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Attitudes of Saudi Arabian mothers towards the digit-sucking habit in children

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Summary. *Objective.* The purpose of this study was to report on the attitudes of Saudi mothers towards the digit-sucking habit in their children and their attempts to stop this fixation.
Design. The research took the form of a cross-sectional study.
Methods. Data was collected from a sample of 50 Saudi mothers whose children currently had a digit-sucking habit. One investigator used a specially designed questionnaire to interview all the mothers.
Results. The results showed that 48% of mothers did not like to see the habit at any age, and no mother accepted the habit after the age of 4 years. Most mothers (86%) tried to stop their children digit-sucking. Sixty-six per cent of the present sample had noticed the adverse effect of this fixation on their child's occlusion, and this was given as the main reason for their attempts to stop the habit. The most common method used by Saudi mothers to stop their children sucking their digits was the application of a bitter tasting lotion to the fingers (66%). Although 48% of mothers had sought advice about digit-sucking from dentists and paediatricians (30% and 18%, respectively), 60% of the dentists and all of paediatricians had made no suggestions about any solutions.
Conclusion. No mother accepted the habit in their children after the age of 4 years. The majority of mothers had noticed the adverse effect of the digit-sucking fixation. Non-invasive procedures were most commonly used by Saudi mothers attempting to stop this habit in their children.

Introduction

A habit is a fixed practice produced by constant repetition of an act [1]. At each repetition, it become less conscious, and if repeated often enough, may be relegated to the subconscious. The digit-sucking habit is the most common oral fixation seen in children [2]. Either the thumb, or one or more fingers may be sucked to varying extents [3]. The prevalence of digit-sucking in children ranges from 0% to 46% in different populations [4,5]. In general, its prevalence appears to be increasing, especially in industrialized countries [6]. The prevalence varies and depends on a number of factors, such as the child's age, sex, socio-economic status and racial background [7]. Farsi and Salama [8] reported that 10·5% of 3–5-year-old Saudi children suck their digits.

The aetiology behind the initiation of the digit-sucking habit in children has been extensively investigated and divergent explanations have appeared in the literature. There are three main theories to explain this habit: Freud's psychoanalytic theory, which was described by Ayer and Gale [9]; the learning theory [10]; and the hypothesis of insufficient satisfaction of sucking needs in infancy [11]. The prolonged practice of digit-sucking may lead to

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dental problems including the development of open bite, increased overjet and class II malocclusion [12]. Accidental ingestion of harmful substances [13] and digital deformation [14] have also been associated with the digit-sucking habit.

According to Mutafchiev *et al.* [15], most parents detect and then carefully observe the adverse effect of digit sucking and oral breathing habits in their children. Parents, however, often lack the proper knowledge and motivation to cope with the causes of this condition, and fail to request assistance from dentists when necessary. Vadiakas *et al.* [16] investigated parents' attitudes towards the digit-sucking habit using questionnaires distributed to the parents of 600 children. Their findings revealed that the majority of parents noted the adverse effect of the habit and that non-invasive procedures were the most popular method used to try to stop children from practising the habit. VanNorman [17] reported that treatment of the digit-sucking habit is often neglected or approached with hesitancy. This is because of the psychological theory that suggests that elimination of the digit-sucking habit will lead to the substitution of other possibly aberrant behaviours. Thus, according to VanNorman, paediatricians often counsel parent 'not to worry' in an attempt to protect the child from punitive measures that the parents or others may employ. In contrast, the deleterious effects of digit-sucking habit itself on normal dentofacial growth and development have been reported in the dental literature [18–20]. Interestingly, VanNorman suggested that older children who request assistance to quit the habit are already emotionally wounded because of the habit itself and because of the negative responses resulting from their environment [17].

A review of the literature reveals that most investigators have concentrated on studying the prevalence of the digit-sucking habit in children, and its aetiology, adverse effects and management [6,21–24]. Little attention has been given to the evaluation of parents' attitudes towards digit-sucking as an important factor in the elimination of this habit. It is probably correct to assume that attitudes towards oral habits vary among different ethnic groups since they might differ in culture, beliefs and awareness, as well as socio-economic development and caring level. The dental and medical literature appears to lack studies that evaluate the attitudes of mothers in Saudi Arabia towards the digit-sucking habit in their children, and their attempts to discourage this behaviour in their children. Accordingly, this study aimed to investigate these aspects of digit-sucking in a group of Saudi mothers.

