that one can learn required communication skills with such patients through coursework. The 14.5% who did not think these skills could be learned were most likely to have had over 18 years of practice (OR=4.2, CI=1.8–10.4, $\chi^2=10.2$; $P=0.001$).

Discussion

Most of the literature about adult dental anxiety has focused on the perceptions and experiences of persons with dental anxiety and consequences for their oral health (16, 17, 21–23). These studies point to a history of traumatic and/or painful dental experience as the most frequent cause of dental anxiety (13, 15–18, 21–23). Since dentists are implicated in traumatic and/or painful treatments and since technical quality of dental health care has been shown to be dependent on the psychosocial climate of dentist-patient relating (1, 24), it seemed compelling to investigate dentists' occupational stress in relation to their perceptions about anxious patients. Present results indicated possible clinical consequences of dentists' perceived stress.

Since most job stressors have been related to pressures for the dental team to produce a certain amount of dental work within a certain period of time, anything perceived to slow down production is likely to be perceived as stressing, since fee-for-service schedules have been normative. Dentists in Swedish (1), American (3), and South African (6) studies were similar to these Danish dentists who ranked anxious patients as creating less stress than did running behind schedule or causing patients pain. However, it seemed that in relation to time or economic pressures, more time may indeed be required for anxious patients than many of the present dentists were willing to spend. The potential that even one anxious patient might change office dynamics for any given clinical work day would be a threat to fee-for-service economics. Therefore, since anxious patients exhibit unpredictable behaviors and require time consuming management, they do not fit the description of "good patients" (12) (being on time, paying bills promptly, accepting the dentist's treatment plan) and may contribute more uncertainty and stress than dentists are willing to admit. In this context, present Danish dentists expressed a need for insurance coverage that would encourage them to treat anxious patients. Regardless of nationality or whether coverage is private or national, perhaps an hourly rate for these patients would be more supportive of patient and practitioner needs than present fee-for-service schedules.

The majority of these Danish dentists perceived that they could "usually" spot dental anxiety. Only 16 dentists reported not being able to spot dental anxiety and results should be viewed with caution, since cell sizes were sometimes small. However,

any potential self-report bias would favor dentists reporting that they were able to spot anxiety, since this is a more desirable behavior to report to dental anxiety researchers. Thus, present results perhaps only provide a conservative estimate of dentists' abilities to spot anxiety and are likely to be robust. Since a number of dentists felt they could not spot anxiety, present results supported the conclusions of an experimental study by Baron, Logan & Kao (10). They suggested that some dentists need to learn to recognize emotional distress and that all dentists should encourage patient expression about distress, in order to emphasize its significance. More research of factors influencing dentist perceptions of distressed patients is needed.

Present results for this representative sample of private dentists in Denmark also confirm qualitative study results about dental anxiety in 42 Danish private practices (14). Assuming the 42 practitioners in Aarhus are similar to the 216 presently surveyed, what they subjectively judged as "anxious patients" could be measured by a mean reported intensity of anxiety as DAS 15.7 (SD=3.2) out of 20, which is considered to be high. General anxiety tests indicated that most of the 53 patients studied in those 42 practices did not manifest general anxiety, similar to the literature (13, 15–17), where ca. 20–35% of highly anxious dental patients also had complicating general anxiety symptoms. Since over 9% of present dentists perceived anxious dental patients to suffer primarily from general psychological problems, these typically older, "high stress" solo practitioners, may tend to stigmatize this patient group and perhaps consciously or unconsciously avoid them.

Danish dentists were similar to international colleagues in their strategies for treating the anxiety of their patients. The primary treatment strategy was talking with anxious patients (98%), similar to studies in America (9, 11) where up to 87% also named it as the main strategy. Talking, taking extra time and allowing brief rest pauses during anxious moments or discomfort all have successful histories (11, 25). Not unlike Swedish colleagues (1), Danish dentists expressed confidence in treating patients with dental anxiety, yet frustration about unpredictable behaviors of anxious treatment avoiders. Most asserted that dental anxiety required special skills that they believed could be learned through continuing education. The literature also supports this (9, 25–27), as well as that other related psychological strategies such as practice stress management and optimal staff com-

munication can also be learned at continuing education courses (6, 27).

Given the levels of present dentists' perceived occupational stress, it was concluded that psychosocial aspects of dental practice have meaningful and often adverse associations with dentist perceptions about anxious patients. Some of these Danish dentists appeared to require more knowledge about dental anxiety and managing their own stress.

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