





The relationship between public law-abiding tendency and safe COVID-19 behaviors, development of a new scale, and association with health-related behaviors

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The objectives of the present study were to develop and validate the Public Law-Abiding Tendency Scale (PLATS) and to examine its association with some health-related behaviors. Several steps were taken including item suggestion and discussion by an expert panel, sequential item reduction to maximize internal consistency using exploratory and confirmatory factor analysis. A sample comprised 1108 community-dwelling participants. Internal consistency and construct validity of the PLATS were examined. The 10-item scale showed good psychometric properties. There was a significantly moderate association between PLATS scores and COVID-19 preventive behaviors ($r = 0.564$; $p < .001$), indicating that a greater tendency to abide by public regulations was positively associated with more adherence to health recommendations during the COVID-19 pandemic. The study findings suggest the PLATS is a promising new scale for assessing individuals' tendency to abide by general public laws that could provide an empirical basis for further study on this topic.

Keywords: COVID-19 pandemic; health-related behaviors; psychometrics; Public Law-Abiding Tendency Scale; validation study.

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Introduction

Human behaviors are influenced by many factors including personal characteristics and socio-cultural milieu (Reynolds, 1981). One of the main features of social ecology that promotes or hinders specific behaviors from occurring are public laws and regulations. Legal regulations may affect individuals' behavior through fear of sanctions, desire for rewards and/or by changing attitudes toward specific behaviors (Bilz, & Nadler, 2014). Therefore, laws not only affect

individuals' behavior through expected punishments or rewards, but they also play an important role in shaping and expressing social norms, that are unwritten values in society (Benabou & Tirole, 2011; Galbiati et al., 2021; Martin, 2008).

Although, there are different definitions in different jurisdictions and legal systems, public law is used broadly to refer to a set of legal rules, enforceable by the governments, that regulates the relationship between individuals and the state (Boughey, 2013). In contrast to private law by which the government horizontally supervises and facilitates relationships between individuals as well as non-governmental private parties, public laws vertically regulate the relationships between government and individuals, and the government imposes an obligation owed to it on individuals (Rosenfeld, 2013; Wang, 2021). Therefore, public law deals with issues that affect the general public or society as whole, rather than specific social sections or population subgroups. Overall, they express public policies responsible for creating and maintaining welfare and safety of citizens (Gostin et al., 2019).

Public laws may be classified as administrative (laws that govern government agencies), constitutional (laws that protect citizens' rights as afforded in the Constitution), criminal (laws that relate to crime), municipal (those that are ordinances, regulations and by-laws that govern a city or a country, representing local or national governments) and international laws (laws that oversee relations between nations) (Coglianese, 2015; Stephan, 2006; Gilbert & Russell, 2002). The present paper refers to public laws as those laws, mostly municipal, that are publicly observable and their violations are expected to be followed by or lead to a legal penalty or social punishment. Compliance with laws and regulations is of crucial importance for social functioning, safety and sustainability. Moreover, law violations can be a source of social instability (Auzoult, 2018).

Law-abiding behavior is defined as a stable behavior of an individual in following most important public municipal rules (Salakhova et al., 2020). According to Tyler, law-abiding individuals are motivated to voluntarily obey the law, because they recognize law obedience behavior as both socially appropriate and ethical (Tyler & Darley, 1999). Law-abiding behaviors originate from recognition of an existing law (law awareness) and perception of the law as a social value and obeying it as a law (Haitao, 2022). Therefore, individuals' obedience to law requires belief in values contained in psychosocial and cultural context (Tyler & Darley, 1999). In addition to genetic and psychological factors, Jackson suggested other influencing determinants associated with compliance with laws including legitimacy, that is "an authority being recognized and believed by people as rightful" (p.1053) and existence of a shared moral purpose between the government and its citizens (Jackson et al., 2012).

