Family Medicine and Community Health
REVIEW

Systematic reviews in general practice: Applicability of the review "Mass media interventions for preventing smoking in young people" in the People's Republic of China

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Abstract

A major problem for Chinese primary health providers such as general practitioners has been the lack of a clear role within the entire health system, unlike in other countries where the general practitioner is rightly considered to be the cornerstone of the system and the gatekeeper to specialist services. In 2011 the national government of the People's Republic of China issued a policy acknowledging the role of primary health and the general practitioner as a gatekeeper, with an inherent expectation of the provision of quality services. For the most part, this means that evidence-based practice will be increasingly relied on to supplement existing polices, practices, and prescribed care plans currently in use within many community health centers. This article explores the concept of hierarchy of evidence for use by general practitioners by considering the applicability of the findings of the systematic review "Mass media interventions for preventing smoking in young people" published by the Cochrane Collaboration in the context of the health systems in the People's Republic of China, and in particular, the contribution general practice may have in addressing this issue.

Keywords: General practitioner; evidence based practice; systematic reviews; hierarchy of evidence; China

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Received 5 August 2015;
Accepted 15 September 2015

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Introduction

This article explores the concept of hierarchy of evidence for use by general practitioners by considering the applicability of the findings of the systematic review "Mass media interventions for preventing smoking in young people" [1] published by the Cochrane Collaboration in the context of the health systems in the

Family Medicine and Community Health 2015;3(4):65–73
www.fmch-journal.org DOI 10.15212/FMCH.2015.0141

People's Republic of China, and in particular, the contribution general practice may have in addressing this issue.

The *contextual role* of the general practitioner in China is historically relatively undefined. Unlike many other countries, such as Australia and the United Kingdom, where the general practitioner is the gatekeeper to the specialist health care system, in China there are few financial barriers to people bypassing general practitioners and seeking specialist treatment in major hospitals, provided they can afford this. Zhao et al. [2, p. 1] describe this motivation as being driven by consumer perceptions of "higher prestige and perceived [higher] levels of training," as qualified general practitioners are in short supply. Attitudes at the national level are changing [3]: in July 2011, a guidance policy was issued by the central government that recognizes the importance of the general practitioner system to the overall health system in China, perhaps for the first time formally recognizing the gatekeeper role of the general practitioner, and noting the importance of specific training. Implicit in this policy is the need for quality outcomes: namely, safe, effective, convenient, inexpensive (primary) health services or "为群众提供安全、有效、方便、价廉的基本医疗卫生服务" [4]. For general practitioners to meet these ideals, the importance of evidence-based practice becomes clear.

Implications for general practice

The central government expects that quality services are provided by general practitioners, which suggests that there will be an ever-increasing reliance on evidence-based medicine. This begs the question of what constitutes best evidence. Systematic reviews are studies that collect all known evidence on a particular topic at a date, assesses the evidence by comparing and contrasting the findings, and drawing conclusions. Cochrane reviews are publications of systematic reviews of available evidence located in the Cochrane Library, and are published in a variety of languages, including Chinese.

There is a hierarchy of evidence, which describes systematic reviews as being the most *reliable* sources of information, and expert opinion as perhaps being the least *reliable* (see Fig. 1). A problem with this common model is that it favors quantitative research measures (such as randomized controlled trials), which is perfectly valid if one wants to know *what* the problem is, the magnitude of the problem, and whether one can reliably

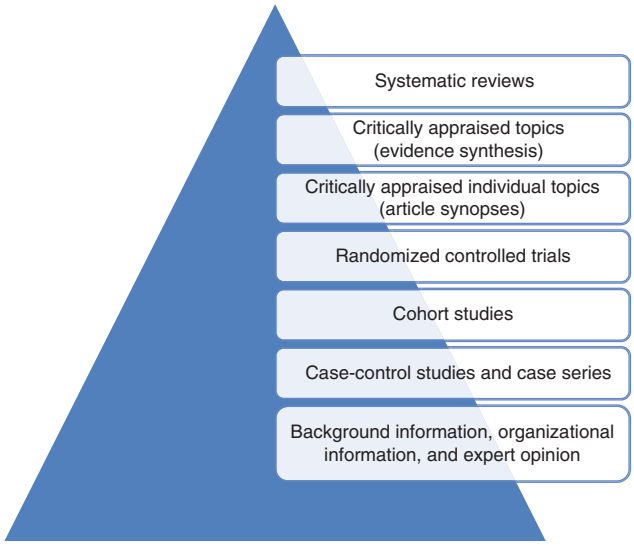

Fig. 1. Hierarchy of the types of evidence.

predict future probabilities, but often there is a deeper question of "*why?*" In understanding behavioral choices, for example, a different approach is needed, a qualitative approach.