Subjects and methods

Fifty mothers who had children who were currently practising the digit-sucking habit were interviewed to study their attitudes towards the behaviour. The sample was selected by asking adult patients who visited the primary care clinic* at the College of Dentistry in Riyadh City, Kingdon of Saudi Arabia, whether they had a child who currently practised digit-sucking. The children were not themselves regular dental attendees. All the mothers involved were then interviewed using a questionnaire designed for the purpose. The questionnaire included general information about the mother, her child's age and sex, the mother's attitude towards the habit, the mother's attempts to stop the habit, and whether she had sought medical or dental advice about digit-sucking. The data were analysed using the SPSS Version 10 computer program, and the chi-square test and Fisher's exact test were utilized to evaluate differences. The mothers were provided with appropriate advice, and the children were referred for habit management where this was indicated.

Results

General information about the mothers is presented in Table 1. Analysis showed that most mothers belonged to the 31–40-year-old age group (48%). A high percentage of the mothers had had a university-level educational (48%), and 50% of them were employed. In addition, 82% of the mothers had one child who practised the digit-sucking habit, whilst the remaining 18% had more than one child with the behaviour. The majority of the children in this study belonged to the 4–6-year-old age group and 62·3% were female (Table 2).

All the mothers in this study considered digit-sucking to be a bad habit. Twenty-four (48%) had never found it acceptable, while 12 (24%) had accepted it up to 2 years of age and 14 (28%) up to 4 years of age. No mothers were happy about the habit after their child had reached the age of 4 years.

*The primary care clinic accepts a large number of patients and only provides treatment to address chief complaints of patients attending as acute cases.

Table 1. Descriptive analysis of the mothers involved in the present study ($n = 50$).

Variable	Number	Percentage
Age (years):		
20–30	20	40
31–40	24	48
41–55	6	12
Level of education:		
illiterate	2	4
primary school	4	8
intermediate school	2	4
secondary school	18	36
university	23	46
postgraduate	1	2
Employment status:		
employed	25	50
unemployed	25	50
Number of children who practised the digit-sucking habit:		
1	41	82
2	7	14
3	2	4

Table 2. Age and sex distribution of the children currently practising the digit-sucking habit, as reported by the mothers involved in the present study ($n = 61$).

Variable	Number	Percentage
Age (years):		
< 3	17	27·9
4–6	21	34·4
7–9	15	24·6
10–12	8	13·1
Sex:		
male	23	37·7
female	38	62·3

Table 3. Techniques used by mothers to stop the digit-sucking habit in their children.

Technique	Number*	Percentage
Bitter taste (substances on digit)	33	66
Reinforcement (reward)	25	50
Tape	24	48
Socks or gloves	22	44
Hot sauce	15	30
Wrapping the hand	15	30
Nail polish	14	28
Digit splint	5	10
Physical punishment	5	10
Other	6	12

*Some mothers selected more than one answer.

Most of the mothers ($n = 43$, 86%) had tried to stop their children indulging in the digit-sucking habit, and the majority of them ($n = 42$, 84%) had told their children to stop the behaviour before taking any further action. Two mothers had tried to stop the habit in their children by other means and without first telling the child, and one mother had told her child to stop digit-sucking without making any further attempt. Thirty-three (66%) of the mothers had noticed the harmful effects of the behaviour on their children's teeth.

In mothers who had not tried to stop the digit-sucking habit in their children, their main reason was that the child was too young (< 3 years), while two considered the fixation to be a temporary habit and two others were too busy looking after another child in the family. No mother was afraid of the habit transferring to another child.

The reasons given by the mothers for their attempts to stop the digit-sucking habit in their children were as follows: its effect on dental occlusion (41·82%), followed by its effect on the finger or fingers (15·30%), and its psychosocial effect on the child (15·30%). The effect on speech was noted by 10 mothers (20%), and loss of appetite and microbial transmission were also considered by some as other reasons for their attempts to stop the behaviour in their children (4·8%).