It is widely recognized that social environment and relationships are fundamental determinants of individuals' physical and mental health. The concept of social determinants of health seeks to understand how social ecology affects individuals' health-related behaviors and health outcomes (Short & Mollborn, 2015). It has been suggested that social determinants of health are strongly influenced by laws through forming social interactions (Gostin et al., 2019). Predicting and influencing public behaviors (including health-related behaviors) necessitate developing appropriate tools to assess factors associated with individuals' law-abiding behaviors at the society level. Obviously, individuals behave differently with regard to public laws and regulations, some of which may influence health. For example, one of the challenges health systems faced during the COVID-19 pandemic was non-compliance with COVID-19 related public health measures, especially among young adults (Nivette et al., 2021). While some individuals strictly adhere to the public laws, some individuals ignore them or do not take them seriously. As an important outcome,

assessing law-abiding behaviors and understanding correlates of beliefs with regard to them, may elucidate paths toward more safe and sustainable societies.

To best of the present authors' knowledge, there is currently no scale that directly assesses individuals' tendency to comply with the law. The lack of unified and widely accepted definition of public laws and diversity of laws across countries may be the reasons why (to date) no psychometric instrument has been developed that assesses individuals' law-abiding behaviors. Therefore, the main objective of the present study was to develop and validate a brief tool for assessing individuals' public law-abiding tendency. The study also had a secondary objective to evaluate the relationship between general public law-abiding tendency (as assessed by the new scale [PLATS]) and generally recommended health behavior (i.e., COVID-19 self-protective behaviors during the pandemic).

Methods

Scale development process. To develop the new scale, a sequential item-reduction approach was followed. Figure 1 outlines the steps for the development and validation of the new scale. The steps included identifying the concept of public laws, generation of the items (brainstorming by a group of experts), pooling of the suggested items (n=22), checking the relevance of the items through expert group discussion (18 items retained), checking for ambiguity and readability of statements by a group of lay persons (16 items retained), checking for quantitative content validity by content experts (14 items retained), piloting the items with a small group of people, checking for construct validity of the factor structure by EFA (10 items retained), and final evaluation of model fit of the 10-item scale using confirmatory factor analysis.

Identifying the public law domain. The first step of the study was to identify a set of items that encompassed the domain of public laws. A review of literature was conducted on law and its classification. Public laws were defined as a set of legal rules, primarily municipal, enforceable by the governments, that regulates the relationship between individuals and the government which aim to provide and maintain welfare and safety of the population (Martin, 2008; Boughey, 2013; Rosenfeld, 2013; Wang, 2021).

Item generation. Due to lack of pre-existing scales and scarcity of related literature, the inductive method was used for item generation (Boateng et al., 2018). A group of experts from various fields was created. The experts were selected based on the following criteria: (i) having a PhD degree in one of the related disciplines including: psychology, law and sociology, public health, and epidemiology, (ii) working as professors in the university with more than five years professional experience in their field. The first two authors (RS & AKJ) interviewed the experts and explained the objectives of the new scale and the boundary of the domain to them based on the preliminary literature review and asked them to suggest domain-related items. The target items were those public regulations that individuals frequently encounter in their daily life where following them is publicly deemed to be right doing and disobeying them can lead to a legal/social warning or penalty. Noting the diversity of laws across the world, the experts were asked to focus on public laws that are acceptable to the majority of civilized societies. The suggested items (n=22) were then collated by the first author (RS).

Discussing the relevance and format of the suggested items. In this step, 22 suggested items were reviewed and discussed for their relevance (content coverage) and format (item stem and response options) by the aforementioned expert group. All the items were rated on a five-point Likert-type scales from 1 (*strongly disagree*) to 5 (*strongly agree*). Four items were identified as irrelevant to

the domain or expressing similar contents and were excluded by the expert panel. Therefore, the number of items reduced to 18 after conducting a screening process for redundancy and content coverage and overlap of proposed statements.

Assessing the face validity of the items. Face validity is defined as the perceived relevance, clarity, appropriateness and sensibility of the test to its intended audience (Allen et al., 2023). It designates whether the individuals in the target population agree with the appearance, wording and understandability of the scale items with respect to what is supposed to be assessed. This kind of validity is seen as the minimal and basic component of validity that should be followed by content validity evaluation by the experts (Zhang & Garcia, 2023). In this step, the research team asked 15 lay individuals (through convenience sampling) to rate the ‘relevance’, ‘ambiguity’, and ‘comprehensibility’ of the items. Based on the feedback provided by the lay individuals, two items were removed due to lack of clarity or different understanding of the items and the wording of some items were changed. For example, the item “*I avoid physical fights even if someone makes me angry*” was changed to “*Physical fights and violent behaviors are legally banned and I follow the rules*”.