Daly et al. [5] noted that until relatively recently, Cochrane systematic reviews excluded qualitative research because qualitative research methods did not easily fit into these rigidly defined definitions, and proposed a parallel hierarchy of reliability ranging from a single case study to generalizable studies. The reason for this was to address the publication bias that existed, whereby previously randomized case-control trials were considered to be the gold standard, and qualitative research was often ignored or remained unpublished. Figure 2 incorporates the model of Daly et al. into a traditional hierarchy as a parallel pathway: but caution should be taken in that it represents a *generalized* hierarchal indication of reliability. In no way should the diagram be taken to suggest that they are matched equivalent methods: for example, cohort studies are not a quantitative corollary of qualitative conceptual studies.

This is a particularly useful development for Cochrane reviews, because it now provides the ability not only for the collation of evidence regarding the *what*, but also for considering the reasons *why*.

This is not the only model for establishing a hierarchy of evidence: Miller and Jones-Harris [6] developed a three-level model (gold, silver, and bronze) for use in evidence-based

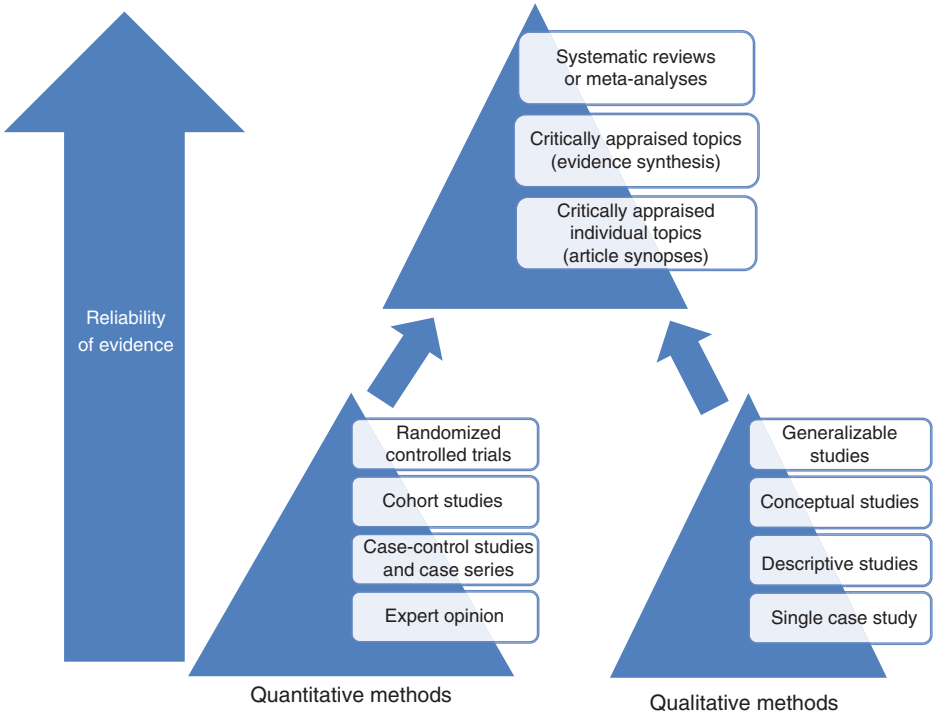

Fig. 2. Incorporation of qualitative methods into the hierarchy of evidence (adapted from Daly et al. [5]).

medicine that specifically listed eight different types of data enquiry, five of which addressed quantitative methods, and three of which addressed qualitative methods. In every case, the systematic review was considered to be the highest or most reliable indicator of quality of evidence [6]. Although their model may be a little cumbersome, it is useful for general practitioners who may be seeking reassurance about the data enquiry they may be seeking.