The different methods used by the mothers to stop digit-sucking habit in their children are summarized in Table 3. Thirty-three (66%) mothers used the application of some form of bitter-tasting substance, 25 (50%) used reinforcement behaviour, 24 (48%) used wrapping the finger in tape, and 12% of the mothers used other methods such as henna, Vicks

Table 4. Relationship between the mothers' attitudes to the digit-sucking habit, and their age, education and occupation.

	Age (years)			Educational level		Employment status	
Mothers' attitudes	20–30 (n = 20)	31–40 (n = 24)	41–55 (n = 16)	Low (n = 26)	High (n = 24)	Employed (n = 25)	Unemployed (n = 25)
Habit acceptance:							
never	9 (45%)	11 (45·8%)	4 (66·7%)	15 (57·7%)	9 (37·5%)	9 (36%)	15 (60%)
until 2 years of age	4 (20%)	6 (25%)	2 (33·3%)	7 (26·9%)	5 (20·8%)	7 (28%)	5 (20%)
until 4 years of age	7 (35%)	7 (29·2%)	0 (0%)	4 (15·4%)	10 (41·7%)	9 (36%)	5 (20%)
Mother's attempt to intervene:							
tried	18 (90%)	19 (79·2%)	6 (100%)	23 (88·5%)	20 (83·3%)	19 (76%)	24 (96%)
didn't try	2 (10%)	5 (29·2%)	0 (0%)	3 (11·5%)	4 (16·7%)	6 (24%)	1 (4%)
Mother's instruction:							
gave instruction	16 (80%)	20 (83·3%)	6 (100%)	23 (88·5%)	19 (79·2%)	19 (76%)	23 (96%)
didn't instruct	4 (20%)	4 (16·7%)	9 (0%)	3 (11·5%)	5 (20·8%)	6 (24%)	2 (8%)
Seeking dental advice:							
yes	3 (15%)	9 (37·5%)	3 (50%)	9 (34·6%)	6 (25%)	2 (8%)	13 (52%)*
no	17 (85%)	15 (62·5%)	3 (50%)	17 (65·4%)	18 (75%)	23 (92%)	12 (48%)
Seeking paediatric advice:							
yes	4 (20%)	4 (16·7%)	1 (16·7%)	6 (23·1%)	3 (12·5%)	4 (16%)	5 (20%)
no	16 (80%)	20 (83·3%)	5 (83·3%)	20 (76·9%)	21 (87·5%)	21 (84%)	20 (80%)

*P = 0·001.

VapoRub or mercurochrome. Although all the mothers had tried one or more of the methods mentioned above, the majority reported that methods had only a small or transient effect on eliminating the habit in their children.

Twenty-six mothers (52%) had not sought any professional advice, while 15 (30%) had sought advice from dentists and nine (18%) had consulted paediatricians. Only nine dentists and none of the paediatricians had given any advice about stopping the behaviour. Four dentists had offered a habit-breaking appliance and one had suggested motivational methods.

An assessment of the relationship between the mothers' attitudes towards the digit-sucking habit in their children, and other variables such as the age of the mother, her level of education, her occupational status, the number of affected children, and the children's age and sex was carried out. The findings are summarized in Table 4 and suggest that older mothers tend to be more against the habit, but no statistical significant difference was found between mothers in different age groups. The mothers whose education had been below the university level were more concerned than the more highly educated mothers, although, once again, no statistically significant differences were detected between the two. A highly significant statistical difference (P = 0·001) was found in the relationship between a mother's occupation and seeking dental advice. Unemployed mothers (52%) sought dental advice more than had mothers who were employed (8%). There was also a significant relationship between a mother's occupation and her attempts to stop the habit (P = 0·045). Ninety-six per cent of unemployed mothers had tried to stop the habit compared to 76% of employed mothers. No significant relationships were detected between employed and unemployed mothers with respect to other outcomes.

No significant relationships were found between the number of affected children in the same family and a mother's acceptance of the habit. The majority of the mothers tried to stop the habit in their children regardless of how many children in the family practised the habit. Although no significant difference was detectable between the mothers of children of different age groups and their attempts to stop the behaviour, the percentage of mothers who attempted to break the habit also increased as their children grew older. This relationship was statistically significant (P = 0·021). The results also indicate a highly significant relationship between a mother seeking dental advice and an increase in her child's age (7–12 years) (P = 0·001). The present study shows no relationship between the mothers' attitude and the gender of their child (Table 5).