Assessing the content validity of the items. Content validity of the 16 remaining items were quantitatively evaluated by the expert panel. Item-level and scale-level content validity ratio (CVR) and content validity index (CVI) were used to examine the content validity of the scale. Item-level CVR was calculated using the formula: $CVR = (NE - N/2) / (N/2)$, where NE is the number of experts who described the item as essential and N is the total number of experts. Scale-level CVR was measured by calculating the average of items’ CVR. The item-level content validity index (CVI) was computed as the number of experts who gave 3 or 4 points (out of 5) for clarity and relevancy of the item divided by the total number of experts. Scale level CVI for relevancy

was computed as the proportion of items considered relevant (items scoring 3 or 4) by all the experts divided by the total number of the items (Zamanzadeh et al., 2015). In this step, two items were removed based on the content validity evaluation.

Piloting the items. A pilot study was carried among 80 participants (53% male, mean age: 40 years [SD±16]) for initial evaluation of the scale and to check for appropriateness and comprehensibility of the items among a larger number of respondents. In this step, no item was removed, but some minor changes were made in wording of the items. Finally, the expert committee agreed on 14 items covering public laws to be tested for construct validity.

Construct validity. The construct validity of the scale was evaluated using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). In this step, the new scale (named the Public Law-Abiding Tendency Scale [PLATS]) was evaluated among a sample of 1108 Iranian community-dwellers (of which 808 comprised the sample for exploratory factor analysis and 300 comprised the sample for the confirmatory factor analysis).

Known-groups validity. Because there are no similar scales to compare the new scale with a gold standard test, known-groups validity was used to evaluate how much the new scale can discriminate between two groups known to differ on the scale of the interest. To assess known-groups validity of the scale, item points of PLATS were summed and total scores were calculated. Educational level was dichotomized into (i) college degree or (ii) high school or lower education. It was assumed that those with a university degree would be more law-abiding than those without one (Dong & Zeb, 2022). Total PLATS scores were compared between two groups.

Convergent and divergent (discriminant) validity. To assess convergent and divergent validity, participants were asked a relevant one-item question “*I follow public laws as much as I can*” and an irrelevant item question “*I have easy access to healthcare facilities*”, respectively. Responses

were rated from 1 (*strongly disagree*) to 5 (*strongly agree*). The correlation between PLATS scores with each of these items were evaluated using the Spearman's rank correlation coefficient.

Study design, sample and data collection

The scale items were developed in Persian and were evaluated among a sample of Iranian population. Participants were recruited from general population of Shiraz, Southern Iran. The inclusion criteria were being Iranian and aged 18 years and older and being able to understand spoken Persian. The data were collected using a face-to-face structured survey through paper and pencil administration. For exploratory factor analysis (EFA), a convenience sample of 808 participants were recruited from public places (including bus stations, public parks, banks, clinics) in 17 community neighborhoods of Shiraz from November to December 2022. For confirmatory factor analysis, a convenience sample of 300 participants were also recruited from public places in six community neighborhoods of Shiraz during May 2023. These analyses were carried out to test the internal structure of the PLATS and to determine how well the data fitted the parameters. The survey was voluntary, self-administered and anonymous and took about five minutes to complete. The protocol was approved by Research Ethics Committee of Shiraz University of Medical Sciences (ref: IR.SUMS.MED.REC.1401.042).

Measures

Demographics. Basic demographic data comprising age, gender, marital status, and educational level were collected.

COVID-19 preventive behaviors. To evaluate COVID-19 preventive behaviors, participants were asked how often they followed five recommended safe COVID-19-related behaviors during peak months of the pandemic in the past 12 months. The item questions included: (i) *"I have regularly*

sanitized my hands with water and soap or alcohol hand-rubs", (ii) *"I have regularly avoided touching my eyes, mouth and nose"*, (iii) *"I have regularly covered my nose with tissue or bent elbow while coughing or sneezing"*, (iv) *"I have regularly maintained at least one meter distance with other people"*, and (v) *"I have stayed at home when feeling sick"*. Items are rated on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were summed to create a total COVID-19 preventive behaviors score that ranged from 5 to 25, with a higher score indicating safer COVID-19 behaviors. In the present study, the scale had adequate internal consistency and reliability (Cronbach's alpha = 0.798; McDonald's omega = 0.809).