Quantitative methods remain the dominant method represented in publishing, especially in China. A truly effective general practitioner will be both comfortable and comforted in understanding the value of both the *what* and the *why*. So, let us explore an issue that is probably familiar to most general practitioners: the prevention of teenage uptake of smoking.

The problem

Tobacco consumption in the People's Republic of China

Cigarette smoking in China is endemic, described as a "public health emergency" [7]. The population of the China is estimated to be some 1.37 billion people, and more than half now live in urban areas because of government policies to industrialize the country [8, 9].

Li [7] describes China as possessing one quarter of the world's cigarette smokers, with 1.2 million people dying of tobacco-related diseases each year, which is expected to rise to 2 million in 2020, and 3 million in 2050, and describes the hazards associated with smoking as an "ongoing catastrophic health crisis" [7]. Zhu et al. [10] suggest that noncommunicable diseases are responsible for more than 80% of deaths in China, with tobacco use being "among the most preventable causes."

The Global Adult Tobacco Survey reports that in 2010, 52.9% of men in China were regular smokers, the rate being slightly higher at 56.1% in rural areas compared with 49.2% in urban areas. Smoking rates among women are reported as 2.4%, considerably lower than those for men [11, 12]. For the age group between 15 and 24 years, 33.6% of men and 0.7% of women were reported as current tobacco users [11]. The Chinese Ministry of Health released findings in 2008 that

stated "among 130 million adolescents 13–18 years old…, 15 million were smokers, another 40 million attempted to smoke, and 65 million were exposed to second hand smoke" [7].

Rural residents have, on average, a far lower socioeconomic status than their urban counterparts, and the prevalence of smoking is higher: there is a correlation between poverty and smoking in rural areas [7].

Social context

With the opening up of the People's Republic of China to the world, Western fashions, brands, and customs – in particular, American cigarette brands – have become highly prized as fashion statements especially by young people: Chinese television programs and films often depict people smoking in the context of being "handsome, cool and attractive" [9]. A recent increase in smoking rates in "women, adolescents and young adults … [may be ascribed to being] a symbol of personal freedom … associated with independence and charisma" [12], which echoes the earlier findings of Hesketh et al. [13]. A more recent study concluded that the drivers for smoking in Chinese adolescents included "curiosity about smoking, coping, social image, social belonging, engagement, autonomy, mental enhancement, and weight control" [14], but perhaps most concerning for those who were not yet smokers was that they might "smoke in the future to project a social image of autonomy" [14] – an important issue in a society where there are strong historical role expectations coupled with a governance system that encourages political consensus among the population.

Numerous authors cite the influence of social customs and "goodwill"; particularly with respect to gift giving and social interaction, cigarettes proving a convenient and socially acceptable means of accomplishing this custom [15]. The rejection of such gifts is offensive: there is considerable social pressure to accept the gift and show enjoyment, and it is an obligatory component of the commencement of any successful business relationship [7, 9, 12, 16]. This may contribute to the difference between those identified as current tobacco smokers (28.1%) and those who identify as daily tobacco smokers (24.1%) [11].

Health professionals

There is a surprisingly high proportion of habitual smokers among health professionals, in particular among men [16]. Unlike in Western countries, the prevalence of smoking in nurses is lower than that of physicians, nursing in China being an almost exclusively female profession. Zhang et al. [12] noted that more than a third of all male physicians were smokers, and that this "high smoking prevalence in health professionals can result in misinformation among the general public and is a negative factor for smoking cessation." The implication of this will become apparent.

Soon after the establishment of the People's Republic of China, health care funding for the population was provided via cooperative medical schemes supported by their local collectives and delivered by a tiered health system, with the "barefoot doctors" providing primary health services [8]. In this way, health care was universal and egalitarian, although there were problems of equity and access to tertiary services especially for rural residents. After the economic reforms intended to transform China into a middle-income country [7], the cooperative medical scheme system of health care financing collapsed, and health care expenses required ever-increasing consumer out-of-pocket expenditure. Despite incremental reforms in health care provision, such as the development of alternative pooled funding insurance schemes and supportive measures such as the National Essential Medicines Scheme [17], the serious illness of an individual often leads to catastrophic health expenditure, resulting in intergenerational poverty for the family of that individual regardless of their socioeconomic status [8]. Measures to avert preventable diseases are imperative, not only from an individual's perspective (in terms of both health and economic well-being), but also from a familial and even national perspective.