Discussion

This study aimed to evaluate the attitude of Saudi mothers toward the digit-sucking habit in their

Table 5. Relationship between the mother's attitudes to the digit-sucking habit, the number of affected children, and the children's age and sex.

	Number of children		Children's age (years)				Children's sex	
Mothers' attitudes	One ($n = 41$)	Two or more ($n = 9$)	< 3 ($n = 17$)	4–6 ($n = 21$)	7–9 ($n = 15$)	10–12 ($n = 8$)	Male ($n = 23$)	Female ($n = 38$)
Habit acceptance:								
never	18 (43·9%)	6 (66·7%)	9 (52·9%)	9 (42·9%)	9 (60%)	4 (50%)	13 (56·5%)	18 (47·4%)
until 2 years of age	10 (24·4%)	29 (22·2%)	2 (11·8%)	8 (38·1%)	2 (13·3%)	2 (25%)	4 (17·4%)	10 (26·3%)
until 4 years of age	13 (31·7%)	1 (11·1%)	6 (35·3%)	4 (19%)	4 (26·7%)	2 (25%)	6 (26·1%)	10 (26·3%)
Mother's attempt to intervene:								
tried	35 (85·4%)	8 (88·9%)	12 (70·6%)	19 (90·5%)	14 (93·3%)	8 (100%)	20 (87%)	33 (86·8%)
didn't try	6 (14·6%)	1 (11·1%)	5 (29·4%)	2 (9·5%)	1 (6·7%)	0 (00%)	3 (13%)	5 (13·2%)
Mother's instruction:								
gave instruction	34 (82·9%)	8 (88·9%)	11 (64·7%)	18 (85·7%)	15 (100%)	8 (100%)*	19 (82·6%)	33 (86·8%)
didn't instruct	7 (17·1%)	1 (11·1%)	6 (35·3%)	3 (14·3%)	0 (0%)	0 (0%)	4 (17·9%)	5 (13·2%)
Seeking dental advice:								
yes	12 (29·3%)	3 (33·3%)	2 (11·8%)	3 (14·3%)	8 (53·3%)	6 (75%)**	10 (43·5%)	9 (23·7%)
no	29 (70·7%)	6 (66·7%)	15 (88·2%)	18 (85·7%)	7 (46·7%)	2 (25%)	13 (56·5%)	29 (76·3%)
Seeking paediatric advice:								
yes	7 (17·1%)	2 (22·2%)	3 (17·6%)	5 (23·8%)	1 (6·7%)	2 (25%)	4 (17·4%)	7 (18·4%)
no	34 (82·9%)	7 (77·8%)	14 (82·4%)	16 (76·2%)	14 (93·3%)	14 (93·3%)	19 (82·6%)	31 (81·6%)

*$P = 0·021$.
**$P = 0·001$.

children and to examine some of those factors that might be expected to influence their perceptions. The results revealed that 48% of the mothers never tolerated digit-sucking after the age of 4 years. This finding is in agreement with Schneider and Peterson [25], who considered the behaviour to be a normal childhood activity until the age of 4 years. Eighty-six per cent of mothers had tried to stop the habit. This number is slightly higher than that given by Vadiakas *et al*. [16], who reported that 71% of mothers of 3–5-year-old children had attempted to stop the behaviour. This difference in findings may be caused by the inclusion of older children in this study. Age was shown to have an influence on mothers' increasing attempts to stop the habit in the present study.

The clinical effects of the digit-sucking habit on primary and permanent dentitions are similar, with one exception being the premature atypical root resorption of the primary maxillary anterior teeth [26]. The effects of digit-sucking on occlusion include the development of anterior open bite, posterior cross-bite, maxillary protrusion and class II malocclusion [18,19,27]. The degree of severity of the malocclusion depends on the duration, frequency and intensity of the habit [28]. Thus, it has been suggested that the chances of self-correction are good if the child abandons digit-sucking before the age of 4 years, and are still reasonable provided that the habit stops before 6 years of age [29].