PLATS. The initial version of the *PLATS* that was assessed for construct validity comprised 14 items. Each item was in the form of a statement about compliance with a public municipal law that people commonly encounter in their daily life and individuals rate their degree of agreement from 1 (*strongly disagree*) to 5 (*strongly agree*). After conducting EFA and CFA, the final version of the *PLATS* comprised 10 items (see Appendix 1). Items were summed to create a total *PLATS* score that ranged from 10 to 50, with a higher score indicating greater compliance with public municipal laws. The internal consistencies are reported in the Results section.

Statistical analysis

Individual characteristics of the participants were described using frequencies (percentages) for categorical variables, and means (and standard deviations) for numerical variables. Common factor analysis was performed to evaluate the structural validity of the scale. An EFA using principal axis functioning with varimax rotation method was used to understand which items grouped into a single factor. Bartlett's test of sphericity was used to confirm adequate correlation between variables in the *PLATS*. The appropriate number of factors was determined using Eigen values

and scree plot and was confirmed with parallel analysis. To determine best fitting model, CFA was performed (Guo et al., 2009). Cronbach's Alpha coefficient was computed to calculate internal consistency. Also, McDonald's omega coefficient was calculated as a measure of composite reliability. McDonald's omega coefficient was calculated for the PLATS and its subscales using Hayes' Omega Macro (Hayes & Coutts, 2020). Reliability coefficients of 0.7 or more were considered as acceptable. To estimate the correlation between law-abiding tendency and safe COVID-19 behaviors, total scores of both scales were calculated by summing up points obtained from each scale items. Correlation coefficient was computed using Spearman rank test. Written informed consent was obtained from all participants.

Results

According to the item-level CVRs, Item 13 (*“Spitting in public places is not allowed, I follow the rules”*) was deleted due to low CVR value (CVR= 0.2). CVR of the remaining items were good. Also, Item 16 (*“In places [like around hospitals] where blowing unnecessary horns by vehicles is not allowed, I follow the rules”*) was deleted due to low clarity score on item-CVI (Table 1). The results of the EFA are shown in Table 2. The mean age of the participants in the EFA sample (n=808) was 40.4 years (SD±14.6). Approximately half of the participants were male (51.4%), more than half of them were married (58.7%), and 40.5% had a college degree. The mean age of participants in the CFA sample (n=300) was 37.2 years (SD±12). More than half of the participants were female (57%), approximately half were married (52%), and three-fifths had a college degree (59%).

EFA results showed a KMO measure of 0.916, which indicates that the data were appropriate for this analysis. Bartlett's test of sphericity yielded a significant result ($p<0.001$),

indicating that correlations exist among the scale dimensions. Results of the first step of EFA showed a structure with three factors.

In the next stage, Item 1 (“*In public places where smoking is legally prohibited, I follow the rules*”) was removed from the scale because there were fewer than three loaded items for a single factor. Parallel analysis supported retaining two factors. Factor analysis was continued with 13 items, where the value of the loading for three other items (Items 3, 5 and 8) was < 0.4 and so they were removed from the scale. Finally, the EFA results demonstrated a structure consisting two factors with eigenvalues greater than 1.0 and a cumulative variance of 63.34% (Table 2). Results of CFA confirmed two factor model with good psychometric properties. The identified factors were named traffic laws (TLs) comprising three items and general laws (GLs) comprising seven items (Figure 2). Psychometric properties of the two-factor PLATS are shown in Table 3. Model fit estimates showed good to excellent results (CFI: 0.96, CMIN/DF: 2.340, SRMR: 0.053, RMSEA: 0.067, PCLOSE: 0.080). Moreover, both subscales showed suitable internal consistency, composite reliability, and construct validity: (General laws: Cronbach’s alpha: 0.883, McDonald’s omega: 0.884, AVE: 0.538), (Traffic laws: Cronbach’s alpha: 0.779, McDonald’s omega: 0.784, AVE: 0.548).