Implications for the government

All Chinese tobacco companies are state owned [18]. Very little of the domestic production is intended for exportation: 99.2% of locally produced cigarettes are consumed on the domestic market [19]. Most governments are intent on increasing and improving the living standards of their people; but there is a dilemma when a substantial proportion of their revenue depends on income arising from the consumption of tobacco products [9]. In recent decades the tobacco industry in China provided approximately 6% of revenue for the government at all levels of Chinese society, even to the extent

of sponsorship of secondary schools [10]. Despite this, the tobacco industry is no longer the cash cow for China it once was: tobacco-related losses associated with medical and labor loss costs to the government first exceeded revenue income in 2000, and by 2010 the associated net loss was estimated to be 13.1 billion yuan per annum [7].

China is an aging society [20], and health expenditure will grow accordingly. Li [7] emphasizes that "the rapidly rising cost of smoking related medical care and the loss of productivity should urge China's policy makers to recognize the negative economic and social consequences of promoting cigarettes." This is at odds with a leadership that is primarily focused on sociopolitical stability. Surprisingly (as this is rarely reported in the Western media) in 2010 there were some 180,000 protests, riots, or group petitions associated with instances of social unrest, due to "rampant official corruption, social dislocation, political injustice, lack of work safety or job security, inadequacy of human rights, and problems … [associated with] internal migration" [7]. Public measures to curb smoking could be seen as "potentially risky because of the potential to stoke resentment and provoke social unrest, especially among the … vast body of low income smokers" [7], despite public opinion which tends to favor bans on smoking in public places [7], with greatest support favoring bans in hospitals (85.7%), in schools (84.9%), and on public transportation (84.4%), and less so in offices (67.6%), restaurants (49.7%), and bars (32.2%) [7, 16].

Despite China being a signatory to the World Health Organization's Framework Convention on Tobacco Control, the Xinhua News Agency reported that China had not achieved a ban on indoor smoking by 2011, with the blame being placed on "a lack of state-level legislation, ineffective administration, low-priced cigarettes and a deep-rooted tobacco culture" [16, 21]. Recent indications suggest incremental changes in thinking at the central government level; however, the widespread availability and affordability of cigarettes in China remains problematic. Until such time as the government increases taxation levels on cigarettes to provide an economic disincentive, there is likely to be little reduction in smoking rates [10].

The systematic review

When considering studies included in a systematic review, on should consider whether the contributory studies were conducted in similar settings and if so, the degree to which the findings are consistent across settings or time periods. The studies included in "Mass media interventions for preventing smoking in young people" [1] were collected from articles published from 1983 to 2010, and with the exception of one article from Norway, all were from the United States [1]. All eligible participants were younger than 25 years [1], and the review sought evidence from "randomized trials, controlled trials without randomization and time series studies" [1] that included both broadcast and print media but specifically excluded peer-to-peer communication. The objectives were wide: the primary objective was to examine the effectiveness of preventing uptake of tobacco smoking in this age group; it also included secondary outcomes that examined "improved smoking outcomes, attitudes, behaviors, knowledge, self-efficacy and perception" [1]. The outcome measures were divided into primary and secondary or intermediate measurements. The primary measure was whether a person had a history of cigarette use, and if so, the person was defined as a smoker, together with the frequency of use. Secondary or intermediate measures were defined as smoking attitudes, behaviors, knowledge, self-esteem and self-efficacy, and finally perception (norms, adult, sibling, and peer perspectives). Only two of the studies "addressed outcome imbalances at baseline," both of which were conducted more recently than the earlier studies and were done in the United States [1]. Four of the seven studies investigated whether a mass media intervention had any effect compared with no intervention (control group): a further study used a factorial design [1, p. 8], and the results were generally favorable expressed in odds ratios with confidence intervals, although difficulties were found with participants lost to follow-up. The second comparison examined the effect of a mass media campaign when combined with a schools-based program compared with no intervention (control group), and only one study partially addressed this [1, p. 9]. The third comparison was a mass media campaign combined with a schools-based program, compared with mass media campaign alone: again only one study made this comparison [1, p. 9]. Finally, mass media campaigns combined with schools-based programs were compared with schools-based programs alone: two studies addressed this, and one study partially addressed this [1, p. 9]. The intermediate variables were inconsistent,