The adverse effect of the digit-sucking habit on dental occlusion was the main reason for the attempts of the mothers' in this study to stop the behaviour in their children. The harmful effects of digit-sucking on dental occlusion were often noticed by mothers who had linked the habit with the development of malocclusion. This is in agreement with Vadiakas *et al*. [16]. A few mothers in this study did not try to stop the habit because their children were too young, but no mother apparently believed that an attempt to stop the habit might lead to the development of another habit. This finding is in contradiction with the concepts of psychoanalytic theory [30]. Analysis of the most commonly recorded methods used to stop the digit-sucking habit in this study indicted that the majority of Saudi mothers were not at all aggressive in their attempt to stop the habit in their children, and that they avoided procedures such as punishment and nagging. Mothers also reported little benefit from employing one or more of the simple methods recorded in this study, however, and considered that they only had a temporary effect on habit cessation. When describing the number of procedures for eliminating the digit-sucking habit in children (e.g. pinning and tying the child's hand, using bitter-tasting substance on the

digit, splinting the thumb, or covering the thumb with tape), De la Cruz and Geboy [31] stated that 'little can actually be said about the effectiveness of these measures'.

Sixty per cent of the dentists who were visited by mothers provided them with no substantial treatment protocol to discourage the habit. This might be a result of the fact that the majority of these dentists were general practitioners who tended not to involve themselves in treating paediatric patients. Furthermore, paediatricians often advised the mothers not to interfere and let the child stop the habit by her or himself. No paediatrician advised the mother to consult a dentist. This finding is in close accord with that of Vadiakas *et al*. [16], who reported that only 0·05% of paediatricians referred an affected child to a dentist. This could possibly be attributed to paediatricians lacking information regarding the role of dentists in managing oral habits or not appreciating the deleterious dental side-effects of the habit, or the fact that many paediatricians attempt to protect the child from any punitive measures that parents or others may employ [17].

The results indicate a highly significant relationship between mothers seeking dental advice and an increase in their child's age. This may explained by the expected increase in the degree of deformation of dental occlusion with a prolonged sucking habit. Popovich and Thompson [19] reported a definite association between an increase in a child's age and the degree of malocclusion in a group with the digit-sucking habit. According to the above authors, class II malocclusion increased from 21·5% at 3–4 years of age to 41·9% at 12 years. No significant relationship was found between a mother's age and her attitude toward the habit, but older mothers were more concerned than younger mothers. This may be because older mothers are more experienced, have an increased level of awareness and are mature enough to deal with the problem. Interestingly, less highly educated and unemployed mothers were found to be more concerned regarding the digit-sucking habit compared to more highly educated and employed mothers. Warren *et al*. [32] suggested that this may be because of the mothers' indifferent attitude towards the habit. Employed mothers are often busier and work away from the house, which reduces the time they spend with their children in turn.

In this study, no significant relationship was established regarding the number of affected children in the same family and whether this has an influence on a mother's attitude towards digit sucking. This could be because only nine mothers were found to have more than one child practising the habit. Although no significant difference was detectable when the issue of gender differences was correlated with mother's attitude toward the habit, more mothers of male children did not accept the habit and the children had visited the dentist more often. The mothers of male children may, therefore, make every effort to stop the habit in their children.

It may be concluded that the mothers did not find digit-sucking to be acceptable, particularly after the age of 4 years. Most mothers had noticed the effects of digit-sucking on occlusion and many had made efforts to stop the habit, most often by using non-invasive procedures.

Résumé. *Objectif.* Cette étude a eu pour objectif de rapporter les attitudes des mères saoudiennes envers les habitudes de succion des doigts de leurs enfants et de leurs tentatives pour faire cesser cette habitude. *Protocole.* Etude transversale.
Echantillon et méthodes. Les données ont été obtenues à partir d'un échantillon de 50 mères saoudiennes dont les enfants avaient l'habitude de succion digitale. Un investigateur a interrogé toutes les mères à l'aide d'un questionnaire créé spécialement.
Résultats. Les résultats ont montré que 48% des mères n'aiment pas voir cette habitude, quel que soit l'âge, et aucune mère ne l'acceptait après 4 ans. La plupart des mères (86%) ont essayé de le faire cesser à leur enfant. Soixante-six pour cent d'entre elles ont noté l'effet de la succion sur l'articulé et ceci constituait la principale raison de leurs essais d'en provoquer l'arrêt. La méthode la plus fréquemment utilisée par les mères saoudiennes a été l'application sur les doigts de lotions amères (66%). Bien que 48% des mères avaient pensé à demander conseil à des dentistes ou pédiatres (30% et 18% respectivement) 60% des dentistes et aucun pédiatre n'ont pu proposer de solution.
Conclusion. Aucune mère n'acceptait de son enfant l'habitude de succion des doigts au-delà de 4 ans. La majorité des mères ont noté son effet néfaste. Des procédures non invasives étaient le plus souvent utilisées par les mères saoudiennes afin de stopper cette habitude chez leurs enfants.