According to the Spearman rank correlation coefficient, there was a positive correlation between participants’ PLATS scores and safe COVID-19 behavior scores ($r = 0.564$; $p < .001$), indicating that a greater tendency to abide by public regulations was positively associated with more adherence to a generally recommended health behavior. The result of the known-groups validity evaluation showed the scale could differentiate well between those with a college degree and those with high school or lower education ($p < .001$). There was no statistically significant gender difference between males and females with regard to PLATS scores ($p = 0.768$). There was

a high correlation between the one-item question “*I follow public laws as much as I can*” with the total PLATS score ($r=0.644, p<.001$), indicating good convergent validity. Additionally, the total PLATS score had a negligible correlation (Mukaka, 2012) with the irrelevant item (*I have easy access to healthcare facilities*), indicating appropriate divergent validity ($r=0.148, p=0.05$).

Discussion

Based on the present limited literature on the concept of being law-abiding as well as feedback from the expert panel members and lay people in the development phase, a scale for assessing the law-abiding tendency was successfully developed (i.e., Public Law-Abiding Tendency Scale [PLATS]). The present study outlined the development and preliminary validation of the PLATS, as a self-report scale designed for assessing law-abiding tendencies. Generally, the results indicated that the PLATS showed good psychometric properties, as evidenced by measures of composite reliability, internal consistency, construct validity, convergent validity, and discriminant validity.

In the content validity evaluation phase, two items (Item 13 and Item 16) were discarded. Item 13 did not achieve adequate CVR by the expert panel, probably due to the fact that in most countries there is no enforceable rule or social punishment to warn or punish individuals who spit in public places. Also, Item 16 was deleted due to low clarity and relevancy of the item. Additionally, EFA did not support the inclusion of Items 1, 3, 5 and 8. Item 1 (smoking in public places) tended to be loaded on a single factor and was therefore removed. Removing these aforementioned items significantly improved the model fit measures. Sequential item reduction using exploratory factor analysis showed that items on traffic laws tend to be loaded on a separate factor and parallel analysis confirmed that the scale best fitted into two factors. The final scale

included 10 items which appear to be widely accepted public regulations in most civilized countries.

Traditionally, societal and rational approaches have been used to explain reasons for motivations of compliance and obeying the law (Kuiper et al., 2023). In the societal approach, individuals are conceived as members of social groups and the society. Therefore, they largely unconsciously accept obeying the laws (irrespective of situations and content of specific laws) because they are perceived as social norms, which are values, norms, customs and moral standards of that society/ social group (March & Olsen, 2006). Based on the rational (deterrence) approach, individuals estimate the benefits and the expected sanctions of following or breaking the law. In this approach, sanctions play a crucial role and factors such as information, attitudes toward risk, and the perceived probability and size of sanctions are major issues (Pratt et al., 2014).

According to the Tyler (1990), procedural justice of law is the key factor in law-abiding behavior. Tyler argues that a deterrence model of legal authority is neither adequately effective, nor guarantees long-term commitment of the public to the law. Therefore, fairness of procedures, rather than sanctions, strengthen the social bonds between individuals and authorities, and promotes normative modes of compliance that are more stable and sustainable in long run (Tyler et al., 2014). The present authors' view in developing the items of the PLATS for assessing law-abiding tendency was mainly based on the Tyler's theory, because despite diversity of the rules in different countries, ideas about fairness of laws are roughly the same in most cultures and societal arrangements.

Moreover, procedural fairness can enhance public trust and compliance with health recommendations during national and global crises. It has been shown that low and high trust in governmental authorities can decrease or increase compliance with control policies during large-

scale outbreaks and pandemics (Prati et al., 2011; Blair et al., 2017). According to the present study findings, there was a significantly positive association between individuals' public law-abiding tendency (assessed using the PLATS) and their self-reported safe COVID-19 practices. The COVID-19 pandemic was a good example of how people's behavior with respect to public health-related regulations could affect the society as whole. Additionally, some of the public laws, directly or indirectly, can affect people health (Burriss et al., 2010). For example, cigarette smoking in public places can negatively impact other people's health through passive inhalation of smoke. Therefore, obeying smoking bans in public places would be beneficial to all society (Cao et al., 2015). Ideally, the legitimacy of legal authorities and acceptability of laws to people will result in good compliance with all the rules. Encouraging a law-abiding lifestyle, including both non-health and health-related laws, may prepare society for emergency situations such as natural disasters and pandemics (Moulton et al., 2003).