as were the process measures, and only one study included the costs associated with broadcasting the media campaign, expressed as a cost per student, as well as per life year gained [1, p. 10]. Disparities between gender behaviors, and rural/urban locations were also considered and reported where available. The conclusion of the mass media intervention review is that although the evidence is weak and there were methodological flaws in the available reports, there was some evidence that supports the use of mass media interventions [1].

There may be important differences in on-the-ground realities and constraints that might substantially alter the feasibility and acceptability of options open to local general practitioners. Although there are significant cultural differences between the studies cited by Brinn et al. [1] and China, the findings of the systematic review are valuable, in particular the identification of campaigns based on "social influences and social learning theory" [1] and the importance in predicting that "young people will anticipate, initiate and adopt smoking as part of the socialization process" [1] in light of the ingrained customs involving smoking encountered in China. Xiao et al. [18], for example, consider that "core messages of health education … [coupled with] a national mass media campaign … [are] one of the most important strategies for tobacco control in China … [to] drive changes from knowledge and belief to action" [18].

The prevalence of smoking according to sex does not mirror that in the West: in China the vast majority of adolescent smokers are male [11, 13, 14], whereas in high-income countries there is often very little difference in the smoking rates between sexes.

Nevertheless, the commonsense implications for practice identified by Brinn et al. [1] are particularly valuable for public health planners in China because they are *suggestive* rather than *prescriptive*, enabling Chinese social researchers to develop strategies to best meet the needs of local communities, which differ significantly across a vast country. The traditional delivery of mass media campaigns has, until relatively recently, been achieved via television, radio, and newsprint, and this was certainly the overlying assumption of Brinn et al. [1]. Even in China, where international social media are blocked by the national firewall, domestic social media are flourishing. The focus of much social media commentary is primarily concerned with social transparency and may provide an avenue for greater freedom of thought [7]; however, the potential for the delivery of beneficial health-related interventions remains largely untapped and is in a developmental if not an experimental stage.

There are important differences in health system arrangements that may mean evidence from other places may not work in the same way, owing to significant differences in the health system from that of the United States and Australia, which both inherited a common law system of governance, where the judiciary interprets law independently of the legislature, whereas China functions on the basis of civil law, and the judiciary implements the laws determined by the legislature. There is little wonder that to date there has been a refusal by the court system in China to accept class actions against tobacco companies [7]. This issue is not unique to China: the plain packaging initiatives undertaken by Australia are currently subject to international legal challenges. Perhaps the most fundamental difference is that in Western countries tobacco companies are privately owned multinational companies with stockholders that may be influenced by social disquiet and disapproval, as well as being subject to the respective judiciaries. In China, the health regulators, most health providers [2], *and* the tobacco companies are owned by the state in some form of another. An added issue is the disproportionately high number of health professionals, mainly men, who are regular smokers, which has implications for the credibility of health information to dissuade a behavior that the health provider himself engages in. Health workers in China do not have the status and trust enjoyed by their counterparts in the West: in fact, extreme violence perpetrated against health providers in China by disgruntled patients or their families is common, often with tragic outcomes [22].

There are also important differences in the baseline conditions that might yield different absolute effects even if the relative effectiveness was the same. There are significant differences in Chinese society; particularly with respect to the impact of state influence on the organs of society. Overwhelming social pressures to achieve in business in the emergent competitive economy of China means that acceptance of social customs – the exchange of business gifts, often involving cigarettes or alcohol – is critical for success. The

public health factors that might dissuade adolescent males from smoking might count for little once they enter the business world in their early 20s, where there may be significant competition to achieve the appropriate business contacts and social connections. For this reason, a range of measures might be needed that are tailored not only to the needs of adolescents and younger adults, but also to change perceptions of older adults to avoid inculcating younger people through social mores.