Zusammenfassung. *Ziele.* Der Zweck der hier vorgestellten Studie war es, die Einstellung saudiarabischer

Mütter im Hinblick auf Daumenlutschen ihrer Kinder zu untersuchen ebenso wie die Anstrengungen, diese Gewohnheit abzustellen.
Design. Querschnittstudie.
Stichprobe und Methode. Daten wurden von einer Stichprobe von 50 saudiarabischen Müttern gewonnen, deren Kinder zum Untersuchungszeitpunkt an Daumenlutschen gewöhnt waren. Ein Untersucher nutzte einen speziell entworfenen Fragebogen zur Befragung der Mütter.
Ergebnisse. Die Ergebnisse zeigten, dass 48% der Mütter diese Gewohnheit in keinem Alter des Kindes gerne sahen, nach Vollendung des vierten Lebensjahres wurde es von keiner Mutter akzeptiert. Die meisten Mütter (86%) versuchten, die Gewohnheit zu unterbinden. Sechzig Prozent der Sichprobe hatten bereits Auswirkungen das Daumenlutschens auf die Okklusion des Kindes bemerkt, dies war zugleich der Hauptgrund für den Versuch, die Gewohnheit zu stoppen. Die häufigste Methode der saudiarabischen Mütter dem Daumenlutschen entgegenzuwirken war das Auftragen von Bitterstoffen auf die Finger. Obwohl 48% der Mütter Rat gesucht hatten bei Zahnärzten (30%) und Kinderärzten (18%) gaben 60 % der befragten Zahnärzte und keiner der Kinderärzte einen Hinweis.
Schlussfolgerungen. Ab Vollendung des vierten Lebensjahrs akzeptieren Mütter Daumenlutschen nicht. Eine Mehrzahl der Mütter hatte unerwünschte Effekte des Lutschens bemerkt. Nichtinvasive Methoden werden am häufigsten von saudiarabischen Müttern benutzt, um die Lutschgewohnheit ihrer Kinder zu beenden.

Resumen. *Objetivo*. El propósito del presente estudio fue comunicar las actitudes de las madres Saudíes hacia el hábito de chupeteo del dedo en sus niños y sus intentos en lograr parar este hábito.
Diseño. Estudio transversal
Muestra y métodos. Los datos se recogieron a partir de una muestra de 50 madres Saudíes que tenían niños con un hábito de chupeteo del dedo de forma habitual. Un investigador usó un cuestionario especialmente diseñado en la entrevista con todas las madres.
Resultados. Los resultados mostraron que al 48% de las madres no les gustaba ver el hábito a ninguna edad y que ninguna madre aceptaba el hábito después de la edad de cuatro años. La mayoría de madres (86%) intentó parar el hábito de chupeteo del dedo en sus niños. El 66% de la muestra presente había notado el efecto adverso del hábito en la oclusión del niño y esta fue la razón principal dada para sus intentos de parar el hábito. El método más común usado por las madres Saudíes para parar los hábitos de chupeteo del dedo en los niños fue la aplicación de una loción de sabor amargo en los dedos (66%). Aunque el 48% de las madres habían buscado consejo sobre el hábito de chupeteo del dedo en los dentistas y pediatras (30% y 18% respectivamente), el 60% de los dentistas y ningún pediatra habían sugerido soluciones.
Conclusión. Ninguna madre aceptó el hábito en sus niños más allá de la edad de cuatro años. La mayoría de las madres habían notado el efecto adverso del hábito del chupeteo del dedo. Los procedimientos no invasivos fueron los más comúnmente usados por las madres Saudíes, en el intento de parar este hábito en sus niños.

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