The present authors believe that the new scale appears to be a reliable and valid tool for assessing the law-abiding tendency of individuals. It could also provide a basis for further studies on this topic and be used as a benchmark for comparison in potential future research on law-abiding tendencies. The resultant model showed a robust structure with good reliability and validity indices. Moreover, the results of convergent, divergent, and known-groups validity evaluations showed that the scale corresponded well with the main expected goal of the study and was able to differentiate individuals with different levels of law-abiding tendency. Therefore, the PLATS has the potential for future use to explore psychosocial factors associated with adherence to social regulations.

The PLATS is a brief scale with 10 items, so it takes little time for individuals to complete. The scale has potential implications for researchers from various disciplines such as psychology,

sociology, public health, and urban sciences to compare law-abiding behaviors of various community subgroups and their deviations from the average of the general population, so that the correlates of such behaviors can be clarified in each subgroup. In addition, it may provide a useful benchmark for researchers of political sciences and law decision-makers to identify which specific laws are more likely to be accepted and followed by individuals. The association between PLATS scores and health behaviors need to be confirmed in future studies, and may be useful in developing strategies to promote positive health-related behaviors.

Limitations

There were some limitations to the present study that should be noted. The present study was conducted in one city of one country, and participants were recruited through convenience sampling. These sampling issues may compromise generalizability. The study population appears to have been more law-abiding than expected. This may be due to factors such as the type of sampling (convenience), high average age (mean age 37 years), and high educational level of the participants. Additionally, individuals often evaluate themselves more favorably than their peers (Zell et al. 2020) and there is tendency to underreport socially undesirable attitudes and behaviors and to over-report more desirable attributes (Latkin et al., 2017). Therefore, it is recommended that specific scales are used, such as Marlowe-Crowne Scale (Crowne & Marlowe, 1960), to identify the potential social desirability bias in related studies (Barger, 2002). Also, future research on the association between the PLATS score and the scores on Big Five personality scales would be helpful to understand how personality traits are associated with compliance with general public laws.

Assessing public law-abiding behaviors is conceptually challenging and diversity of public laws throughout the world makes it difficult to cover all aspects of the issue. However, the present study developed a brief scale that consisted of items which are supposed to be legal in most parts of the world. Regarding some items, individuals might not have ever experienced specific situations (for example, some individuals might never have driven a car). However, since the overall goal of the scale was to assess law-abiding tendency, individuals could assess the items according to their opinions and beliefs toward that specific item based on their previous observations in their daily life, even though they may have not had any personal experience with that situation.

The present study was based on a sample of adults from general population. Therefore, it was unable to compare specific population subgroups who have a greater tendency to disobey the law, such as substance addicts, prisoners and individuals with antisocial personality disorder. To the best of the present authors' knowledge, there is no gold standard test for evaluating law-abiding behaviors. Therefore, the criterion validity of the PLATS could not be tested. Nevertheless, assessment of known-groups validity confirmed that the scale could discriminate between groups that are known to differ in their law-abiding tendency (i.e., those with or without a university degree). Due to limited religious and racial diversity in Iran (i.e., almost all of the population is Muslim), these variables were not evaluated as influencing factors. Further cross-country and within-country studies are needed to validate the PLATS in diverse language and cultural contexts.

Conclusion

The present study's findings suggest that the PLATS is a promising new measure for the assessment of law-abiding tendency among the general public. Preliminary evaluation of the

PLATS indicated robust psychometric properties although further research with other cultures and validity measures is warranted. Development and validation of appropriate measurement tools are critical for expanding research on social and behavioral sciences. Looking for correlates of public law-abiding tendency may contribute to development of strategies for promotion of positive collective behaviors within societies, especially in critical circumstances such as natural disasters, epidemics, and pandemics.