The Chinese cultural concept of "balance" to all facets of life is in itself an admirable and useful philosophical view [23]; however, if tobacco consumption is regarded as something one might balance with another action to offset potential negative impacts instead of being regarded as an absolute ill, it may be difficult to dissuade people from consuming tobacco. Failure to appreciate this cultural perspective is often a major stumbling block for Western policy makers intent on "improving" things in China, and worse still, gives the appearance of external imperialism.

Although the state develops rules and regulations, the manner in which they are implemented, if they are implemented at all, at the local level differs across the country. Despite the concerns and policy development favoring health concerns and strategies for improvement by the central government, there is often failure at the local level: health bureaus often lack the means to offer compliance incentives or ensure regulatory compliance, and local government officials have little political leverage [24]. Top-down policy approaches adopted by the Chinese central government have the potential to create the perception within the general public that the government is solely responsible for public health management, and that there is likely to be resistance to the concept of shared responsibility (governments, communities, and individuals) as being representative of return to the "regressive … commune system" [24].

Insights can be drawn about options, implementation, and monitoring and evaluations of systematic reviews, but it is both unwise and inappropriate to transplant any program from one culture into another and expect similar results. Nevertheless, the findings of Brinn et al. [1] regarding the planning for future mass media interventions, particularly with respect to social learning theory, are extremely helpful in assisting the development of a Chinese model of mass media implementation. I argue that this is the most singular helpful aspect of the systematic review, given the complex social mores and traditional customs that pertain to China.

Chinese academics are already aware of the vast potential for intersectoral cooperation; however, there are challenges for achieving intersectoral cooperation in any "command and control" structure. All organizations have political hierarchies and infrastructures that occur in parallel to organizational structures. Requests for collaboration must often pass up various levels of communication until commonality is achieved. There is often some considerable distance from the level of implementation, which has a profound effect on the manner in which cross-sectoral or horizontal collaboration may occur.

Nevertheless, one of the more recent Chinese studies published regarding predictive smoking in adolescents does not refer to Brinn et al. [1] and mentions social learning theory only in passing, in favor of protection motivation theory. Yan et al. [25] suggest that smoking behavior in adolescents is a combination of "two closely related pathways, Threat Appraisal and Coping Appraisal, which link environmental influences to a behavior through a series of cognitive processes." Although this technically may be true, I find the argument of social learning theory proposed by Bandura [26] that most learning, social or otherwise, occurs by observing others, and that positive reinforcement occurs by modeling "behaviors on those … people admired for their skills and expertise … and those with status, prestige and power are more likely to influence others" [27] to be a far more convincing and persuasive argument. To suggest that hectoring teenagers with facts and education will prevent the uptake of smoking is fanciful, especially when there are strong social pressures (such as the giving and perhaps even more importantly the graceful *acceptance* of gifts) and media portrayals of glamorous and desirable role models who include smoking as part of their image of sophistication. The lesson from the West and in this systematic review is that interventions by local general practitioners or teachers alone are insufficient. A coordinated approach is needed.

Conclusion

Although the findings of Brinn et al. [1] in terms of the implication for further action are valid and useful, particularly with

respect to the importance of social learning theory, the societal conditions and political complexity of China often make cross-sectoral cooperation difficult. A top-down approach from the State Council is necessary to facilitate cross-sectoral implementation, but this must be managed carefully to avoid suspicion and rejection by the communities which these initiatives are intended to benefit. In addition, because cigarette smoking has significant "utility" in terms of business social benefits, antismoking messages and measures are likely to be held in low regard until societal changes occur. It would seem, therefore, that achievement of the timelines imposed on China by virtue of its being a signatory to the World Health Organization's Framework Convention on Tobacco Control need to be considered in terms of the massive societal changes required. Although sociopolitical containment remains the primary focus of the central government, tobacco control measures are likely to remain a secondary priority, and responsibility for smoking reduction will be conveniently delegated to primary care providers, such as general practitioners. General practitioners have a role to play and an important contribution to make toward smoking prevention and cessation, it is clear that they *are* not and *should not* be considered the sole players, or have sole responsibility.

Acknowledgment

The author would like to acknowledge the unfailing kindness and encouragement of Dr Sophie Hill, Dr George Liu, Dr Sally Fawkes, Dr Priscilla Robinson, Dr Wu Qunhong and Mr William Peng in the preparation of this paper.

Conflict of interest

The author declares no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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