Abbreviations

PLATS: Public Laws-Abiding Tendency Scale

CVR: Content validity ratio

CVI: Content validity index

S-CVR: Scale-level content validity ratio

S-CVI: Scale-level content validity index

ICC: Intra-class correlation

EFA: Exploratory factor analysis

CFA: Confirmatory factor analysis

KMO: Kaiser-Meyer-Olkin

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Table 1. Decisions on Retaining or excluding primary items suggested for PLATS after face validity evaluation phase.

Item questions	Corrected item-total correlation	Decision	Reason for exclusion
Q1: In public places where smoking is legally prohibited, I follow the rules.	0.569	Excluded	< 3 items loaded on a single factor in EFA
Q2: Using mobile phone while driving is legally prohibited, I follow the rules.	0.463	Retained	-
Q3: In places (like protected areas of natural or cultural values) where entrance is legally prohibited, I follow the rules.	0.562	Excluded	Low factor loading in EFA
Q4: On roads where there is a driving speed limit, I follow the rules.	0.550	Retained	-
Q5: In situations where wearing a seat belt is mandatory for car passengers, I follow the rules.	0.602	Excluded	Low factor loading in EFA
Q6: In places where parking is not allowed, I follow the rules.	0.528	Retained	-
Q7: In public places (like public museums) where eating and drinking are banned, I follow the rules.	0.608	Retained	-
Q8: On pedestrian crossings where there are signals telling individuals when they can cross the road, I follow the rules	0.555	Excluded	Low factor loading in EFA
Q9: Damaging public property is legally prohibited, I follow the rules.	0.681	Retained	-
Q10: Physical fights and violent behaviors are legally banned, I follow the rules.	0.638	Retained	-
Q11: In places (like hospitals and libraries) where speaking loudly is not allowed, I follow the rules.	0.568	Retained	-
Q12: When people are standing in a queue, jumping the queue is not allowed, I follow the rules.	0.576	Retained	-
Q13: Spitting in public places is not allowed, I follow the rules.	-	Excluded	Low item-CVR
Q14: Throwing litter in public places is not allowed, I follow the rules.	0.593	Retained	-
Q15: Making too much noise that could disturb neighbours is not allowed, I follow the rules.	0.608	Retained	
Q16: Blowing unnecessary horns in the streets is not allowed, I follow the rules.	-	Excluded	Low item-CVI

EFA: exploratory factor analysis, CVR: content validity ratio, CVI: content validity index

Table 2. Results of exploratory factor analysis of the 10 items PLATS.

Dimension variables	Mean item score (\pm SD)	Factor loading	Eigen value	Variance explained	Cumulative variance explained
Factor 1: General laws (GL)			4.724	47%	47%
GL1: In public places (like public museums) where eating and drinking are banned, I follow the rules.	3.22 \pm 0.85	0.640			
GL2: Damaging public property is legally prohibited, I follow the rules.	4.53 \pm 0.62	0.816			
GL3: Physical fights and violent behaviors are legally banned, I follow the rules.	4.46 \pm 0.68	0.779			
GL4: In places (like hospitals and libraries) where speaking loudly is not allowed, I follow the rules.	4.07 \pm 0.62	0.803			
GL5: When people are standing in a queue, jumping the queue is not allowed, I follow the rules.	4.45 \pm 0.46	0.866			
GL6: Throwing litter in public places is not allowed, I follow the rules.	4.51 \pm 0.39	0.796			
GL7: Making too much noise that could disturb neighbours is not allowed, I follow the rules.	3.43 \pm 0.65	0.640			
Factor 2: Traffic laws (TL)			1.610	16%	63%
TL1: Using mobile phone while driving is legally prohibited, I follow the rules.	4.15 \pm 0.68	0.879			
TL2: On roads where there is a driving speed limit, I follow the rules.	4.08 \pm 0.79	0.860			
TL3: In places where parking is not allowed, I follow the rules.	3.87 \pm 0.72	0.762			

Table 3. Scale level psychometric properties of 10-items PLATS.

Psychometric index	Value	Acceptable cutoff
Goodness of fit index (GFI)	0.947	> 0.90
Comparative fit index (CFI)	0.960	> 0.95
Minimum Discrepancy Function by Degrees of Freedom divided (CMIN/DF)	2.340	Between 1 and 3
Standardized Root Mean Square Residual (SRMR)	0.053	< 0.08
Root-mean-square error of approximation (RMSEA)	0.067	< 0.08
Composite reliability (CR)	0.858	> 0.7
Average variance extracted (AVE)	0.541	> 0.5
Content validity ratio (CVR)	0.934	> 0.5
Content validity index (CVI)	0.993	> 0.8
Internal consistency (Cronbach's α)	0.862	> 0.7

Figure 1. Development steps of the Public Law-Abiding Tendency Scale (PLATS)

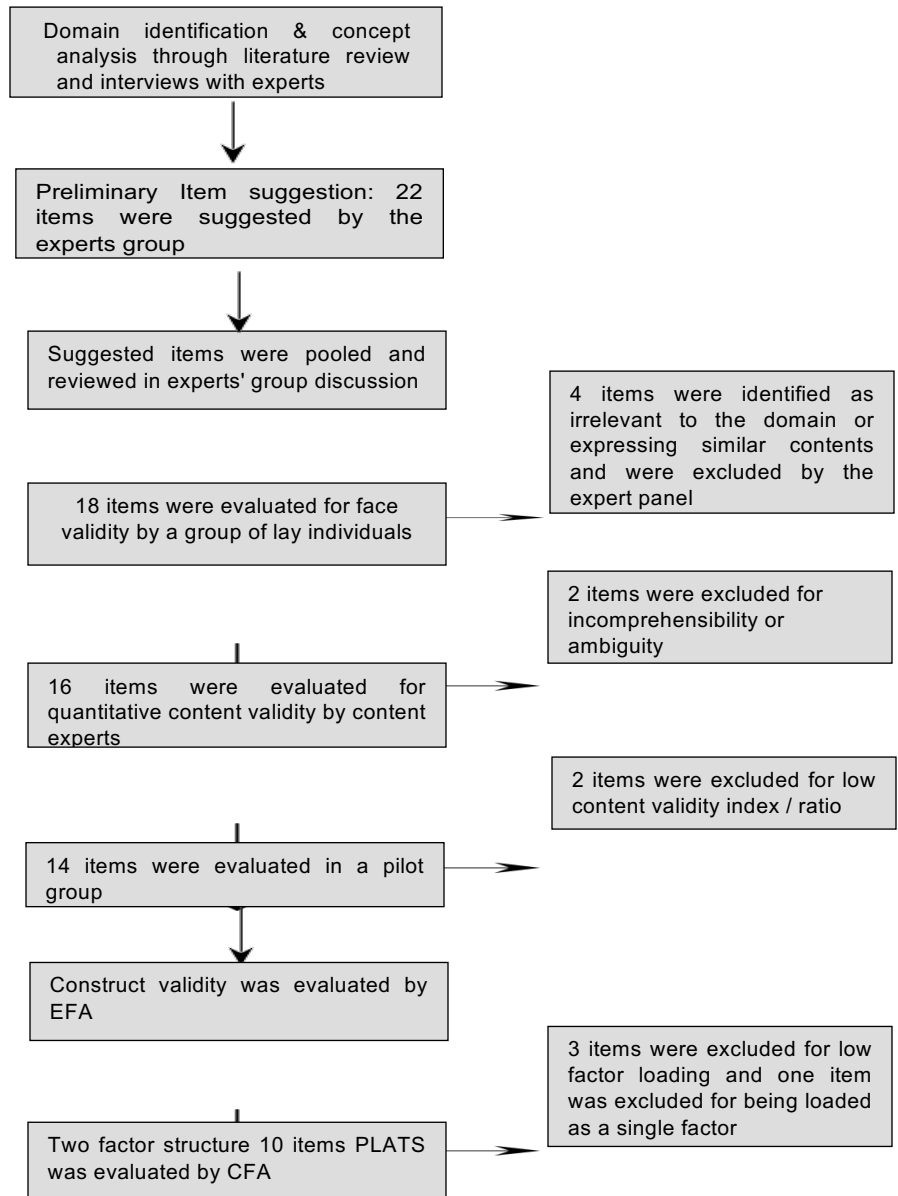


Figure 2. Results of confirmatory factor analysis including standardized regression weights and R-squares of two factors PLATS structure: General laws (GL) and Traffic laws (TL). (n=300)

